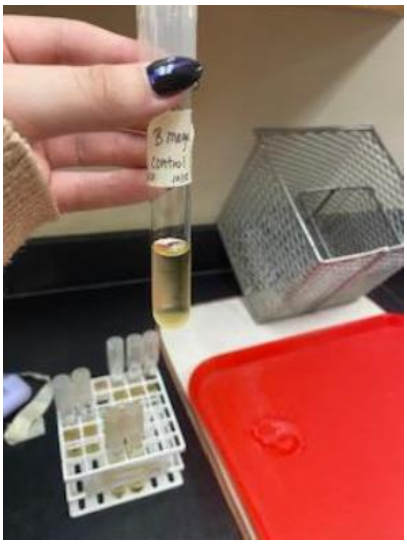
Undergraduate Research Experiences Completed by

St. Petersburg College Students

2022 Student Research Projects and Inaugural Symposium



SPC St. Petersburg College

URE UNDERGRADUATE RESEARCH EXPERIENCE SYMPOSIUM

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About the Undergraduate Research Experiences Report

In 2018 St. Petersburg College (SPC) developed and implemented a model to provide interested STEM students with paid Undergraduate Research Experiences (UREs) facilitated by faculty in their field of interest. The URE implementation was made possible by The Tampa Bay Bridge to the Baccalaureate (TB-B2B) Program, which was grant funded by the National Science Foundation (NSF) as part of the Louis Stokes Alliance for Minority Participation (LSAMP).

Over the ensuing years, student and faculty interest in UREs has continued to increase. In 2021 building on this success, SPC initiated a collegewide expansion and began offering paid UREs to first generation students, in both STEM and non-STEM fields.

In fall 2022, the SPC Foundation awarded a grant to further promote the expansion of paid UREs collegewide and to conduct the Inaugural Undergraduate Research Symposium, a collegewide event.

Students' final reports for each URE completed by first generation students during 2022 are contained within this publication.

Report Overview

Prior to the start of each semester in 2022, first generation students were informed that 8-week research opportunities within their undergraduate major were available during the following semester, and included a paid stipend of $250. Interested students were provided the name of a professor in their field, and were directed to schedule a meeting with the professor to discuss their research interests. Once a student agrees to start a project, the professor updates the URE Commitment and Agreement form with the project details and the form is signed by both. A sample form is provided in Appendix A.

Fourteen SPC first generation students participated in 8-week UREs within their field of interest during 2022. Students received their stipend after all research project requirements were met at the conclusion of the eight weeks, including the completion of a final report. UREs included research projects in five categories, Biology, Ecology, Microbiology, Psychology, and Technology.

Upon completing a URE, students were surveyed to measure their perspective about the impact the UREs had on them, and assist the college to continuously improve. The survey was adapted from the Community College Undergraduate Research Initiative (CCURI), and the Undergraduate Research Student Self-Assessment (URSSA) from the University of Colorado, and with their permission, we removed a few questions that were not applicable to our URE model. The survey consists of six categories: 1. GAINS IN THINKING AND WORKING LIKE A SCIENTIST; 2. PERSONAL GAINS RELATED TO RESEARCH WORK; 3. GAINS IN SKILLS; 4. OVERALL RESEARCH EXPERIENCE AND CHANGES IN ATTITUDES OR BEHAVIORS AS A RESEARCHER; 5. ACADEMIC AND CAREER IMPACT; 6. INTENT TO PURSUE MORE HIGHER EDUCATION DUE TO RESEARCH. Each category contains 4 to 8 question that align to specific aspects related to the category.

About the Undergraduate Research Experiences Report (continued)

Over fifty students have completed paid UREs at SPC collegewide, and their research projects are featured on the college website at: Student Research. Five annual URE publications are available on the site beginning with 2018. Each booklet includes the final research reports submitted by student researchers each year.

SPC's Inaugural Undergraduate Research Experiences Symposium was held in fall 2022, and featured 22 student researchers alongside their poster presentations, which encompassed the fields of Biology, Ecology, Health Science, Microbiology, Psychology, Public Policy, Social Science, and Sustainability. Student researchers and faculty mentors are featured on the college website at: Symposium

Funding for first generation student researchers, and for SPC's Inaugural Undergraduate Research Experiences Symposium was provided by the SPC Foundation.

Undergraduate Research Experiences (UREs)

Listed below are the names of fourteen first generation students who completed paid UREs with guidance from St. Petersburg College professors in five disciplines, and submitted their final reports contained within this document.

Biology URE conducted with Professor Ray Menard, PhD

- Faith Parlapiano *Determining the Efficacy of the Olaplex Hair Products*

Ecology UREs conducted with Professor Erin Goergen, PhD

- Frank Reiter *Effect of Substrate on Germination and Growth of Crop Plants*
- Alexandra Acuna *Insect Diversity in an Urban Garden*

Microbiology UREs conducted with Professor Shannon Ulrich, PhD

- Kaitlyn Haynes *Can DNA and/or RNA be used as an indicator of freshness with iceberg lettuce?*
- Vanessa Almodovar *Are the ingredients for the proteins (chicken, lamb, turkey) on dog food labels accurate?*

Psychology UREs conducted with Professor Sharon Olsen, MA

- Emily Vandermeir and Rafael Guilarte Ramirez *Living the College Experience Through a Computer Screen*
- Storme Quinn *Problematic Social Media Use: Identifying Trends of Problematic Use Amongst Frequent Users*
- Melina Korovessi *Reaction Times and Cognition: An Investigation of the Stroop Effect*

Psychology URE conducted with Professor Rebekah Barnett, PhD

- Tyler M. Bauer *Rebranding bullying in the United States in an effort to stigmatize the bully not the victim*

Psychology URE conducted with Professor Janice Kicklighter, MA

- Caleb Elliott *Male abusers in traditional relationships: Why is it so prevalent?*

Psychology UREs conducted with Professor Kimberly Molinaro, MEd

- Alexis VandePol *Earliest Verifiable Childhood Memory Variations Among Deaf and Hearing Populations*
- Melina Crowder *College Student Stressors and Coping Mechanisms*

Technology URE conducted with Professor Chad Mairn, MLIS

- Endrit Ngjelina *The Building, Use and Importance of Intelligent Cameras in the 21st Century*

Undergraduate Research Experiences (UREs) Survey Results Highlights

The URE survey was administered to fourteen students who completed UREs in 2022, and eight responded resulting in a 57% response rate. As of fall 2022, students must complete the survey before receiving their stipend. Below are some survey results highlights.

I. GAINS IN THINKING AND WORKING LIKE A SCIENTIST: APPLICATION OF KNOWLEDGE TO RESEARCH WORK: How much did you GAIN as a result of your URE:

Percent of respondents who reported 'Great Gain' or 'Moderate Gain'

- Understanding the theory and concepts guiding my research project: 100%
- Analyzing data for patterns: 100%
- Understanding the relevance of research to my coursework: 100%

II. PERSONAL GAINS RELATED TO URE:

Percent of respondents who reported 'Great Gain' or Moderate Gain'

- Developing patience with the slow pace of research 100%
- Comfort in discussing scientific concepts with others: 88%
- Confidence in my ability to do well in future science courses: 88%

III. GAINS IN SKILLS: How much did you GAIN as a result of your URE:

Percent of respondents who reported 'Great Gain' or Moderate Gain'

- Writing scientific reports or papers: 100%
- Understanding journal articles: 100%
- Conducting database or internet searches: 86%

Percent of respondents who 'Strongly Agree' or 'Agree' with the following statements:

- Doing research confirmed my interest in my field of study: 86%
- Doing research clarified for me which field of study I want to pursue: 71%
- My URE has prepared me to transfer from a 2-year to a 4-year institution: 57%

IV. Compared to your intentions BEFORE doing research, HOW LIKELY ARE YOU NOW to:

Percent of respondents who are now 'Extremely More Likely' or 'Somewhat More Likely' to:

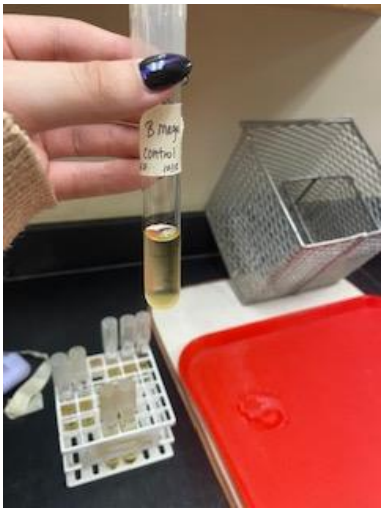
- Complete your Bachelor's degree in science, mathematics, or engineering? 86%
- Transfer to a 4-year institution? 71%
- Complete your Associates degree? 57%

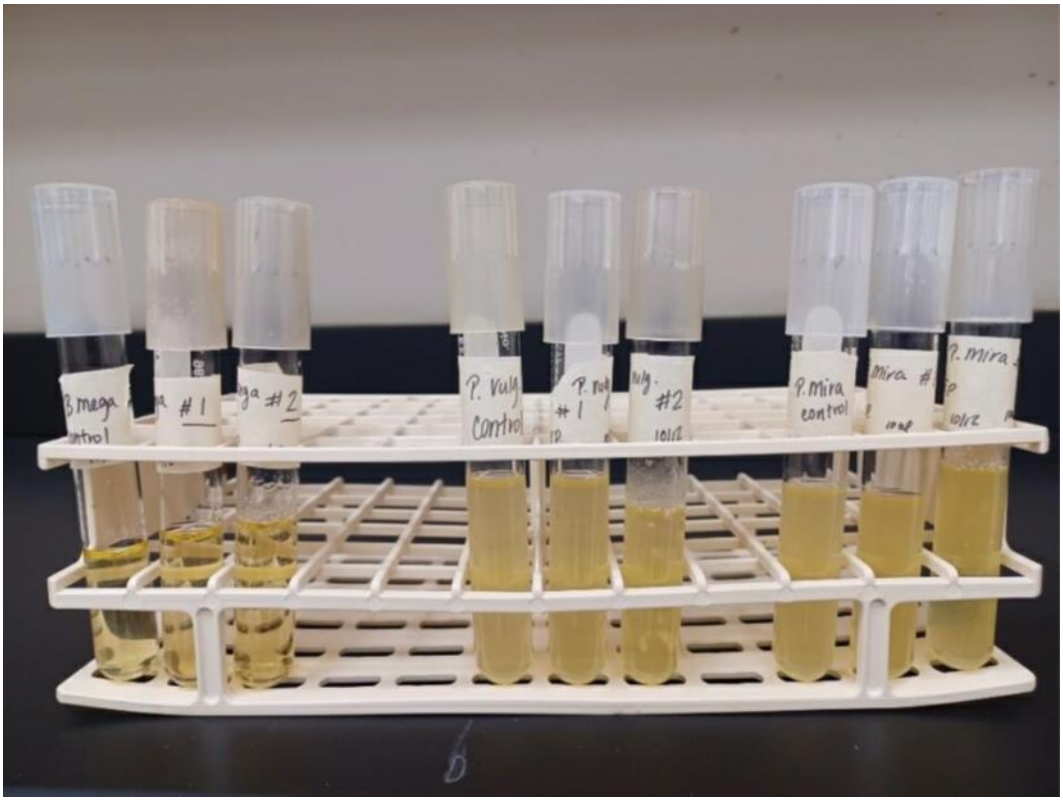
Student Comments

- "I will use this on my transcript when I apply to medical schools."
- "Personally, I think that it is a beautiful thing to see when you find yourself going the extra mile, or getting engulfed by information that you are excited about!"
- "This experience has made me enjoy and learn about the process of research and science. For my future career I plan to become a psychologist and this research has helped me to get more excited about my future plans and I'm no longer as nervous as I used to be to do research in a graduate school!"
- "My research experience led to positive experiences, knowing that I want to work in a preserve, the diversity experiment helps me understand the differences in areas and how to keep track of them."

Source: This survey was adapted from the Community College Undergraduate Research Initiative (CCURI), and the Undergraduate Research Student Self-Assessment (URSSA) from the University of Colorado.

Biology Research Project





St. Petersburg College Student Research Report

Name: Faith Parlapiano **Professor:** Dr. Raymond Menard, PhD

Date: 12/12/2022

Responsibilities:

- Attend weekly meetings on Thursday for 8 weeks
- Perform research and experiment with the Olaplex hair care line, specifically products No. 1 and No. 2, and their effect on both hair strands and bacterial growth
- Complete a report of research and experiment

Weekly Schedule and Data Reports:

Week 1:

Met with Dr. Menard in person to discuss research ideas, how to go about testing Olaplex products, and complete any necessary forms for the project.

Week 2:

Dr. Menard and I started bacterial inoculations in preparation for the experiment. The bacteria we inoculated and incubated were as follows: *Bacillus megaterium*, *Proteus vulgaris*, and *Proteus mirabilis*.

Week 3:

Dr. Menard supervised while I made the necessary media for the experiment. The media included Nutrient agar plates, DNase agar plates, MHA agar plates, and LB broths.

Week 4:

Three separate groups were organized with 3 LB broths in each, totaling 9 tubes. One group consisted of three broths inoculated with *Bacillus megaterium.* The second group consisted of three broths with *Proteus vulgaris.* The third group consisted of three broths with *Proteus mirabilis*. One tube in each group was labeled "control" and was incubated at 37 degrees Celsius for 24-48 hours with no additional product. Another tube in each group was labeled "No. 1". These tubes each had approximately 10µl of Olaplex No.1 added to each. Finally, the third tube in each group was labeled "No. 2" and had approximately 10µl of Olaplex No.2 added to each. All tubes were then incubated at 37 degree C for 24-48 hours.

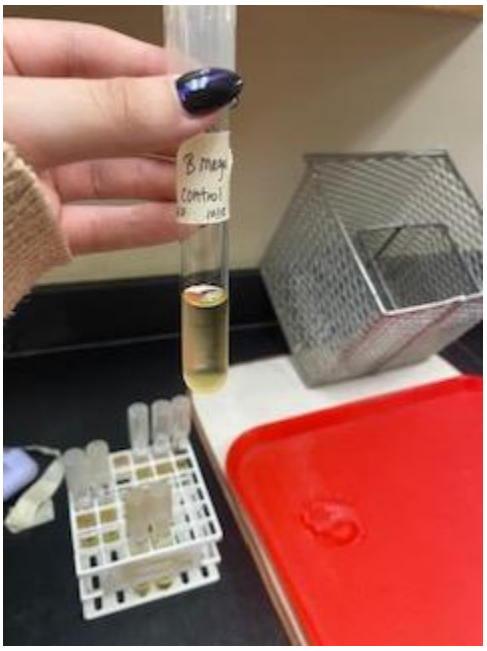


Figure 1: *Bacillus megaterium* - control

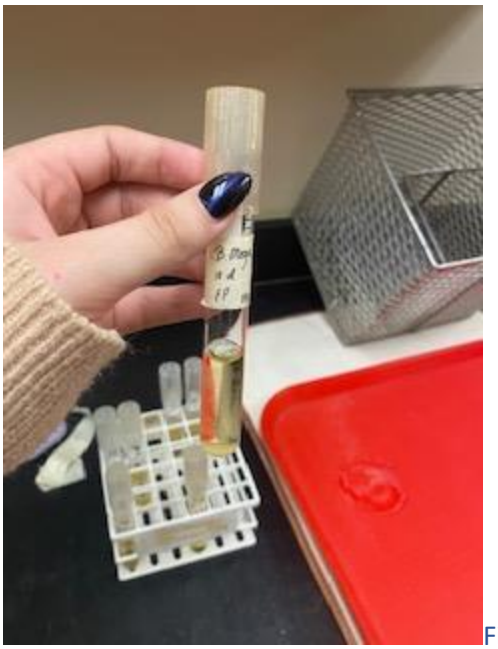


Figure 2: *Bacillus megaterium* with Olaplex No.1

Figure 3: *Bacillus megaterium* with Olaplex No. 2

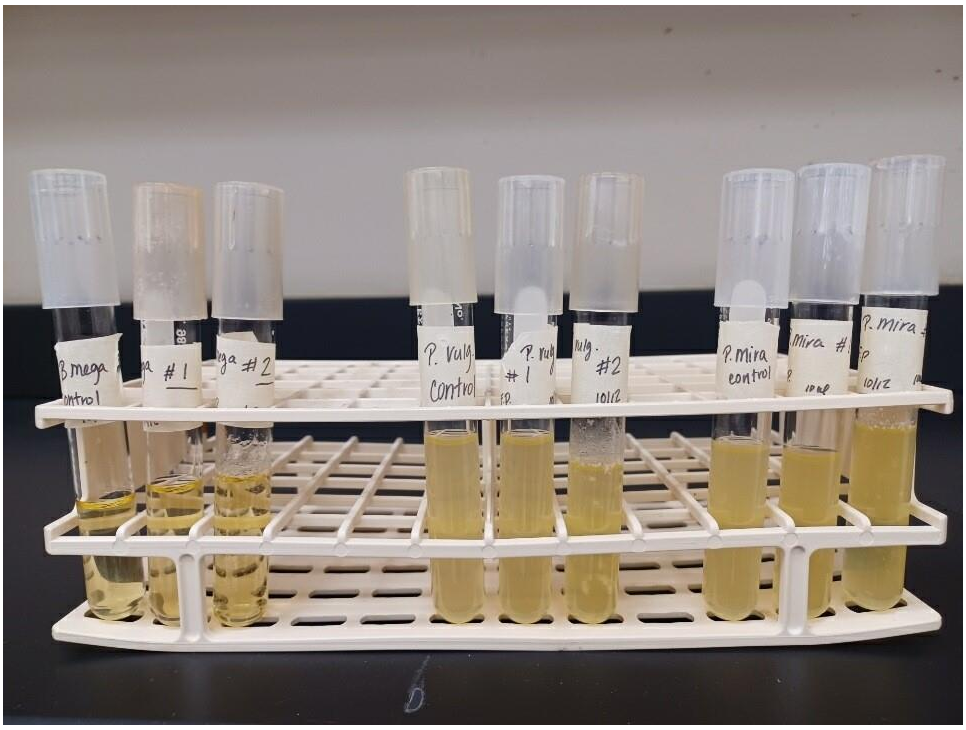


Figure 4: *Bacillus megaterium, P. vulgaris,* and *P. mirabilis* control, No.1, and No.2 after incubation.

Week 5:

In order to test how these samples would grow on different types of media, 9 NA plates and 9 DNase plates were quadrant streaked with approximately 10µl of each broth from Week 4. In total, there were 18 agar plates used in this step of the experiment. Three NA plates were used for each bacteria (the control, the No.1, and the No2) and three DNase plates were used for each bacteria (the control, the No.1, and the No.2). These plates were incubated at 37 degree C for 24-48 hours.

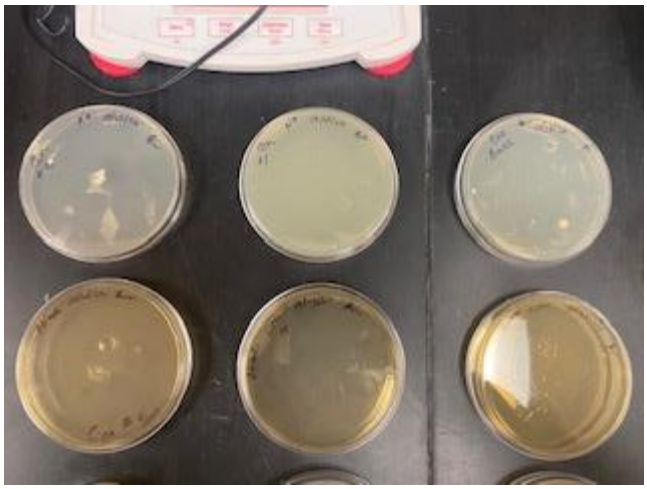


Figure 5: Top left – *B. megaterium* No.2, No.1, and control on NA plates

Bottom left – *B. megaterium* No.2, No.1, and control on DNase plates.

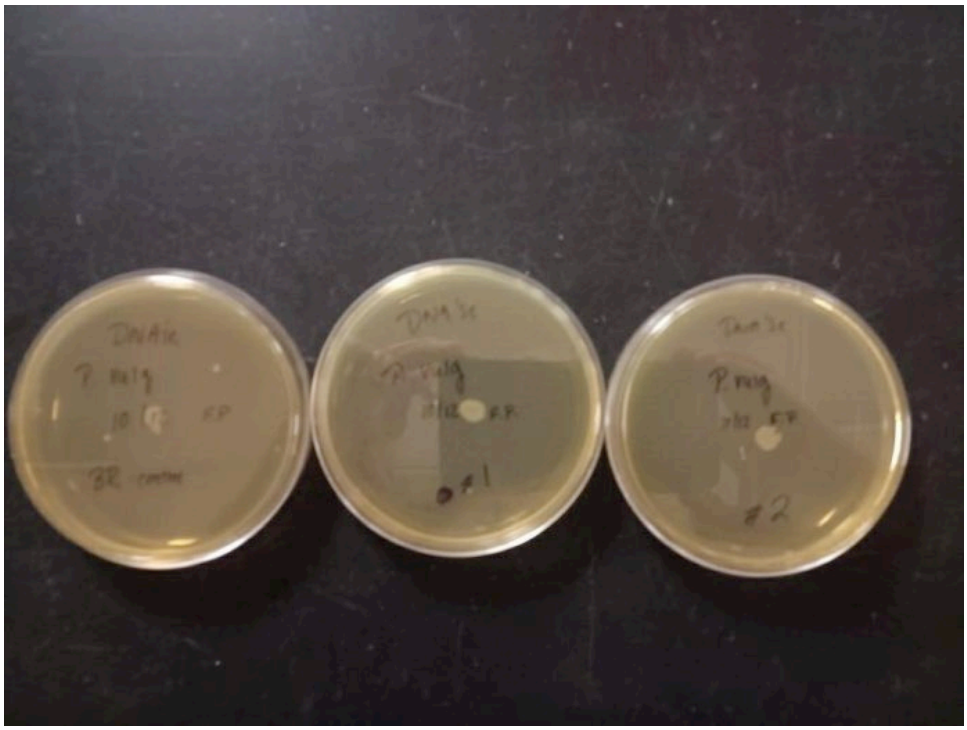


Figure 6: *P. vulgaris* on DNase plate (control, No.1, and No.2)

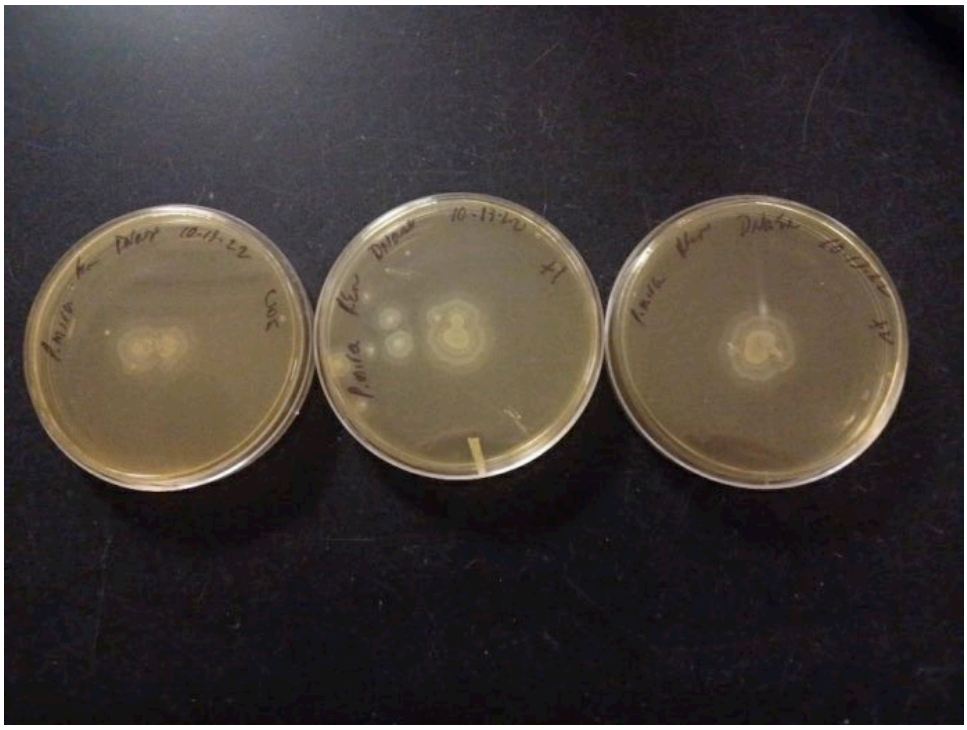


Figure 7: *P. mirabilis* on DNase plate (control, No.1, and No.2)

Notice Swarming

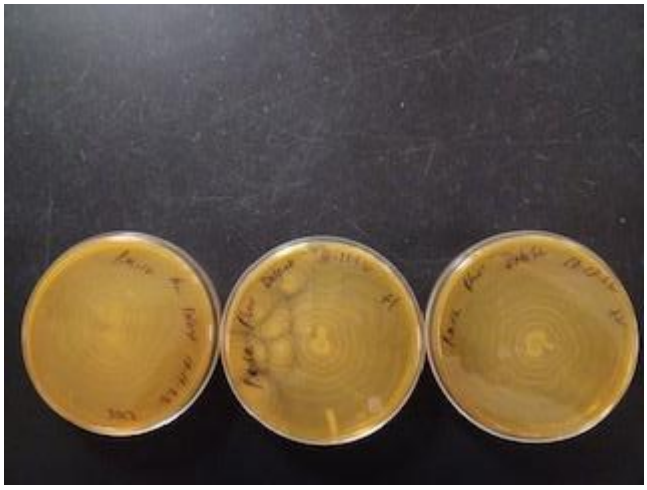


Figure 8: *P. mirabilis* on DNase plate (control, No.1, and No.2)

Notice Swarming

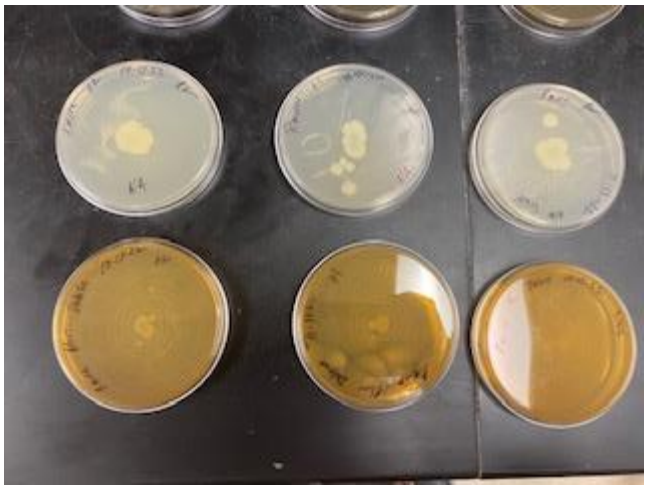


Figure 9: Top left – *P. mirabilis* No.2, No.1, and control on NA plate

Bottom left: - *P. mirabilis* No.2, No.1, and control on DNase plate

Notice Swarming

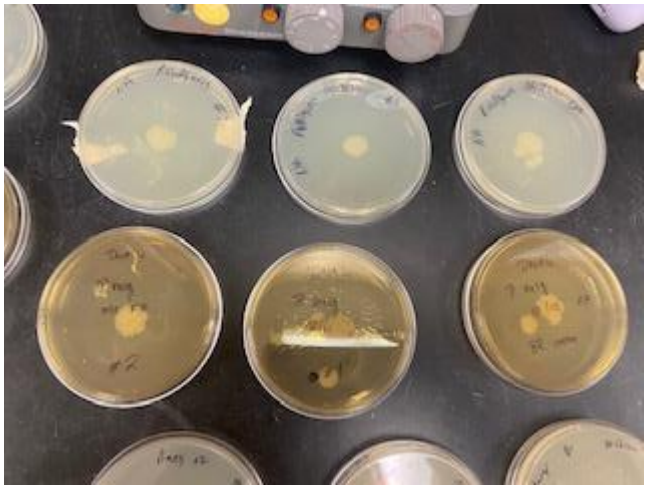


Figure 10: Top left – *P. vulgaris* No.2, No.1, and control on NA plate

Bottom left: - *P. vulgaris* No.2, No.1, and control on DNase plate

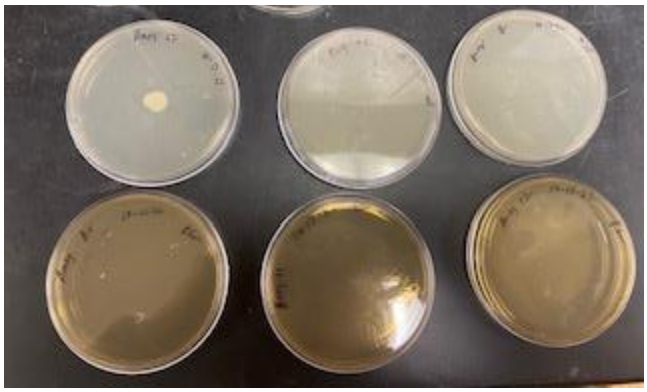


Figure 11: Top left - *B. megaterium* No.2, No.1, and control on NA plate

Bottom left – *B. megaterium* No.2, No.1, and control on DNase plate

Figure 12: Inoculated LB broths used for streaking plates, NA plates, DNase plates, and Olaplex No.1 and No.2

Week 6:

In order to determine if Olaplex had an effect on bacterial resistance or susceptibility, three MHA plates were prepared. Each plate was covered with *P. mirabilis.* The first plate was labeled as "Control" and no additional product was added to it. The second plate was labeled as "No.1" and had 1ml of Olaplex No.1 added to it. The third plate was labeled "No.2" and had approximately 1ml of Olaplex No.2 added to it. Antibiotic disks were dispensed on all three plates and were placed in an incubator at 37 degrees C for 24-48 hours.

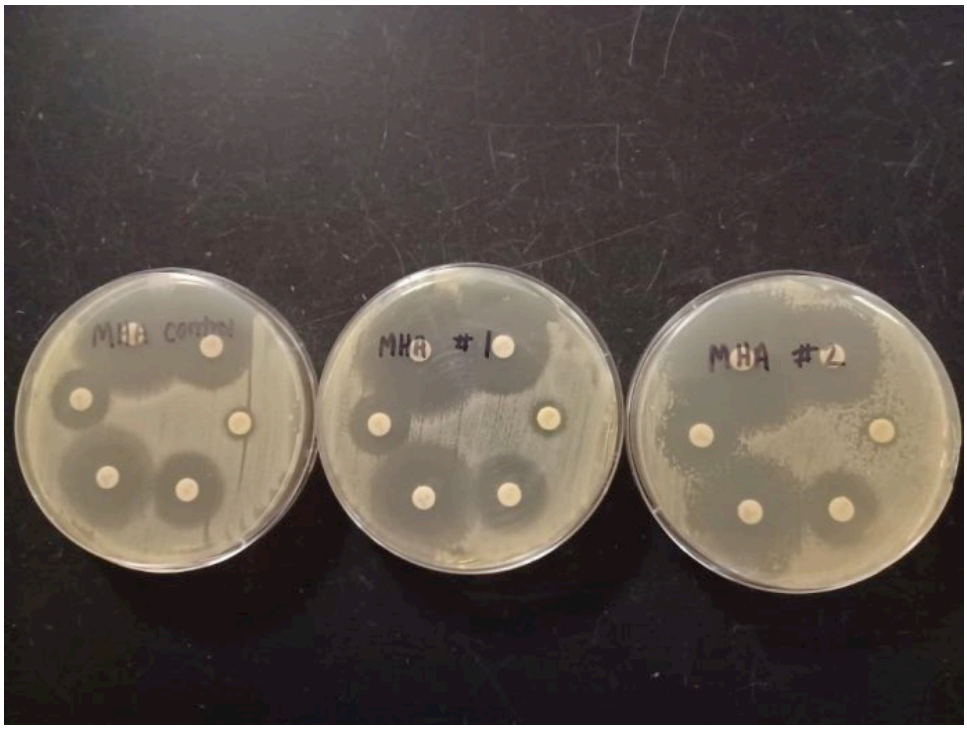


Figure 13: Antibiotic disks dispensed on MHA plates streaked with *P. mirabilis*

Week 7:

In order to test Olaplex's effect on damaged and non-damaged hair, four hair strands were plucked (two strands from each participant). One strand from each participant was added to a slide with DI water and were used as controls. The second strand from each participant was damaged with heat by waving a Bunsen burner striker through the flame of a Bunsen burner and then applying it to the hair in a similar manner that a hair straightener would be used to straighten hair with heat. Once both strands of hair had heat damage, they were mounted on a slide with water and placed under the microscope for analysis. After pictures had been taken of both the controls and the heat damaged strands, the heat damaged strands and the control strands were removed from the slides and place in a petri dish with Olaplex No.1 where they soaked for approximately 10 minutes. After soaking in the solution, the strands were mounted in DI water once again and placed under the microscope for comparison. (Note: Participant 2 has bleached/color treated hair while Participant 1 does not)

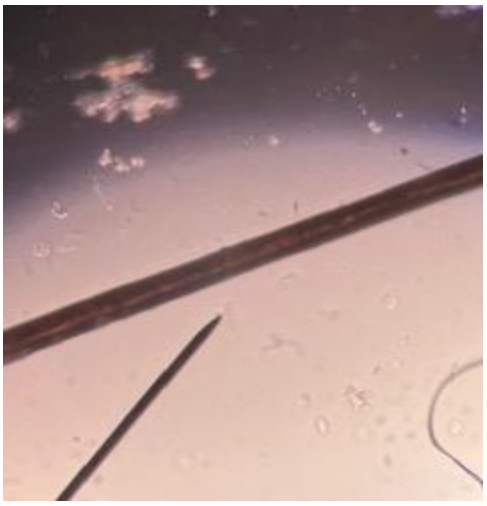


Figure 14: Participant 1 - Control (no product)

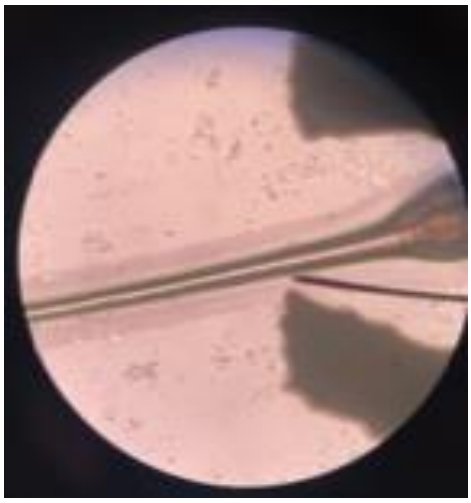


Figure 15: Participant 2 - Control (no product)

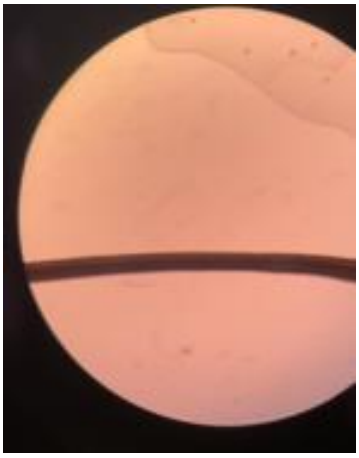


Figure 16: Participant 1 – Heat Damage (no product)

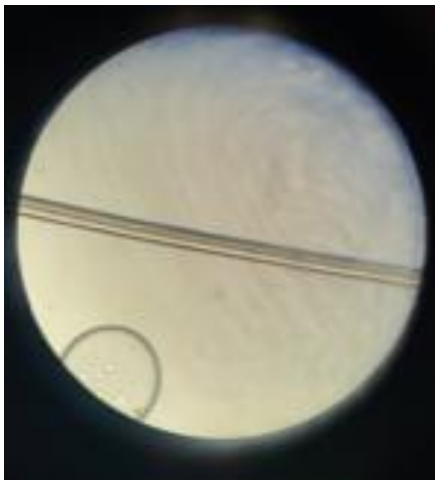


Figure 17: Participant 2 – Heat Damage (no product)

Figure 18: Participant 1 – Control (Olaplex)

Figure 19: Participant 2 – Control (Olaplex)

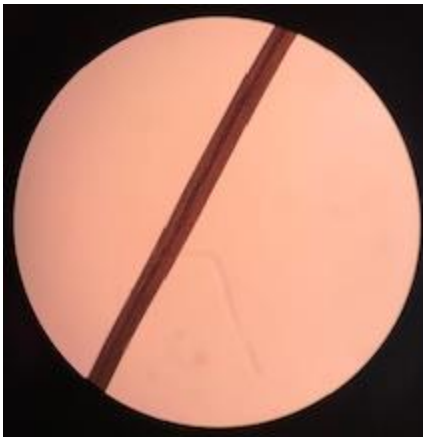


Figure 20: Participant 1 – Heat Damage (Olaplex)

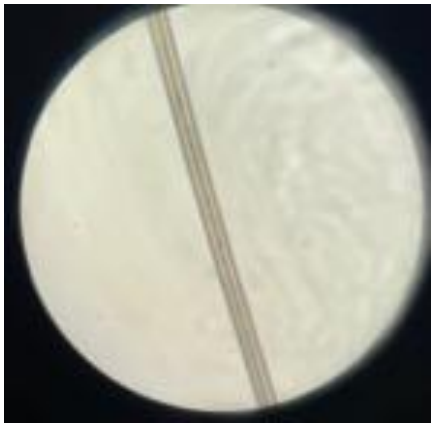


Figure 21: Participant 2 – Heat Damage (Olaplex)

Week 8:

To determine if temperature had an effect on growth of *P. mirabilis* with the Olaplex products added, 4 LB broths were inoculated, and 4 NA plates were quadrant streaked with the bacteria. Two of the LB broths and two of the NA plates were incubated at 37 degrees C and two of the LB broths and 2 NA plates were incubated at 42 degrees C. After determining that the 37 degree C broths and plates grew as normal but the plates at 42 degrees C did not, we decided to further test the 42 degree C incubation. Two new NA plates were quadrant streaked with *P. mirabilis*. One was labeled as "Control" and no additional product was added. The other plate was labeled as "No.1" and has a drop of Olaplex No.1 streaked with the *P. mirabilis*. Both plates were incubated at 42 degree C for an additional 24-48 hours.

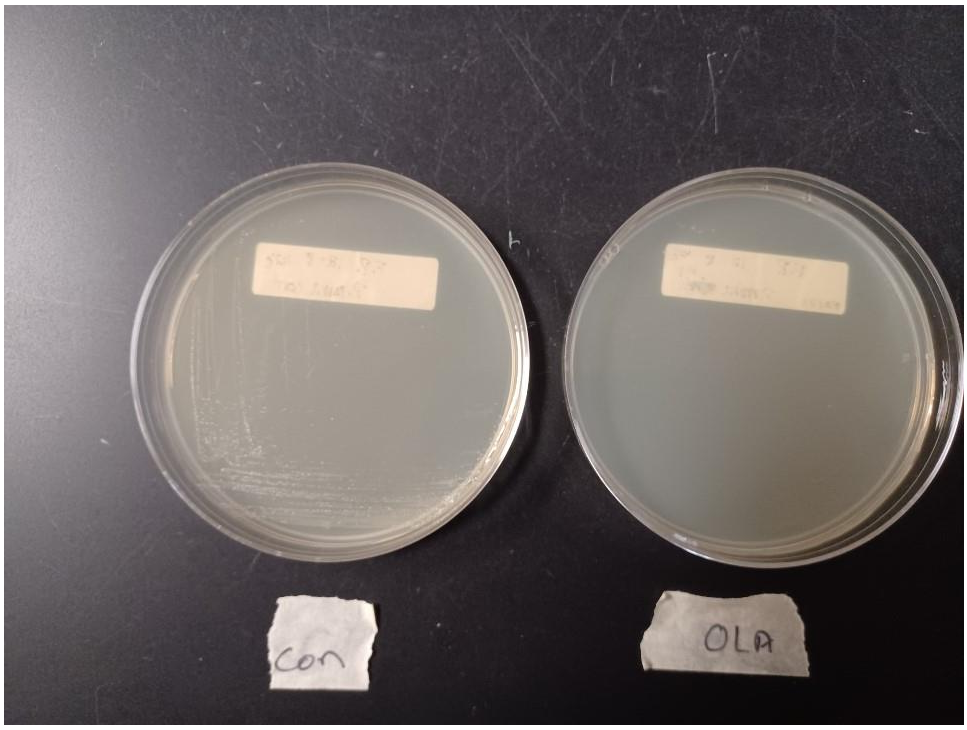


Figure 22: Left to Right – NA plate with *P. mirabilis* control, NA plate with *P. mirabilis* and Olaplex No.1. Both plates were incubated at 42 degrees Celsius for 24 hours.

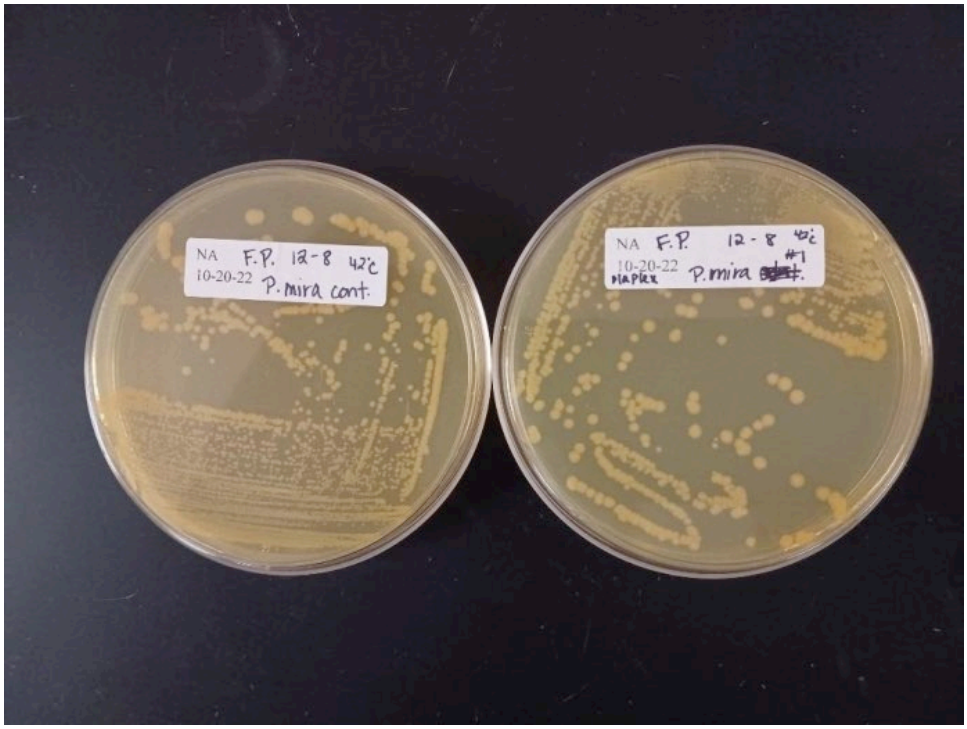


Figure 23: Left to Right – NA plate with *P. mirabilis* control, NA plate with *P. mirabilis* and Olaplex No.1. Both plates were incubated at 42 degrees Celsius for 48 hours.

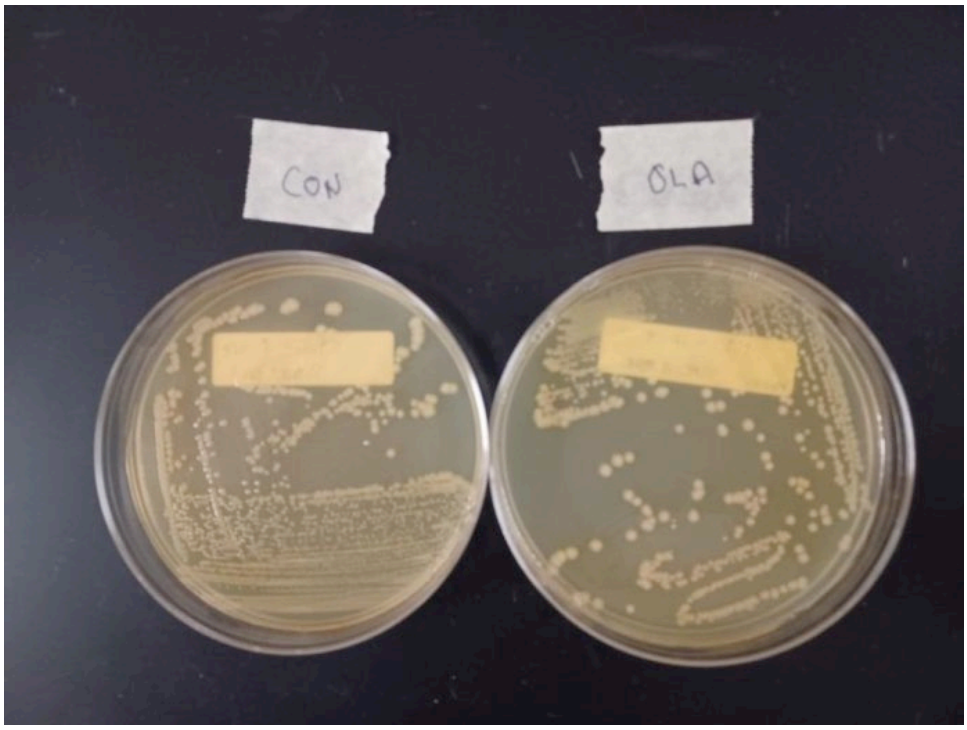


Figure 24: Left to Right – NA plate with *P. mirabilis* control, NA plate with *P. mirabilis* and Olaplex No.1. Both plates were incubated at 42 degrees Celsius for 48 hours.

Discussion and Conclusion:

Olaplex hair care claims to restructure broken disulfide sulfur bonds in the hair shaft in order to give the appearance of healthier hair. The entire line consists of over 10 products that can be used sequentially or on their own. The two products that were tested in this experiment were Olaplex No.1 and No.2, which are only for salon use and cannot be purchased by the general public. Permission was granted from U.B.U. Color Salon in Tampa and the products were purchased for this experiment. The key ingredient in all Olaplex products is called *bis-amonopropyl diglycol dimaleate (*Wong, 2018*).* Due to Olaplex No.1 and No.2 containing an extremely concentrated amount of this ingredient, these products are restricted to salon-use only (*What are Olaplex No 1 and No 2?,* n.d.*)*. However, the rest of the products in the line contain the same ingredients in smaller concentrations and are able to be purchased and used by the general public. Not only does Olaplex claim to repair damaged hair, but it also claims to prevent damage from occurring in the first place during color treatment processes and can be added to bleach and/or color (Wong, 2018).

The purpose of this experiment was to determine the efficacy of the Olaplex products when used on damaged hair strands, analyze the effects of Olaplex on hydrogen sulfide producing bacteria

such as *P. mirabilis (*Schaffer, 2015*)* and *P. vulgaris (Proteus vulgaris,* n.d.*),* determine the effect on antibiotic susceptibility and resistance, and to observe its effect on spore producing bacteria such as *Bacillus megaterium (Bacillus megaterium,* n.d.*).*

In week 4, it was noted that while all three types of bacteria grew, *P. mirabilis* and *P. vulgaris* grew superior compared to *B. megaterium* as seen in Figure 4. This could be due to the *B. megaterium* being from an older stock, as the control did not grow well either. When the bacterial broths were transferred to plates, once again *B. megaterium* did not grow as well as *P. mirabilis* and *P. vulgaris* on both the NA and DNase plates (Figure 5). It appears that neither Olaplex No.1 nor No.2 had any effect on the bacterial growth on any of the plates, thus it seems Olaplex did not aid the bacteria in sulfur production nor spore production. Swarming can be seen on the *P. mirabilis* plates (Figure 7, 8, & 9), which is to be expected with that bacterium (Schaffer, 2015).

As for its effect on antibiotic susceptibility and resistance, Figure 13 shows that there was little to no difference among the control, No.1, and No.2 plates. From this test alone, it seems as though Olaplex does not aid in bacterial resistance nor susceptibility.

The results obtained during week 7 were promising. As seen in Figures 14-21, it appears that Olaplex No.1 improved the overall appearance and texture of the damaged hair shafts, leading to the conclusion that Olaplex does contain some restorative properties.

In week 8, *P. mirabilis* grew on both the control and the Olaplex plates at 42 degrees Celsius in the second trial, but not the first. This is possibly due to the culture growing in broth prior to being transferred to the NA plate. In other words, a possible explanation for the *P. mirabilis* not growing properly on the first set of plates could be that the *P. mirabilis* did not have enough time to grow in the LB broth (log phase) prior to being streaked onto plates and incubated at a higher temperature, whereas the second set of plates incubated at 42 degrees C had been cultured from a broth with ample amounts of *P. mirabilis* in the log phase. Not only did the *P. mirabilis* grow well on both the control and Olaplex plates (second trial), the Olaplex plate had noticeably larger colonies than the control plate did (Figures 23 & 24). This could be due to the Olaplex aiding in repair of the *P. mirabilis*.

Skills utilized in this project:

- Bacterial inoculation and incubation
- Media preparation (plates and broths)
- Sterile technique
- Quadrant streak-plating
- Microscopy

Special thank you to Dr. Menard for assisting in this project.

References

Bacillus megaterium. Bacillus Megaterium - an overview | ScienceDirect Topics. (n.d.). Retrieved December 14, 2022, from https://www.sciencedirect.com/topics/immunology-and-microbiology/bacillus-megaterium

Proteus vulgaris. Proteus vulgaris - an overview | ScienceDirect Topics. (n.d.). Retrieved December 14, 2022, from https://www.sciencedirect.com/topics/medicine-and-dentistry/proteus-vulgaris

Schaffer, J. N., & Pearson, M. M. (2015, October). *Proteus mirabilis and urinary tract infections*. Microbiology spectrum. Retrieved December 14, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4638163/

What are Olaplex No 1 and No 2? What are Olaplex No 1 and No 2? | Radiant Family Home. (n.d.). Retrieved December 14, 2022, from https://radiantfamilyhome.com/olaplex-1-and-2/

Wong, M. (2018, August). *How does olaplex hair treatment work?* Lab Muffin Beauty Science. Retrieved December 14, 2022, from https://labmuffin.com/how-does-olaplex-hair-treatment-work/

Ecology Research Projects

Compost Transplants - Day 21

Topsoil Transplants - Day 21

STEM Program Student Research Final Report

Name: Frank Reiter **Professor:** Erin Goergen, PhD

Dates: 2/21/2022 through 4/11/2022

The Effect of Substrate on Germination and Growth of Crop Plants

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Purpose

As the human population continues to increase, there is a need to clarify mechanisms that influence germination, growth, and productivity of crop plants. The purpose of this project was to observe and record the effects that two compositionally divergent substrates may have on germination and growth of three crop plants: bean, pepper, and spinach.

Hypothesis

It is predicted that there will be faster imbibement and germination, as well as increased growth when plants are grown in the compost laden substrate versus the commercially available topsoil product. The compost likely contains more microbial activity to produce plant nutrients, will retain moisture at a greater rate, and offer greater porosity for eased root penetration. Based on earlier studies, seedling morphology will likely be affected by the quality of the substrate because of its chemical composition (Díaz-Pérez, 2010). Leaf number and area is expected to be markedly greater in the more compost enhanced substrate.

Experimental Approach

All seeds were started in seedling pots (*Jiffypots®* (No. 110007) organic biodegradable peat pots filled with either compost or potting soil (n=14 per species per soil type). The compost was locally developed and consisted of primarily plant-based organic municipal solid waste (MSW). The topsoil was commercially purchased (Earthgro Topsoil, 40 lb. Product No. 71140180). Once seedlings were large enough (~3 weeks after sowing), they were transplanted into *Regal* 50 (No. AZD0500) pots prepared with identical soil compositions as seedling pots.

Plant species used included Heirloom Variety, Bloomsdale Longstanding Spinach (Valley Greene), Chili Cayenne Pepper (American Seed), and Non-GMO, Royal Burgundy Garden Beans (Ferry-Morse). Pots were saturated once seeds were sown, and additional watering was on an 'as needed' basis initiated by visual examination of the pots' saturation levels. A review of the pot exteriors showed clear delineations of saturation. Pots with a line of saturation below 2/3 of the overall pot height (red arrow) received water in 10 ml increments with 10 min drainage periods until saturation returned to within 10% of the pot's edge (green arrow) (Figure 1). Once seedlings were transplanted to standing pots, visual and 'to-the-touch'

inspection was conducted. Examinations occurred in the morning and evening each day. Standing pots were rotated regularly to minimize solar exposure differences.

Figure 1. Method used to determine need for watering in peat pots.

Weekly Processes and Observations

Week 1 (Feb. 21st):

Activities - Initial physical setup as below (Figure 2).

Planting – Seeds for all three varieties of plants were sunk in the appropriate soil to the depth prescribed on the printed packet on Saturday Feb 26, 2022. 42 seedling pots and 12 standing pots will be filled with locally developed compost. An additional 42 seedling pots and 12 standing pots (seedling dependent) will be filled with Earthgro Topsoil, 40 lb. (Product No. 71140180)

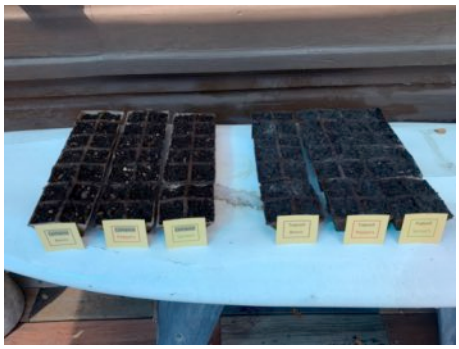
Initial Watering – All 84 seedling pots received approximately 15 ml of water which was allowed to settle for 15 min. Additional water was added as described in *Procedures/Watering.*

Weekly Observations

No changes in Week 1

Compost						Topsoil					
CB1	CB8	CP1	CP8	CS1	CS8	TB1	TB8	1	TP8	TS1	TS8
CB2	CB2	CP2	CP2	CS2	CS9	TB2	TB2	TP2	TP2	TS2	TS9
CB3	CB10	CP3	CP10	CS3	CS10	TB3	TB10	TP3	TP10	TS3	TS10
CB4	CB11	CP4	CP11	CS4	CS11	TB4	TB11	TP4	TP11	TS4	TS11
CB5	CB12	CP5	CP12	CS5	CS12	TB5	TB12	TP5	TP12	TS5	TS12
CB6	CB13	CP6	CP13	CS6	CS13	TB6	TB13	TP6	TP13	TS6	TS13
CB7	CB14	CP7	CP14	CS7	CS14	TB7	TB14	TP7	TP14	TS7	TS14

Figure 2. Experimental layout of the pots. C = compost, T= topsoil, B = bean, P = pepper, S= spinach; number corresponds to replicate.



Week 2 (Feb. 28th):

Activities - Daily watering and rotation as prescribed in *Procedures/Watering and Procedures/*Maintenance.

Weekly Observations - germination of the different species was recorded. There was earlier germination in the compost than in the topsoil treatments and higher rates of germination in the beans than pepper or spinach (Figure 3).

Figure3. Germination of seeds.

Week 3 (Mar. 7th):

Activities - Daily watering and rotation as prescribed in Procedures/Watering and Procedures/Maintenance. Natural precipitation occurred on 3/10 and manual watering was suspended for the day.

Weekly Observations - germination was again recorded and the first measurements for growth were conducted.

Week 4 (Mar 14th):

Activities - Daily watering and rotation as prescribed in Procedures/Watering and Procedures/Maintenance.

Weekly Observations - pots were observed for germination, but no new germination was noted in the compost, but a few peppers germinated in the topsoil. Plants were again measured, and all plants were transplanted to the larger standing pots (Figure 4).

Figure 4. Comparison of plants after transplanting. Compost on the L and topsoil on the R.

Week 5 (Mar. 21st): - All sprouting considered complete post-transplant

Activities - Daily watering and rotation as prescribed in Procedures/Watering and Procedures/Maintenance.

Weekly Observations - growth in all pots was monitored. Some bean plants in both the compost and topsoil began to exhibit evidence of leaf miner infection (Figure 5).

Figure 5. Evidence of leaf miners on the bean plants.

Week 6 (Mar. 28th):

Activities - Daily watering and rotation as prescribed in Procedures/Watering and Procedures/Maintenance.

Weekly Observations - Non-linear leaf striations identified as a species of 'leaf miners', a leaf boring insect whose larvae consume leaf tissue (Nielson, 2021). Now affecting 66.7% of compost/bean replicates and 77.8% of topsoil/bean replicates. Compost/pepper replicates were infected at 58.3% and topsoil/pepper replicates 33.3%.

Week 7 (April 4th):

Activities - Plants were returned to the Clearwater campus to be transplanted into the campus garden.

Weekly Observations - it was observed that there was some misidentification in the germinating plants. In many of the compost pots there were volunteer tomato plants that had originally been mistaken for pepper plants.

Week 8 (April 11th):

Activities - Writing up data and compiling the report.

Results

There were very low germination rates for the pepper and spinach in both compost and topsoil treatments. Due to this, the results will focus on the effect of substrate on bean germination and growth. In direct substrate comparisons, beans in the compost germinated an average of 2 days earlier than in topsoil (Fig. 6, $t=5.22$, $p<0.001$). Despite earlier germination by beans in compost soil, both substrate types had 100% germination (Fig. 7).

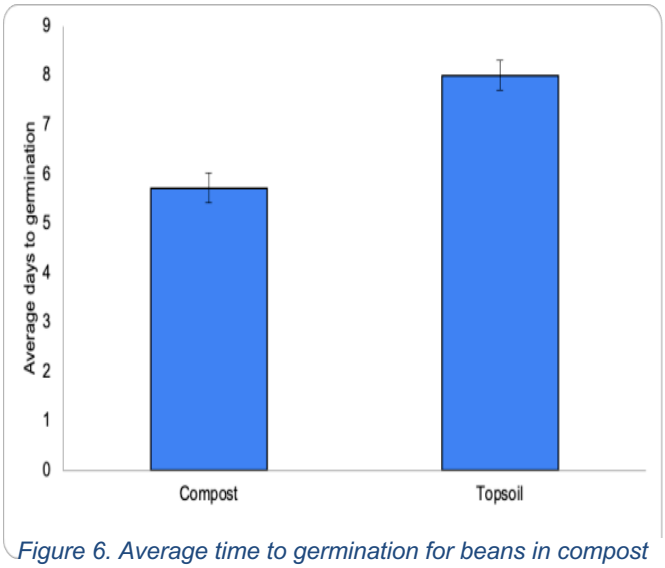


Figure 6. Average time to germination for beans in compost vs. topsoil.

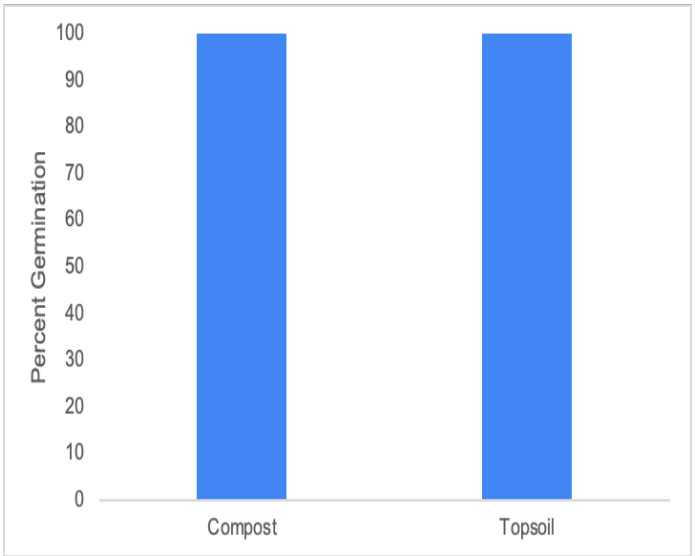


Figure 7. Percent germination of bean in compost and topsoil substrate.

Additional observation showed compost provided for greater leaf number over the course of the experiment than the topsoil substrate (Fig. 8), although differences were not statistically significant ($p>0.05$ for all). In contrast, although the bean plants in compost were initially taller, by the end of the 3-week experiment, the bean plants grown in topsoil were significantly taller (Fig. 9, $t=1.79$, $p=0.05$).

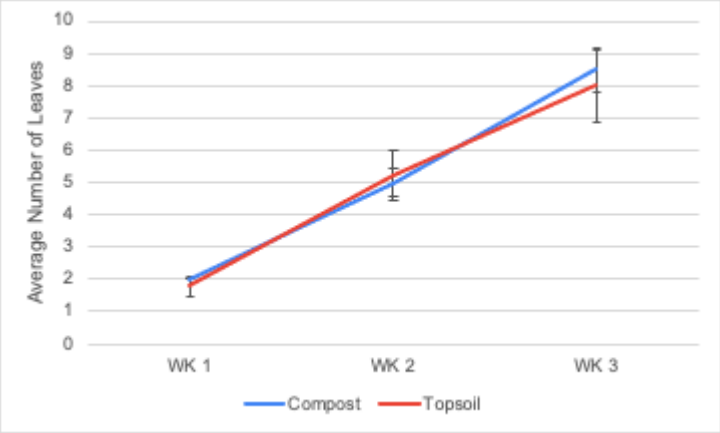


Figure 8. Average number of leaves on bean plants grown in compost and topsoil.

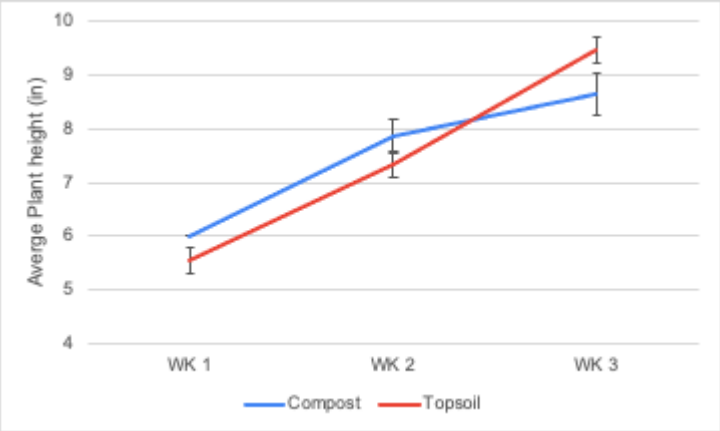


Figure 9. Average plant height of bean plants grown in compost and topsoil.

When comparing the water holding capacity between topsoil and compost, the compost held nearly twice the amount of moisture as did the topsoil (64% vs 35%: Fig. 10, t=19.5, p<0.001).

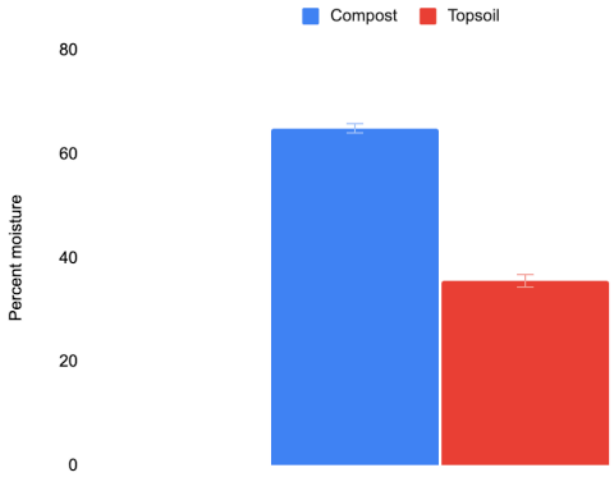


Figure 10. Mean percent moisture that the different substrates can hold.

Conclusion

Shorter time for imbibement provided a rapid means of initial germination and showed increased seed emergence in compost vs. topsoil substrate. This was likely due to superior moisture retention and increased porosity typically found in compost laden substrate (Zemánek, 2011) as compared to the replicates with a topsoil substrate. Limited imbibement and emergence by the spinach and pepper variety could have been a result of seeds being unviable or having unmet germination requirements such as stratification rather than an effect of the substrate. Further studies could examine this by testing the seed viability with tetrazolium before planting (França-Neto and Krzyzanowski, 2019). The low germination rate result may also have been due to compost maturity which can limit nitrogen availability or even cause phytotoxicity (Rogers, 2017). Soil nutrient analysis could shed some light on this possibility. However, the difference in species germination in response to substrate was most likely a result of seed quality based on 100% germination rates in beans with much lower germination in peppers and spinach overall in both substrates. Further study to examine imbibement tendencies could reveal the capability of remaining seeds to germinate (Siva, 2021). Seeds that showed less than complete germination would be additionally tested to see if any remaining seeds are viable and would require additional germination time or techniques.

Despite faster germination in compost substrate, there was high bean emergence in both topsoil and compost. The earlier germination likely gave the compost beans an advantage in terms of biomass production as compost plants tended to have slightly higher numbers of leaves than topsoil plants over the course of the experiment. In contrast, although compost plants tended to produce more leaves and were initially taller, by the end of the experiment there was no significant difference in the number of leaves between the two soil types and the topsoil plants were on average taller. Also, the observed leaf color and size comparisons showed higher quality levels in compost. This suggests that the two different substrates caused the bean plants to partition resources differently – those in compost invested more in

to leaf production and those in topsoil invested more into growing taller. These results are similar to other studies that showed the time-to-germinate and growth rates both were elevated soils were amended with compost (Díaz-Pérez, 2010). With increased nutrient availability, moisture retention and porosity, the additional compost stimuli provide faster, stronger plant growth.

Compost provides a clear means to augment growth rates and offers a sustainable integrated process to dispose of organic MSW adding an external supporting factor. Natural soil additives like compost can provide simple and effective steps to increase food production. These results could indicate earlier maturity and resultant yield dates for seed production as adult plants begin the reproductive process sooner in compost. Utilizing compost also lowers or even removes the need for additional fertilizers so pollutant generated from agricultural runoff would also be reduced. Expectant yields would likely benefit as well, providing more food per acre than in poorer quality soils (Bedada et al. 2014).

Additional studies are needed to further examine and reinforce this idea. Allowing a longer experimental growth period for plants to mature would provide yield volume results to confirm growth continues at an elevated pace. Also, soil composition should be analyzed to determine best practices for compost development to ensure the appropriate nutrients and microbial composition to enhance plant productivity. Results from this study show that the compost had higher water holding capacity than topsoil, and additional studies could help to illustrate the superior moisture retention in compost and compost amended soils, resulting in less potable water required for growth. All these considerations would provide additional understanding about best practices to improve crop production with the smallest ecological imprint.

References

Bedada, W., Karltun, E., Lemenih, M., & Tolera, M. (2014). Long-term addition of compost and NP fertilizer increases crop yield and improves soil quality in experiments on smallholder farms. *Agriculture, ecosystems & environment*, *195*, 193-201.

Devika, O. S., Singh, S., Sarkar, D., Barnwal, P., Suman, J., & Rakshit, A. (2021). Seed priming: a potential supplement in integrated resource management under fragile intensive ecosystems. Frontiers in Sustainable Food Systems, 5, 209. DOI, 10.3389/fsufs.2021.654001.

https://www.frontiersin.org/article/10.3389/fsufs.2021.654001

Díaz-Pérez, M., and F. Camacho-Ferre (2010). Effect of composts in substrates on the growth of tomato transplants. *HortTechnology hortte* 20.2: 361-367. <https://doi.org/10.21273/HORTTECH.20.2.361>. Web. 4 Ap. 2022.r

França-Neto, J. D. B., & Krzyzanowski, F. C. (2019). Tetrazolium: an important test for physiological seed quality evaluation. *Journal of Seed Science*, *41*, 359-366.

Nielsen, L. Leaf Miner Invasion? How To Eliminate Trailblazing Larvae. Epicgardening.com. Last Updated May 18, 2021. Retrieved Mar 28, 2022

https://www.epicgardening.com/leaf-miner/

Rogers, M. A. (2017). Organic Vegetable Crop Production in Controlled Environments Using Soilless Media, *HortTechnology hortte*, *27*(2), 166-170. Retrieved Apr 5, 2022, from https://journals.ashs.org/horttech/view/journals/horttech/27/2/article-p166.xml

Zemánek, P. (2011). Evaluation of compost influence on soil water retention. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *59*(3), 227-232.
. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis. 59. 227-232. 10. https://www.researchgate.net/publication/288277601_Evaluation_of_compost_influence_on_soil_water_retention11118/actaun201159030227

STEM Program Student Research Final Report

Professor: Erin Goergen, PhD

Name: Alexandra Acuña

Dates: 8/25/2022 through 10/27/2022

INSECT DIVERSITY IN AN URBAN GARDEN

Purpose: The garden area at SPC Clearwater Campus was constructed to increase habitat in an urban environment. One way of determining whether or not the garden area is aiding in providing usable habitat is to look at the abundance and diversity of different organisms. The focus of this study is insect populations as they provide numerous ecosystem services (Noreiga et al. 2018). It's estimated that there are 200 million insects for every human on the planet (Dobric 2022), and these insects are essential in an ecosystem from providing food to being food. Among studies that investigate the role of insects, the most abundant role contributed include serving as pollinators and decomposers, assisting in biological control, and being a food source to other organisms (Noreiga et al. 2018). Despite this important role, studies suggest that urbanization is leading to a decrease in insect populations (Fattorini 2011), necessitating an understanding of how to best promote insect populations in urban greenspaces. The study examined different microsites with different amounts of vegetation in the SPC Clearwater Campus garden to see if the amount of vegetation is influential in types of insects found, as well as their diversity and density.

Hypothesis: If there is an abundance in vegetation, then it is most likely we will find higher insect diversity in that area.

Experimental Approach: To determine if differences in vegetation cover influenced insect diversity, pitfall traps were placed in 3 different areas of the garden where vegetation varies from almost none (low vegetation), moderate amounts of plants (medium vegetation), to a thick area with vegetation all around the trap (dense vegetation). The pitfall traps were made from a red, 16-ounce solo cup, a small needle was used to puncture holes in the bottom to reduce the chance of rainfall being contained in the cup and the drowning of any insects caught in the trap, and an overhead awning was constructed with 4 screws and a block of wood for a reduced rate of rainfall going into the trap. A hole was dug in each of the different vegetation areas and the cup was placed level with the ground (Figures 1-4). Traps were baited with either bread or banana and left for one week before emptying and recording species present. This was repeated 4 times. To examine arboreal insects, flying insect traps were added near the in-ground pitfall traps to see if there was a correlation between ground and flying insects with the amounts of vegetation. The flying insect traps were made from water bottles that were cut in half, the top part of the water bottle was placed upside down inside the bottom half of the bottle, pipe cleaners were used to create a handle to place the traps on a branch, and a sugar solution was added to increase the chance of flying insects being caught inside the trap. Finally, field cameras were added, in an attempt to capture insect activity along with surrounding

activity of the different organisms that benefit from the insects in the garden area. Both cameras were set to collect 10 second videos instead of images to increase the likelihood of capturing insect activity.

Weekly Processes and Observations

Week 1 (8/25/22): Garden area was surveyed and location for pitfall traps were selected. Research for construction was conducted this week by reviewing published literature about different pitfall trap designs.

Week 2 (9/1/22): Construction and set up of the pitfall traps. Three pitfall traps were constructed; one in dense vegetation (figure 1), one in medium vegetation (figure 2), and one in an open area with minimal vegetation (figure 3). Pitfall traps were constructed of a 16 oz. solo cup with pin holes in the bottom that was embedded into the ground so that it was flush with the soil surface. To prevent flooding from rain, all pitfall traps had a 'roof' constructed of wood that was suspended over the top of the cup (figure 4). All three pitfall traps were baited with small pieces of wheat bread.


Figure 1. Dense vegetation area of pitfall trap


Figure 2. Medium vegetation area of pitfall trap


Figure 3. Open vegetation area of pitfall trap


Figure 4. Design of pitfall trap; for all three of pitfall traps.

Week 3 (9/9/22): The pitfall traps were poured into an empty bin for review of insects caught inside. The pitfall trap with minimal vegetation contained about 20-30 fire ants, no more than 5 springtails, and 1 unknown insect. There was only 1 piece of bread left. The pitfall trap in the medium vegetation area was uncovered due to rain over the week and was replaced into the soil; the trap had no insects and no bread when poured into the bin. The pitfall trap in the dense vegetation area contained 1 springtail and no bread. Bread was placed again in all cups to reassess for next week. Field cameras were added in hopes to capture flying insect activity. One camera was placed on the live oak tree underneath a birdhouse for a high-profile view, the second camera was placed on a pole by many flowering plants for a low-profile view.

Week 4 (9/15/22): Cameras were reviewed for activity, the low-profile camera had 15 images when first opened, however most of the pictures were compromised due to a branch entering and blocking the cameras view on day 3. The low-profile camera was moved to a higher profile, attached to a Sea Grape tree. The high-profile camera had 31 images. After review of all images, no noticeable insect activity was displayed in any of the images. Settings were changed on both cameras to capture 10 second videos versus still images.

The minimal vegetation trap was poured into an empty bin where there were 2 unknown beetles with dots, 2 baby cockroaches, about 50 springtails, 1 millipede, 1 Scarab Beetle, and 10 fire ants; there was no bread left. When the medium vegetation trap was removed to be poured into the bin, it is noted that there was an abundance in ant activity happening underneath the cup. When the cup was poured into the empty bin there were no insects, all the pieces of bread were left and there was mud inside. The dense vegetation trap

had about 10 fire ants when poured into the empty bin with no pieces of bread left. The pitfall traps were emptied and put back with 8 small pieces of banana peel added to each pitfall trap.

Four water bottle insect traps were made to be hung around the Garden, 3 were near the pitfall traps and one was located in an area with flowering shrubs, to capture arboreal or flying insects. The hanging traps contained a 15% sugar-water solution to attract insects (figure 5).

Figure 5. Placement of hanging traps.

Week 5 (9/23/22): Videos from both cameras were uploaded to laptop for review, the Live Oak camera had 225 videos and the Sea Grape camera had 431 videos.
The minimal vegetation trap was emptied into a bin and contained 8 little fungus beetles, 1 big multi-colored beetle, 1 dead millipede, 2 normal ants, and 1 unknown dotted beetle; there were 4 pieces of banana still left behind. In the medium vegetation area there was 1 small fungus beetle, 1 fire ant, and 4 unknown insects with all 8 pieces of banana left when emptied into the bin. The dense vegetation trap had 1 baby millipede inside, while when the trap was removed many ants were found underneath; all 8 pieces of the banana peel were left.

Water bottles were taken down due to the expectancy of Hurricane Ian, they were found flooded with water from the rainfall that occurred during the week. Each bottle only had a few insects found floating on top of the water that could not be identified. This test for flying insect activity will remain inconclusive due to the expectant weather and time frame of the project.

Week 6 (9/29/22): Campus was closed this week due to Hurricane Ian. Continued reviewing video images from cameras. Live Oak camera review was completed and 4 unidentified flying insects were observed, along with 1 lizard.
Week 7 (10/7/22): Reviewal of the Sea Grape camera was completed, finding many insects both flying and non-flying captured on camera. On multiple days there was 1-3 ants seen walking around on a leaf of the Sea Grape tree. A bird was seen landing on the ground across from the Sea Grape tree, it is possible it is a Blue Jay, but the species could not be confirmed. Also, seen on the videos were 15 unidentified flying insects, 5 unidentified crawling insects, 5 wasps, 2 green flies (1 which appeared to be trying to eat an ant), 2 lizards, and 2 nats.

Week 8 (10/13/22): Research on paper format was conducted and a Zoom meeting to discuss progress on the research project was completed.

Week 9 (10/20/22): Project wrap up commenced; Pitfall traps were removed, cameras were taken down and recordings were backed up to the laptop for review. The Live Oak camera didn't have any recordings, it is most likely the batteries died. The Sea Grape camera has 283 videos. The pitfall traps were poured over a flat surface for reviewal of insect activity, the pitfall traps in the medium and dense vegetation were ⅛ filled with leaves, only the medium vegetation trap contained about 5 black ants while the dense vegetation had no insect activity, the pitfall trap in the minimal vegetation area was about ⅛ filled with leaves as well but contained 1 baby lizard and 15 fire ants.

Results: The results showed that the area with minimal vegetation had the greatest insect diversity using both the Shannon Weiner and Simpson diversity indices, compared to the dense vegetative area (Table 1). Further, the types of organisms that were found in the different traps varied. For example, in dense vegetation we only observed an α diversity of 3 different insect species, and this location was dominated by fire ants (Figure 6). In contrast, medium vegetation had an α diversity of 4 different species and was dominated by normal ants (Figure 7). Finally, the minimal vegetation had nearly twice as many different species as the other sites with an α diversity of 7 and was dominated by springtails (Figure 8). Despite these differences, there was still some overlap in the species present between the different locations, with the dense and moderate vegetation locations having the lowest species turnover (β diversity, Table 2). Overall, the garden insect traps collected a total of 11 different species (γ diversity, Table 2).

Table 1. Results of diversity calculations for the different sampling locations.

	Shannon Weiner (H)	Simpson (1-D)
Dense Vegetation	0.57	0.44
Moderate Vegetation	0.095	1.01
Minimal Vegetation	1.34	0.67

Table 2. Results of alpha, beta, and gamma diversity of insects found in sites with different vegetation amounts.

	α diversity		β diversity	γ diversity
Dense vegetation	3	Dense-medium	5	11
Medium vegetation	4	Dense - minimal	7	
Minimal vegetation	10	Minimal- medium	8	

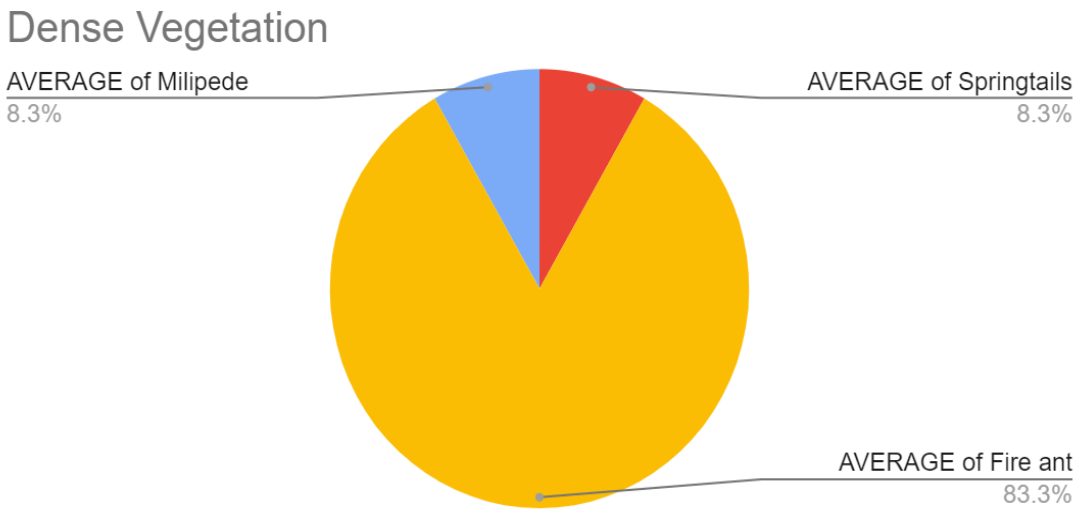


Figure 6. Average proportion of different insects found in insect traps in dense vegetation.

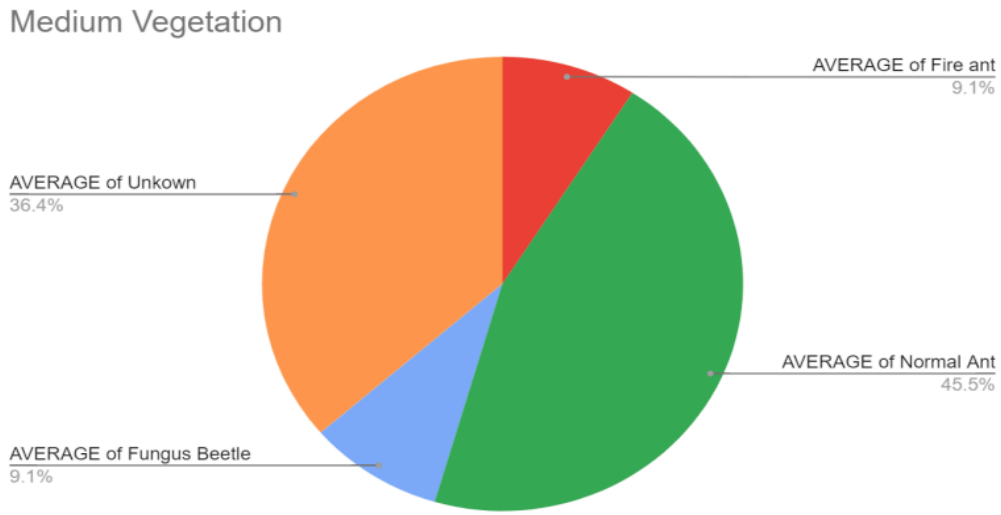


Figure 7. Average proportion of different insects found in insect traps in medium vegetation.

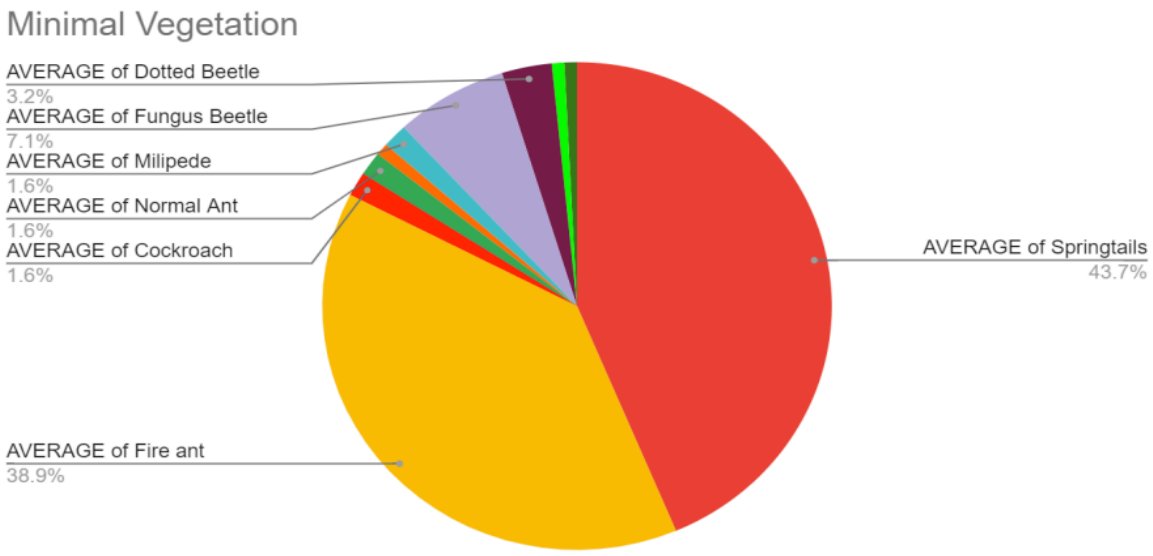


Figure 8. Average proportion of different insects found in insect traps in minimal vegetation.

Conclusion: In the original hypothesis it was stated that if there is dense vegetation, then there must be an abundance in insect activity. However, over the weeks of analyzing the pitfall traps it seems that the opposite is true. The area that had the least vegetation surrounding the pitfall trap showed a higher and diverse population of insects. Our results are also contrary to other similar studies looking at the correlation between density of vegetation and insect diversity. For example, Haddad et al. (2001) found a positive correlation between insect richness and plant biomass. Similarly, Wenniger & Inouye (2008) found that in an arid ecosystem, insect diversity increased with plant species diversity. It is unclear why the open vegetation area had more insect diversity. One hypothesis could be that because the area had a large population of fire ants, it was less disturbed by humans. Further, since the pitfall trap was underneath a bench and less disturbed by larger animal activity due to low forage, insects were able to crawl around more freely. It is also possible that this site had higher diversity of insects because it was located adjacent to the garden beds, which are used by numerous different insects, but less visited by predators such as birds and anoles.

The distribution and abundance of insects in the different sampling locations could also be influenced by the difference in vegetation structure found among the sampling locations. For example, other studies have found that factors such as the amount of tree density and richness can greatly impact the type of insects found, but also the species turnover between sampling locations (β diversity; Leal et al. 2016). Although we did not focus on arboreal insects, the field cameras were a good addition that showed that there is a presence of non-flying and flying insect activity among the trees present, along with other organisms such as lizards and birds in and near the trees.

Overall, although our data does not support our hypothesis, it does suggests that the garden does support a variety of different insect species. Further, the β diversity data suggests that the microsites created by the

different types of vegetation are helping to promote this diversity by creating niches that support different species of insects. Future studies comparing different habitats around campus will further help to verify that the garden has the potential to serve as a hotspot of biodiversity for the campus.

References

Dobric, M. (2022). 27 Fascinating Insect Population Statistics, *Petpedia*, https://petpedia.co/insect-population-statistics/. [Accessed 10/20/2022]

Fattorini, S. (2011). Insect extinction by urbanization: a long term study in Rome. Biological Conservation, 144(1), 370-375.

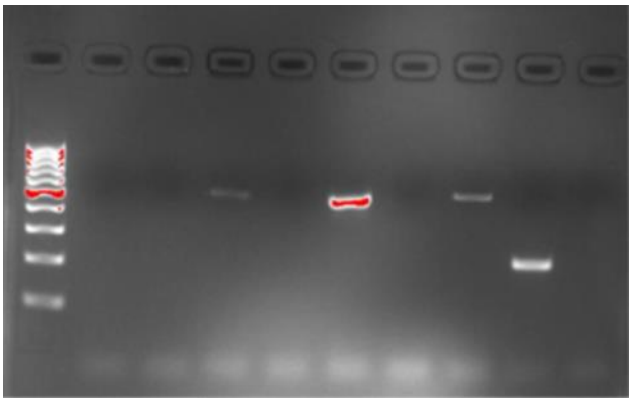
Haddad, N. M., Tilman, D., Haarstad, J., Ritchie, M., & Knops, J. M. (2001). Contrasting effects of plant richness and composition on insect communities: a field experiment. *The American Naturalist*, *158*(1), 17-35.

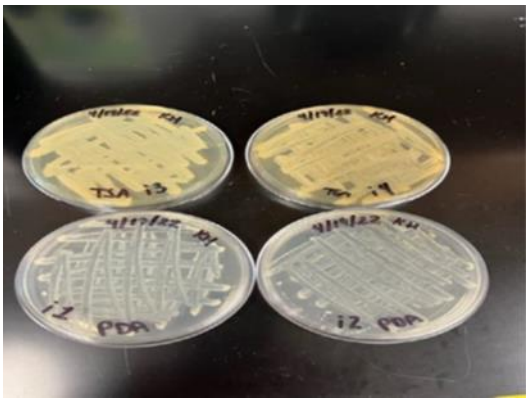
Leal, C. R. O., Oliveira Silva, J., Sousa-Souto, L., & de Siqueira Neves, F. (2016). Vegetation structure determines insect herbivore diversity in seasonally dry tropical forests. *Journal of Insect Conservation*, *20*(6), 979-988.

Noriega, J.A., Hortal, J., Azcárate, F.M., Berg, M.P., Bonada, N., Briones, M.J., Del Toro, I., Goulson, D., Ibanez, S., Landis, D.A. and Moretti, M. (2018). Research trends in ecosystem services provided by insects. *Basic and Applied Ecology*, 26, 8-23.

Wenninger, E. J., & Inouye, R. S. (2008). Insect community response to plant diversity and productivity in a sagebrush–steppe ecosystem. *Journal of Arid Environments*, *72*(1), 24-33.

Microbiology Research Projects





First Generation Undergraduate Research Experience

Student Research Final Report

Name: Kaitlyn Haynes **Professor:** Shannon Ulrich, PhD
Date: 16 May 2022

Outline of Responsibilities

- Attending a weekly microbiology research meeting Wednesdays 12-1PM
- Performing primary literature research and/or laboratory experiments
- Meeting with Professor Ulrich on a weekly basis for status updates and determination of the following week's goals
- Complete compiled report of the research/activities done each week (e.g. results observed, assumptions, and/or conclusions, learning achieved)

RESEACH QUESTION: Can DNA and/or RNA be used as an indicator of freshness with iceberg lettuce.

Weekly Reports & Data

Week 1: 03/17/2022
Met with Dr. Ulrich via Zoom to discuss research topics and narrow down selection. Came to a decision to research if RNA concentration can be used as an indication of freshness in iceberg lettuce.

Week 2: 03/23/2022
Microbiology lab tour of CL-NM 26, discussed experimental design, looked at extraction kits, planned schedule for the remaining weeks of research. In addition to this, the URE agreement was signed.

Week 3: 03/30/2022
Preliminary research was conducted to determine appropriate area to swab on the surface of lettuce and appropriate amount of lettuce for the DNA extraction.

To assess an appropriate amount of area to swab, a 2 x 2 cm^2 square was cut into a piece of filter to use as template. The head of lettuce was then swabbed in this area. The swab was used to inoculate a nutrient agar (NA) plate and potato dextrose agar (PDA) plate to enumerate bacteria and fungi, respectively. Samples were processed in duplicate.

Table 1. Enumeration of bacteria and fungi in a 2 x 2 cm^2 area on a head of iceberg lettuce.

	CFUs		
Agar	**A**	**B**	**Average**
NA	29	23	26
PDA	9	10	9.5

Based on the data presented in Table 1, we decided to continue with the 2x2 cm^2 area for swabbing.

The amount of lettuce to assay was determined by weighing 1g, 2g, 5g and 10 g samples of iceberg lettuce. DNA was extracted from each sample. Briefly, a mortar and pestle was used to grind each lettuce sample. Five 5-ml of sterile 1X PBS was added to the mixture. Approximately, 20 µl of lettuce mixture was added to 200 µl of InstraGene matrix. The tube was incubated at 56ºC for 15 minutes. The tube was then vortexed for 10 sec and then placed at 100ºC for 8 mins. Afterwards, the tube was microcentrifuged at 12,000 rpm for 2 minutes and 20 µl of the DNA-containing supernate was placed in a clean, sterile tube for analysis. The concentration of DNA in each sample was evaluated using a Nanodrop spectrometer. DNA concentrations are recorded in Table 2.

Table 2. DNA concentrations obtained via nanodrop using various weights of lettuce samples. Samples were assayed in triplicate.

	DNA Concentration (ng)			
Sample Weight (g)	**A**	**B**	**C**	**Average**
1	0.6	0.4	0.9	0.63
2	6.2	6.6	6.6	6.47
5	16.0	15.6	16.3	15.97
10	19.3	18.9	18.8	19

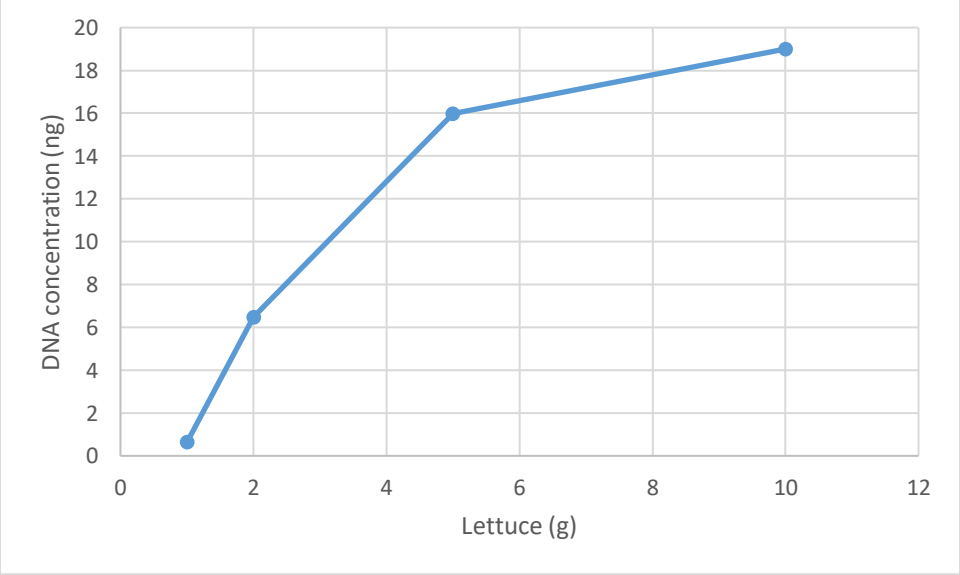


Figure 1. DNA concentrations obtained via nanodrop using various weights of lettuce samples. Samples were assayed in triplicate.

Based on the preliminary date, DNA concentrations began to plateau between 5 and 10 grams, therefore we chose to assay 5 g of lettuce in subsequent analysis.

Week 4: 04/06/2022 – Lettuce Day 0
Three iceberg lettuce heads were purchased and labeled: "G" in the refrigerator, "H" room temperature in light, and "I" room temperature in dark. Samples of 5 g were taken from each head of lettuce for initial DNA concentrations. An area of 2 x 2 cm^2 was swabbed on each head of lettuce and used to inoculate NA and PDA plates.

Week 5: 04/13/2022 – Lettuce Day 7
Plates were observed from Day 0 (Figure 2). Lettuce was observed (Figure 3). Samples of 5 g were taken from each head of lettuce for initial DNA concentrations. An area of 2 x 2 cm^2 was swabbed on each head of lettuce and used to inoculate NA and PDA plates.

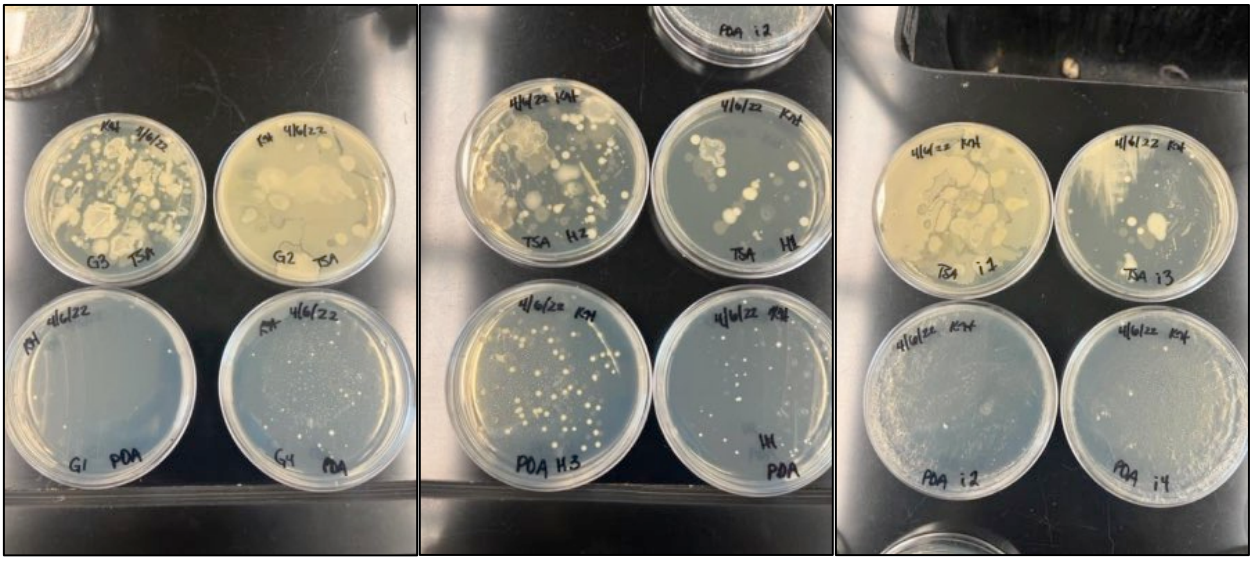


Figure 2. TSA/PDA results from Day 0

(Light) (Dark) (Refrigerator)

Figure 3. Lettuce samples after 7 days.

Week 6: 04/20/2022 – Lettuce Day 13
Plates were observed from Day 7 (Figure 4). Lettuce was observed (Figure 5). Samples of 5 g were taken from each head of lettuce for initial DNA concentrations. An area of 2 x 2 cm^2 was swabbed on each head of lettuce and used to inoculate NA and PDA plates.

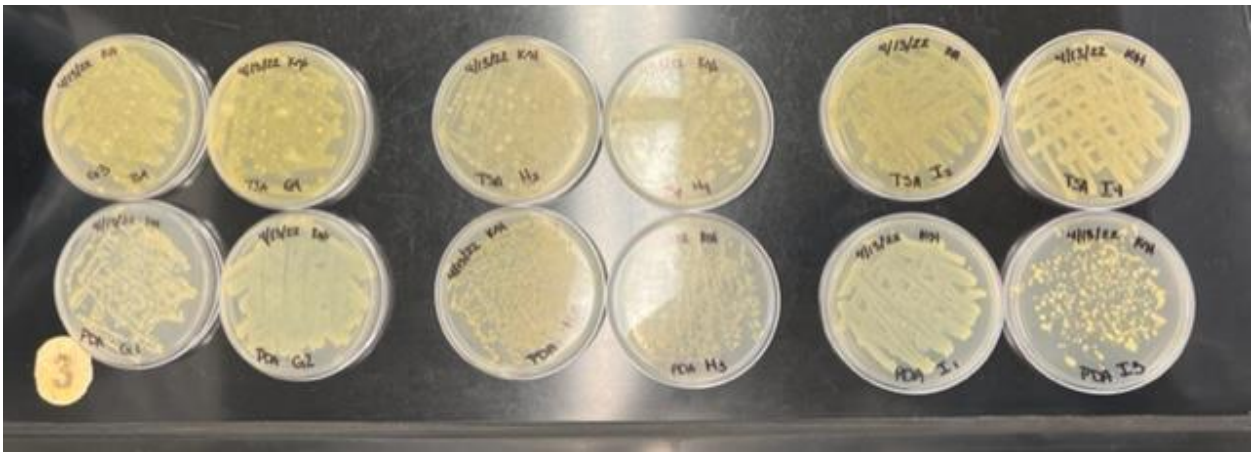


Figure 4. TSA and PDA results from Day 7.

(Refrigerator) (Dark) (Light)

Figure 5. Lettuce Day 13. Surprising observation of iceberg lettuce left in the sunlight broke down and had significantly more bacterial growth at day 13. Not pictured: liquid decomposition from lettuce head left in the light.

Week 7: 04/27/2022 – Lettuce Day 13

Plates were observed from Day 7 (Figure 6). DNA and RNA concentrations were determined using the Nanodrop spectrometer.

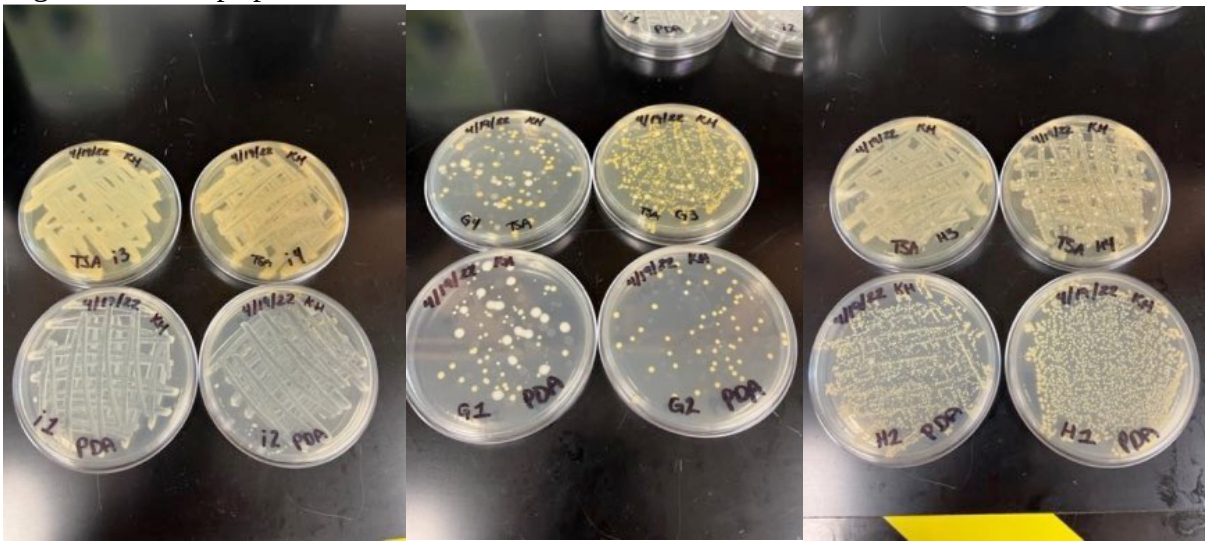


Figure 6. TSA and PDA results from Day 13.

Week 8: 05/04/2022

Data was compiled and analyzed.

Results & Conclusions

The iceberg lettuce left out at room temperature in the light shown the most amount of visual decay. All 3 heads of lettuce showed an increase of fungal growth, however the refrigerated lettuce had the smallest increase (Figure 7). Interestingly, the refrigerated lettuce showed a decrease in bacterial counts over the 13 day period (Figure 8).

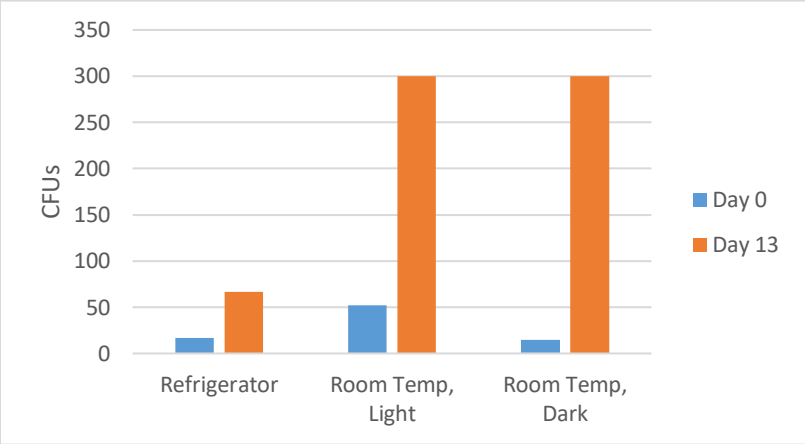


Figure 7. Enumeration of fungi on PDA plates at Day 0 and 13. NOTE: Plates with >300 CFUs were recorded as TNTC, but 300 was used in calculations and graphing.

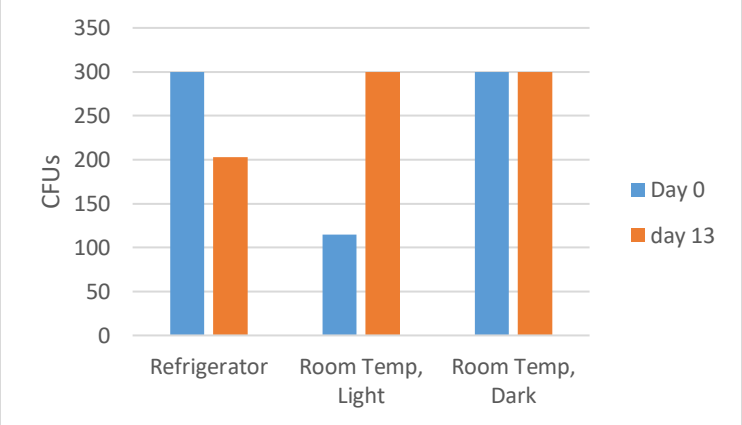


Figure 8. Enumeration of bacteria on NA plates at Day 0 and 13. NOTE: Plates with >300 CFUs were recorded as TNTC, but 300 was used in calculations and graphing.

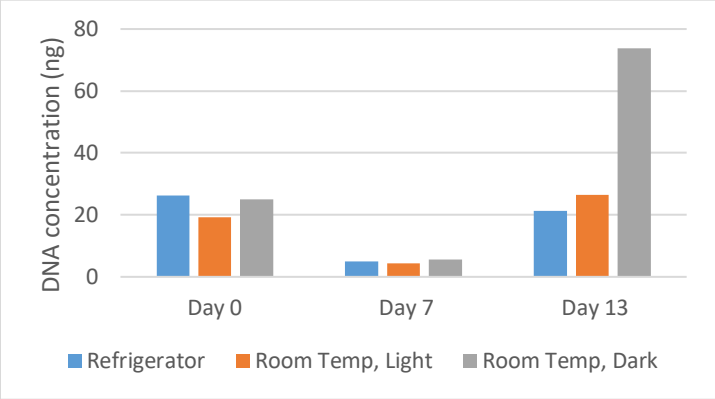


Figure 9. DNA concentrations at Day 0, 7 and 13.

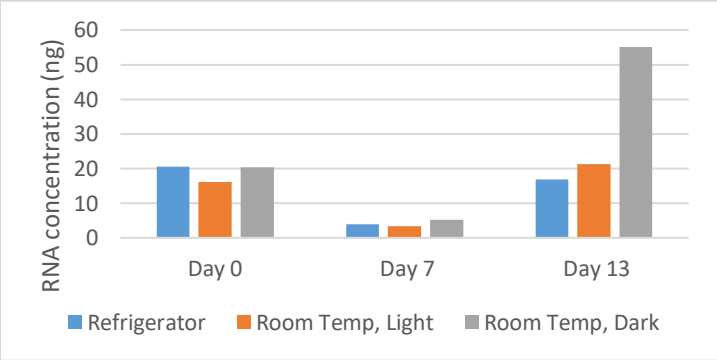


Figure 10. RNA concentrations at Day 0, 7 and 13.

Both DNA and RNA concentrations (Figures 9 & 10) showed similar trends with a decrease in concentrations after 7 days but an increase by Day 13.

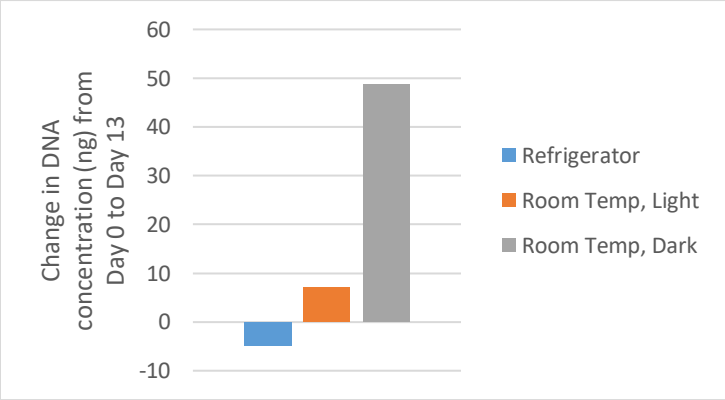


Figure 11. Change in DNA concentration from Day 0 to Day 13.

Interestingly, DNA concentrations decreased for the refrigerated samples but INCREASED for both room temperature samples. This may be due to increased microbial counts (however the decrease in DNA/RNA concentrations at Day 7 convolutes this hypothesis). We originally

hypothesized that DNA and/or RNA could be used as an indication of freshness in iceberg lettuce, however our data did not support this. However it should be noted only one head of lettuce was used per treatment. Future studies should be used to confirm these results before concrete conclusions can be made.

Techniques Utilized

Microbiological techniques learned:

- Media culturing
- Enumeration
- DNA extraction
- Nanodrop

First Generation Undergraduate Research Experience

Student Research Final Report

Name: Vanessa Almodovar **Professor:** Shannon Ulrich, PhD

Date: Dec. 1, 2022

Outline of Responsibilities

- Attending a weekly microbiology research meeting Tuesday/ Thursday 12:30-1:30PM
- Performing research and laboratory experiments
- Meeting with Professor Ulrich on a weekly basis for status updates and determination of the following week's goals
- Complete compiled report of the research/activities done each week (e.g., results observed, assumptions, and/or conclusions, learning achieved)

Research Question: Are the ingredients for the proteins (chicken, lamb, turkey) on dog food labels accurate?

Weekly Reports & Data

Week 1

Met with Dr. Ulrich via zoom to discuss research topics and what days to meet. Decided on possibly doing the project on cat food with different kinds of fish and to meet Tuesday / Thursdays.

Week 2

First in-person meeting at the Microbiology lab CL-NM 263. Discussed potential mitigating factors associated with target fish in samples; mainly the possibility of more than one fish species in the sample and therefore sequencing would not be possible. Our directive was changed to analyzing proteins in dog food. I researched PCR, gel electrophoresis, and DNA extraction. I chose the 7 samples of dog food and Dr. Ulrich obtained each sample.

Week 3

Extracted DNA from each of the 7 samples.

Dog Food Sample	Consistency	Advertised Protein	Listed Protein Ingredients
Purina One Smart Blend Lamb and Brown Rice	Wet	Lamb	lamb, chicken, pork
Purina Pro Plan Adult High Protein Turkey Lamb Venison	Wet	Turkey, Lamb and Vension	turkey, lamb, chicken, venison, meat by product
Blue Wilderness with Chicken	Dry	Chicken	chicken, salmon

Blue Wilderness Duck Grill Trail Tray	Wet	Duck	duck, chicken
Blue Buffalo Chicken and Brown Rice	Dry	Chicken	chicken
Nulo Duck and Chickpea	Wet	Duck	duck, turkey
Hill's Science Diet Lamb and Brown Rice	Dry	Lamb	lamb, chicken

The following steps were used for the DNA EXTRACTION:

Protocols for Tissue Lysis and DNA Extraction

A. Cut ~10 mg* tissue, and place in a 1.5 ml sterile microcentrifuge tube.

Note*: Tissue does not need to be accurately weighted, but it is essential to only take a small amount of tissue with this extraction kit to obtain the optimal DNA yields for PCR.

B. Add 50 µl of buffer ATL and 5.56 µl proteinase K. Mix thoroughly by vortexing, and incubate at 56°C until the tissue is completely lysed. Vortex occasionally during incubation to disperse the sample. Lysis time varies depending on the type of tissue processed. Lysis is usually complete in 1–3 h. If it is more convenient, samples can be lysed overnight; this will not affect them adversely. After incubation the lysate may appear viscous but should not be gelatinous as it may clog the DNeasy Mini spin column.

C. Vortex for 15 s. Add 55.6 µl Buffer AL to the sample and mix thoroughly by vortexing. Then add 55.6 µl ethanol (96–100%) and mix again thoroughly by vortexing. It is essential that the sample, Buffer AL, and ethanol are mixed immediately and thoroughly by vortexing to yield a homogeneous solution.

Note: A white precipitate may form on addition of Buffer AL and ethanol. This precipitate does not interfere with the DNeasy procedure.

D. Pipet the mixture from previous step (including any precipitate) into the DNeasy Mini spin column placed in a 2 ml collection tube (provided). Centrifuge at 6000 x g (8000 rpm) for 1 min. Discard flow-through and collection tube.

E. Place the DNeasy Mini spin column in a new 2 ml collection tube (provided), add 140 µl Buffer AW1, and centrifuge for 1 min at 6000 x g (8000 rpm). Discard flow-through and collection tube.

F. Place the DNeasy Mini spin column in a new 2 ml collection tube (provided), add 140 µl Buffer AW2, and centrifuge for 3 min at 20,000 x g (14,000 rpm) to dry the DNeasy membrane. Discard flow-through and collection tube. Note: It is important to dry the membrane of the DNeasy Mini spin column, since residual ethanol may interfere with subsequent reactions. This centrifugation step ensures that no residual ethanol will be carried over during the following elution. Following the centrifugation step, remove the DNeasy Mini spin column carefully so

that the column does not come into contact with the flow-through, since this will result in carryover of ethanol. If carryover of ethanol occurs, empty the collection tube, then reuse it in another centrifugation for 1 min at 20,000 x g (14,000 rpm).

G. Place the DNeasy Mini spin column in a clean 1.5 ml microcentrifuge tube and pipet 50 µl Buffer AE (warmed to 37°C) directly onto the DNeasy membrane. Incubate at room temperature for 1 min, and then centrifuge for 1 min at 6000 x g (8000 rpm) to elute.

Week 4

Dr. Ulrich and I took the DNA samples and used the Nano Drop 2000 to qualify the DNA in each sample.

Dog Food Sample	DNA Concentration (ng/ul)
Purina One Smart Blend Lamb and Brown Rice	7.7
Purina Pro Plan Adult High Protein Turkey Lamb Venison	7.7
Blue Wilderness with Chicken	32.15
Blue Wilderness Duck Grill Trail Tray	12.2
Blue Buffalo Chicken and Brown Rice	53.35
Nulo Duck and Chickpea	35.65
Hill's Science Diet Lamb and Brown Rice	33.0

Week 5

We performed the poultry PCR that allowed amplify turkey and chicken DNA in each sample. NOTE: This was a multiplex PCR with various poultry species; however, we did not have a positive control for the duck or ostrich so those results were omitted from analysis.

The following are the details of the Poultry PCR:

Target	Primer Sequence	Primer Conc.	Product Size
Poultry	5' – CAA CAA CTC ACT AAT CGA CCT – 3'	0.8 µM	n/a
Turkey	5' – GCC ATT CGC ATG GAG GTT ATG – 3'	0.8 µM	217 bp
Ostrich	5' – ATT AAT GTT AGT AGG AGG ATA ACG C – 3'	0.12 µM	330 bp
Chicken	5' – GGG AGG AGG AAG TGT AAA GC – 3'	0.6 µM	516 bp
Duck	5' – TTT GTT TGG GAT TGA CCG CA – 3'	0.4 µM	820 bp

PCR PROTOCOL

To set-up the PCR "master" master mix, you will need to determine the number of samples you plan to analyze. Add 3 to that number (for the positive and negative controls; and one extra—because solution gets "stuck" on pipette tips during pipetting). Multiply the volume of each reagent by the number of samples (+3) to be analyzed. Use the following table to help you calculate:

Reagent	Volume per reaction (ul)	Number of Samples	Final volume of reagent for master-master mix (ul)
GoTaq® Green Master Mix	25	10	250
Poultry (10uM)	4	10	40
Turkey (10uM)	4	10	40
Ostrich (10uM)	0.6	10	6
Chicken (10uM)	3	10	30
Duck (10uM)	2	10	20
Nuclease-free water	6.4	10	64

- Add the final calculated volume of each reagent to ONE 1.5-ml tube.
- Vortex briefly and quick spin.
- Add 45 ul of the master mix to a PCR reaction tube.
- Add 5 ul of your DNA samples.
- Add 5 ul of nuclease-free water to negative PCR control.
- Add 5 ul of appropriate positive control DNA to positive PCR control.
- Close tubes.
- Label PCR tubes.
- Place in the thermocycler and select appropriate program with the following conditions: 94°C for 5 mins; 30 cycles of: 94°C for 30 sec, 61°C for 30 sec, 72° for 45 sec; and final extension at 72°C for 7 mins

Week 6

We analyzed the Poultry PCR results using gel electrophoresis and a Biorad Gel Imager.

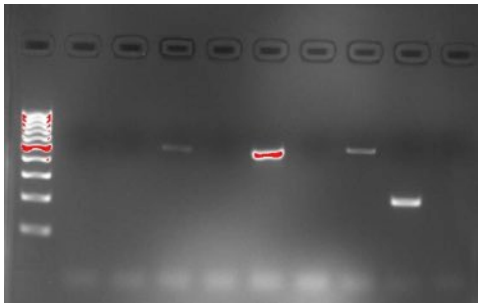


Figure 1. Gel electrophoresis results of the poultry PCR.

Wells:
1 – DNA ladder
2 - Purina One Smart Blend Lamb and Brown Rice
3- Purina Pro Plan Adult High Protein Turkey Lamb Venison
4- Blue Wilderness with Chicken
5- Blue Wilderness Duck Grill Trail Tray
6- Blue Buffalo Chicken and Brown Rice
7- Nulo Duck and Chickpea
8- Hill's Science Diet Lamb and Brown Rice
9- Turkey Positive Control
10- Negative Control

According to the Poultry Gel, we found that samples #3: (Blue Wilderness with Chicken dry dog food, protein ingredients listed: chicken, salmon), #5: (Blue Buffalo Chicken and Brown Rice dry dog food, protein ingredients listed: chicken), and #7: (Hill's Science Diet Lamb and Brown Rice dry dog food, protein ingredients listed: lamb, chicken) all had chicken. No dog food samples were positive for turkey.

I also perform the Lamb PCR on this day.

The following are the details of the Lamb PCR:

Target	Primer Sequence	Primer Conc.	Product Size
Sheep FWD	5' – CTAGAGGAGCCTGTTCTATAATCGATAA – 3'	0.5 µM	371 bp
Sheep REV	5' – GTCTCCTCTCGTGTGGTTGAGATA – 3'	0.5 µM	

PCR PROTOCOL

To set-up the PCR "master" master mix, you will need to determine the number of samples you plan to analyze. Add 3 to that number (for the positive and negative controls; and one extra—because solution gets "stuck" on pipette tips during pipetting). Multiply the volume of each reagent by the number of samples (+3) to be analyzed. Use the following table to help you calculate:

Reagent	Volume per reaction (ul)	Number of Samples	Final volume of reagent for master-master mix (ul)
GoTaq® Green Master Mix	25	10	250
FWD (10uM)	2.5	10	25
REV (10uM)	2.5	10	25
Nuclease-free water	15	10	150

- Add the final calculated volume of each reagent to ONE 1.5-ml tube.
- Vortex briefly and quick spin.
- Add 45 ul of the master mix to a PCR reaction tube.
- Add 5 ul of your DNA samples.
- Add 5 ul of nuclease-free water to negative PCR control.
- Add 5 ul of appropriate positive control DNA to positive PCR control.
- Close tubes.
- Label PCR tubes.
- Place in the thermocycler and select appropriate program with the following conditions: 94°C for 5 mins; 35 cycles of: 94°C for 30 sec, 63°C for 30 sec, 72° for 45 sec; and final extension at 72°C for 5 mins

Week 7

I analyzed the Lamb PCR amplicons using gel electrophoresis and visualized the results using the Biorad Gel imager.

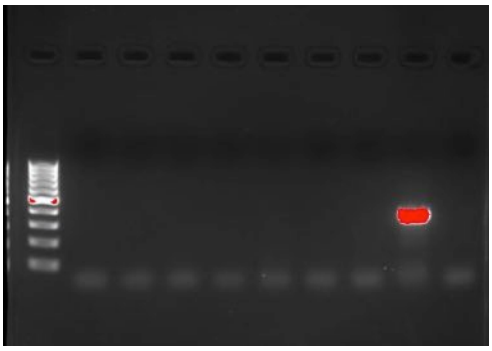


Figure 2. Gel electrophoresis results of the lamb PCR.

Wells:
1 – DNA ladder
2 - Purina One Smart Blend Lamb and Brown Rice
3- Purina Pro Plan Adult High Protein Turkey Lamb Venison
4- Blue Wilderness with Chicken
5- Blue Wilderness Duck Grill Trail Tray
6- Blue Buffalo Chicken and Brown Rice
7- Nulo Duck and Chickpea
8- Hill's Science Diet Lamb and Brown Rice
9- Lamb Positive Control
10- Negative Control

Based on the Lamb Gel, we found that none of the samples contained any lamb DNA.

Week 8

Data was compiled and analyzed.

Results and Conclusion

After gathering data from both gels, the results are as follows:

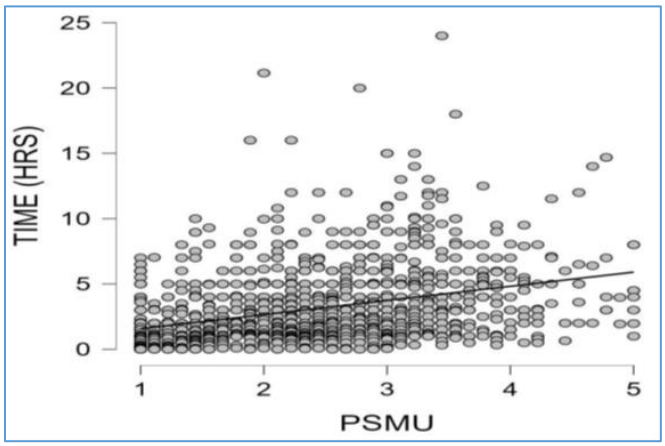
Table 1. Results of poultry and lamb PCR.

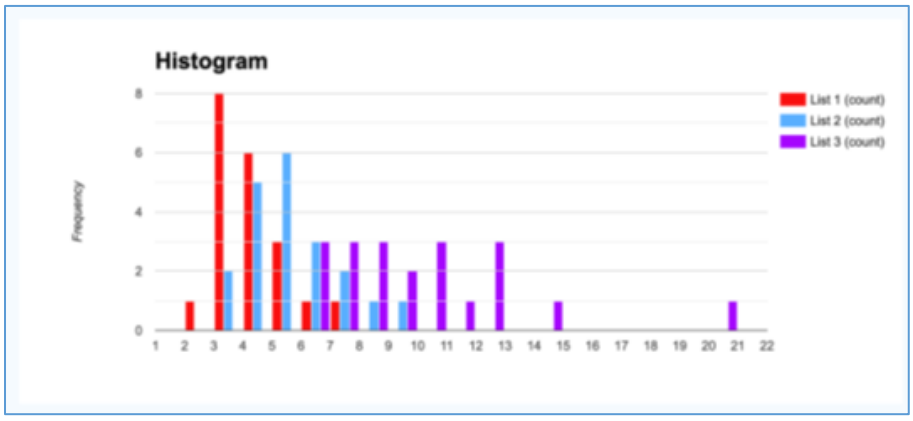
Sample #	NAME	Ad. Meat	Ingred. Meat	Chicken PCR result	Turkey PCR result	Lamb PCR result
1.	Purina One Smart Blend Lamb and Brown Rice wet	Lamb	Lamb & Chicken	NEGATIVE	NEGATIVE	NEGATIVE
2.	Purina Pro Plan Adult High Protein Turkey Lamb Venison wet	Turkey, Lamb, & Venison	Turkey, Lamb, Venison, & Chicken	NEGATIVE	NEGATIVE	NEGATIVE
3.	Blue Wilderness with Chicken dry	Chicken	Chicken & Salmon	**POSITIVE**	NEGATIVE	NEGATIVE
4.	Blue Wilderness Duck Grill Trail Tray	Duck	Duck & Chicken	NEGATIVE	NEGATIVE	NEGATIVE
5.	Blue Buffalo Chicken and Brown Rice dry	Chicken	Chicken	**POSITIVE**	NEGATIVE	NEGATIVE
6.	Nulo Duck and Chickpea wet	Duck	Duck & Chicken	NEGATIVE	NEGATIVE	NEGATIVE
7.	Hill's Science Diet Lamb and Brown Rice dry	Lamb	Lamb & Chicken	**POSITIVE**	NEGATIVE	NEGATIVE

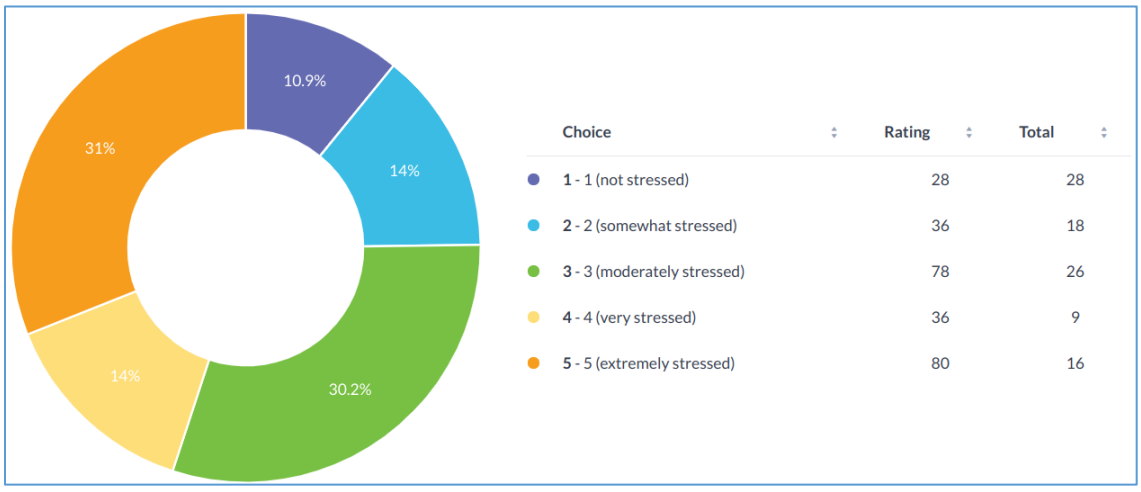
As we can see from the results, the Purina One and Purina Pro Plan samples that we tested did not have any of the protein DNA advertised or that was displayed in the ingredients list. The Blue Wilderness wet food and Nulo Duck and Chickpea wet food tested negative for all turkey, chicken and lamb. Only the dry food samples (Blue Wilderness Chicken, Blue Buffalo Chicken and Brown Rice, and Hill's Science Diet Lamb and Brown Rice) tested positive for chicken DNA. There is the possibility that the small amount taken from the wet foods for the DNA extraction did not have that specific protein in it; though some of the wet foods were in pate form, meaning, all the ingredients had been mixed and processed together.

We originally hypothesized that the wet food would easily show the DNA listed due to it being a little less processed and you can also see with the naked eye some of the ingredients in the can. But based on this project, it seems to be the opposite. The dry food seems to have more of the protein DNA we were testing for. Future projects and studies should confirm these results and make sure that pet parents know exactly what's in their pet's food.

Psychology Research Projects







Choice	Rating	Total
1 - 1 (not stressed)	28	28
2 - 2 (somewhat stressed)	36	18
3 - 3 (moderately stressed)	78	26
4 - 4 (very stressed)	36	9
5 - 5 (extremely stressed)	80	16

Living the College Experience Through a Computer Screen

Emily and Rafael Guilarte Ramirez

SPC Undergraduate Research Project (URE)

Professor Olsen

April 6, 2022

Living the College Experience Through a Computer Screen

In the late year of 2019, the Covid-19 pandemic struck the United States, causing all schools in every district to be forced into an online learning experience. Student's feelings of connectedness to their college and campus faltered and took a sharp dive. In fact, numerous studies have shown mental illness spikes in all age groups as well as a wave of isolation. Some were able to adapt quicker than others while others struggled much worse than previously believed. Students started looking for ways to feel normal again while actively seeking ways to feel connected to their campus.

Mental health is a major problem in the world but for college students who had to transfer online without a lot of warning it became an even bigger issue. In This article "The Covid 19 pandemic and mental health of first year college students" ((2021a). Jane Cooley Fruehwirth, Siddhartha Biswas and Krista M. Perreira.) data was collected from 419 students, ages 18-20, at a public university in North Carolina in October 2019 and February 2020. The study showed that the students who had moderate to severe anxiety increased from 18.1 percent before the pandemic began to 25.3 within four months of the pandemic. The rate of depression in students went from 21.5 to 31.7 percent. The difficulties that come with distance learning only contributed to these numbers due to isolation, as well as not being able to go back to campus to see peers or professors.

In this article, "Psychological Impact of Covid-19 on College students after school reopening: A cross-sectional study based on machine learning" (Ren, Xin, January 1) it has shown that there has been a definitive spike in both depression and post-traumatic anxiety through their self-diagnostic report. With more media coverage on schools during the Covid-19 pandemic, growing concerns with mental health have also spiked. People have felt more alone,

isolated from their groups and families as well as having to lower their ability of going out has negatively impacted most people's health – more so for those within the college/university environment. At the beginning, the initial outcome of the stay-at-home order was rather positive, but as time progressed to months, those that relied on others for communication and entertainment started to worsen. Those that fall within the youth of early college starters felt as if they were missing out on all they used to enjoy: friend groups, parties, group study sessions, even the regular walk to classes. With those commodities stripped, loneliness worsened. Those in the older community within the same environment have shown the same effect on a different scale. Their anxiety and self-motivation has taken a plummet due to having to learn everything on their own when compared to their counterparts who have grown up with the technology.

Depression and anxiety can be difficult to deal with, having suicidal thoughts is even worse. Being disconnected from your peers for students who have prior experience in college can be a rather difficult transition into an online environment, with no prior experience. The goal of this article “Connectedness sense of Community "(LWW 2014) explains the connectivity of the Campus connectedness and the likelihood of someone seeking help for their mental health through professionals or school counselors. The survey was sent in to see the likelihood of those seeking help for their suicidal thoughts, though not having that campus connectedness, the sense of the togetherness with peers and the presence of the supporting group of friends on the campus of the college all but disappeared. This showed that the feelings of campus showed that people are more likely to get help with their mental health when associated with their peers on campus. Being with other students on campus and having a sense of connection to the larger community campus while also building the peer relationships can assist in mending the sense of isolation.

It has been found that age also has an impact on campus connectedness (Czaia, Fisk, Hertzog, Nair, Rogers & Sharit, June 2006). It's been negatively associated with the understanding of computer information or acknowledgement of how computers/ modern media use is used - this new outcome has been dubbed "computer anxiety". Within this research though, when it comes down to connecting via computer on a campus environment, those with higher level of confidence within their computer did not exhibit the anxiety. They started out performing their peers and their regular levels of work in faster peers. Those that are confident with their computer literacy have no issue with keeping up with their communication skills online while also being able to work on their schooling effectively and within a timely manner. On the other hand, those of the older generation seem to struggle easier where they much prefer verbal, face to face communications. Their feeling of community dwindles rather rapidly. During the covid pandemic, the younger generation had a much easier time adjusting to online learning, and although clubs and meets were being held online, they had no issues regarding that.

Another issue that relates back to issues arising from online learning talks on the regard of how internet usage can either benefit or worsen someone's ability to connect or stay connected due to technical issues. Schools were hit rather hard when the change to online was made due to the reason that the internet bandwidth could not fully support everyone's usage at the same time. With distance learning though, other rural areas have been hit harder as well since their only ability to stay connected has been strictly through the internet. All ages have been impacted negatively because without the internet, the students cannot connect to their clubs, work, meeting, and everything else – they have been left in the dark. Some have had to take extra steps to assure their internet works by going to public places, but then, that only works for those that can drive easily and on their own time.

In this last article (Santa, 2018), it speaks on the behalf of how social media influences communication in a college environment. For those that have grown up within the digital age, they can use their phones to connect worldwide in an infinite number of ways. They have the ability to stay in touch with friends and family, continue to work on their careers, understand new info, and so much more. On top of it all, they can even have “face-to-face chats" through multiple locations via the internet. Now, for those that have not grown-up internet savvy, these benefits become issues. Without any previous knowledge of how the internet works, that includes the basic information, it can look like an endless battle, where clicking on one topic leads to an infinite amount more. Without the digital strategy that most users’ younger users follow instinctively, the social world becomes a wall that the older generation has a hard time climbing. With the Covid-19 pandemic, everyone was abruptly dropped at the same starting point of working from home – that be school too. The younger generation was able to take off running, forming their support groups, speaking with others directly, making multiple plans from different devices all at once, while the other side had to learn a whole new different language.

Everyone wants to have a good college experience, it's what most people dream about. Making sure that students have the best experience in school as well as making sure that they are getting into a classroom so they can learn with their peers, not just sit at a computer all day. Developing a sense of community and establishing connectivity are important in enhancing learners' success and preventing their sense of isolation. The comparisons revealed an increasing degree of isolation and a decreasing sense of community and academic satisfaction progressing from the first through fourth years in any schools. The students have suggested the possible solution to help with the connectedness for students who are being forced into distance learning. Students prefer traditional classroom communities over online communities. The positive

relationships exist between the students and their sense of community and their academic gains and overall satisfaction. A sense of community at any college has been able to help decrease isolation and reduce retention and promote satisfaction for the students at the college.

References

Abudu, J. (2008, December). College Adjustment and the Shy Student. Pittsburg State University Library Services. Retrieved from https://digitalcommons.pittstate.edu/etd/186/.

Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., & Sharit, J. (2006, June). *Factors predicting the use of technology: Findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE)*. Psychology and aging. Retrieved February 23, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1524856/#:~:text=They%20found%20that%20age%20was,anxiety%20and%20higher%20computer%20interest.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr.(2003). A Very Brief Measure of the Big FivePersonality Domains. Journal of Research in Personality,37, 504-528.

Horzum, M. H. (2016). Examining the relationship to gender and personality on the purpose of Facebook usage of Turkish university students. Computers in Human Behavior, 64, 319-328. http://doi.org/10.1016/j.chb.2016.06.010

Lai, J., & Widmar, N. O. (2020, October 12). *Revisiting the digital divide in the covid-19 ERA*. Applied economic perspectives and policy. Retrieved March 7, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7675734/

Ren, Z., Xin, Y., Ge, J., Zhao, Z., Liu, D., Ho, R. C. M., & Ho, C. S. H. (1AD, January 1). *Psychological impact of covid-19 on college students after school reopening: A cross-sectional study based on machine learning*. Frontiers. Retrieved March 7, 2022, from https://www.frontiersin.org/articles/10.3389/fpsyg.2021.641806/full

Santa Ono (University of British Columbia), interviewed by G. C. K. (2018, April 30). *How social media influences communication on college campuses*. MIT Sloan Management Review. Retrieved February 22, 2022, from https://sloanreview.mit.edu/article/how-social-media-influences-communication-on-college-campuses/

Tucker, K. & Rudmann, J. (2008). Campus Connectedness, Unpublished instrument, Irvine Valley College Department of Psychology.

Tucker, K. & Rudmann, J. (2009). Interpersonal Communication Efficacy Scales, Unpublished instrument, Irvine Valley College Department of Psychology.

Weyer, C. Y., & Carducci, B. J. (2001, August). The three-component model of shyness: Conceptual, correlational, and treatment considerations. Post presentation at the annual meeting of the American Psychological Association, San Francisco.

Xanidis, N., & Brignell, C. M. (2016). The association between the use of social network sites, sleep quality and cognitive function during the day. Computers in Human

Behavior, 55, 121–126. https://doi.org/10.1016/j.chb.2015.09.004*OpenAthens: 400*. (2021a). Jane Cooley Fruehwirth, Siddhartha Biswas and Krista M. Perreira.

Connectedness, Sense of Community, and Academic. . . : Academic Medicine. (2014b). LWW. Retrieved 2014, from https://journals.lww.com/academicmedicine/fulltext/2014/01000/Connectedness,_Sense_of_Community,_and_Academic.41.aspx

Connectedness to Campus and Likelihood of Help-Seeking for Suicidality among College Women. (2017). Taylor & Francis. https://www.tandfonline.com/doi/full/10.1080/87568225.2017.1312176

8 Week Psychology Research Project
Supervised by Professor Sharon Olsen

Student Name: Emily Vandermeir
Date started: February 14,2022
Title of Project: An Investigation of College Connectedness Factors During a National Pandemic
Weekly Journal:
Please maintain a weekly journal/report of the research/activities done each week (e.g., literature reviewed, assumptions, and/or conclusions, learning achieved). **This journal will be turned in with the final research paper at the end of the 8 weeks. **

Week 1 February 15, 2022

During the first meeting that we had on February 14th, we introduced ourselves and we went over all of the instructions for all the things we will be doing for the next 8 weeks. We went over all the paperwork, and we looked at some of the examples from other students. I have started to research "Why is it important to stay connected to your campus?"

Week 2 *February 22, 2022*

We did not have a meeting on Monday, the 21st however I am continuing with my research, and so far, I have 2 articles, on campus connectedness and mental health and how not being on campus can affect someone's mental health.

Week 3*March 1st, 2022*

We did not have a meeting on February 28, 2022, Professor Olsen had to cancel. For my research I now have 3 articles, and I plan to get the fourth this week. I have started to summarize the first article, and I will be working on article 2 this week.

Week 4*March 10, 2022*

We did not have a meeting again on March 7th due to Spring Break. This week I have got 3 articles, and they have all been paraphrased. The fourth article I thought I found ended up not working. I will be finding the fourth and final article this week, and paraphing it soon after.

Week 5*March 15, 2022*

We had a meeting this week on March 14th, we talked about the next steps, and got to see the data from the survey, which was pretty cool. I have 3 of my articles and they have all been paraphrased. I need to clean up my paper and put my citations in APA format. This week, me and Rafael are planning on combining our research into one paper, for a rough draft,

Week 6*March 25,2022*

On March 21st, 2022, we had a meeting, and we discussed the next steps that we will take to being done with the research project. Professor Olsen talked about me and Rafael presenting the research at a conference. During the meeting, we also watched a video that explained about presenting research to other people. They gave a lot of really great points. In the upcoming week, I will be working on finishing up, and putting together everything from the rough draft I created. I will also be finishing my work cited.

Week 7*April 1, 2022*

I was not able to attend the meeting on Monday, but from what I heard it was canceled. For this week, I added my work cited, and I am planning on going to see what Rafael worked on. We are almost done, just adding the finishing touches.

Week 8*April 7, 2022*

During our final meeting, we brought in two other people, and they explained some of the data, and the statistics of the numbers. Then me, Rafael, and Professor Olsen went over the final

steps for completing the research. This week I was able to fix my citations and make them APA format. Me and Rafael were able to come up with a title for the project. We just have a few more minor things to tweak, and then we are done! I have really enjoyed my time with the research team, it gave me a break from schoolwork nonstop and it was fun! Thank you for the opportunity!

8 Week Psychology Research Project
Supervised by Professor Sharon Olsen

Student Name: Rafael Guilarte Ramirez
Date started: 2/7

Title of Project: An Investigation of College Connectedness Factors During a National Pandemic

Weekly Journal:

Please maintain a weekly journal/report of the research/activities done each week (e.g., literature reviewed, assumptions, and/or conclusions, learning achieved). **This journal will be turned in with the final research paper at the end of the 8 weeks. **

☐ **Week 1** *2/7-2/11*

Discussed accordingly to the discussion given. Spoke directly to Olsen about the project itself. Also, we spoke about how I could start and brainstormed some ideas for related to the hypothesis.

☐ **Week 2** *2/14-2/18*

Researched multiple articles regarding the hypothesis given as well as other priorities related to the topic. Got quite a few potential articles with significant amount of data and information regarding my subjects.

☐ **Week 3** *2/19-2/25*

Rsearch continued. Less was done this week besides acquiring the four articles I deemed worthy for research pruposes. Essential elements of each article has been grabbed as well.

☐ **Week 4** *2/26-3/4*

Two out of the four sumarries have been written. Enough data gathered for the articles already read as well as the analyzations of the two. Article 1speaks on the behalf of age and how it directly correlates to technological use. Article 2 is based on how poor internet usage creates problems for youths that do not have a stable connection to an internet provider.

☐ **Week 5** *3/5-3/11*

Third summary was finished and the forth one currently in progress. Article 3 speaks on the behalf of the psychological impacts covid had in the early days of the pandemic, as well as how it continued to worsen as more time was mandated for work at home rules. Currently, each summary can be expanded out into multiple paragraphs if needed. (slow progress this week)

☐ **Week 6** *3/12-3/18*

All summaries are complete. All data collected including the student survey. Waiting on the finalization of the data from the main group/partner. Currently on stand by till then.

☐ **Week 7** *3/19-3/25*

Everything has now been written out. All key points have been reached as well as the data needed to go with said hypothesis. Also, all information is currently transferred to shared google docs. Only thing to do now finish transisions, final editing key points, and a thurogh read through for any spelling errors (if needed). Color coded the work for individual separation, including edited work.

☐ **Week 8** *3/26-4/1*

Finished typing entire paper during week 7. Edited the previous draft into the full complete research paper as well as my partners half. Currently waiting for my partner to continue finishing their half of the paper and going over the edits I have done for them. Edit: final edits have been made, any errors have been corrected. Sending complete compy to Professor Olsen as well as weekly log for final evalutation.

Problematic Social Media Use: Identifying Trends of Problematic Use Amongst Frequent Users

Name: Storme Quinn, Darcy Warms Professor: Sharon Olsen, MA

St. Petersburg College

Abstract

Using data gathered in a survey administered by Psi Beta National Honor Society, this study analyzes the correlation between participants (n=1382) social media usage (TIME HRS), and problematic habits grounded in usage (PSMU). Participants in the survey were asked various questions concerning their social media habits, perceived problems by self and others involving their use, and overall time spent on their preferred social media website. This study's results yielded a moderately significant positive correlation (r=.350 p=.001) between the two variables, demonstrating the value of future investigation into the relationship between frequency of use and problematic usage.

Problematic Social Media Use: Identifying Trends of Problematic Use Amongst Frequent Users

Introduction

As technology becomes further ingrained in society, social media use has become ubiquitous regarding communication but with such distinction comes scrutiny. Relevant research has been analyzing trends between overreliance, addiction, and problematic social media usage habits especially amongst adolescents. In 2021, a study examining self-control and problematic social media use determined the average time spent on social media websites was about 2 hours and 23 minutes daily (Zahrai et al., 2021). Over 2 hours' worth of social media use implies a major lack of activity, as cell phone, computer or tablet usage is fundamentally sedentary. In students and working adults, these 2 hours spent on social media forces them to use what little free time they have or imperils their goals and safety. One study found that drivers will risk their lives to check social media (Turel & Qahri-Saremi, 2016), while another found that students will visit social media during lectures, regardless of the negative impact on academic performance (Cao et al., 2018). Although these findings are a concern to researchers, determining the factors that define problematic social media usage is inherently difficult because it is a relatively nuanced issue and analysis relies on self-reporting methods. A survey in 2016 administered to Dutch students aged between 10-17 attempted to establish a scale to differentiate disordered social media users and high-engaging non-disordered social media users (Van den Eijnden et al., 2016). The survey utilized a 27-item scale that categorized participants' answers under the following traits: preoccupation, tolerance, withdrawal, persistence, displacement, problems, deception, escape and conflict (Van den Eijnden et al., 2016). Through a series of questions including but not limited to: subjects involving anxiety caused from lack of social media access,

variances in time intended to spend and actual time spent on social media and using social media as an escape from negative feelings, the group was able to establish a reliable scale determining differences in disordered and non-disordered users (Van den Eijnden et al., 2016). Although this scale is able to discern disordered and non-disordered patterns of behavior, its quantifiers are limited and do not relate to the participants' overall life satisfaction. One group of researchers measuring the correlation between social media and its effect on adolescent life satisfaction found that results vary greatly in participants, stating that the quantity of social media use by itself is not a strong predictor of the adolescent population's overall satisfaction with life (Orben et al., 2019). Although measurable life satisfaction is valuable to the study of participants' mental health, it is not in of itself deterministic of disordered or problematic social media usage. Findings surrounding life satisfaction may be influenced by trait emotional intelligence (TEI). An experiment measuring TEI in respect to problematic social media usage found that when excluding its use for informational and educational purposes, all other motives demonstrated some degree of correlation with problematic social media use (Süral et al., 2018). Thus, there may be an observable correlation between participants indicated life satisfaction and their trait emotional intelligence. A common trend in research regarding social media use addiction, disorders and other problematic behavior stemming from its use, is the reported amount of time spent checking social media and the likelihood of problematic usage. In the development of "The Social Media Disorder Scale", a measurement of adolescent participants' daily social media use was recorded, and in all groups a positive correlation was established between higher daily social media use and the value denoting severity of disorder (Van den Eijnden et al., 2016). This study expects similar trends in examining the relationship of time spent on social media websites and the prevalence of problematic social media use habits amongst college-aged participants.

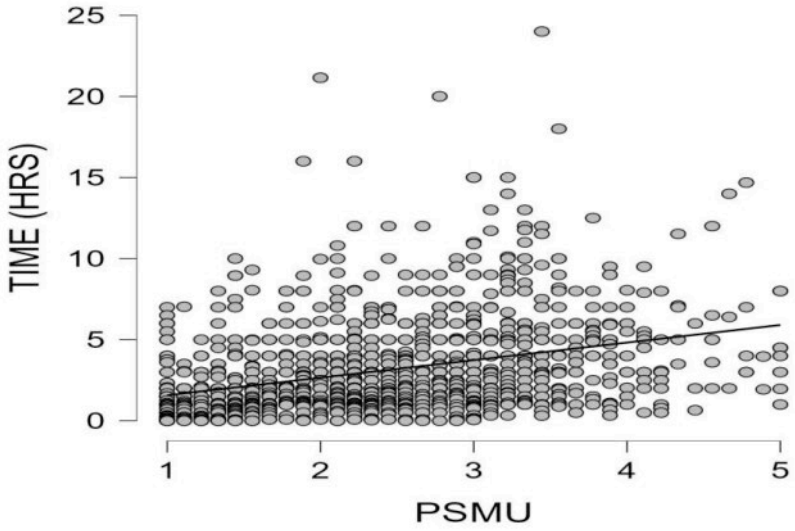
Method

Using data collected in a study administered by Psi Beta National Honor Society for Psychology Students, this study examines the correlation between the amount of time spent of social media (TIME HRS), the independent variable, and the severity of problematic social media use habits (PSMU), the dependent variable, among college students in psychology classes. Based on prior research measuring similar variables, it is hypothesized that with an increase of reported social media usage (TIME HRS), an increase in problematic social media (PSMU) use habits will also be recorded. As well as overall time spent on social media, participants were also asked a series of questions designed to identify characteristics of problematic usage. Participants were required to respond via Likert scale (1-5) about questions regarding anxiety when unable to access social media, discrepancies between intended and actual time spent, and negative feelings shared by participants' family about their social media use habits. A value was derived from an average of their responses and compared to their reported amount of social media use.

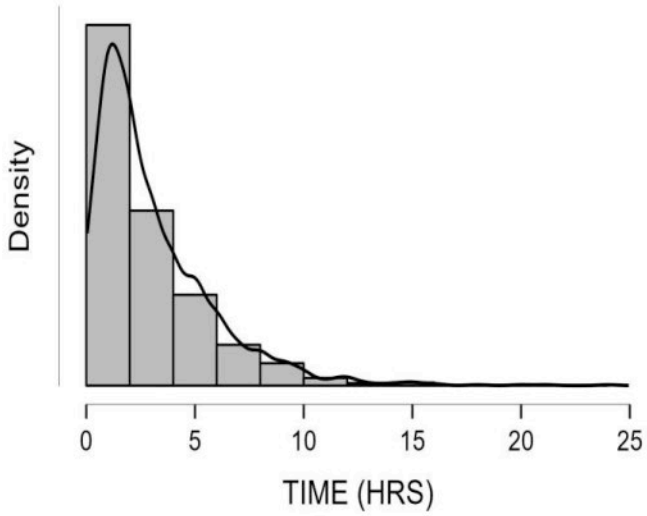
Results

Comparing the participants' (n=1382) self-reported daily time spent on social media (TIME HRS) and the mean score of their Likert responses regarding problematic social use habits (PSMU) yielded a moderately significant positive correlation (r=.350 p=.001). These findings support the hypothesis that with an increase of usage a related increase in problematic habits would also increase.

			n	Pearson's r	p	Lower 95% CI	Upper 95% CI
PSMU	-	TIME (HRS)	1382	0.350***	< .001	0.303	0.395



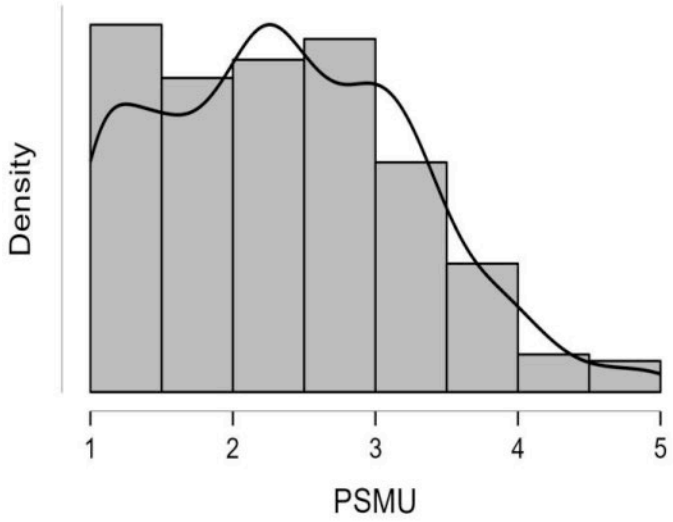
The amount of time spent online the average time participants reported is 3.07 hours per day with a standard deviation of 2.795 hours. The weight of deviation being driven by responses as high as 24. 3.07 hours is an increase from of a 2021 study which reported average use at 2 hours (Zahrai et al., 2021). Although this study has a reported average higher than previous studies, the majority of users judged their time on social media to be 2 hours.



	TIME (HRS)
Valid	1382
Mode	2.000
Median	2.000
Mean	3.070
Std. Deviation	2.795
Coefficient of variation	0.910
Skewness	2.019
Std. Error of Skewness	0.066
Kurtosis	6.690
Std. Error of Kurtosis	0.132
Minimum	0.000
Maximum	24.000

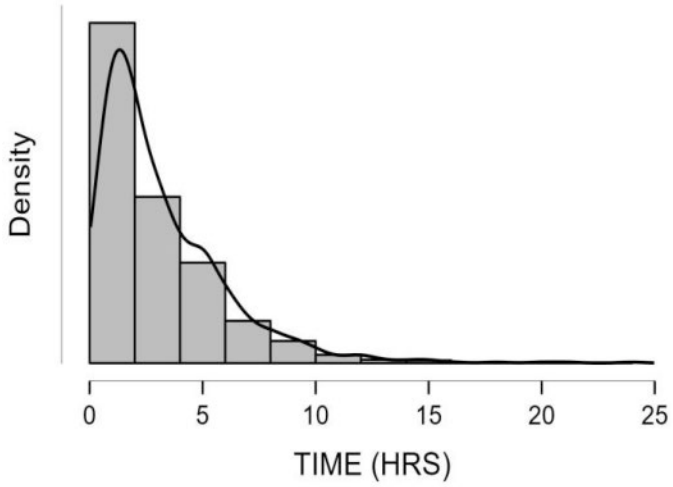
The average PSMU score is 2.382 out of a maximum of 5 with a standard deviation of .903, with most participants judging the severity of their habits at the base score of 1 skewing the result to

the right. These findings imply that a bulk of college age participants reflecting on their social media use find little to no occurrence of problematic use in 2 hours of usage a day.



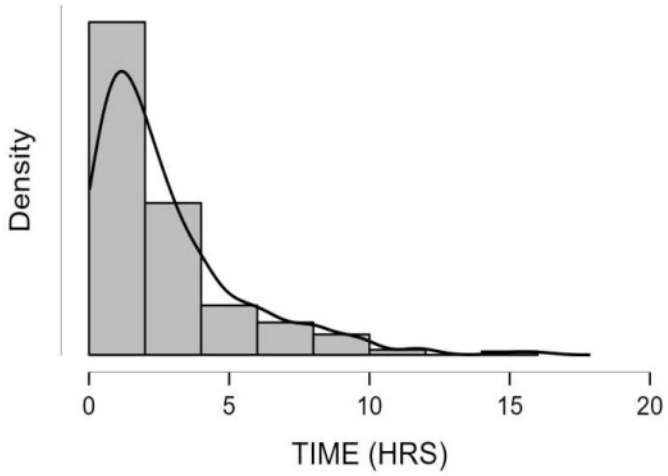
	PSMU
Valid	1382
Mode	1.000
Median	2.333
Mean	2.382
Std. Deviation	0.903
Coefficient of variation	0.379
Skewness	0.361
Std. Error of Skewness	0.066
Kurtosis	−0.417
Std. Error of Kurtosis	0.132
Minimum	1.000
Maximum	5.000

Separating results based on gender yielded slightly different results for each. Participants who identified as female spent an average of 3.207 hours on social media with a standard deviation of 2.88 which is slightly higher than the study's mean of 3.07 hours but still garnered the same average response of 2 hours.



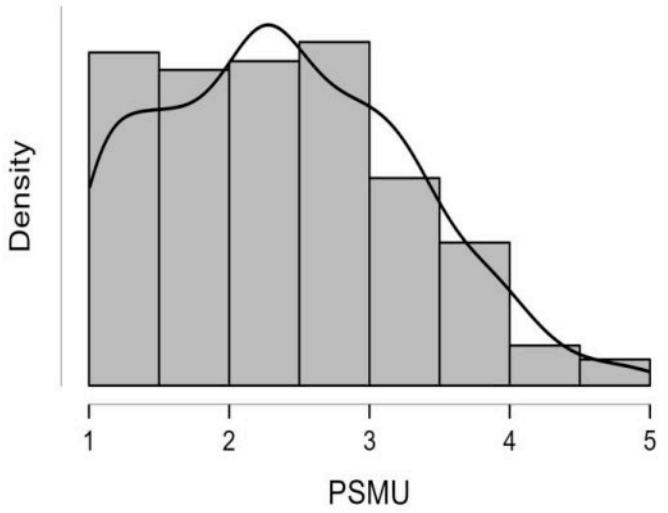
Female	TIME (HRS)
Valid	994
Mode	2.000
Median	2.075
Mean	3.207
Std. Deviation	2.880
Coefficient of variation	0.898
Skewness	2.069
Std. Error of Skewness	0.078
Kurtosis	7.129
Std. Error of Kurtosis	0.155
Minimum	0.000
Maximum	24.000

Participants who identified as male (n=349) reported spending a slightly lower daily average of 2.739 hours using social media with a standard deviation of 2.624 hours. Most male participants reported a lower-than-average usage of 1 hour.



Male	TIME (HRS)
Valid	349
Mode	1.000
Median	2.000
Mean	2.739
Std. Deviation	2.624
Coefficient of variation	0.958
Skewness	1.739
Std. Error of Skewness	0.131
Kurtosis	3.738
Std. Error of Kurtosis	0.260
Minimum	0.000
Maximum	16.000

Female-identified participants reported a PSMU Likert score average of 2.402 with a standard deviation of .896 using a range between 1-5. Most participants reported a score of 2.222, slightly less than the average.



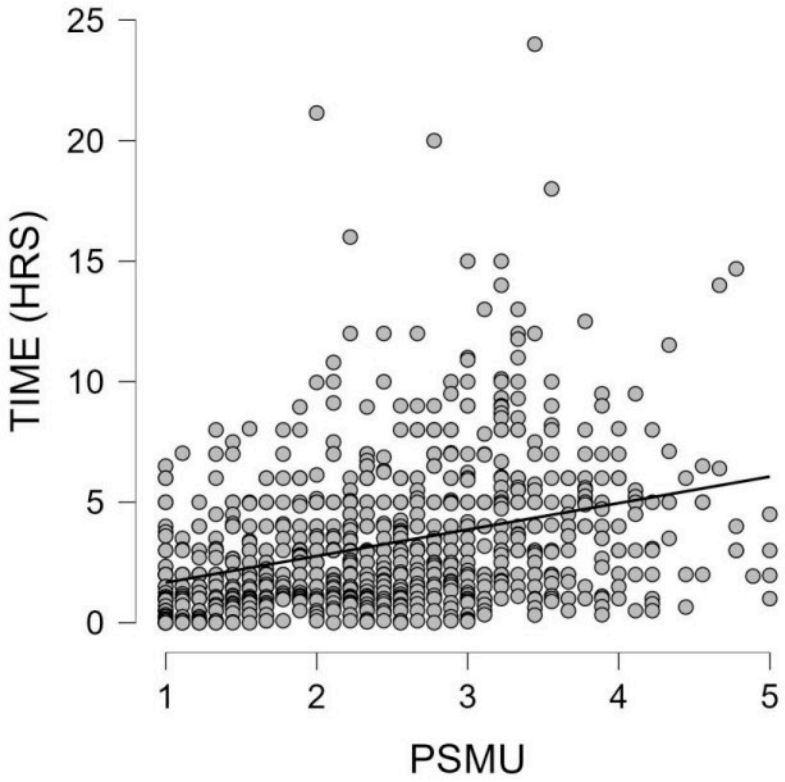
Female	PSMU
Valid	994
Mode	2.222
Median	2.333
Mean	2.402
Std. Deviation	0.896
Coefficient of variation	0.373
Skewness	0.356
Std. Error of Skewness	0.078
Kurtosis	−0.478
Std. Error of Kurtosis	0.155
Minimum	1.000
Maximum	5.000

In male-identified participants, the average PSMU Likert score average is 2.317 with standard deviation of .927 using a range of 1-5. Similar to time reported, the most common male-identified PSMU score was 1.

Comparing the correlation between TIME (HRS) and PSMU in female-identified participants (n=994) yielded a moderately positive correlation (r=.342 p=.001), slightly lower than this study's joint results (r=.350 p=.001).

			n	Pearson's r	p	Lower 95% CI	Upper 95% CI
PSMU	-	TIME (HRS)	994	0.342***	< .001	0.286	0.396

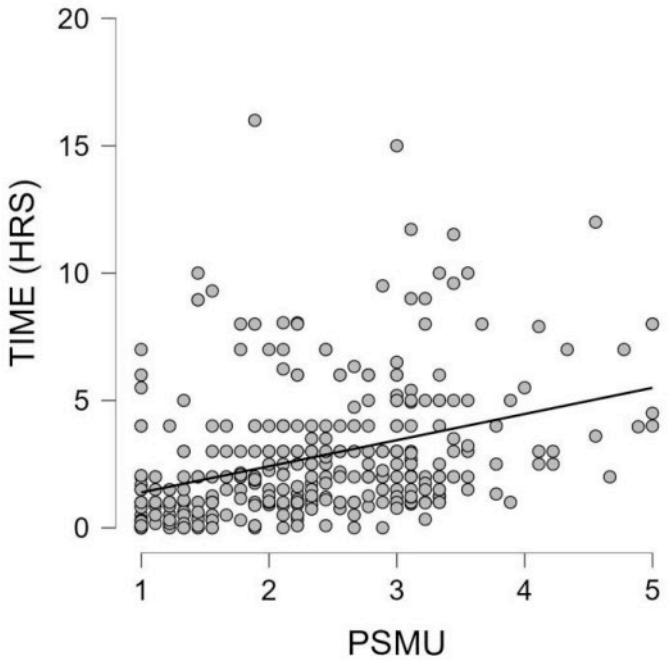
* p < .05, ** p < .01, *** p < .001



Comparing the correlation between TIME (HRS) and PSMU in male-identified participants (n=349) also yielded a moderately positive correlation (r=.363 p=.001), slightly higher than this study's joint results (r=.350 p=.001).

			n	Pearson's r	p	Lower 95% CI	Upper 95% CI
PSMU	-	TIME (HRS)	349	0.363***	< .001	0.268	0.451

* p < .05, ** p < .01, *** p < .001



Discussion

Post-Covid, people have cultivated undeniable changes in sentiment towards social media. During the height of the pandemic, online communication became a lifeline to families and friends amidst the chaos surrounding everyday lives. Businesses, education, and typical lines of communication relied completely on online means of connection. Post-Covid, these changes have yet not reversed to their pre-Covid state and is expected to have substantial and long-standing effects on the way cultures will communicate in the future. Problematic social media use stemming from over-reliance, dependency, and anxiety from the inability to access typical means of social media interaction is measurable and this study has shown a moderately significant correlation amount of time. Today, work-from-home, Zoom classes, and FaceTime are all mainstays of basic communication, increasing the amount of time civilization spends connected. With this increase of connectivity, it should be expected that problematic habits will also increase across the board. This study adds to the growing body of research surrounding

social media and its implications. Further development into the concept of problematic or disordered internet use and the future direction of defining dependency in the Diagnostic and Statistical Manual of Mental Disorders should be considered. Some limitations were noted in the survey, primarily the honesty or awareness of participants' usage of social media being problematic. As the survey is self-reported, it is difficult to obtain a more objective view on what constitutes problematic use. For example, outliers of the highest-usage participants (TIME HRS=22) reported low scores regarding their use being problematic (PMSU=2). Other notable outliers in time drove significant values of standard deviation. A standardized model for reporting time would lower the prevalence of inaccurate or erroneous time reports. More objectivity in questions surrounding problematic social media use would beget honest evaluation of social media habits therefore gaining accuracy in the results. The survey was administered to currently enrolled psychology students and additionally, the survey was wholly online. Gathering information online from a narrow scope of college students regarding social media use garners a concern of a sample bias as those most willing to complete the survey are also most likely frequent users. Possible direction to mitigate biases should consider an in-person, on campus method of information gathering.

Appendix

In your appendix, you can include standardized briefing and debriefing instructions and informed consent forms used with your participants before you began data collection.

References

Cao, X., Masood, A., Luqman, A., Ali, A. (2018). Excessive use of mobile social networking sites and poor academic performance: Antecedents and consequences from stressor-strain-outcome perspective. *Computers in Human Behavior, 85*, 163–174.

Orben, A., Dienlin, T., & Przybylski, A. K. (2019). Social Media's enduring effect on Adolescent life satisfaction. *Proceedings of the National Academy of Sciences, 116*(21), 10226–10228. https://doi.org/10.1073/pnas.1902058116

Süral, I., Griffiths, M. D., Kircaburun, K., & Emirtekin, E. (2018). Trait Emotional Intelligence and problematic social media use among adults: The mediating role of Social Media Use Motives. *International Journal of Mental Health and Addiction, 17*(2), 336–345. https://doi.org/10.1007/s11469-018-0022-6

Turel, O., Qahri-Saremi, H. (2016). Problematic use of social networking sites: Antecedents and consequence from a dual-system theory perspective. *Journal of Management Information Systems, 33*(4), 1087–1116. https://doi.org/10.1080/07421222.2016.1267529

Van den Eijnden, R. J. J. M., Lemmens, J. S., & Valkenburg, P. M. (2016). The social media disorder scale. *Computers in Human Behavior, 61*, 478–487. https://doi.org/10.1016/j.chb.2016.03.038

Zahrai, K., Veer, E., Ballantine, P. W., & Peter de Vries, H. (2021). Conceptualizing self-control on problematic social media use. *Australasian Marketing Journal, 30*(1), 74–89. https://doi.org/10.1177/1839334921998866

8 Week Psychology Undergraduate Research Experience (URE)
Supervised by Professor Sharon Olsen

Student Name: Storme Quinn
Date started: 5-16

Title of Project: An Investigation of College Connectedness Factors During a National Pandemic

Weekly Journal:

Please maintain a weekly journal/report of the research/activities done each week (e.g., literature reviewed, assumptions, and/or conclusions, learning achieved). **This journal will be turned in with the final research paper and poster (one PowerPoint slide) at the end of the 8 weeks. **

☐ **Week 1** 5-16

Week 1: Our team reviewed online database usage using the library's database and google scholar as examples. After walking through examples of how to search and cite research we examined Psi Beta's research on campus connectedness and how our hypothesis will draw from it. We concluded the meeting after reviewing the URE timeline.

☐ **Week 2** 6-1

Week 2: Our team, discussed possible hypothesis for the project and the benefits and drawbacks to each. We took more of an in-depth look at the data collection process and considered possible hypothesis for the project. The team decided to postpone selecting the hypothesis until we reviewed scholarly literature pertaining to the ones we formulated. We concluded the meeting after reviewing positive and negative correlations regarding data collection.

☐ **Week 3** 6-8

Week 3: Our team shared citations for the literature review and looked deeper at the studies we found surrounding problematic social media usage. Looking at previous research we considered methods of quantifying what denotes problematic usage and what further research our team needs to do as well as reviewing proper APA citation format.

☐ **Week 4** 6-16

Week 4: The team dove into the consolidated list of sources gathered and reviewed them for relevance and usefulness. After consideration we decided to not involve changes in covid to the direction of the research and to instead mention it the discussion section of the paper. As our team was small, we separated parts of the literature review by sources and began work on it.

☐ **Week 5** 6-29

Week 5: Our team screen shared our current progress on the literature review and addressed the order of topics presented. We further discussed the method and discussion sections and how their content should be written. The team reviewed a video and addressed any questions about the data section and how the data would be created and used.

Week 6 7-6

Week 6: The team took the gathered data and discussed its results. The data analysis and scatterplots were described in detail explaining the purpose of measures of central tendency, standard deviation, and skewness. The data supported the team's hypothesis, and a moderately significant positive correlation was represented in the data. To end the meeting, we delegation responsibility for handling the data and inputting it into the paper.

Week 7 7-13

Steps to finalize the paper are being taken including transferring the graphs and charts to a file form compatible with word documents and finalizing the results section. The team was given additional resources to support editing and overall finalization.

Week 8 7-20

The team addressed future direction for research, possible biases, and other possible topics of the discussion section. Responsibilities for consolidation, editing, and reviewing all the work is delegated, and a tutoring appointment with a research consultant was made. The team was given resources on creating a poster as well as resources for data creation.

Reaction Times and Cognition: An Investigation of the Stroop Effect

Name: Melina Korovessi **Professor:** Sharon Olsen, MA

St. Petersburg College

Undergraduate Research Experience

Reaction Times and Cognition: An Investigation of the Stroop Effect

The Stroop Effect (1935) was first developed by John Ridley Stroop in the 1930's. The Stroop test measures how fast a person can read aloud only the color of a word, when the word is a color name that is different than the ink or font color it is printed in. In the Stroop task, participants are shown color names (red, green, yellow, blue) in different font colors. Participants are asked to respond to the font color. For example, if the participant sees the word GREEN, they will need to respond to the font color (blue). The Stroop task requires individuals to read a list of words that are printed in a different color than the meaning of the word. Participants are asked to name the color of the word, not the word itself, as fast as they can. The effect explains the difficulty naming a physical color when it is used to spell the name of a different color (Lesley University para, 1). Stroop's original experiment was broken down into three phases. First, he asked participants to read a list of colors printed in black ink. Then he asked them to name the word despite the color they were printed in (Lesley University para, 2). In the second phase, Stroop asked the participants to name the ink color instead of the word written (Lesley University para, 3). Additionally, participants were asked to identify the colors of squares (Lesley University para, 4). At the end of the experiment, he learned it took the subjects longer to name the ink colors of the words than it took them to identify the color of the squares (Lesley University para, 5).

The Stroop Effect has been the subject of much research, and thus has sprouted many theories onto why it occurs. There are four main theories that attempt to explain the significance of the Stroop Effect. The first theory is the Selective Attention Theory, which suggests that because identifying the color of the words takes more attention than reading the text, people's brains process the written information instead of the colors of the

information (Chudler, 2020 para, 3). The second theory is called the Automaticity Theory. This theory, on the other hand, states that our brain reads the word first because reading is more of an automatic cognitive process than recognizing color is (Lesley University para, 9). The third theory is the Speed of Processing Theory, which is similar to the Automaticity Theory. The Speed of Processing Theory asserts that we can process written words faster than colors, so our brains identify the color after reading the word (Chudler, 2020 para, 4). The final theory is called the Parallel Distributed Processing theory, which states that the brain creates different pathways for tasks, thus the reading pathway is stronger than the one for naming the color of the text. These four theories attempt to explain the Stroop Effect and how the brain processes information (Lesley University para, 11).

After Stroop's original experiment and the theories that followed suit, others performed similar experiments, such as the Picture-Word Interface Task where a word conflicting an image was embedded in the image. As expected, naming the picture was met with interference from the word but reading the word was not influenced as much by the picture (The Stroop Effect; Colin M. MacLeod para, 6). Another variation of the Stroop Experiment revolved around a word that was in a mismatched arrow. The word made it more difficult for the participants to identify the direction of the arrow (The Stroop Effect; Colin M. MacLeod para, 7). The Flanker task is another version of the Stroop experiment. In this experiment, subjects are asked to identify a central arrow pointing in a different direction than an array of other arrows pointing in a different direction (The Stroop Effect; Colin M. MacLeod para, 8). In all of these variations of the Stroop Effect, we find clear differences in reaction times between automatic and controlled processing of information.

The purpose of the present study was to investigate the differences in reaction time between automatic and controlled processing of information when participants were presented with a congruent versus an incongruent task.

Method

In the present study, participants were asked to read a list of words written in a certain color of ink. The words on the list were names of colors, but the words themselves were written either in the same color as the written word (the congruent task) or in a different color than the written word (the incongruent task). The amount of time to read the assigned list was measured in seconds using a stopwatch. It was hypothesized that the names of words would interfere with the ability to name the color of ink used to print the words, and thus it would take participants longer to read the words in the incongruent list than to read the words in the congruent or control conditions. All lists contained ten words printed in bold in Times New Roman 35-point font. List # 1 contained words printed in black ink (control condition). List # 2 contained words printed in congruent colors. List # 3 contained words printed in incongruent colors.

The word colors used were as follows: green, blue, red, purple, pink, brown, orange, yellow, black, gray. A repeated measures design was used, meaning that all participants were exposed to all conditions. The order that the lists were presented to the participants was randomized to control for order effects. The independent variable in this study was the color of ink used to write the word. The dependent variable was the amount of time that it took each participant to read each list of words.

Volunteer participants (n=20) were recruited from the SPC Clearwater campus tutoring center lobby. Each participant was tested independently. Each participant received and signed an informed consent form agreeing to participate in the study. Although there were no known harms

associated with the study, each participant was told that if they felt uncomfortable at any time, they could withdraw from the study with no penalty. After each participant completed the study, they were debriefed and given a QR code that took them to a website that supplied them with information about the Stroop effect. After all data was collected, the measures of central tendency were calculated and are reported below in the results section.

Results

The present study aimed to research how the brain processes colors and words. In this study n=20 participants were tested in three conditions. The amount of time to read the assigned list was measured in seconds using a stopwatch and the times are listed in Table 1.

Table 1

Reaction Times by List

Participant #	List 1	List 2	List 3
1	3.90	5.71	6.16
2	5.16	7.51	11.93
3	4.60	5.77	8.70
4	3.99	5.99	10.23
5	5.12	4.92	10.30
6	5.56	6.60	14.62
7	4.24	6.45	7.57
8	4.91	9.03	12.20
9	4.01	4.84	9.50
10	3.86	5.75	6.50
11	3.51	5.36	12.98

12	4.84	7.59	9.69
13	6.00	8.79	20.44
14	7.90	6.87	8.37
15	2.62	3.00	12.07
16	3.35	4.30	7.27
17	3.35	3.73	10.52
18	3.62	4.11	6.17
19	3.45	4.38	7.93
20	4.32	5.43	8.76
Total	58.715	117.43	200.48
Mean	4.4385	5.8715	10.024
Median	4.1	5.73	9.98
Mode	3.9	4.3	6.5
Standard Deviation	1.14696763	1.56571477	3.3002795
Range	5.28	5.79	13.94

In the control condition (list 1), colors in black ink, the mean (average) time to read the list was 4.4385 seconds. Next, in the congruent condition (list 2), colors in corresponding colors, the mean (average) time to read the list was 5.8715 seconds. Finally, in the incongruent condition (list 3), colors in randomized/non-corresponding colors the mean (average) time to read the list was 10.024 seconds. This type of data is important because it gives us an idea of where the center value is in a dataset and in this case, shows the average amount of time it took participants to read each list.

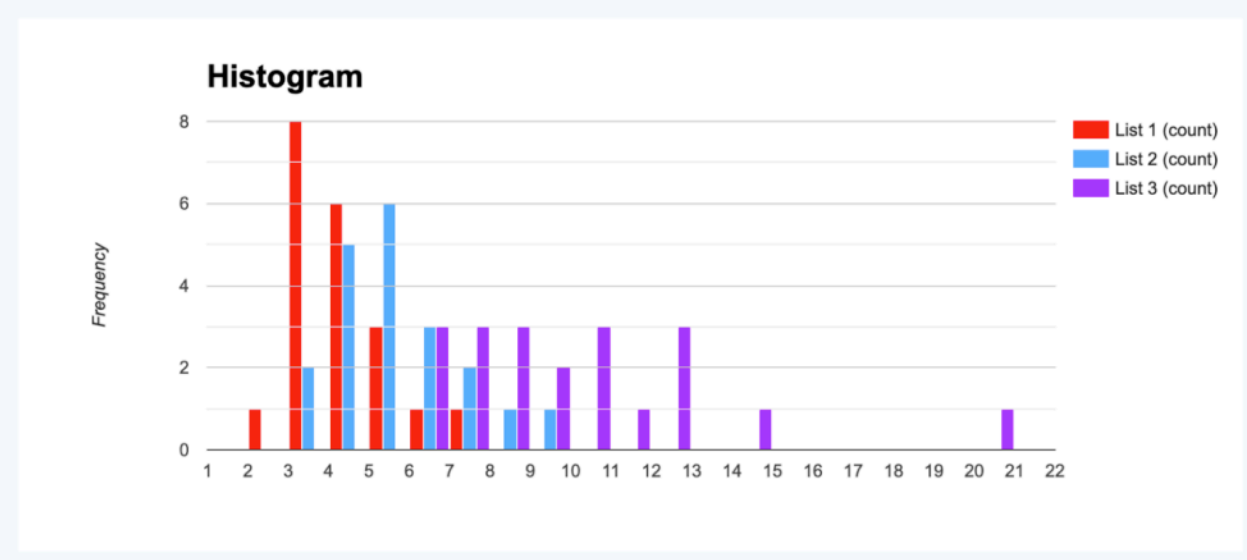
For this study, the median is also important to look at, for example, in the control condition (list 1), colors in black ink, the median time was 4.1 seconds. Next, in the congruent condition (list 2), colors in corresponding colors, the median was 5.73 seconds. Finally, in the incongruent condition (list 3), colors in randomized/non-corresponding colors the median time it took for participants to read the list was 9.98 seconds. This type of data is important because the median is calculated by taking the "middle" value, the value for which half of the observations are larger and half are smaller. The median is less affected by outliers and skewed data than the mean.

In this study the mode is also important to look at, for example, in the control condition (list 1), colors in black ink, the mode was 3.9 seconds. Next, in the congruent condition (list 2), colors in corresponding colors, the mode was 5.73 seconds. Finally, in the incongruent condition (list 3), colors in randomized/non-corresponding colors the mode was 6.5 seconds. This type of data is important because it shows the most prevalent and most frequent value(s) in the data sets.

Throughout study, n=20 participants were tested in three conditions. In the control condition (list 1), colors in black ink, the standard deviation was 1.14696763. Next, in the congruent condition (list 2), colors in corresponding colors, the standard deviation was 1.56571477. Finally, in the incongruent condition (list 3), colors in randomized/non-corresponding colors the standard deviation was 3.3002795. This type of data is important because it helps in understanding the measurements when the data is distributed.

In this study, n=20 participants were tested in three conditions. In the control condition (list 1), colors in black ink, the range was 5.28. Next, in the congruent condition (list 2), colors in corresponding colors, the range was 5.79. Finally, in the incongruent condition (list 3), colors in

randomized/non-corresponding colors the range was 13.94. This type of data is important because it shows variability when there is distribution without extreme values.



Discussion

The results of this study showed that it generally took people longer to read the ink color of a word when word was incongruent with the ink color. This data is in line with the results of the original Stroop effect, and this is important information because it proves that humans' brains have a hard time processing information when there are two stimuli conflicting with one another. The effect observes people's ability to have selective attention and how the brain demonstrates different levels of cognition for color and word recognition.

There are some limitations in the present study. For example, the sample size (n=20) was quite small. Very small samples can undermine the internal and external validity of a study. Additionally, our sample was not diverse. Our sample consisted of only community college students at one campus of one community college. Future research could utilize different test types such as the emotional Stroop test, the arrow test, or the animal test. All of these tests focus

on similar cognitive abilities as the original color Stroop test but widen the theories and abilities tested.

The Stroop effect could also be used to investigate the cognitive ability in depressed individuals, for example for a depressed person it would typically take them longer to read the words overall. Beck and Bower, two scientists who were researching the Stroop effect predicted that depression could be linked with an attention bias for mood stimuli (Epp, Dobson, Dozois, Frewen, 2012). This suggests that there would be mood-congruent interference effects for depressed populations to compare with Stroop effect (Epp, Dobson, Dozois, Frewen, 2012). The mixed pattern results identified with the Stroop task in depression examine the relationships between depression and attention-based stimuli, the Stroop effect.

References

Chudler, E. H. (2020). *Neuroscience for kids*. Neuroscience For Kids - Stroop Effect. Retrieved September 23, 3022, from https://faculty.washington.edu/chudler/words.html

Epp, A. M., Dobson, K. S., Dozois, D. J., & Frewen, P. A. (2012). A systematic meta-analysis of the Stroop task in depression. Clinical Psychology Review, 32(4), 316-328. https://doi.org/10.1016/j.cpr.2012.02.005

Macleod, C. M., & Ridley, J. (1970, January 1). [PDF] the Stroop effect: Semantic scholar. undefined. Retrieved September 23, 2022, from https://www.semanticscholar.org/paper/The-Stroop-Effect-Macleod-Ridley/372668884e4c9609fcbbe143a6432d0cb7e9df7a

MacLeod, C. M. (1991). Half a century of research on the Stroop effect: An Integrative Review. Psychological Bulletin, 109(2), 163–203. https://doi.org/10.1037/0033-2909.109.2.163

Our Amazing Brain. Log In - Films on Demand. (n.d.). Retrieved September 23, 2022, from https://fod.infobase.com/

Scarpina, F., & Tagini, S. (2016). The Stroop Color and Word Test. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2017.00557

Stroop, J., (1935). Studies of interference in serial verbal reactions. Journal of Experimental Psychology, 18(6), pp. 643-662.

Tzelgov, J., Henik, A., & Berger, J. (1992). Controlling Stroop effects by manipulating expectations for color words. Memory & Cognition, 20(6), 727–735. https://doi.org/10.3758/bf03202722

What the Stroop effect reveals about our minds. What the Stroop Effect Reveals About Our Minds | Lesley University. (n.d.). Retrieved October 29, 2022, from https://lesley.edu/article/what-the-stroop-effect-reveals-about-our-minds

8 Week Psychology Undergraduate Research Experience (URE)
Supervised by Professor Sharon Olsen

Student Name: Melina Korovessi
Date started: 09/14/22

Title of Project: A Study on the Stroop Effect

Weekly Journal:

Please maintain a weekly journal/report of the research/activities done each week (e.g., literature reviewed, assumptions, and/or conclusions, learning achieved). **This journal will be turned in with the final research paper and poster (one PowerPoint slide) at the end of the 8 weeks. **

☐ **Week 1** *09/14/22*

Introductions, overview of searching articles, exposition of Stroop Effect

☐ **Week 2** *09/24/22*

Continued research for articles, designed plan for possible research methods

☐ **Week 3** *09/28/22*

Hurricane Ian no meet, worked independently

☐ **Week 4** *10/6/22*

Found hypothesis, worked out details of methodology

☐ **Week 5** *10/14/22*

Conducted experiment on Stroop effect

☐ **Week 6** *10/24/22*

Continued research and made a table of data for Stroop effect

☐ **Week 7** *10/29/22*

Edited and developed discussion, results, and designed graph of results

☐ **Week 8** *11/07/22*

Finalized research paper

Rebranding bullying in the United States in an effort to stigmatize the bully not the victim.

Tyler M. Bauer

Dr. Rebekah Barnett, PhD Research Coach

St. Petersburg College Undergraduate Research Experience

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The research in this study was presented by Professor Kimberly Molinaro at St. Petersburg college, working as links in a chain, we all played a role in developing this research. She helped guide me towards the URE at SPC and I am very thankful for that. Thank you to Dr. Rebekah Barnett, PhD Research Coach for being a wonderful mentor and helping me learn through this research process, they helped guide me through this process . Thank you to St. Petersburg College for giving me the opportunity to take part in the URE, I am very thankful for the opportunity I was given. Thank you to the schools in Pinellas county that respected our researchers efforts and provided data in a non confrontational manner. Thank you to the Pinellas County school board's district attorney for reaching out to schools that were pushing back on our data collection efforts.

Introduction

This research study focuses on rebranding bullying, from victimization of the person being bullied and shifting the narrative back onto the bully. The research in this study aims to accurately define the bully victim and the bully along with opening the door for researchers to do more research on the complex nature of bullying victimization. The research literature viewed in this study focuses on types of school atmospheres and age groups: public schools, private schools and alternative schools, with special focus on 3rd graders up through freshman college students. Rebranding bullying hopes to redirect how victimized bullying support programs educate their students and faculty, the research in this study will bring to light the long lasting mental health effects of victimized bullying support programs.

REBRANDING BULLYING LITERATURE REVIEW

The literature review branches off into six pathways in an effort to clearly communicate the research in the study. The first pathway; methods of searching, reviews what sources the study used to obtain information on the research topic and question. The second pathway; Glossary for this review, defines words pertaining to this research study in an effort to make sure there is proper transference of the research. The third pathway; Review of the literature lists all the research pathways the study researched those being: Bullying and victimization, Comparing and Contrasting stigmatizing the bully vs stigmatizing the victim, Comparing and contrasting bullying and victimization in traditional school settings vs bullying and victimization in alternative school settings.

Methods of Searching

The researchers in this study used several sources to build off the research that was previously published in the psychology and education fields. The goal of this study is to link previous research done on the topic of bullying with this current study. In an effort to gather accurate articles, keywords were used relating to the topic of bullying and the research question: School, Bullying, Bully, Victimization, Victim, Victimology, attention, America and United States. We used these keywords in Scholar and library databases such as ApA Psycarticles and NcBI. In an effort to gather definitions and relevant information, search engines including Google Scholar and textbooks were used.

Glossary for this Review

This review consists of several key definitions and terms. The terms in this glossary were defined by the Oxford English Language dictionary, and defined in context of this study. The terms in this glossary focus on victimology and bullying behaviors. First, victimology as defined in the Oxford English Language Dictionary; “The study of the victims of crime and the psychological effects on them of their experience. Specialists in victimology will gather to consider how best to help victims of crime recover”. Second, victim as defined in the Oxford English Language Dictionary “a person harmed, injured, or killed as a result of a crime, accident, or other event or action.” Third, Victimization as defined in the Oxford English Language is “The act of singling someone out for cruel or unjust treatment; A mark of disgrace associated with a particular circumstance, quality, or person (e.g.Shame, disgrace, dishonor...).” Fourth, victimize as defined in the Oxford English Language Dictionary is “single (someone) out for cruel or unjust treatment.” Fifth, Bullying as defined in the Oxford English Dictionary is “a person who habitually seeks to harm or intimidate those whom they perceive as vulnerable.”

Review of The Literature

The Review of The Literature will be broken up into three sections, The first section will be on Bullying and Victimization the following section will look at Comparing and Contrasting stigmatizing the bully vs stigmatizing the victim following up with a final section on Comparing and contrasting bullying and victimization in traditional school settings vs bullying and victimization in alternative school settings. The sections in the Review of Literature are linked together to make sure all the information builds off the previous pathway.

Bullying and Victimization.

This pathway of the review of literature aims to build a better understanding of bullying behavior and victimization from the lense of the bully, the victim and third party perspectives. Countless hours of research was done through the American Psychiatric Association (APA) articles database and research articles done in the education field using keywords (i.e. bully, bullying, victim, victimization, school and America) to gather the most accurate data. To understand victimization the perpetrator must be identified and understood as the bully so this is where the section will start off; a bully intentionally harms another individual causing victimization in school environments.

The bully can be anyone of any gender, race, ethnic background and financial background no one is exempt from being a bully unless they are not actively victimizing their peers. Previous research shows that bullies are more likely to victimize their peers that are in the same gender group as them; girls are more likely to victimize girls and boys are more likely to victimize boys, see the next section for a more in depth look into how the bully is stigmatized. Bullying behavior as described by StopBuillying.gov is organized into categories “Verbal bullying, social bullying and physical bullying” (Assistant Secretary for Public Affairs [ASPA], 2021). However, understanding these behaviors within a bully is crucial.

A child is not born a bully, it is not biological, it is a mix of potentially psychological and social factors from at home or other environments. The bully may feel a sense of shame, a strong feeling of painful humiliation or distress that they are not able to internally process due to a situation going on in their life or it could be a reflection of themselves therefore, they take out their built up sense of shame on their peers. The bully may feel a sense of enablement by their

peers as well if their behaviors are not directly called out, for example: If there are kids playing in a school yard; child A is the bully, child B is the victim and, Child group C are the bystanders. Child B gets called first for an activity or resembles something that brings out a strong sense of shame in Child B, Child B not knowing how to internally process their emotions in a healthy way chooses to bully child A using one of the Bullying methods previously provided. Child group C see's the bullying and either laughs, intervenes or doesn't say anything in fear of being bullied as well. If group C intervenes then Child A may feel less likely to bully others which is why it is important to identify and understand the bully. If group C were to approach Child B then they will potentially continue the victimization the child feels which is why some people will experience victimization throughout school even after bullying has stopped.

The research in this study focuses on switching the narrative off the victim and putting the focus back onto the bully in a non dismissive way. As previously stated victimization exists in the school environment because of the bully similar to how victimization exists because of murderers, rapists, robbers and other types of offenders that have been labeled in the world of criminal justice. Victimology is an intricate pathway however, victimology exists due to the unfortunate fact that there are people who victimize others. A murderer, robber, thief and bully all land on different areas for how extreme they victimize other people in comparison, what they share is that they are victimizing other people which shows they are lacking regard for the rights of others, this is something that can be observed and confirmed through psychological assessments.

Compare & Contrast Stigmatizing The Bully vs Stigmatizing the Victim

This path discusses comparing and contrasting stigmatizing the bully versus stigmatizing the victim and builds off the previous path bullying and victimization. Stigmatize as defined by the Oxford English Language Dictionary is "describe or regard as worthy of disgrace or great disapproval." The bully is victimizing their peers and the Victim is the outcome of their actions. According to current research (Hymel & Swearer, 2015), Bullying has been stigmatized as an underground behavior with no accurate way to assess a bully. There are also gender stigmas that have been backed up with statistics showing bullies are more likely to bully within the same gender groups, There are not a lot of stigmatized labels surrounding the bully on public resources such as StopBullying.gov.

The current focus is heavily victim focused through stigmatizing the victim, StopBullying.gov resources inform the reader that people of certain racial backgrounds, LGBTQ groups are more likely to be bullied rather than focusing on who the bully is in those situations if they occur. According to Sonia et al., (2019) victims are also likely to be stigmatized amongst their peers, if a victim displays aggressive behavior towards the bully they are less likely to be defended and more likely to remain victimized by their peers. Peer's that experience poor social skills are also more likely to be victimized. Both the bully and the victim are subject to some form of victimization, some victims transition out of victimization, others remain victimized as youth move forward toward the end of elementary school, there is also a theory that people are inclined to believe people experience what they deserve which may be a factor in why some bystanders don't intervene or take part in the bullying (Hymel & Swearer, 2015; Niwako et al., 2017; Sonia et al., 2019).

Compare & Contrast Bullying and Victimization in Traditional school settings vs in Alternative School Settings.

This path of the review of the literature focuses on comparing and contrasting bullying and victimization in traditional school settings vs in alternative school settings, the research in this path aims to build off the work from (Sonia et al., 2019). A synthesis of the research helps push the research in this study forward by showing youth attending alternative school settings are at a greater risk of victimization caused by bullying, in these atmospheres bullying gets more violent in comparison to a traditional school setting. However, students moving from a traditional school setting to an alternative school may also get bullied by their peers in the traditional school due to how alternative schools tend to be stigmatized amongst peers as schools for bad kids rather than schools to help kids succeed. The effects that bullying and victimization have on attention and academic performance is similar in both environments; one environment may be worse than the other however, the negative effects are the same which leads the research to its next path (Hymel & Swearer, 2015; Sonia et al., 2019).

Compare and contrast Victimization With Attention and Academic Performance

This section of the review of the literature focuses on comparing and contrasting victimization with attention and academic performance, the research in this section builds off previous research articles from APA psycarticles. The research has shown victimization and attention coexist and affect one another, when victimization goes up attention rates go down however, when victimization goes down attention goes back up in students. Overall findings show that victimization has serious effects on youth mentally, the more prolonged victimization is the more likely they are to develop mental health disorders and sleeping issues, research shows

that these factors negatively affect academic scores according to a research study done in an alternative school “When examining teachers’ report of learning and attention problems in their students, the average t-score of learning problems was 57.15 (SD10.96) and the average t-score of attention problems was 56.30 (SD 10.10). Within this sample, 40 (23%) were rated in the at-risk range and 23 (13%) in the clinically significant range for learning problems. Fifty-five participants (32%) were rated in the at-risk range and 10 (6%) in the clinically significant range for attention problems.” (Sonia et al., 2019, P.511&512) . The data in this research shows a majority of the students that took part are negatively being affected because of bullying and victimization. Victimization can become so prominent and extreme that it mentally prevents students from either going into college or successfully moving through college, this study primarily follows the effects of victimization in elementary through high school however, it is important to note there are a majority of students that do drop out of college due to the victimization they experienced in their youth. Academic scores and attention are correlated as well, therefore low attention in a student due to victimization will lead to poor academic scores due to how they withdraw themselves from the classroom (Davis et al., 2018).

Synthesis of Research Findings

The review of the literature pertaining to this study included works by Hymel and Swearer (2015) Holt et al., *(*2016), Davis et al. *(* 2018), Niharika et al., (2019), (Glenn, 2021), (Sonia et al., 2019), (Niwako et al., 2017), (Fite et al., 2014) and, (APA Council of Representatives, 2004).

Additional secondary works of note include that by the Assistant Secretary for Public Affairs [ASPA], 2021). Which discussed information on bullying behavior, the bully and

victims, ASPA discussed and labeled which groups are more likely to be subject to bullying and the different types of bullying that occur in school atmospheres, it also covers how a bully should be talked to.

All of the research studies reviewed similarly concluded that bullying and victimization have negative effects on children and their peers during school years. The research studies reviewed also concluded that bullying and victimization has negative effects on mental health for children and their peers, bullying and victimization are also correlated to attention issues which correlate to academic problems. Starting off with Four Decades of Research on school bullying (Hymel & Swearer, 2015). The conclusion of their study states that after compiling four decades worth of research that questions still outweigh the answers on this research topic, their conclusion emphasizes finding the most effective way of addressing bullying clinically, legally and academically concluding there is still a lack of research and information. Second; Examining the pathways Between Bullying & Victimization depression, academic achievement, and problematic drinking in adolescence (Davis et al., 2018). This study concluded that targeted programs could significantly reduce bullying and victimization rates in adolescence which would also help lower alcohol abuse rates amongst adolescents and their peers. Moving onto the next research study that was reviewed; Bullying and psychopathic traits: A longitudinal study with adolescents in India (Niharika et al., *Bullying and psychopathic traits: A longitudinal study with adolescents in India.* 2019). The conclusion in this study addresses measures that can be used in India, the conclusion also addresses how researchers in India are using western research on psychopathy in an effort to properly research this path on bullying in India, they suggest more longitudinal studies on the pathway. The researcher in this study also reviewed; Trajectories of

bullying victimization and perpetration in Australian school children and their relationship to future delinquency and conduct problems. (Glenn, 2021). This study concluded that there is a significant overlap between bullying victimization and bullying preparation, this relationship could have implications on the relationship between bullying and self reported delinquency. Fifth; Associations of bullying, victimization, and daytime sleepiness with academic problems in adolescents attending an alternative high school (Sonia et al., 2019). This study concluded that bullying, victimization and daytime sleepiness increase the risk for attention and academic problems in their sample. They also concluded that bullying and victimization are areas of high concern for students attending alternative high schools; it also uniquely linked bullying and victimization with attention and academic problems. This study also concluded that it is crucial for teachers and staff in alternative schools to be familiar with their students, getting rid of stigmatized images or ideas is crucial to helping students in these environments succeed. Sixth, A latent class analysis of past victimization exposures as predictors of college mental health (Holt et al., 2016). This study identified that there are a combination of victimization experiences someone may experience prior to attending college, their study concluded that universities should have proper support systems in place for their students. Their study also concluded that universities should have specialites trained to help certain minority groups due to how they are more likely to have prior victimization experiences that could affect them while attending university.

Critique of Previous Research Methods

The previous research methods listed in the previous section of the review of literature, helped the research in this study show how victimization and bullying rates in school are high.

Building off previous perspectives, stigmatizing the bully rather than the victim with targeted in-school programs could significantly help lower victimization rates, victimization and bullying will never fully go away however, how its addressed can change and lead to a better future for students. The current research articles in the United States on bullying and victimization within the field of psychology are lacking and the prior research articles back this up in their conclusions, the most recent article this study could find was published in 2015 (Hymel & Swearer, 2015). It is possible the current data available is outdated therefore if more recent data were to be collected it may reflect a more accurate image of bullying and victimization within school environments. Most of the research that was used for the review of literature states within their work how questionable their data may be due to the number of participants, future studies should use larger groups of students. Current research creates more questions rather than answering the ones already put out there by previous researchers, like stated in Four Decades of Research On School Bullying, questions outweigh the answers (Hymel & Swearer, 2015) future research should answer the already existing questions with their research.

Summary of Literature Review

The summary for the review of literature focusing on rebranding bullying in the United states to be less victim focussed and to stigmatize the bully not the victim will briefly summarize each pathway. Thus far, bullying and victimization, compare and contrast stigmatizing the bully versus the victim and, compare and contrast bullying and victimization in traditional school settings versus in traditional school settings. The overall research done in this study dedicated itself to understanding bullying and victimization to better reinforce our research topic and question thus far, rebranding bullying in the United States to be less victim focused and to

stigmatize the bully not the victim, through the review of literature pertaining to bullying and victimization it was concluded that through comparing and contrasting bullying and victimization through several different prior research studies, the research pertaining to this study gained a better understanding of how bad bullying and victimization rates are together; attention and academic performance are negatively affected, different school atmospheres experience it worse than others. Understanding bullying victimology and shifting the dynamic is a pathway that needs more accurate research, the review of literature was able to conclude that shifting the dynamic with direct approaches on the bullying and victimization in schools could reduce bullying and victimization rates in the United States, this is reinforced using the data gathered from all prior research pertaining to this study. Thus, this researcher completed additional research on the current resources available to students in traditional and non traditional school settings.

III. Discoveries

Data Collection

The data collection process for this study consisted of twelve public schools in Pinellas County, Florida, in which there are 140 schools in total. Out of the 141 schools, 121 of those schools are public schools. The researcher attempted to collect data from twelve public schools; the researcher contacted nine schools in total; three elementary schools: Curlew Creek, Belcher Elementary, and Pinellas Park Elementary. Three public Middle schools; Oak grove middle school, Carwise Middle School and Palm Harbor Middle School and, data collection was attempted at three high schools one of those being an alternative school: Clearwater Highschool, Countryside High School and Pinellas Gulf Coast alternative school. This study aimed to gather

readily available bullying resources that schools provide for their students, teachers and parents (pamphlets, Powerpoints, Public Service Announcement videos, student self reports, interactive activities and (or) in classroom discussions ex…).

The researcher also tried to gather any data the schools might already have gathered on how bullying is currently being handled in their school environment. The schools the researcher was unable to retrieve data from were Belcher Elementary school, Palm Harbor Middle school, Carwise Middle school and the Pinellas Gulf Coast Academy alternative high school. The following data on bullying resources was gathered from Clearwater Highschool; Say something anonymous reporting system lesson plan through the sandy hook promise, SAVE club lesson plan, HOPE scholarship opportunity, FortifyFL, 5 mental health lessons per year. The following bullying resource data was gathered from countryside highschool; say something anonymous reporting system through sandy hook promise, monthly mental health lessons provided by the Pinellas County School Board, Anti-bullying signs posted throughout the campus, preparing to use 7 habits of highly effective teens program through the covey organization.

The following bullying resource data was gathered from Pinellas Park Elementary school; Utilizes interactive lessons using burger king anti bullying public service announcement (PSA) with questions, Utilizes Be brave video for pre-k to 2nd grade with questions aimed at helping children learn about bullying in a constructive way. The following bullying resource data was gathered from Curlew Creek Elementary school; The PCSB prevention and intervention resource. The following bullying resource data was gathered from Oak Grove Middle school; utilizes see something say something through the sandy hook promise, violence prevention program ran by JWB which involves students meeting during lunch in small groups and talk

about anything in an effort to help students understand and relate to personal change as well as the world changing, school provided social worker who facilitates small groups with students who struggle with communication, feelings and processing them and fitting in with their peers.

Outcomes and observations of data collection

The outcomes and observations the researcher experienced will be thoroughly mentioned in this section, the researcher attempted to reach out to twelve schools in an effort to gather 10 percent of the bullying resources available to students attending Pinellas county schools. The researcher was only able to gather data from five out of the twelve schools in Pinellas county, the researcher went into the data collection portion expecting that schools would be willing to provide bullying resource data. However, the researcher discovered a heartbreaking reality during the data collection process; Upon contacting local schools for data collection, most schools came across unready and unprepared to provide bullying resource information; schools were asked to provide any and all resources they provide to their students, teachers and the parents, A majority of schools could not point the researcher to who was running their bullying programs and were unprepared.

After several failed phone calls the researcher contacted the schools in person and made visual observations noting the lack of pamphlets, posters and other informative resources about bullying available to students in the front office. The researcher also had a small conversation with a front desk clerk at one of the highschools that was visited; the front desk clerk and highschool will remain anonymous however, she opened up to the researcher and claimed she could not remember the last time their school did bullying lessons, videos or pamphlets. In the same highschool environment that will remain unnamed, the researcher naturally observed an act

of social bullying while waiting in the front office; a student was eating lunch brought in by their parents. The lunch was referred to as “outside food” therefore the student had to eat in the office by the desk clerk. The researcher then observed students bang on the office window glass making remarks towards the other student saying “aye yo gimme your food bro, where is mine?” The child that was eating their food had very tense body language and was hovering their body over their food in a protective manner, the researcher observed no one intervene eventually the instigators got bored and walked away.

The researcher observed high reports of bullying and poor intervention on google reviews for Carwise Middle school leading the researcher to investigate if the school provides any bullying resources, the researcher met with the principal of Carwise middle school and was greeted with very assertive rude behavior. The principal attempted to undermine the research efforts by claiming we had no right to ask for such resources without proper documentation in comparison to the other schools that gave us resources, Carwise middle school was the least willing to provide any bullying resources and the researcher believes there may be a serious bullying problem within the school. The principal masked his unwillingness to provide such crucial data by being a rule follower which may be a projection of something deeper going on within his school. The researcher observed a majority of the data gathered from the schools was government provided lessons that focus on gun and violence prevention which is a valid and crucial topic in schools however, the education on bullying was more creative and interactive in pinellas park elementary school compared to the other four schools the researcher gathered bullying resources from.

The lessons on gun violence may unintentionally victimize students by making them hyper aware that they could be the victim of a mass shooting if they don't notice the signs. The researcher wants it to be noted that the assistant principle that provided the study with bullying resources for Clearwater Highschool stated "Bullying has been placed sort of on the backburner ever since covid started" stating covid has faced schools with serious limitations on assemblies and other resources they could use before covid basically, addressing covid in the school environment has taken priority over bullying. The resources gathered from pinellas park elementary school were some of the most interactive and informative lessons on bullying, this allowed the researcher to observe there are direct approaches available however, it is the schools responsibility to utilize the material.

General Conclusion

The researcher concludes that bullying and victimization could potentially be developing into a bigger problem in schools, based on research reviewed and discussed in the previous pathways in this study and with the bullying resources gathered from Pinellas county schools. In conclusion, the researcher recommends that further research be done with schools to compare and contrast how direct approaches for bullying prevention and education affect bullying and victimization rates compared to current approaches. The researcher recommends more in depth research be done to gather data on how victimization through bullying presents in school atmospheres, the researcher also recommends that researchers in the education and psychology field work together in a joint effort to put out more data on bullying. The researcher recommends local researchers within pinellas county do more in depth research in pinellas county schools with more in depth approaches to gather more data building off this research study. The

researcher concludes that current approaches in the United States stigmatize students and their peers through fear mongering over gun violence in schools, the focus has shifted heavily away from helping students cope with bullying; as a bully or a victim with creative engaged activities and has shifted towards preventing the next school shooting. The researcher concludes that if current approaches shift their focus onto the bully to understand their behavior and to create better treatment plans within school atmospheres rather than stigmatizing them as school shooters may help decrease bullying and victimization rates, current approaches for victims should also shift in a similar direction. The researcher finally concludes that if more intensive research is done to understand bullying victimology, researchers could potentially build behavioral profiles on the different types of bullies and why they bully, prior research built off four decades of research claimed there is no golden mean therefore, this research effort concludes if more researchers focus on this pathway to look for answers the golden mean may exist through more research.

References

APA, C. (2004, July). APA Resolution on Bullying Among Children and Youth.

Assistant Secretary for Public Affairs (ASPA). (2021, November 5). *What is bullying.* StopBullying.gov. Retrieved March 23, 2022, from https://www.stopbullying.gov/bullying/what-is-bullying

Davis, J. P., Merrin, G. J., Tan, K., Dumas, T. M., Espelage, D. L., & Madden, D. (2018). Examining the Pathways Between bully Victimization, Depression, Academic Achievement, and Problematic Drinking in adolescence. *American Psychological Association,* 605–616.

Fite, P. J., Evans, S. C., Cooley, J. L., & Rubens, S. L. (2014). Further Evaluation of Association Between Attention Deficit/Hyperactivity and Oppositional defiant Disorder Symptoms and Bullying-Victimization in Adolescence. *Child Psychiatry & Human Development* , *45*, 32–41.

Glenn, W. D. (2021). Trajectories of bullying victimization and perpetration in Australian school children and their relationship to future delinquency and conduct problems. *Psychology of Violence, 11,* 19–27. https://doi.org/vio-11-1-19

Holt, M. K., Green, H. G., Felix, E., Grimm, R., Nylund-Gibson, K., & Poteat, V. P. (2016). A Latent Class Analysis of Past Victimization Exposures as Predictors of College Menatal Health. *American Psychological Association*, 521–531.

Hymel, S., & Swearer, S. (2015). Four Decades of Research on School Bullying. *American Psychological Association*, 293–299. https://doi.org/amp-70-4-293

Niharika, T., Mitch, V. G., Maike, M., Ralph, R. C., & Paul, V. (2019). Bullying and psychopathic traits: A longitudinal study with adolescents in India. *Psychology of Violence, 10*, 223–231. https://doi.org/vio-10-2-223

Niwako, S., Daniel, B., Wendy, T. G., & Karen, R. D. (2017). Early social behaviors and the trajectory of peer victimization across the school years. *Developmental Psychology, 53*. https://doi.org/dev-53-8-1447

Sonia, R. L., Molly, M. A., Megan, Z. M., & Robert, L. D. (2019). Associations of bullying, victimization, and daytime sleepiness with academic problems in adolescents attending an alternative high school. *American Journal of Orthopsychiatry, 89*, 508–517. https://doi.org/ ort-89-4-508

URE: Activity Summary

Tyler Bauer

Weekly Reporting

Student Report: I am writing this at the end of the study and not at the end of each week, i have poor short term memory recall so I apologize if the reports lack detail. Week one of the project consisted of initial contact with the mentor, getting a meeting set up, and giving an initial summary of the research study. The first meeting occurred on february 16th via zoom, i left the first meeting with research goals and began searching through databases for sources. Overall i spent countless hours researching bullying and victimization, i learned a lot on how to write a research paper in APA format.

Mentor Report: Week one of the project consisted of initial contact with the student, getting a meeting set up, and getting an initial summary of the students' study. The first face to face meeting occurred on February 16th. At that time general goals for the project were identified, topic ideas were discussed and honed, and an initial timeline was created.

On Feb 23rd the topic was again honed and tightened, with specific paths within the topic to be researched. Literature already discovered was reviewed. Strategies for literature review were provided.

Two meetings occurred the week of February 28th. Both meetings were to continue the literature review, adding references, and begin adding content into a written literature review. The student was provided with specific strategies and steps to accomplish over spring break. The student declined to meet over spring break.

The student contacted faculty member on March 14th, rescheduling the days meeting due to some personal conflicts. A rough draft of the literature review was sent. A meeting was set for March 16th but did not occur as the student did not show up to the meeting. Faculty reached out to other faculty members (Kim Molinaro) for support and assistance and encouraged the student to do so as well. The student contacted the faculty at the end of the week, describing current barriers and needs. A new timeline was created, new assignments and strategies provided, and the first draft was sent back with edits made.

Between March 14th and March 21st, faculty edited the LR draft.

On March 23rd, literature review was finalized. Observational research and the interviews with the schools (the research conducted by student) was addressed and organized.

Between March 23rd and March 30th, contact was ongoing between student and faculty ensuring interviews were being conducted, information was being recorded, and resources recorded (data collection). Additional drafts of the writing document were sent by student and reviewed by faculty. March 30th: Final face to face meeting occurred, summarizing the

conclusions made from the students' data collection and how to report those conclusions and observations appropriately. At this meeting, and directly leading up to it, it became apparent that the final document may not be ready by the close of the week. Faculty reached out to other support members involved in URE.

Following March 30th, student was advised to continue editing final documents and complete any remaining tasks for faculty/ mentor review by 4/11. A document was not received on 4/11. Faculty reached out to student advising of final steps and final due date for project.

Literature research: The research focuses on Rebranding bullying in the United States in an effort to stigmatize the bully not the victim.

Scientific method: Qualitative Research was conducted, including interviews.

Results observed: View discoveries section of the literature review for research results observed. I learned a lot about doing research through this process and appreciate the chance I was given. I am super thankful and feel inspired to do more research for the psychology field.

Male abusers in traditional relationships: Why is it so prevalent?

Caleb Elliott

Professor Kicklighter

June 30, 2022

Why is domestic abuse in traditional relationships so prevalent?

A romantic relationship is a connection that typically involves two people who share a deep bond with one another. No relationship is the exact same, due to the plethora of relationship dynamics in the world, but all relationships have some similarities. The most common trait seen in many relationships is unconditional love and intense care for one another. With that being said, reports of abuse continue to rise as each year passes by. Men or women can be victims of abuse in a relationship in various ways. According to the World Health Organization, 1 in 3 women have experienced physical or sexual violence from a partner in 2021. The CDC reports that 1 in 3 men are also victims of intimate partner violence as well. But how come we see abuse against women more often than abuse against men? This is because most women don't speak about the abuse they experience at home with their partner. To make matters worse, the statistics don't account for all the women in the world who are too frightened to tell anyone about what they experience in their abusive relationship. Why do men choose to abuse their partners? There is no specific answer to this question unfortunately. However, there are a multitude of reasons that can explain the violent behaviors men exhibit.

Firstly, we must come to understand the full meaning of abuse. When we hear the word 'abuse' we tend to immediately think of physical violence. This is true that abuse can be physical, but it is not the only form of abuse. Other forms of abuse include emotional abuse, psychological abuse, verbal and sexual abuse. After much extensive research, psychologists have been able to identify some reasons why people choose to abuse others. These factors include but are not limited to harmful use of alcohol and drugs, past history of exposure to violence in early to late childhood, economic status, and social norms to name a few. All of these factors can

affect an individual's mind in a negative way, resulting in frustrations being directed toward another person. Psychologists worldwide have different opinions on what may cause a male to abuse their partner, Sociologist Willard Waller developed the 'principle of least interest' which states that the partner who is less interested in the relationship has more power, thus having more control of the relationship. The other partner in the relationship who is more invested in the relationship is more dependent on the other, having less power and less control, thus making them vulnerable to being manipulated. Men often maintain power and control during dating relationships through direct strategies such as shaming, threats, and aggression; women tend to use indirect strategies such as hinting, withdrawing or attempting to manipulate a partner's emotions (Christopher and Kisler, 2004; Garbarino, 2006; Wincentak et al., 2017).

A 2005 study conducted by Todd K. Shackelford, Vlad Burtăverde, and Mohaned G. Abed was done to investigate the associations between male mate retention and violence against women in romantic relationships. The results of the study concluded that particular male mate retention behaviors predicted violence against romantic partners. Jealousy and blaming, intimidation and threats, physical and sexual abuse, emotional as well as verbal abuse are negative behaviors that men often project onto their female partners. There is always a particular underlying reason that causes men to act violently, a certain experience that has changed the way they think or act. For example, a young boy that lives in a household where his parents are constantly fighting and yelling may believe that's how relationships should be; violent and aggressive, or even emotionally or verbally abusive. This boy would grow up to be a man who believes violence in a relationship is normal or necessary to maintain control within the relationship. The experiences people have in their adolescence shape how they view the world as

they grow older, and if they do not seek help for the trauma that they have endured they are bound to repeat the same cycle over and over again.

If someone was in a toxic relationship where their needs weren't met and they were experiencing physical or emotional trauma, most people would attempt to distance themselves in an effort to escape the toxicity. So, with this in mind, the question at hand is why do women choose to stay in toxic relationships? After decades of rigorous studying and researching, psychologists and scientists have been able to establish some predictions to try and answer the question. Several factors that predict why women stay in an abusive relationship include: income concerns, victim age, self-blame, presence of children, isolation and lack of social support, commitment and consistency, fear of retaliation from the abuser, positive future beliefs and learned helplessness, love, diminished self-esteem, lack of resources, health and disability status, having no other place to go, and cognitive dissonance. All of these factors can have a major impact on a woman's life and may alter her own beliefs, morals, and ideologies.

Modern society paints the general image of the man to be both physically and mentally strong, affectionate, caring, and selfless. This is the image all men are expected to mimic; however, the undeniable truth is that most men will not be able to maintain it. The societal pressure pushed upon men to be strong and independent can be immense for some, for others it can be as easy as riding a bicycle. Most fathers and mothers teach boys to be tough and not to cry because crying shows fragility and a fragile man is a poor man or would be recognized as a boy rather than a man. Being raised as a man this way leads to unresolved problems within oneself, they may be unable to properly assess their emotions, leading to violence or abuse to another person or themselves. If parents focused on developing a good person who processes emotions and feelings rather than a 'macho man', the chances of that man being uncaring or abusive would

be lower than being raised to be strong. A person can be strong and vulnerable, they shouldn't have to abide by society's expectations of them.

There is always a reason behind our actions, so there are ways to explain why men abuse others or themselves. Our interactions, our upbringing, the lessons we were taught as children, all of our experiences shape who we all are as individuals. If we were to take a step back and fully examine a man's life, we can gain a better understanding of their actions. Certain experiences may cause a man to abuse their spouse or other loved ones, which is why mental health is a vital part of everyday life we must give careful attention to.

References

1. **"Intimate Partner Violence, Sexual Violence, and Stalking among Men |Violence Prevention injury Center CDC."** ***Centers for Disease Control and Prevention*****, Centers for Disease Control and Prevention, 1 June 2020, https://www.cdc.gov/violenceprevention/intimatepartnerviolence/men-ipvsvandstalking.html.**

2. **Shackelford, Todd K., et al. When We Hurt the Ones We Love: Predicting Violence against Women from Men's Mate Retention, Dec. 2005, https://www.researchgate.net/publication/227650777_When_we_hurt_the_ones_we_love_Predicting_violence_against_women_from_men's_mate_retention.**

3. **Benokraitis, Nijole V., and Cheryl Buehler.** ***Marriages & Families: Changes, Choices, and Constraints*****. Pearson, 2019.**

Week 1
Professor Kicklighter and I did some brainstorming on my proposed research.
I was instructed to keep a bibliographic trail. Making note of where I obtain this information, to ensure that all authors receive credit for their work.
I was encouraged to seek information, that I related to, or found to be very interesting.

Week 2
We reviewed my findings and shared more solid questions.
Was encouraged to construct a list of experts in the field
Decide if I would like to interview anyone on this topic.

Week 3
Professor Kicklighter provided me with APA guidelines
She provided me with information on how to properly critique an article
I was provided with quite a few resources to assist me in my research.
Was able to speak with a Librarian.
We briefly discussed compiling resources and completing a pamphlet.
I was suffering from the flu, so we didn't cover anything else.

Week 4
So far, I have collected information from the World Health Organization and one of my textbooks.
My plans today are to look at peer-reviewed articles on domestic abuse.
I will look at current research studies on why men and women abuse their spouses and partners.
I will also go to YouTube and seek video clips of actual cases.
I shared my paper with her, which I have started to complete.
I am also planning to complete a resource pamphlet closer to the end of this project.

Week 5
Professor Kicklighter and I discussed my progress so far and she made further recommendations.
I shared my screen with her, showing her my paper that I was working on.
I shared that I had spoken with Cassie the librarian again. We discussed other resources and she provided more suggestions. I will continue working on pulling everything together and gather additional data.

Week 6
I shared with Professor Kicklighter, that thanks to her guidance and the librarian, that I was more, clear about the paper and where I was going with the project. I shared my progress and what I would be doing moving forward.

Week 7

I reported that I was continuing to work on pulling the paper together. I was experiencing some very personal problems at this meeting. Professor Kicklighter helped me through this, and I agreed to continue working. I made the decision to not create a pamphlet at this time, as time would not allow me to.

Week 8

I completed a compiled report of the research/activities completed each week. I had to relocate to Chicago, and I left my computer in Florida. I spoke with Professor Kicklighter who encouraged me and convinced me that I could still complete the project. I agreed to go to the public library in Chicago, to complete the work. I had no transportation, so I shared that I would take the bus. I was able to take a bus, get to the library, pull my work together and submit it to Professor Kicklighter.

I am so grateful for this opportunity. I apologize that my work isn't better, but even though I was having some personal delays, I was encouraged to continue and not give up.

Caleb Elliott

Caleb,

It was so great speaking with you today and I look forward to working with you for the next 8 weeks. I have copied some additional SPC resources below, that I know will benefit you greatly. As discussed today, you have agreed to:

Possible Topic: Male Abuse in relationships

- You will need to come up with the questions that you want answered. **Examples** would be: When was the person first exposed to abuse? Does the environment in which a child is raised affect their abusive relationships? When did the behaviors begin? What might be some of the causes?
- Remember you will need to look at your topic as it relates to Psychology.
- As a psychologist how would you treat a person or family struggling with abusive relationships.
- Remember these are answers that you desire to have. Doing what you are interested in, motivates and drives you, to dig for great and informative information.
- I want you to have fun and remember that no "Stress" is allowed. 😊
- Lastly, I believe in you, and you can do whatever you make up your mind to do.

I'm cheering you on!!!

Caleb,

You will be able to utilize assistance from various resources. You have access to peer-reviewed articles, one-on-one assistance through the online appointment process, Tutor.com, and Ask-A-Librarian. These are resources that are available in addition to meeting with me weekly. Please take advantage of these resources, and don't hesitate to reach out to me if you have any questions. You can reach me at (727) 497-5050.

Don't forget you have additional options for library research assistance.

*Online appointments

*In-person appointments

*Tutor.com via MyCourses

*Zoom Room

*Ask-A-Librarian

*Workshops (ask a tutor)

Everything you need to know can be found HERE: https://spcollege.libguides.com/studentsneedtoknow

Warm Regards,

Professor Kicklighter

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SPC St. Petersburg College

Student Research Final Report

Name: Alexis VandePol **Professor:** Kimberly Molinaro, MEd

Date: 7/14/2022

Earliest Verifiable Childhood Memory Variations Among Deaf and Hearing Populations

Outline of Responsibilities

- Performing primary literature research.
- Performing structured interviews for data collection.
- Meeting with Professor Molinaro via Zoom on a weekly basis for status updates and determination of the next week's goals.
- Establishing the methodology for the structured interview data collection for the deaf and hard of hearing and the hearing populations through samples of convenience. Discussed methods for literature review, implementation, and interpretation.
- Completing compiled report of the research/activities done each week (e.g. results observed, assumptions, and/or conclusions, learning achieved).

Literature Review and Purpose of Project

Childhood amnesia describes a lack of ability to retrieve autobiographical memory before the ages of between three or four. The age of onset of childhood amnesia has been agreed upon almost since its naming (Miles, 1893; Dudycha G. & Dudycha M., 1941; Kihlstrom & Harackiewics, 1982). In the past 20 years, the age threshold of childhood amnesia has been challenged. Eacott and Crawley (1998) published data on the effects of a sibling birth on retrieval of memory before the age of three. Their findings indicated that although an individual might be able to recall memories prior to three years old, particularly related to a common childhood experience, such as when a sibling was born, that the actual recall was a result of familial anecdotes (Eacott & Crawley, 1998). Neisser and Usher (1993) identified four events that could affect the age at which childhood amnesia occurred. These four events included family move, death of a family member, hospitalization, and the birth of a sibling (Neisser & Usher, 1993). Data consistently denied memory retrieval prior to two years old (Eacott & Crawley, 1998; Neisser & Usher, 1993).

Currently, a lack data exist in the literature exploring the extent to which childhood amnesia differs between the deaf community and the hearing population. The four events identified by Neisser and Usher (1993) are certainly available and perhaps even more so among the deaf community. For instance, deaf individuals may likely be subjected to more doctor and hospital visits at a young age as the family and child learn to navigate and communicate without auditory stimulation. According to Howe and Courage (1993), early memory is not available prior to the ages of three or four among the hearing population because the ways in which an individual accesses these memories later is through external cues. However, these data exclude the deaf population. The purpose of this study is to gather data on early memory content in the deaf and hearing populations regarding the Neisser and Usher (1993) events. For this study, the data collection is through structured interviews of two samples of convenience, one from the deaf community and the other from the hearing population, to explore recall, feelings at the time of recall, and any related details gleaned relevant by the subjects regarding the Neisser and Usher (1993) four events.

References

Dudycha, G. & Dudycha, M. (1941). Childhood memories: A review of the literature. *Psychological Bulletin, 28*(8), 668-682. https://doi.org/10.1037/h0055678

Eacott, M.J. & Crawley, R.A. (1998). The offset of childhood amnesia: Memory for events that occurred before age 3. *Psychological Bulletin, 127*(1), 22-33. https://doi.org/10.1037/h0055678

Howe, M.L. & Courage, M.L. (1993). On resolving the enigma of infantile amnesia. *Psychological Bulletin, 113*(2), 305-326. https://doi.org/10.1037/h0055678

Kihlstrom, J. F. & Harackiewicz, J. M. (1982). The earliest recollection: A new survey. *Journal of Personality, 50*(2), 134–148. https://doi.org/10.1111/j.1467-6494.1982.tb01019.x

Usher, J.A., Neisser, U. (1993). Childhood Amnesia and the beginnings of memory for four early life events. *Journal of Experimental Child Psychology*. *122*(2), 155-165. https://doi.org/10.1037/0096-3445.122.2.155

Weekly Reports and Data

- Meeting #1 (Week 1: 04/18/22) Meeting with Professor Molinaro to discuss research ideas, from which we selected one. The ideas presented included childhood mobility in relation to pet ownership through survey of parent populations and earliest childhood memories among deaf and hearing populations. Settled on the latter with a structured interview approach, discussed availability of subjects within each community. Also discussed literature review and sources for obtaining and creating it. Next meeting scheduled for April 25th at 8:30 AM through Zoom.

- Meeting #2 (Week 2: 4/25/2022) Meeting with Professor Molinaro to compose literature review and beginnings of partial replication study of Neisser 1993. Laid out foundation for childhood amnesia and how it is affected by four different events (hospitalization, death, family move, birth of a sibling) in childhood. Emotionality measured as

well as memory, discussed standardizing emotionality measurements through Gottman Wheel. Presurvey questionnaire found to be slightly altered and used in gathering subjects from deaf population from Neisser 1993. Focused on the lack of data among the deaf population and how to use research time to fill that void. Next meeting planned for early June. Over the month of May to draft early Literature Review.

- Meeting #3 (Week 3: 06/16/2022) Meeting with Professor Molinaro to refocus and gather methodology as well as outline structured interview questions. Prepared for literature review. Organized three sets of questions for four experiences within our sampling population. These questions based on survey questions from Niesser and Usher 1993. Planned for next meeting on 6/23/2022.

Meeting #4 (Week 4: 06/23/2022) Meeting with Professor Molinaro to edit the literature review, created informed consent form as well as structured interview questions. Discussed Otter AI for transcribing interviews. Next meeting was established for Thursday, the 30th at 8:00 AM via Zoom.

- Meeting #5 (Week 5: 06/30/2022) Amended Otter Ai to zoom method for structured interviews. Updated consent form to reflect change. Practiced informed consent introduction to interviews. Updated citations. Problem solved interpreter issues. Updated all necessary documents. All data collection will be conducted within the next week. Next meeting planned for July 7th 2022.

- Meeting #6 (Week 6: 07/7/2022} Meeting with Professor Molinaro to compile collected data. Created summarized interview transcripts. Began draft of conclusion. Compared information collected from participants. Amended final paper to add informed consent for figure as well as structured interview questions. Established next week's goals: Finished draft of conclusion, updated meeting summaries, and completed interview summaries. Next meeting set for 7/14/2022

Meeting #7 (Week 7: 7/14/2022) - Edited draft of final conclusion, finalized report for project. Proofread past work submitted and formatted it within the finalized report. Discussed future directions and research methods to further explore topic.

SPC St. Petersburg College

INFORMED CONSENT

This is a structured interview study that explores the effects of parenting by lying, that the participants can independently recall. At the beginning of each structured interview, Informed Consent will be discussed and collected for each participant. Participants will be selected through a sample of convenience. Upon arrival, participants will experience the following:

- Researcher will verbally discuss the Informed Consent with the participant.
- Participants will be asked a series of questions related to a memory they have of a parent being dishonest with them in their childhood.

Participation in this structured interview is voluntary and therefore any participant who wishes to withdraw may do so at any time. In conducting this structured interview, we are hoping to add to the research that has been conducted with understanding how children are affected when they are not told the truth. Participants have limited confidentiality.

If you have any questions during the experiment, please feel free to ask. For more information about this research or for any questions concerning participation in this experiment contact Dakota Lawson at 727-227-1287 or kodylawson11@gmail.com. I have read and understood the above information.

_____ _____

Signature Date

Figure 1: Informed Consent

STRUCTURED INTERVIEW QUESTIONS

1. Do you recall any early childhood memories involving hospitalization, such as sibling birth, your own illness that required an overnight stay, visiting a sick family member, etc.

a. If yes, please describe the event.

b. Do you recall this experience independently, or has it been discussed by other family members across time, or are there photos about this experience?

c. Who told you about the event?

d. What age do you think you were when you were told?

e. Do you recall what you were doing when you were told?

f. Do you remember how you were feeling after you were told?

g. Do you remember going to the hospital and if so, will you share what you recall.

h. Was there anything unique or odd to your memory that you recall, such as weird food at the hospital or people visiting or anything else?

2. Do you recall any early childhood memories involving a family move?

a. If yes, please describe the event.

b. Do you recall this experience independently, or has it been discussed by other family members across time, or are there photos about this experience?

c. Who told you about the event?

d. What age do you think you were when you were told?

e. Do you recall what you were doing when you were told?

f. Do you remember how you were feeling after you were told?

g. Do you recall the reason for the move?

h. Do you remember moving and if so, will you share what you recall.

i. Was there anything unique or odd to your memory that you recall, such as sleeping on the floor, eating take out in weird ways, and seeing where you were moving for the first time?

3. Do you recall any early childhood memories involving death of a loved one.

a. If yes, please describe the event.

b. Do you recall this experience independently, or has it been discussed by other family members across time, or are there photos about this experience?

c. Who told you about the event?

d. What age do you think you were when you were told?

e. Do you recall what you were doing when you were told?

f. Do you remember how you were feeling after you were told?

g. Do you remember going to any services, such as a funeral, and if so, will you share what you recall.

h. Was there anything unique or odd to your memory that you recall, such as seeing people grieve, seeing adults vulnerable, experiencing an open casket?

Figure 2: Structured Interview Questions

Conclusions

This study conducted structured interviews through Zoom to query subjects about memories related to three main life events: Hospitalization, family move, and death of a loved one. The goal of this study was to include deaf subjects in the data collection, given the extent to which the deaf population was omitted from prior research about memories related to these

three main life events (Neisser & Usher, 1993). During the first week of the two-week data collection process, all scheduled subjects either cancelled or did not show. During the second week of data collection, two of the three deaf subjects were hospitalized, and the third subject had a virus. During week two of the data collection process, one deaf subject and three hearing subjects completed the structured interview. Consequently, this study is limited not only due to sample size, but also by comparing results of one deaf participant to three hearing participants. Because of this limitation, percentages will consistently note number of subjects.

The participants in this study included 75% female subjects (three of four) and 25% male subjects (one of four). Seventy-five percent of the participants were white (three of four) and 25% were Latinx (one of four). Ages of subjects varied from 37 years old to 56 years old. Seventy-five percent (three of four) of the subjects were from the hearing population and twenty-five percent (one of four) was from the deaf population.

Among participants, 50% had recollections earlier than four years old. The other 50% had their earliest memories between the ages of seven and nine. Of the three main life events, 75% of participants had their earliest memories involving a hospitalization of either themselves (50%; two of four) or a loved one (50%; two of four). One participant's earliest memory involved visiting a dying relative in the hospital, and as such, fell under both categories. No subject had a vivid recollection of a memory of a family move, although one participant did remember moving in general at the age of four. This subject had no detailed episodic memory of a family move, only vague impressions of meeting neighbors and having a room.

In comparing recollections, the two most descriptive memories were from the deaf participant and the youngest participant. Both claimed to recall these memories independently, and both participants stated they had seen no pictures of the event. The hearing participants in this study had very little recollection of feelings or emotional states during the events. The deaf participant was able to describe emotional states. Of the participants, 75% did not recall understanding what was happening in their memory. Of the remaining participants, the most recall came from memories of a dying loved one. Fifty percent (two of four) experienced death of a loved one, and one participant recalled the memory occurring at two years old and the other identified nine as the age of the event. The least vivid memory recall came from hearing participant who recalled being hospitalized at the age of seven.

The two participants with the earliest memories involved a hospitalization event. One participant (the deaf participant) recalled her own hospitalization and the other participant (a hearing participant) recalled hospitalization of a loved one. Both participants identified two years old as the age of the memory. Additionally, both participants claimed to recall these memories independently and not from family pictures or stories.

A future direction needed is larger sample sizes, which will enhance the exploration of memory comparisons of the three life events between the deaf and hearing populations. From the data gathered, the earliest and most articulate memory recall came from the deaf

participant, while the earliest and most detailed memory among the hearing participants came from the youngest participant. Another area for future direction relates to the hospitalizations and illnesses endured during the data-collection process that involved the deaf participants. Though this may be serendipitous, it is plausible that when working with subjects from the deaf community, the data-collection process might need to accommodate medical concerns. Another area for future direction is establishing an accessible, standardized way to communicate when conducting the structured interviews for both the deaf and hearing populations. Because the researcher is proficient in American Sign Language, Zoom was the technology-of-choice. However, scheduling interpreters may provide an additional time delay if a researcher from the hearing population is conducting interviews with deaf participants. Future directions might include integrating a standardized method to verify the memories recalled. Methods to implement this might include family interviews and asking for any evidence to corroborate the memory.

Techniques and Procedures Utilized

Literature research skills:

- Reading and summarizing scientific studies.
- Discerning and synthesizing scientific studies to create a Literature Review.
- Fine-tuning research methodology for current study based on published scientific studies.

Data collection techniques learned:

- Identifying the methodology for standardizing the sample of convenience.
- Learning how to formulate and implement Informed Consent based on the American Psychological Association.
- Formulating, standardizing, and implementing a structured interview.

Data analysis techniques learned:

- Standardization of data collection with use of narratives and transcripts of structured interviews.
- Interpreting the data.
- Writing up the major results of the study.

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Date: October 31, 2022

College Student Stressors and Coping Mechanisms

Outline of Responsibilities

- Performing primary literature research on college student stressors and the most common ways college students cope with the stressors.
- Conducting survey research on stressors and coping responses disseminated through identified professors and student government via Survey Monkey.
- Meeting with Professor Molinaro via Zoom on a weekly basis for status updates and determination of the next week's goals.
- A questionnaire was created using multiple 5-point Likert scales, including health and satisfaction scales. Percentages were calculated based on 98 participants.
- Completing compiled report of the research/activities done each week (e.g. results observed, assumptions, and/or conclusions, learning achieved).

Literature Review and Purpose of Project

College students face stressors that may impair functioning. A stressor is defined as any external or internal event that causes physical or emotional stress (APA, 2022). According to the Traditional College Student Stress Scale, college student stressors range between a relatively minor stressor, such as falling asleep in class all the way to a significant stressor, such as a family member's death.

According to Tran et al. (2018), financial stressors are commonly experienced by college students. Debt and financial stress are linked to severe repercussions, such as obesity, depressive tendencies, low self-esteem, and happiness, alcohol and drug abuse (Tran et al., 2018). Not all people are affected the same by financial stress. Latinx and African American students report higher stress and hardship levels due to student loans as compared to Asian and White American students (Tran et al., 2018). Tran et al. (2018) highlighted the way student views regarding their debt is more relevant than the amount of the debt. For instance, a student who believes their education is worth the debt because their future earnings will quickly repay it reported a lower stress level even if their debt amount were higher. Students who feared repercussions reported a higher stress level even if their debt were lower.

Another significant source of stress is acceleration to the American college system. According to Bhowmik et al. (2018), international students living in the United States might be susceptible to higher stress levels due to language barriers, changes in societal norms, homesickness, and discrimination. For many international students, being away from their country of origin, adjusting to American culture, learning in what may be a different language, and adding a success demands may require developing new coping skills. Coping is defined as "cognitive and behavioral efforts to 'master, reduce, or tolerate' demands created by stress" (Bhowmik et al., 2018, pg. 552). Common coping mechanisms used by international students are denial, emotional suppression, substance abuse, self-blame, and excessive

worrying over mistakes (Bhowmik et al., 2018). Although these coping mechanisms seem harmful and non-beneficial, coping mechanisms such as these are highly common throughout college students.

The repercussions of stress among college students can be detrimental to their mental health. Approximately 43.7 percent of students experience above-average stress (Hirsch et al., 2019). Only 6.8 percent of students who reported sad and depressive feelings sought help (Hirsch et al., 2019). The top factor stopping students from accessing help is external and internal stigma. External stigma includes attitudes towards mental health and fearing social repercussions (Hirsch et al., 2019). Additionally, internal stigma was linked to lower self-esteem and reduced levels of self-efficacy, increased chance of depression, and greater risk of suicide. With the high percentage of students who do not seek help, experience above-average stress, and may be experiencing sad and depressive feelings, a risk of suicide is a source of serious concern. Hirsch et al. (2019) reported that suicide remains the second leading cause of death among college students.

Recently, the impact of the COVID-19 pandemic has added an additional source of stress for college students. Unhealthy coping mechanisms, such as substance abuse, were used to handle loss of employment, loss of loved ones, and major changes in daily life. When comparing pre-pandemic and during pandemic data, an increase in substance consumption has been demonstrated amongst college students (Lancaster et al., 2021). A study done by the American Medical Association reported the increase of all four drugs screened, including cocaine, heroin, methamphetamine, and fentanyl (Lancaster et. al, 2021). Lancaster et al. (2021) reported a rise in alcohol consumption during the pandemic as compared to pre-pandemic. Another source of concern amongst college students is prescription stimulant misuse (PSM). PSM is used primarily for academic enhancement, such as focusing, studying, and improving GPA (Schepis et al., 2021). PSM perceptions raise an additional dilemma. Though considered unhealthy to take prescription stimulants for a non-existent condition, many college students report increased attention span that results in academic achievement. Consequently, using a PSM as a coping mechanism, while unhealthy, may be perceived as satisfactory by the individual user.

The purpose of this study is to employ survey research to collect data regarding what college students perceive as their main stressors and how they cope with the stressors. Each respondent will also identify the extent to which they perceive each coping strategy as health or unhealthy (with a five-point Likert scale) and the extent to which they perceive the coping strategy to be helpful and not helpful (with a five-point Likert scale). They will also be asked if they would like to change the coping strategy and if so, how they would approach making the change. The survey will be disseminated to a sample of convenience at St. Petersburg College. Identified professors and identified club advisors will be asked to send the survey to their students.

References

Bhowmik, M. K., Cheung, R. Y. M., & Hue, M. T. (2018). Acculturative stress and coping strategies among Mainland Chinese university students in Hong Kong: A qualitative inquiry. *American Journal of Orthopsychiatry*, *88*(5), 550–562. https://doi.org/10.1037/ort0000338

Hirsch, J. K., Rabon, J. K., Reynolds, E. E., Barton, A. L., & Chang, E. C. (2019). Perceived stress and suicidal behaviors in college students: Conditional indirect effects of depressive symptoms and mental health. *Stigma and Health*, *4*(1), 98–106. https://doi.org/10.1037/sah0000125

Lancaster, M. & Arango, E. (2021). Health and emotional well-being of urban university students in the era of COVID-19. *Traumatology*, *27*(1), 107–117. https://doi.org/10.1037/trm0000308

Schepis, T. S., Buckner, J. D., Klare, D. L., Wade, L. R., & Benedetto, N. (2021). Predicting college student prescription stimulant misuse: An analysis from ecological momentary assessment. *Experimental and Clinical Psychopharmacology*, *29*(6), 580–586. https://doi.org/10.1037/pha0000386.supp (Supplemental)

Tran, A. G. T. T., Mintert, J. S., Llamas, J. D., & Lam, C. K. (2018). At what costs? Student loan debt, debt stress, and racially/ethnically diverse college students' perceived health. *Cultural Diversity and Ethnic Minority Psychology*, *24*(4), 459–469. https://doi.org/10.1037/cdp0000207

Weekly Reports and Data

- Meeting #1 (August 24th, 2022) Meeting with Professor Molinaro to discuss six research ideas, from which we selected one. We decided on the topic of students stress levels, how they cope with their stress, and their contentness of their coping mechanisms. We identified the way we would like to collect data and decided via an online survey. We discussed what kinds of questions and scales we would like to have on the survey that would identify each factor. Action items were to sign needed forms for URL experience. Next meeting date was established for August 29th at 1:30 pm.

- Meeting #2 (Week 2: August 29th, 2022) Meeting with Professor Molinaro to discuss how we will conduct our research. We reviewed three college student stress scales and identified what we would like to use. We reviewed academic literature together to get an idea of the sources I will include in the literature review. We discussed the meaning of a literature review and how it should look like. Action items were to find 5 sources via SPC library and pull information from each source that aligns with the experiment. Next meeting was established for September 7th at 1:30 pm.

- Meeting #3 (Week 3: September th, 2022) Meeting with Professor Molinaro on how to form and write the literature review. We went over the information I gathered from the 5 sources so we both understand what will be in the literature review. We discussed the goal of the literature review and made writing its rough draft an action item for the next meeting. The next meeting was established for September 12th at 1:30 pm.

- Meeting #4 (Week 3: September 12th, 2022) Meeting with Professor Molinaro to review my completed literature review. Professor Molinaro and I turned the rough draft into the final draft of the literature review. The action items were to write the purpose of this study and the methodology. Next meeting was established for September 21st at 1:30 pm.

- Meeting #5 (Week 4: September 21st, 2022) Meeting with Professor Molinaro to review the methodology and the purpose of this study. After we went over the next step of the research project which is to make the college student stress scale. Professor Molinaro and I went over the basic stressor categories we wanted in the survey. Action items for next week are to give examples for each stressor category and come up with the coping mechanism categories. Next meeting was established for September 26th at 1:45 pm.

- Meeting #6 (Week 5: September 26th, 2022) Meeting with Professor Molinaro to review both the stressor and coping mechanism scales. Professor Molinaro and I edited the scales so they were fit to put into Survey Planet (survey tool used for data collection). Action items for next week are to draft the emails for the professors to pass the survey out to their students. Additionally, to make the survey in Survey Planet. Next Meeting was established for October 12th at 8:30 am.

- Meeting #7 (Week 6: October 12th 2022) Meeting with Professor Molinaro to review the survey on Survey Planet and make any changes needed before passing it out to professors and students. Changes were made to the format of the survey so it's easier and more cohesive for the participants. Action items for next meeting are to send out the pre-formulated emails to the professors with the survey attached and start the data collection process. Next meeting was established for October 24th at 8:30 am.

- Meeting #8 (Week 7: October 24th 2022) Meeting with Professor Molinaro to review the results of the data collection. Professor Molinaro and I went through the survey data and collected it in a format to write the data analysis. We discussed how the data analysis should look like and what it should contain. Action items for next meeting are to finish the data analysis and paper for submission. Next meeting was established for October 31st at 8:30 am.

- Meeting #9 (Week 8: October 31st 2022) Meeting with Professor Molinaro to review the complete data analysis. Professor Molinaro and I reviewed and edited the data analysis to integrate into the final draft.

Conclusions

The data collection process resulted in 98 respondents. All of the respondents agreed to Informed Consent before proceeding with the survey. Thirty-three percent of the respondents were in their first semester of college, and the remaining 66.7 percent were at least in their second semester of college. The majority of respondents, 46.4 percent, were aged 18-24 years old. The next most common age group was 18 and younger (28.9 percent of respondents). Respondents between the ages of 25-35 years old consisted of 13.4 percent, and 9.3 percent of respondents ranged between 35-45 years old. The remaining groups (45-55 years old and 55-65 years old) consisted of 2 percent of respondents (1 percent each). No respondents reported ages of 65 and older.

The survey queried 10 stressors, providing several examples for each. A 5-point Likert Scale was used to measure the intensity of the stressor. The data were analyzed, and this discussion of results will

focus on stressors identified by respondents as having scores of 4 on the Likert Scale (very stressed) and 5 on the Likert Scale (extremely stressed).

When evaluating responses of 4 (very stressed) and 5 (extremely stressed), *Academic Stressors* were most identified, with combined ratings totaling 64.2 percent of respondents (See Graph 1). As shown in Graph 2, the second most prominent stressor was identified by respondents as *Time Management Stressors* (totaling 63.3 percent of respondents choosing ratings of 4 and 5). *Friendship Stressors* were next with 55.1 percent of respondents reporting ratings of 4 and 5 (See Graph 3), and 50.9 percent of respondents noted *Concerns for the Future* with a 4 and 5 rating (See Graph 4). *Self-Image Stressors* were identified by a rating of 4 and 5 for 48.6 percent of respondents (See Graph 5). The sixth most prominent stressor identified with a 4 and 5 rating was *Physical and Mental Health* with 45 percent (See Graph 6). *Financial Stressors* were identified next with 37.1 percent of respondents choosing a rating of 4 and 5 (See Graph 7). *Romantic Stressors* were identified with a 4 and 5 rating by 34.3 percent of respondents (Graph 8), and *Authority Stressors* were reported with a 4 and 5 by 26 percent of respondents (Graph 9). According to Graph 10, 18.6 percent of respondents rated *Loss of Loved One* with 18.6 percent reporting 4 and 5.

Stressors related to the college experience, particularly *Academic Stressors, Time Management Stressors, Concerns for the Future, and Financial Stressors* weighed heavily with the survey participants who ranked them as first, second, fourth, and seventh respectively. Social stressors, particularly *Friendship Stressors, Romantic Stressors, Authority Stresso*rs, and *Loss of Loved Ones* collectively appeared to somewhat impact respondents, ranking these categories third, eighth, ninth, and tenth respectively. Internal factors, such as *Self-Image Stressors* and *Physical and Mental Health* collectively appeared to moderately impact respondents, ranking fifth and sixth respectively.

Respondents were given the opportunity to answer the following question: “In the space below, explain any additional stressor you are experiencing and explain its impact on you.” Twenty-four percent of respondents left comments. Of those comments, most discussed stress relating to a role in current or future life. For example, one respondent shared that she was “stressed about being a good mom and spending enough time with my daughter, making sure her needs are met has been harder with being in school and working full-time." Another area of comment focused on academic concerns. To illustrate, a respondent stated, “Recently, I realized that I did not want to do what I initially gravitated towards when I enrolled into college. It has made me feel stress, incompetence, and uncertainty.” Some respondents also explained physical or mental concerns. For instance, a participant shared, “My health is a huge stressor for me because I have a few things going on that could affect my life negatively. Then with me being stressed makes both things get worse and the side effects worse.”

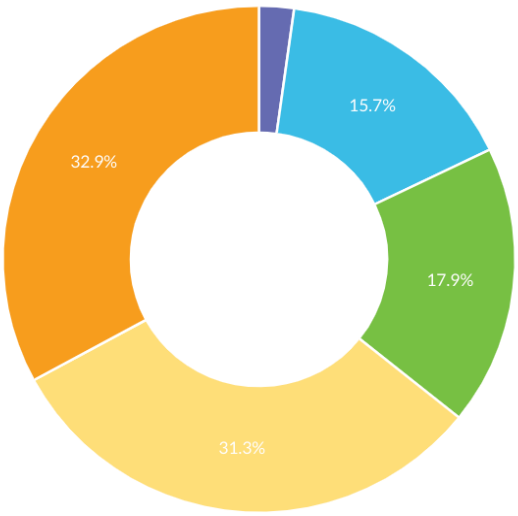
According to Graph 11, the top three coping mechanisms identified by respondents are technology (15.6 percent), exercise (13.8 percent), and social support (12.8 percent). Coping with technology was defined as “video gaming, blogging, and/or social media.” Coping with exercise was defined as “running, walking, going to the gym, and/or engaging in sport of choice.” Coping with social

support was defined as “sharing with family or friends, going out with friends, going to therapy, spending time with your pet, and/or seeking out a causal relationship or hook-up.”

Respondents were also asked to provide a health rating regarding their coping strategies on a 5-point Likert scale from 1 (not healthy) to 5 (extremely healthy). The majority of respondents (39.8 percent) provided a health scale rating of 3 (moderately healthy). The next most selected health rating (30.5 percent) was 2 (somewhat unhealthy). Lastly, respondents were asked to rate their satisfaction with their coping approach on a 5-point Likert scale of 1 (very unsatisfied) to 5 (very satisfied). Most respondents (46.6 percent) rated a satisfactory level of 3 (somewhat satisfied). Next, respondents rated their satisfaction as 4 (satisfied) with 29.7 percent.

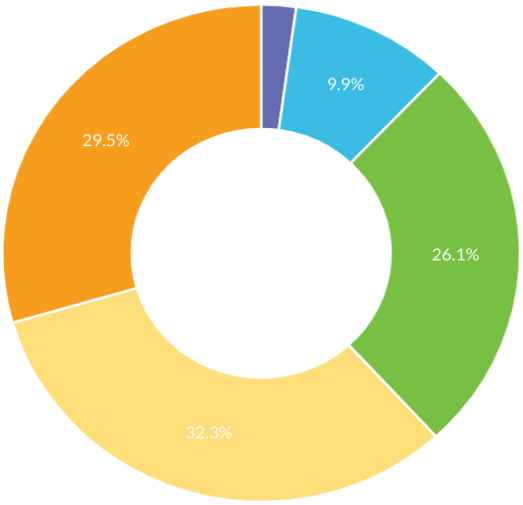
Although coping mechanisms of technology, exercise, and social support are considered healthy, at least to varying extents, a majority of respondents rated the health of their coping mechanisms as moderately healthy to somewhat unhealthy. Future research directions may want to explore specifically the health scale per coping mechanism, including a short answer for respondents to explain their health rating. This study also noted the potential discrepancy between a lower health scale rating and a higher rating of satisfaction with their coping strategies. Consequently, future research should examine the potential inconsistency between each respondents’ satisfaction and health scale.

Graph 1: Academic Stressors



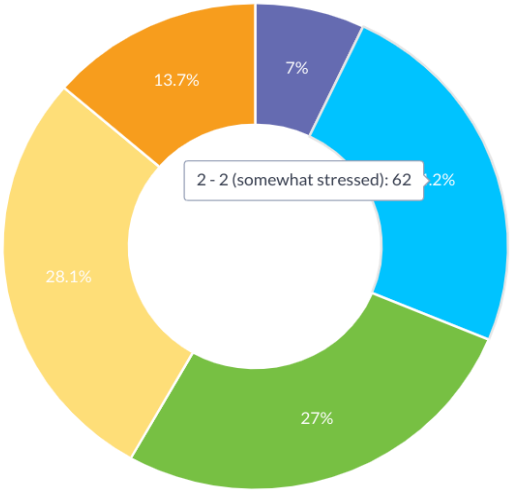
Choice	Rating	Total
1 - 1 (not stressed)	7	7
2 - 2 (somewhat stressed)	50	25
3 - 3 (moderately stressed)	57	19
4 - 4 (very stressed)	100	25
5 - 5 (extremely stressed)	105	21

Graph 2: Time Management Stressors



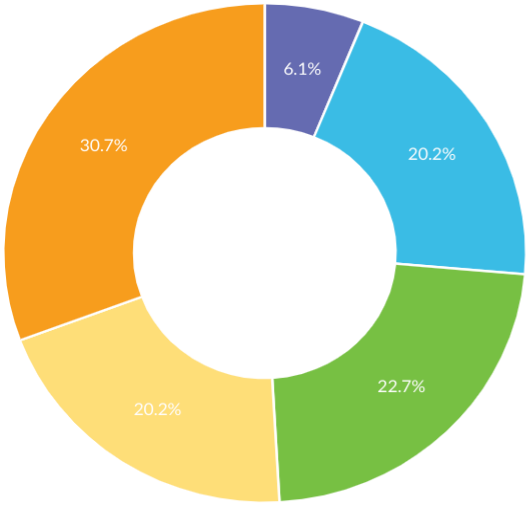
Choice	Rating	Total
1 - 1 (not stressed)	7	7
2 - 2 (somewhat stressed)	32	16
3 - 3 (moderately stressed)	84	28
4 - 4 (very stressed)	104	26
5 - 5 (extremely stressed)	95	19

Graph 3: Friendship Stressors



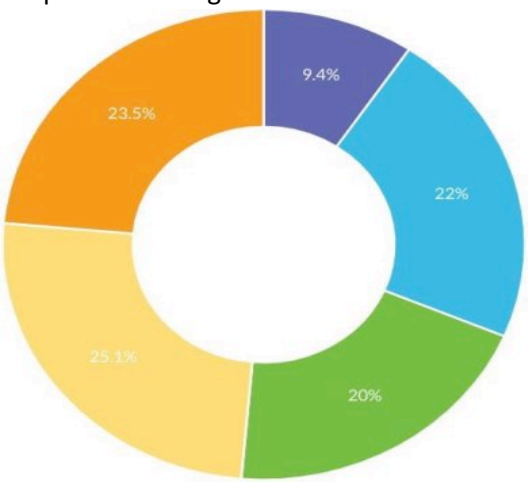
Choice	Rating	Total
1 - 1 (not stressed)	18	18
2 - 2 (somewhat stressed)	62	31
3 - 3 (moderately stressed)	69	23
4 - 4 (very stressed)	72	18
5 - 5 (extremely stressed)	35	7

Graph 4: Concerns for Future Stressors



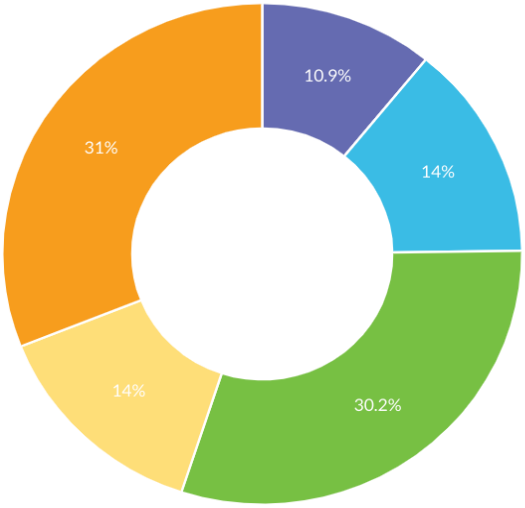
Choice	Rating	Total
1 - 1 (not stressed)	17	17
2 - 2 (somewhat stressed)	56	28
3 - 3 (moderately stressed)	63	21
4 - 4 (very stressed)	56	14
5 - 5 (extremely stressed)	85	17

Graph 5: Self-Image Stressors



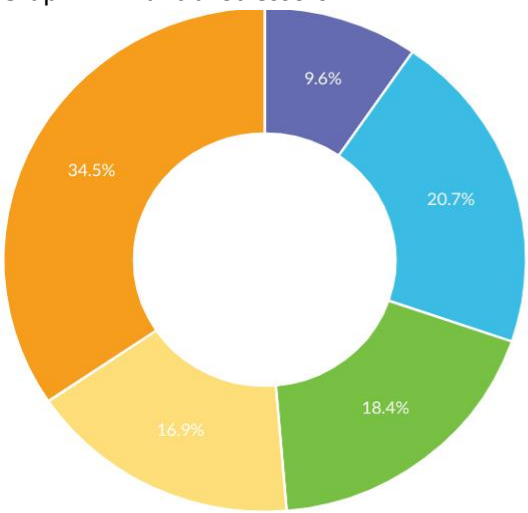
Choice	Rating	Total
1 - 1 (not stressed)	24	24
2 - 2 (somewhat stressed)	56	28
3 - 3 (moderately stressed)	51	17
4 - 4 (very stressed)	64	16
5 - 5 (extremely stressed)	60	12

Graph 6: Physical and Mental Health Stressors



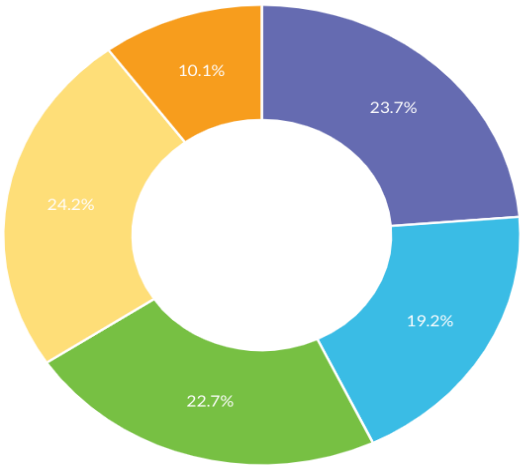
Choice	Rating	Total
1 - 1 (not stressed)	28	28
2 - 2 (somewhat stressed)	36	18
3 - 3 (moderately stressed)	78	26
4 - 4 (very stressed)	36	9
5 - 5 (extremely stressed)	80	16

Graph 7: Financial Stressors



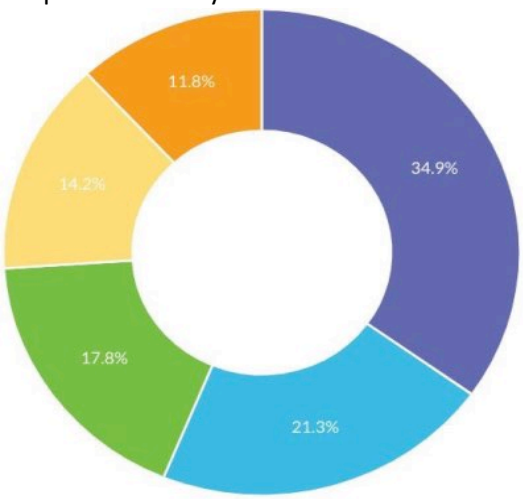
Choice	Rating	Total
1 - 1 (not stressed)	25	25
2 - 2 (somewhat stressed)	54	27
3 - 3 (moderately stressed)	48	16
4 - 4 (very stressed)	44	11
5 - 5 (extremely stressed)	90	18

Graph 8: Romantic Stressors



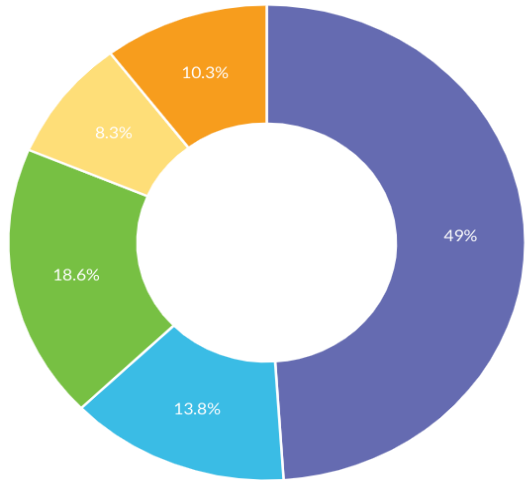
Choice	Rating	Total
1 - 1 (not stressed)	47	47
2 - 2 (somewhat stressed)	38	19
3 - 3 (moderately stressed)	45	15
4 - 4 (very stressed)	48	12
5 - 5 (extremely stressed)	20	4

Graph 9: Authority Stressors



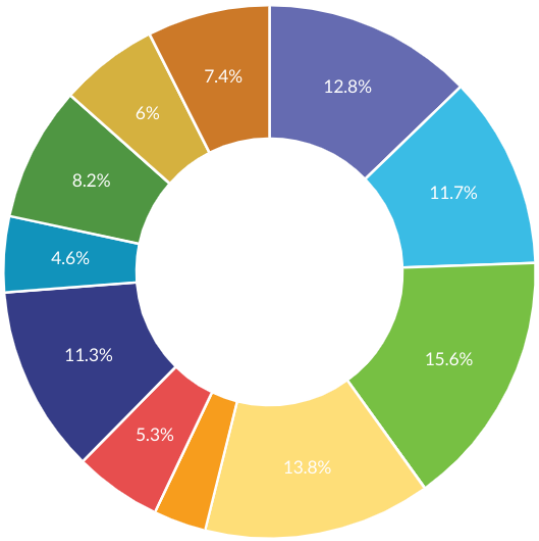
Choice	Rating	Total
1 - 1 (not stressed)	59	59
2 - 2 (somewhat stressed)	36	18
3 - 3 (moderately stressed)	30	10
4 - 4 (very stressed)	24	6
5 - 5 (extremely stressed)	20	4

Graph 10: Loss of Loved One Stressor



Choice	Rating	Total
1 - 1 (not stressed)	71	71
2 - 2 (somewhat stressed)	20	10
3 - 3 (moderately stressed)	27	9
4 - 4 (very stressed)	12	3
5 - 5 (extremely stressed)	15	3

Graph 11: Coping



Choice	Total
Coping with Technology (such as video gaming, blogging, social media)	44
Coping with Exercise (running, walking, going to the gym, engaging in sport of choice)	39
Coping through Social Support (such as sharing with family or friends, going out with friends, going to therapy, spending time with your pet, seeking out a causal relationship/hook-up)	36
*Coping with Creativity * (such as reading, writing, listening to or creating music, painting, drawing, crafting, cooking)	33
Coping through Problem Avoidance (such as ghosting, procrastinating, disengaging from stressor)	32
Coping through Over- or Under-Sleeping (such as sleeping over 8 hours per night or under 6 hours per night)	23
Coping by Spending Money (such as online or in store shopping, buying items for hobbies)	21
Coping through Eating (such as changes in eating behavior, such as over- or under-eating, stress eating, eating more sweets than usual)	17
Coping with Meditation and/or Spiritual Practices (such as praying, practicing yoga, mindfulness, reading related to spiritual or religious beliefs, spending time with people in your spiritual or religious community)	15
Coping with Substance Use (such as caffeine use, alcohol use, smoking, misusing medications, using inhalants, or using other drugs or substances)	13
Coping with Externalizing or Internalizing Behaviors (such as danger-seeking behavior, skin and/or hair picking, throwing objects, physical or emotional aggression of others, engaging in risk-taking behaviors, engaging in self-harming behaviors)	9

Techniques and Procedures Utilized

Literature research skills:

Reading and summarizing scientific studies.

Discerning and synthesizing scientific studies to create a Literature Review.

Fine-tuning research methodology for current study based on published scientific studies.

Data collection techniques learned:

Identifying the methodology for standardizing the sample of convenience.

Learning how to formulate and implement Informed Consent based on the American Psychological Association.

Formulating, standardizing, and implementing a structured interview.

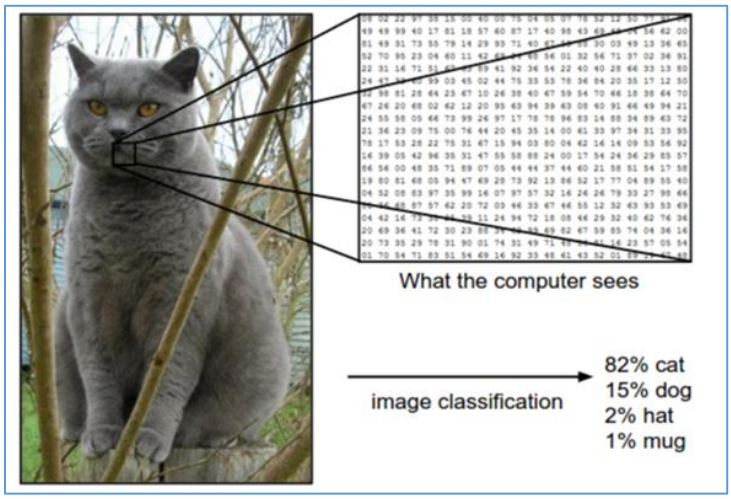
Data analysis techniques learned:

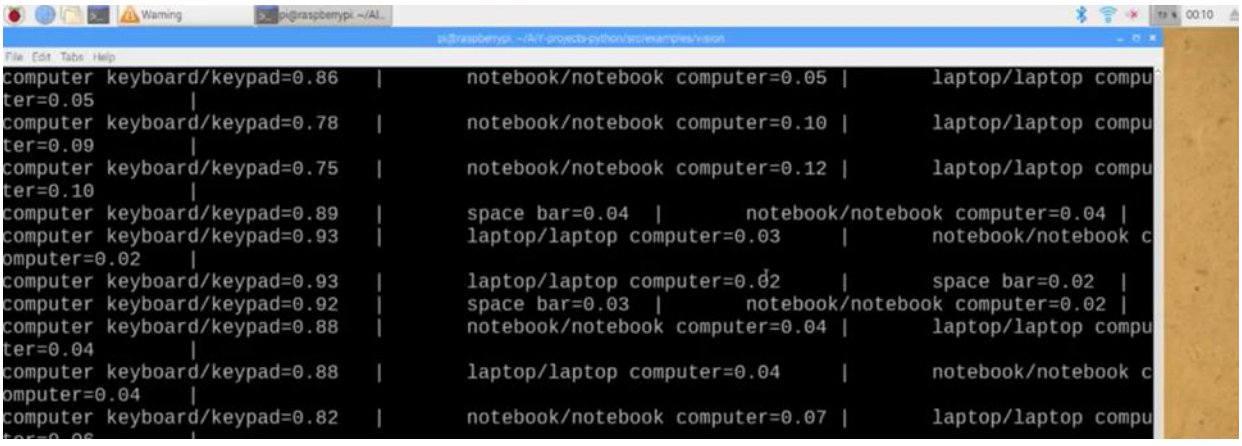
Standardization of data collection with survey research.

Interpreting the data by creating graphs to show the different patterns and trends.

Writing up the major results of the study.

Technology Research Project





The Building, Use and Importance of Intelligent Cameras in the 21st Century

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Innovation Lab, St. Petersburg College

Mr. Chad Mairn

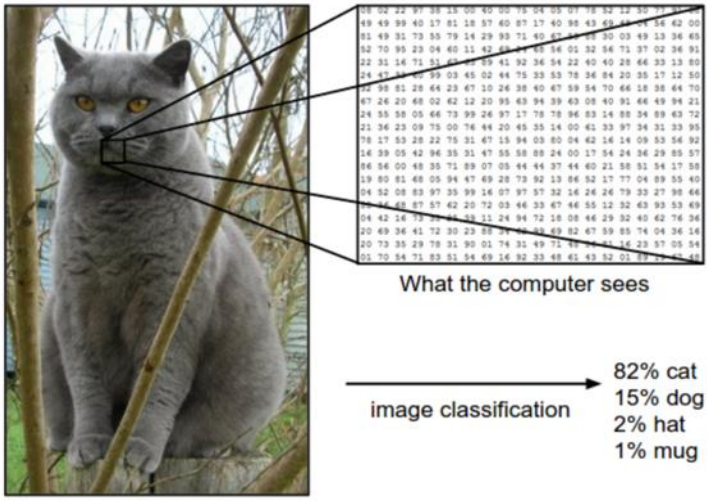
December 7, 2022

The Building, Use and Importance of Intelligent Cameras in the 21st Century

In the 21st century, the world finds itself surrounded by astonishing technological advancements, machines and gadgets that were only thought of as science-fiction the century prior. This rapid sophistication in the industry has prompted the public with innovative devices, alongside great features that accompany them. Amongst big names such as smartphones, artificial intelligence or social media, intelligent cameras speak little but act more. Their ability to gather, select, analyze, and share data is incredible to say the least. They have premises to be used in all areas and can be found from space probes all the way down to cameras used in medical surgeries or those in cars. In their work, Genser et al. (2021) note that, "The camera is a key sensor to achieve a reliable environment perception", (p. 12) referring to the key role that it plays in the car's navigation system. Not only this, but they make work more efficient, precise and they are extremely reliable. That is because seeing the impact that regular cameras have done to all human landscapes, one can expect the same thing to happen with intelligent cameras. They are like regular cameras, but with some tweaks that make them multifunctional and more desirable. While intelligent cameras are still relatively young and have not been fully explored yet, their influence and ability portray their importance in the future.

To set the stage for anyone interested in computer vision, one must be familiar with the fundamental concept first. The way computer vision works is by training machines on a large amount of visual data and creating an algorithm for the pattern of recognition through which the computer makes an assessment on the probability when classifying what the object is. This concept is erected on the basis of machine learning, which is the potential or capability of machines to imitate intelligent behavior through many amounts of training, exploring and studying.

Source: cs231n.github.io



The picture to the left sets an example of how computer vision works. The processing unit examines the pixels, their placement alongside other factors to take into consideration before classifying the focus of the photo. Through much trial, error and training, the computer calculates the probability and then classifies the object to a certain category. In their work, Spirina and Zharovskikh (2020) note that," Thanks to the use of deep learning in image recognition and classification, computers can automatically generate and learn features – distinctive characteristics and properties. And based on several features, machines predict what is on the image and show the level of probability" (p.1).

Building

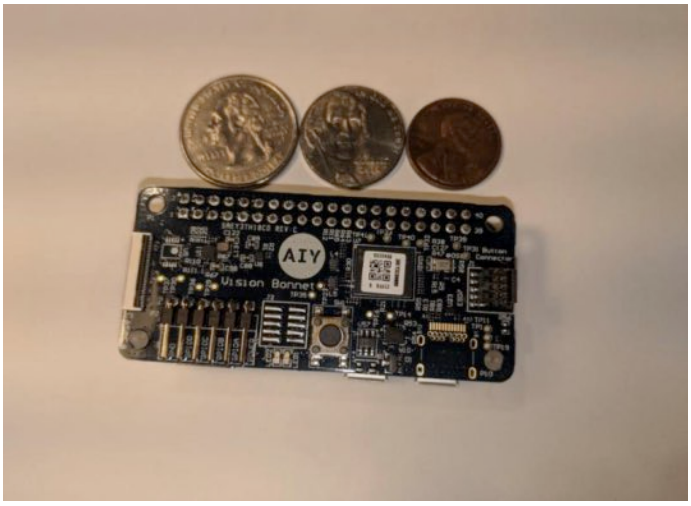
The AIY Vision Kit is an intelligent camera created and designed by Google LLC. It is crafted in 17 parts that through careful handling, come together to form a multifunctional intelligent camera. When powered up, this device can capture and recognize random objects that appear in its sight. It distinguishes their color, form, and size. Not only this, but it is embedded with facial recognition software, so that it can acknowledge when someone is happy, angry or shows other forms of emotions. The instructions to building this intelligent camera can be found in their own dedicated page (AIY Projects, n.d.). Any enthusiastic builder can build and perform

the demos that are available at the web page. The parts that make up this camera are small and fragile, hence it is instructed to handle them with great care, as without them it is impossible to erect this device. Unfortunately, as every endeavor or challenge that one might take, one faces obstacles and issues that need to be overcome. As such, one is advised to look out for any of the following issues:

1. Cable is not properly secured to the latch.

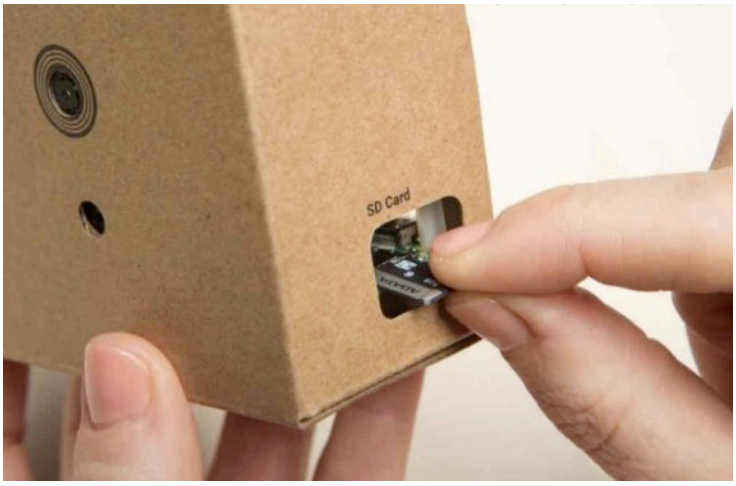
The raspberry pi camera, vision bonnet and the raspberry pi, are connected to each other through a long flex cable and a short flex cable, being tightly secured in their respective latches. If this cable is not secured, if it is loose or easily disconnected, the Vision Kit will not work.

2. Parts are fragile and hard to deal with.



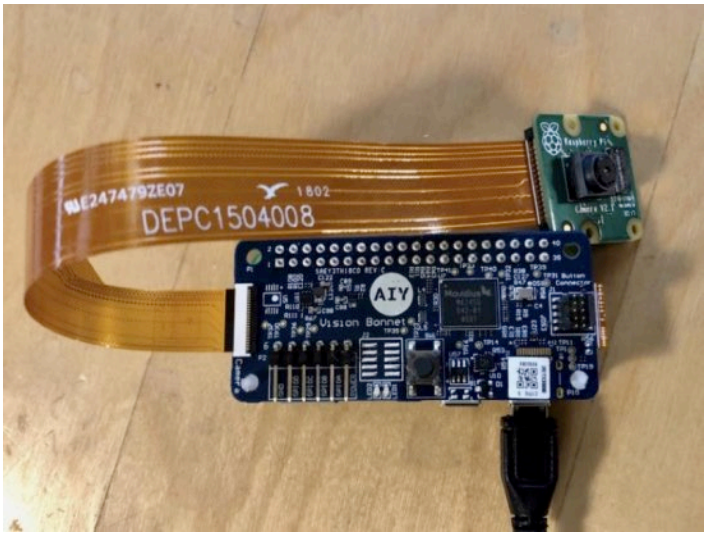
When dealing with the boards or other electronic parts of the Vision Kit, it is strongly suggested to be careful and aware of how fragile they are. To the left is a depiction of the vision bonnet, a main board which powers up the device, and it is as big as three coins.

3. The SD card is not working.



Another technical issue that can be expected is a corrupt SD card. The files within it do not run properly, hence the Vision Kit does not work. Thankfully, there is an easy solution to this, which is reformatting the SD Card and trying again.

4. Cable flex is turned around.



If one follows thoroughly step number three from the dedicated web page, one soon finds out that the kit will not run. To fix this, the copper strip should be turned the other way. This step is incorrectly displayed in the web page, and it should be fixed by the team.

5. The power source is not enough.

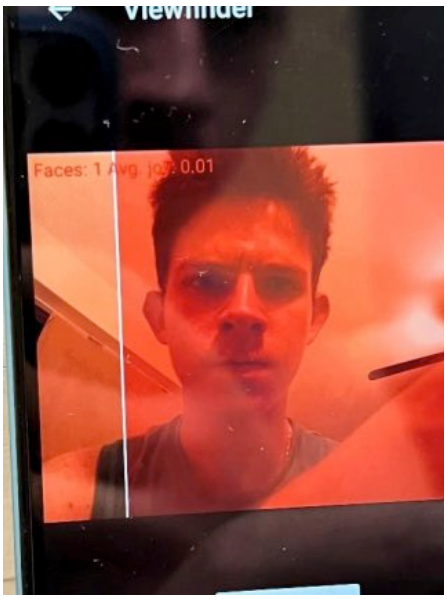
If the power output is not big enough, the kit is not going to start. The power plug in the left has an output of 350mA, which was not enough to start the kit. When switched to the one on the right with an output of 3A, the kit booted up.

Use

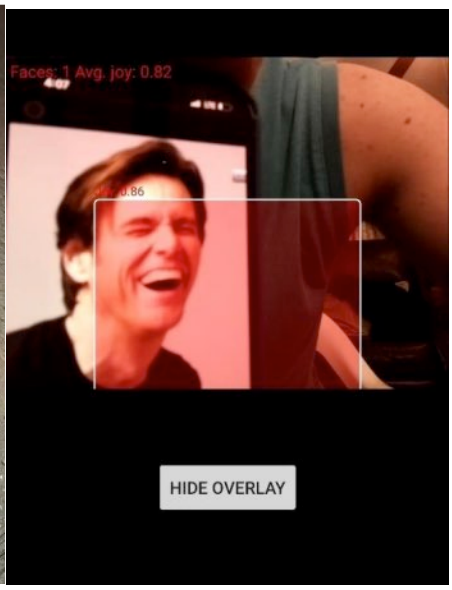
The best part about this machine is watching it in action. The first demo that is put to the test is the Joy Detector. As mentioned before, the vision kit can detect someone's face and show how they are feeling. It does so by lighting up the main button in different colors, based on the person's facial expressions. This effect works on people and surprisingly it works on photos or videos of people. All one must do is point the camera to one's face or at anyone and watch the color change according to their joy. Below is an example of this demo in action.

In the picture on the right, someone is depicted through the intelligent camera. On the top left, the program displays the number of faces in the frame and their joy. The joy index is 82% (or 0.82) and when the camera detects a joyful face, the main button changes color to bright pink or yellow, as depicted on the picture to the left.

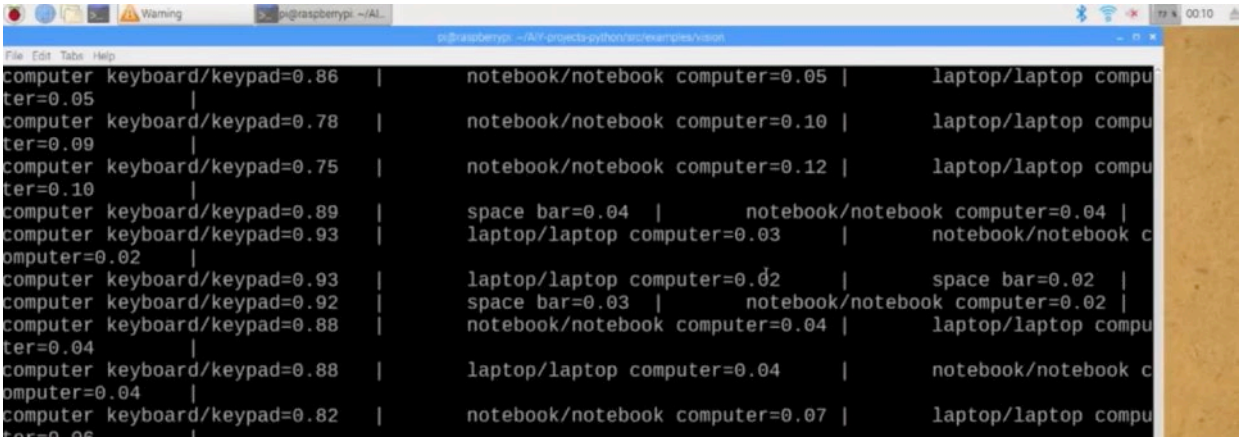
In this example, the joy index has dropped drastically to 1% (or 0.01). The intelligent camera is quick to read off the facial expression, when the face is not joyful the color in the main button shifts to blue or dark blue.



Here, another face is detected but from a photo off the internet. As usual, it detects the joy index (here is 86% or 0.86) and the light correctly turns pink or yellow, to indicate joy.

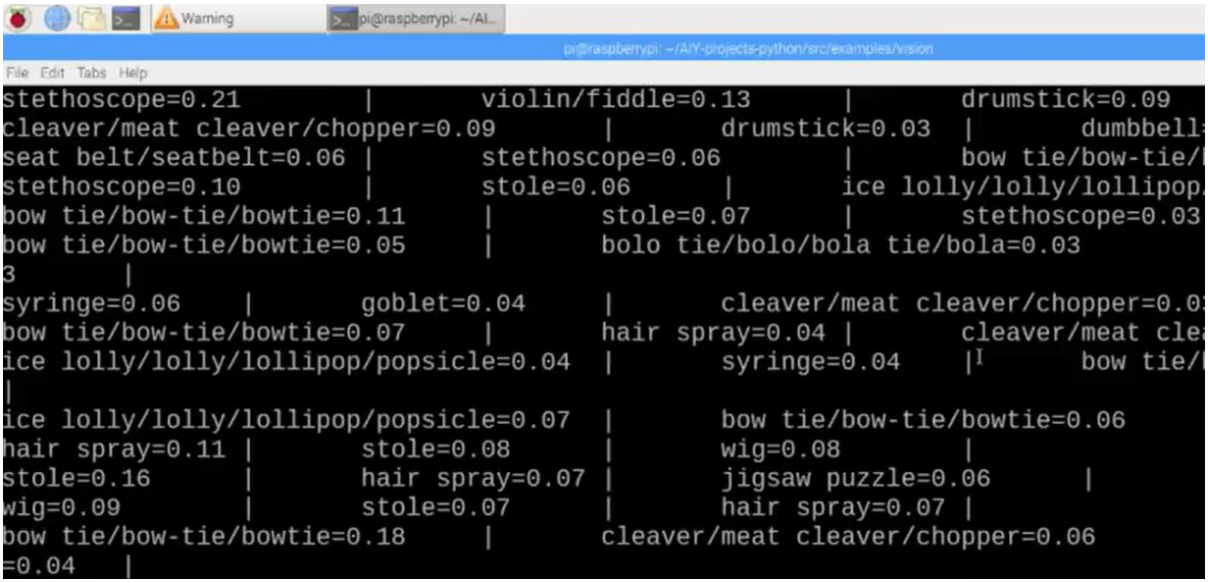


Another mind-blowing feature of this intelligent camera is a demo called “Image Classification Camera”, and what it does is identify, classify and display data about any object just by pointing the camera towards it. This is done through many files in the source code that apply their set of data to the input from the camera and whichever matches is returned as output in the terminal. In other words, there is already a database for common objects in the source folder, and if it happens that you display it in this demo, through its shape, size and color, the database will return those statements that match your object. Below is the output form the terminal when a keyboard was placed in sight.



On the left side of the screenshot, the type of object is displayed and the certainty of the program. It classified the object as a keyboard with a certainty from 75% (or 0.75) as high as 93% (or 0.93). Not too bad for a camera so small that can fit in your pocket. On the middle and right side, are other options but they are less likely to be correct, since the certainty of the program is extremely low, ranging from 12% all the way down to 1%. This certainty percentage is displayed because the camera does not directly examine the object, but rather compares it to the data of common objects already stored in its source files, and then makes an assumption. With some

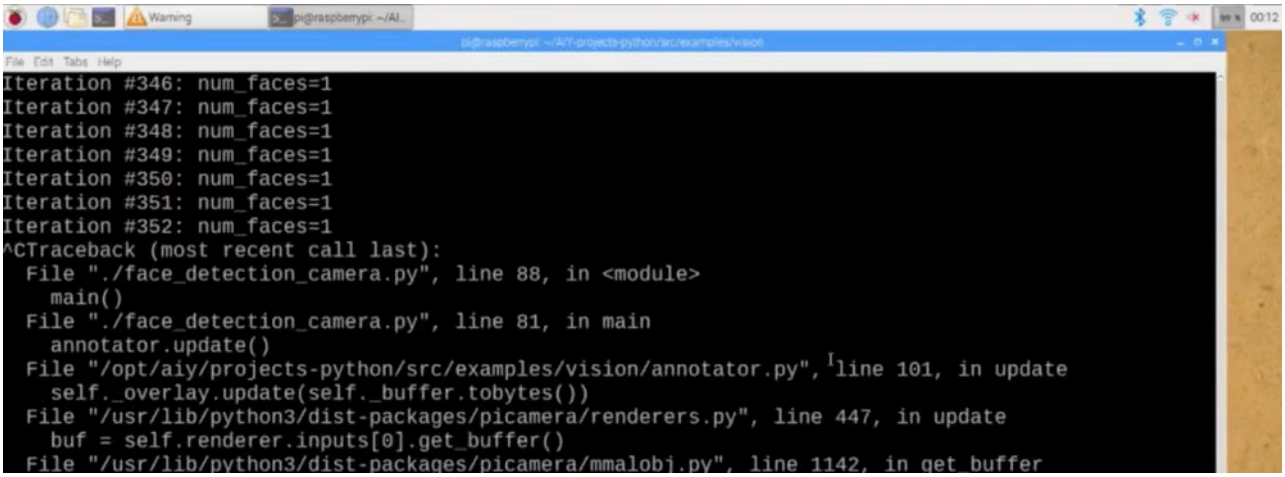
thinking, one might derive to the idea that it is possible to display an object which is not in the database, which is the case for the next example in the terminal.



The object in the instance above is a pair of pliers, but the program does not recognize them. This is most likely since an object named ‘pliers’ is not in the kit’s source code. Since there is not one, the program tries to find similar matches to this object. Pliers, lollipops, bow ties, seat belts all have in common the long – vertical shape. Another detail that one can pick in order to determine that the program is not sure about the object in question is the certainty that it displays. The greatest value regarding certainty is 21%, and that is assigned to a stethoscope. Compare these answers to the one that were shown in the previous example with the keyboard, drastic differences can be noted.

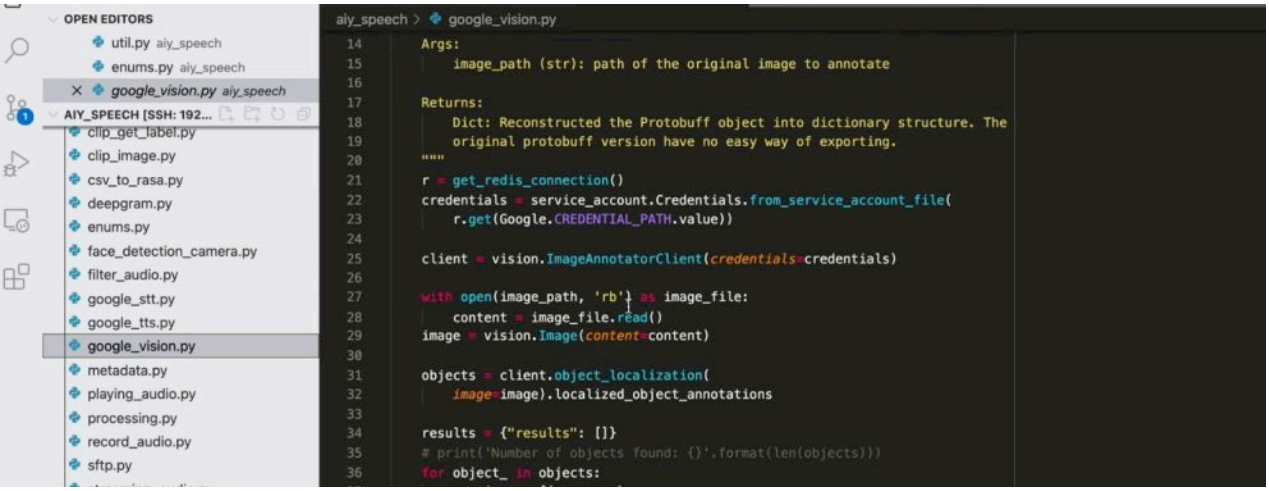
The last demo tried is the face detection feature of the kit. It may not be as exciting as the one’s prior but nonetheless it plays a major role in the overall functioning of the camera. Basically, alongside the face detector code, there is a face tracker feature programed in the source files, this

enables the vision kit to keep track of the people in the shot and simultaneously record data about their face's geometry and expression. Below, the output of this demo is displayed.



All the lines start with the word iteration, which means that the face is recorded for every frame that the camera captures. The three-digit number next to the iteration is the frame number. After that is displayed the number of faces that were detected. In other words, the intelligent camera does not record a video of what is happening, but rather it captures photos and distinguishes them from one another by iterating through each frame for any changes or abnormalities between them. This is quite effective because it pays great attention to detail and minor things that might go unnoticed.

And lastly, some of the source files were opened in Visual Studio Code, which is an Integrated Development Environment (IDE) for all programs. While it is difficult to fully understand why and what each command line means, the general purpose for opening it is to see how the software is divided in sections and how they connect with each-other. The language used in the vision kit is python, which is known for being a versatile and user-friendly programing language, it is fairly easy to read and play with. A screenshot of the code is provided below.



On the left side, there are all the files that make up the software used in the kit. All the processing and 'intelligent' work is done in here. This is what differentiates this camera from a regular plain camera, it contains a lot of power and potential. Inside of the dark background, is displayed the code of the 'google_vision.py' file. If one looks at the top of the photo, one notices that this file is located inside the 'aiy_speech' folder. Explained in simple terms, this nesting of files inside-another is done to efficiently apply software in any given situation.

Importance

Intelligent cameras, although not widely used yet, in the near future will be almost everywhere. That is because of the incredible performance and features that they bring along. Casual cameras that are installed in roof tops of banks or traffic lights, they record footage, but if something noteworthy were to happen, one would need to filter through all that footage and find the accident scene or the crime committed. Whereas an intelligent camera would have the capability to filter and delete all the unnecessary footage and separate the noteworthy event, make it stand out. This is a great feature, because not only does it save storage space and resources, but it also saves time off the appropriate entities. In their work, Khodadin, and Pudaruth (2020) refer to a surveillance system from intelligent cameras as follows, "This system is reliable and meets

the aim of a modern intelligent surveillance system by combining multiple approaches to detect intrusions and to inform users effectively" (p.23). The camera system would have a face recognition software implemented that would regularly update and have its own database for employees. An intruder's face would not be recognized, hence it would be captured and reported to the appropriate people. Such technological improvement is escalated by A.I and its ability to learn, progress and keep going. A.I is so good at learning that many of the world's brightest mind are fearful when it comes to the future of technology and the way artificial intelligence will evolve. The same way, all the magic in the kit is happening between the raspberry pie and the vision bonnet. Those are the components that collect, store, separate, analyze and portray data. They obtain the capacity and power to analyze and distinguish data into an organized and understandable manner. This is what today's technology can achieve, it is astonishing to say the least, and the reason why intelligent cameras are going to be everywhere.

References

AIY Projects. (n.d.) *Vision Kit.* https://aiyprojects.withgoogle.com/vision

Cs231n.github.io

Genser, Muckenhuber, S., Solmaz, S., & Reckenzaun, J. (2021). Development and Experimental Validation of an Intelligent Camera Model for Automated Driving. *Sensors* (Basel, Switzerland), 21(22), 7583–.https://doi.org/10.3390/s21227583

Khodadin, & Pudaruth, S. (2020). An Intelligent Camera Surveillance System with Effective Notification Features. *International Journal of Computing and Digital System* (Jāmiʻat Al-Baḥrayn. Markaz Al-Nashr Al-ʻIlmī), 9(6), 1251–1261. https://doi.org/10.12785/ijcds/0906022

Spirina, K., & Zharovskikh, A. (2020, June 9). How Does Computer Vision Work and What It Gives Technology-Led Industries. *In Data Labs.* https://indatalabs.com/blog/how-does-computervisionwork#:~:text=A%20fundamental%20task%20in%20computer,features%20%E2%80%93%20distinctive%20characteristics%20and%20properties.

2022 Undergraduate Research Symposium

2022 Undergraduate Research Experiences Symposium

SPC's Inaugural Undergraduate Research Experiences Symposium was held in fall 2022, at the Clearwater Campus. The event was open to students, faculty, staff, and administrators collegewide.

The symposium featured 22 student researchers alongside their poster presentations, which encompassed the fields of Biology, Ecology, Health Science, Microbiology, Psychology, Public Policy, Social Science, and Sustainability. Student researchers and faculty mentors are featured on the college website at: Symposium.

Student presenters were interviewed by judges and participants throughout the evening, and many expressed how delighted they were to present their research projects to SPC educators and peers. Student interviews are featured in a You Tube video at: Symposium Video

Medallions on blue ribbons were awarded to student presenters who earned high scores in several academic categories and to research faculty who mentor student researchers.

Certificates of recognition and digital badges were presented to all student researchers, for inclusion in their resumes and university applications.

Funding for first generation student researchers, and for SPC's Inaugural Undergraduate Research Experiences Symposium was provided by the SPC Foundation.

Meet the 2022 Student Presenters

Jade Almeida
Natural Science Department

Research Interests:
I am interested in the research of finding cures for human diseases such as Epilepsy, so I hope to one day be a part of a research for that.

Future Plans:
I plan to finish my Bachelor's degree in biology and go to med school to eventually become a forensic pathologist.

"The important thing is to never stop questioning"
Albert Einstein

Research Mentor: Linae Boehme, PhD

Claudia Brem
College of Business

Research Interests:
My research interests focus on renewable energy and urban ecosystem services within the context of corporate social responsibility, green building practices and social impact.

Future Plans:
I am interested in analysis, research and project management working on corporate social responsibility with a diverse stakeholder base to advance organizational behavioral change implementing viable sustainable practices and solutions.

"We can't change the wind, but we can set the sails differently."
Aristotle

Research Mentor: Lynn Grinnell, PhD

Joshua Brown
Social and Behavioral Sciences

Research Interests:
International Policy, especially on nonproliferation of weapons of mass destruction

Future Plans:
I hope to continue an earn a Bachelor's degree in Electrical Engineering to contribute innovative devices to the world.

"The world's problems transcend borders. We have to transcend our differences to transform our future." -UN Secretary-General António Guterres

Research Mentor: Douglas Rivero, PhD

Meet the 2022 Student Presenters

Heather Canham
Natural Science Department

Research Interests:
I would be interested in continuing to work in carnivorous plant physiology. I'm also interested in plant/insect interaction, gopher tortoise burrow ecology, mycorrhizal networks, and parasitic fungi.

Future Plans:
I eventually want to be a wildlife biologist or to work behind the scenes at a natural history museum or some other ecological institution.

"If we knew what it was we were doing, it would not be called research, would it" - Albert Einstein

Research Mentor: Erin Goergen, PhD

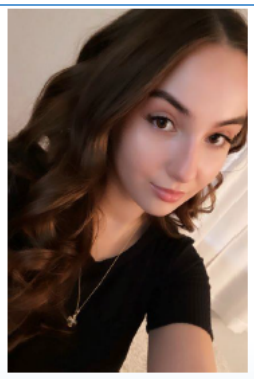
Alex Clark
Natural Sciences Department

Research Interests:
Marine Biology, Ecology & Conservation Biology
Animal Behavior, Genetic Analysis

Future Plans:
- I intend to pursue at least a master's degree, if not a doctorate.
- Perform active research on sharks, focusing on tagging and tracking their movements, as well as testing hypotheses made regarding their genome and its potential influence on human healthcare.
- I'm also considering teaching, as I greatly enjoy sharing my love of science with other people, as well as connecting with my community and giving back to it.

"We are tied to the ocean. And when we go back to sea, whether it is to sail or to watch- we are going back from whence we came." -John F. Kennedy

Research Mentor: Linae Boehme, PhD



Melina Crowder
Honors College, Social and Behavioral Sciences

Research Interests:
I am interested in research involving the most effective treatment for those with mental illnesses and how we can implement that in todays' therapy.

Future Plans:
My future plans are to graduate from USF with my PhD in Clinical Psychology and work with adolescents. My goal is to help children who struggle with mental illnesses by teaching them healthy coping mechanisms and providing them with a safe and healing space.

"Don't become a mere recorder of facts, but try to penetrate the mystery of their origin." By: Ivan Pavlov

Research Mentor: Sharon Olsen, MA

SPC St. Petersburg College

URE UNDERGRADUATE RESEARCH EXPERIENCE SYMPOSIUM

Meet the 2022 Student Presenters

Alexis Gamache
Honors College, Communications Department

Research Interests:
Modern solutions for addiction

Future Plans:
Trauma Nursing

"One is too many and a thousand is never enough"
- NA basic text, 6th edition.

Research Mentor: Amber Estlund, PhD

Madison Gauley
Social and Behavioral Sciences

Research Interests:
I would love to conduct another study to see at what age repression most often occurs, and the deeper roots behind the repressed memories.

Future Plans:
I plan to continue my studies and get my BA at the University of South Florida, where I am currently enrolled. After my BA, my goal is to achieve my MA so I can become a Marital Counselor.

"You will keep in perfect peace those whose minds are steadfast because they trust in You."
~Isaiah 26:3

Research Mentor: Kim Molinaro, M.Ed

Ellyce Hamel
Natural Sciences Department

Research Interests:
Human neuroscience

Future Plans:
I graduate in May 2023 with a Bachelor of Science in Biology with a subplan in Cellular and Molecular Biology. I plan to attend graduate school to become a Physician Assistant.

"Research is formalized curiosity. It is poking and prying with a purpose. It is a seeking that he who wishes may know the cosmic secrets of the world and they that dwell therein."
– Zora Neale Hurston

Research Mentor: Linae Boehme, PhD

Meet the 2022 Student Presenters

Kaitlyn Haynes
Natural Sciences Department

Research Interests:
Microbiology & Cancer Biology

Future Plans:
I plan to attend medical school to pursue pediatric neurology

"The doctor of the future will give no medicine but will interest his patients in the care of the human frame. In diet and in the cause and prevention of disease"- Thomas Edison.

Research Mentor: Erin Goergen, PhD

Vivienne Kountz
Public Policy and Administration

Research Interests:
My interests for research include a multitude of topics, such as the study of human behavior, relationships, and functions.

Future Plans:
I plan on applying and interviewing for available positions overseas here in Germany. I would like to move back to the States to pursue positions in fields I am interested in (i.e., working in Courts, Districts, or other governmental position).

"Education is the most powerful weapon which you can use to change the world."
- Nelson Mandela

Research Mentor: Jeffery Kronschnabl, MPA

Dakota Lawson
Social and Behavioral Sciences

Research Interests:
Clinical Psychology in the mental health field

Future Plans:
My passion is to work with children who have experienced trauma related to family members abusing drugs or alcohol. I hope to start out in an elementary school as a guidance counselor because the school guidance office is where I spent most of my childhood life, and the counselors were the only positive influence that I remember from that age. Later in life, I hope to own and run my own practice.

"Research is to see what everybody else has seen, and think what nobody else has thought"

Research Mentor: Kim Molinaro, M.Ed

"Professor Molinaro quickly became an inspiration to me and truly helped me realize my purpose." Dakota

Meet the 2022 Student Presenters

Nickie Leon
Health Services Administration

Research Interests:
Patient Healthcare / Quality data

Future Plans:
I will begin the UCF Masters of Executive Health Service Administration program in January, 2023

"The best way to predict the future is to create it."
- Peter Drucker

Research Mentor: Will Baldwin, MPH, CPH

Anh Nguyen
Natural Sciences Department

Research Interests:
I am interested in neuroscience research.

Future Plans:
My plan is to apply for graduate school in Neuroscience program after finishing my Bachelor's degree.

"Everything is theoretically impossible, until it is done."
– Robert A. Heinlein

Research Mentors: Dr Erin Goergen, and Dr. Shannon Ulrich

Felix Nickel
Social and Behavioral Sciences

Research Interests:
To pursue further action research under SPC's model UN team

Future Plans:
I would like to attend UF for cognitive neuroscience, where it is my hope to get a PHD and participate in medical research.

"We are born to love, we live to love, and we will die to love still more." St. Joseph Cafasso

Research Mentor: Douglas Rivero, PhD

Meet the 2022 Student Presenters

George Nunoo
Natural Sciences Department

Research Interests:
Science and my favorite research topic is Genetic analysis of multiple primary cancers and Brca1.

Future Plans:
My plan is to apply to PA SCHOOL after acquiring the Bachelor's degree.

"When the going gets tough, the tough keep going."

Research Mentors: Dr Erin Goergen, and Dr. Shannon Ulrich

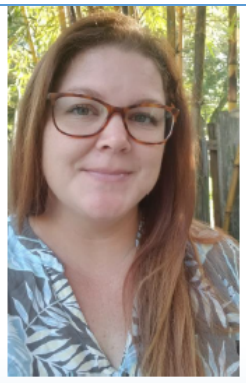
Duke Alexander Panagiotis
Social and Behavioral Sciences

Research Interests:
My research interests as of now are Psychology, International Relations, and Linguistics.

Future Plans:
My future plans are to find an occupation that allows me to utilize all of those interests and to have the ability to travel.

"Do good, get good."
~ Jennifer Panagiotis

Research Mentor: Douglas Rivero, PhD



Talya Redinger
Natural Sciences Department

Research Interests:
Intercoastal coral identification and out planting; Marine debris impacts and solutions on estuarine ecosystems; Submerged aquatic vegetation and watershed influence; Natural rehabilitation of coastal systems

Future Plans:
Continue with marine and coastal conservation efforts under the scope of the contributing anthropogenic factors, and work to create solutions in the degradation of these delicate ecosystems.

" Volunteering is the ultimate exercise in Democracy. You vote in elections once a year, but when you volunteer, you vote every day about the kind of community you want to live in"

Research Mentor: Erin Goergen, PhD

Meet the 2022 Student Presenters

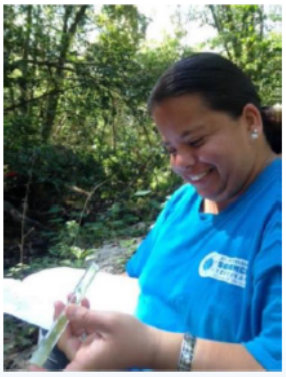
Adam Robinson
Natural Sciences Department

Research Interests:
I am interested in studying the response of Earth micro-organisms to Mars-like conditions. The primary goal of this research is to explore the possibility of discovering extinct or extant life on Mars today.

Future Plans:
Next year I will be starting a PhD program in Microbiology to continue my research exposing microbes to Mars-like conditions.

"If there is life on Mars, I believe we should do nothing with Mars. Mars then belongs to the Martians, even if they are only microbes."
— Carl Sagan

Research Mentor: Shannon Ulrich, PhD



Georgette Rutherford
Natural Sciences Department

Research Interests:
I enjoy being in nature, and working both in the lab and field, as well as conducting experiments with plants and researching water quality.

Future Plans:
To work for the Florida Fish and Wildlife. Environmental specialist technician.

"Colors are the smiles of nature, beauty, peace."
Leigh Hunt

Research Mentor: Erin Goergen, PhD

Alexander Teleszky
Natural Sciences Department

Research Interests:
Stem cells, Corals, and Plant ecosystems

Future Plans:
Finish Bachelor's degree at USF St. Pete while continuing research opportunities to become a marine biologist and work on reversing ocean acidification.

"Everything is theoretically impossible, until it is done."
Robert A. Heinlein

Research Mentor: Erin Goergen, PhD

SPC St. Petersburg College

URE UNDERGRADUATE RESEARCH EXPERIENCE SYMPOSIUM

Meet the 2022 Student Presenters

Alexis Vandepol
Social and Behavioral Sciences

Research Interests:
My research interests include developmental psychology within the deaf community and the effects of ASL in early development.

Future Plans:
I plan to get my degree in educational and community leadership with a focus on ASL interpreting, which I will use to be an advocate for the deaf community.

"It's better to be silent and be thought a fool than to speak and remove all doubt."
Mark Twain.

Research Mentor: Kim Molinaro, M.Ed

Contact Information

Please address any questions or comments regarding this report to:

Magaly Tymms, MA
Co-Principal Investigator NSF LSAMP TB-B2B Grant
Institutional Effectiveness Director
St. Petersburg College, P.O. Box 13489, St. Petersburg, FL 33733
(727) 341-3195
Tymms.magaly@spcollege.edu

Appendix A

Undergraduate Research Experience Commitment and Agreement

SPC St. Petersburg College

Congratulations! You have been offered an Undergraduate Research Experience (URE) opportunity!

Timeline: 8-week session

Upon completing the learning activities listed below you will receive a $250 stipend.

- Performing primary literature review on …
- After the literature review portion, performing data collection on …
- The student will be analyzing data on…, and documenting the results of the study, forming conclusions…
- Meeting with professor individually in person or online on a weekly basis, for a minimum of 1 hour each week, for mentoring, status updates and determination of goals for the following week
- Completing a compiled report of the research/activities completed each week including literature review, data collection/analyses, results, assumptions, conclusions, learning achieved, etc.
- Completing a URE Survey to assist us in continually improving URE opportunities for students

Note that the stipend may be subject to taxes, and student financial aid may be affected.

Do you work at SPC? ____Yes ____No

Do you wish to "**Accept**" or "**Decline**" this opportunity?

[X] Accept

[ ] Decline

I fully understand that to receive the $250 stipend, I must complete the activities listed above during th 8-week period. If I am unable to be present for any mandatory activity, I will alert the professor as soor as I am aware.

Please sign below attesting to your understanding and agreement of these requirements.

_____ _____

Student Signature Professor Signature

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