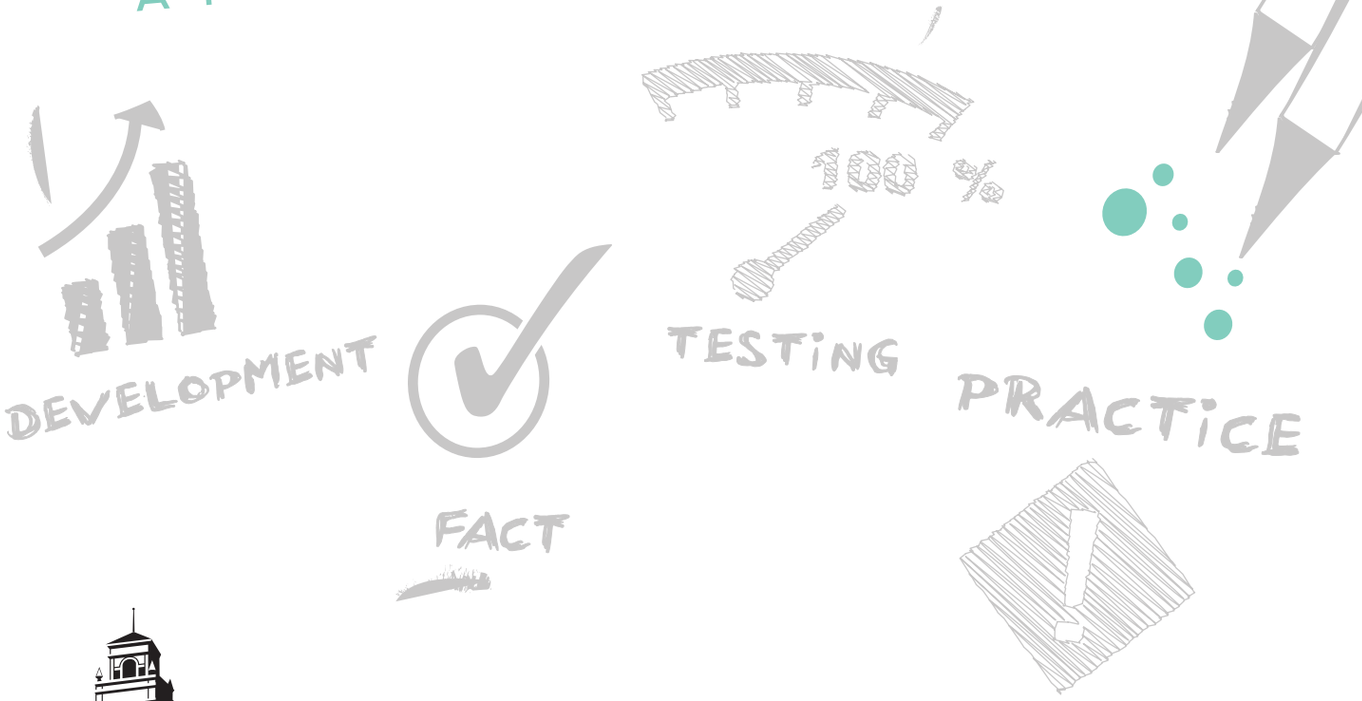
Mid-Atlantic Regional Conference
for Undergraduate Scholarship

MARCUS

AT RANDOLPH COLLEGE



RANDOLPH
COLLEGE

SATURDAY, OCTOBER 23, 2021

Welcome to the 23rd Mid-Atlantic Regional Conference for Undergraduate Scholarship (MARCUS)

We at Randolph College are proud to be hosting you for this fun and rewarding event. Whether you are a presenter, a faculty sponsor, guest or auditor, we are pleased that you are here participating in our conference.

The **Mid-Atlantic Regional Conference for Undergraduate Scholarship (MARCUS)** was founded and hosted by Sweet Briar College from 1999-2018. Since its inception, MARCUS has attracted students from colleges throughout Virginia and surrounding states, who present their research in various formats, including oral presentations, poster presentations, and our newest category, elevator speeches.

Our conference atmosphere is one of lively inquiry in which the student researchers are the experts, presenting to an audience of their peers. Unlike many conferences, MARCUS is purposely interdisciplinary, with an emphasis on the intersection of disciplines across the liberal arts spectrum. For instance, one presentation session may include students in history, economics, political science, and anthropology, all sharing a research interest in globalization. In another session, the common topic may be preserving species habitats and include presentations in biology, environmental studies, and philosophy.

Please help the student presenters hone their presentation skills by asking questions regarding their scholarship during the questions and answer (Q&A) period following their talk, and be sure to visit the poster presenters who are also eager to share their work.

1. Athletic Practice Field
2. Bell Residence Hall
3. Dorothy Crandall Bliss Botanical Garden
4. Butler House
5. Caldwell Commons and Campus Store
6. Casey House
7. Cheatham Dining Hall
8. Doyle House
9. Engagement Tower
10. Even Post
11. Gazebo
12. Grosvenor Apartments
13. Houston Memorial Chapel
14. Lipscomb Library
15. Leggett Building & Thoresen Theatre
16. Maier Museum of Art at Randolph College
17. Mail Room
18. Main Hall
19. Margaret's Gate
20. Martin Science Building
21. Mary's Garden
22. Michels Plaza
23 Moore Residence Hall
24. Norfolk House
25. Randolph College Nursery School
26 Odd Tree
27. Organic Garden
28. The Pines Cottage
29. Presser Hall & Wimberly Recital Hall
30. Psychology Building
31. Michels Athletic Center (MAC)
32. Randolph College Admission Welcome Center (Admission check-in) ★
33. Smith Memorial Building & Smith Hall Theatre
34. Student Center and Skeller
    Hampson Commons, Nichols Theatre, Fitness Center, Alice's E-Cade
35. Tennis Courts
36. Terrell Health & Counseling Center
37. Thoresen Hall
38. Sundial
39. Webb Residence Hall
40. West Residence Hall
41. WildCat Stadium
42. Winfree Observatory
43. Mabel K. Whiteside Greek Theatre (The Dell)
44. Randolph College Labyrinth
45. Wright Residence Hall

(as of 08/05/2021)

You are welcome to explore the rest of our beautiful campus.

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schedule

8:15-9am: Breakfast/ Registration *Nichols Theatre, Main Hall Lobby*

9am: Welcome/Keynote Speaker *Nichols Theatre*

WELCOME:
HOLLY TATUM, PROFESSOR OF PSYCHOLOGY AND DIRECTOR OF THE CENTER FOR STUDENT RESEARCH

KEYNOTE SPEAKER:

SARA BECK, ASSISTANT PROFESSOR OF PSYCHOLOGY

"Children's Interpretation of Song Lyrics in a Multimedia Context"

10:15-11:45am: Oral Presentations *Nichols Theatre, Psychology, Rooms 101 and 102*

11:45am-12:45pm: Lunch *Cheatham Dining Hall*

1pm-3:15pm: Poster Presentations *Hampson Commons*

SATURDAY, OCTOBER 23, 2021

Session 1a: Nichols Theater, Student Center
Moderator: Blair Gross

10:15am Ciara Kocik '23, Sweet Briar College
10:30am Ninfa Amador-Hernandez '22, Randolph College
10:45am Sarah Josephine Perry '22, Randolph College
11:00am Daniel Allee '23, Randolph College
11:15am Molly Goldberg '22, Christopher Newport University
11:25 Hanan Davis '23, Randolph College

Session 1b: Psychology Room 101
Moderator: Karin Warren

10:15am Teresa Jones '22, Virginia Wesleyan University
10:30am Johnathan Watters '22, Randolph College
10:45am Linda Ma '22, College of William & Mary
11:00am Ruth Borges Bispo de Souza '23, Sweet Briar College

Session 1c: Psychology Room 102
Moderator: Danielle Currier

10:15am Kaitlyn Ann Gorodnick '22, Radford University
10:30am Mitchell Gary Masterson '21, Virginia Military Institute
10:45am Michael Van Citters '22, Hampden Sydney
11:00am Mary Katherine Baker '22, Sweet Briar College (WITHDRAWN)

11:45- 12:45PM LUNCH
CHEATHAM DINING HALL
(please sign in on the MARCUS sheets at the entrance to the Dining Hall to access lunch)

POSTER PRESENTATIONS

1:00-2:00 pm: Poster Session 1, Hampson Commons
2:00 pm Afternoon Snack Break, Hampson Commons
2:15-3:15 pm: Poster Session 2, Hampson Commons

presentations

Session 1a: Nichols Theater, Student Center, 10:15am-11:45am

Ciara Kocik '23, Sweet Briar College, Elementary supports for the pipeline for women in STEM, Advisor: Michelle Gervasio
Though efforts are being made to increase the number of women in Science, Technology, Engineering and Math (STEM) fields, women still continue to be underrepresented. Young girls show interest at the elementary school level at an equal level to their male peers. Their decline in interest starts in middle school; eighth-grade boys reported twice as much interest in the STEM fields compared to eighth-grade girls (Subcommittee on Research and Science Education of the House Committee on Science and Technology, 2009). Issues that are believed to cause this include: persistence of stereotype threats, cultural expectations, self-efficacy, and the behavior of teachers and parents. Media also plays a major role in how women perceive themselves; they fear that if they go into science they will be pegged as a "geek" or a "nerd." It is clear that supports are needed to combat this notion and the negative stereotypes to females who are smart and love STEM fields. I will review a curriculum that I created for elementary school teachers. This framework aligns with standards they currently have to meet and will add extra support and structure to the pipeline for women in STEM.

Ninfa Amador-Hernandez '22, Randolph College, Immigration, assimilation and the new era: What does it mean to be an immigrant now?, Advisor: Aaron Shreve
Immigration is an important aspect of American society and social fabric. The United States (U.S.) is hailed to be a beacon of light for immigrants and a "great melting pot of cultures." Before the 1960s, immigration was mostly by White Europeans. After the 1960s, the United States saw a shift from a mostly European immigration to a mostly Asian and Latin one. This shift in the demographics has changed American policies towards immigration as well as the immigrant experience. This article summarizes the extant literature on immigration, immigration policies, immigrants' assimilation process, and their experiences. My research focuses on differences between the legal status of immigrants and their assimilation experience as well as how that experience shapes their lives. I am adding to the assimilation literature by stating that this new generation of immigrants are not simply assimilating straight into the American mainstream via economic measures nor into American subcultures due to lack of economic opportunities. These immigrants are experiencing a parallel assimilation experience characterized by the strong influences race and racialization have in American society. The implications of this new assimilation experience are important in understanding how to best make policies that will aid this new generation of immigrants just as historical policies were used to help older generations of immigrants assimilate into American society.

Sarah Josephine Perry '22, Randolph College, Nesfatin-1 and the effects on the psychological disorder of depression, Advisor: Kristy Bliss
Nesfatin-1 is a newly discovered neuropeptide that has known functions within the metabolic systems of many mammalian bodies. With new research, it has been known to now have an effect on the emotional and stress response within the Edinger-Westphal Nucleus of the brain. After multiple studies have been published, there have been more findings of connections between clinical depression, suicidal ideation, and sex-specific allegations. This research paper was designed to review new studies of the neuropeptide and its possible functions towards the emotional processes, including the psychiatric disorders that now have a possible link to Nesfatin-1.

Daniel Allee '23, Randolph College, Do children perceive change in affective meaning over the course of a familiar multimedia song?, Advisor: Sara Beck
Recent research has explored children's understanding of affective meaning of music, but there is little information on whether children are sensitive to affective transformation within a single song. The current study examines children's understanding of the affective meaning of a single song, "Let It Go" from the hit Disney musical *Frozen*. By asking the same open-ended questions regarding Elsa (one of the main characters from *Frozen*) and her emotional state at three different checkpoints during the song, we investigate whether children perceive an affective transformation in Elsa over the course of the song. I will be reporting on preliminary data from this ongoing study.

Molly Goldberg '22, Christopher Newport University, Nonconformity vs. need for uniqueness: Defining the difference, Advisor: Jason Hart
Everyday life involves many small decisions regarding whether to blend in or stand out from the crowd. Group norms are necessary for social functioning, but people generally choose to break some norms. Need for uniqueness is the extent to which someone feels the desire to be different from others (Snyder & Fromkin, 1977). It is well established as an individual difference, and the Uniqueness Scale (Snyder & Fromkin, 1977) has been used to measure it in multiple studies since 1977 (Dollinger, 2011). Nonconformity is simply any behavior that violates a group norm (Morrison & Wheeler, 2010). These two variables may actually be two components of the urge to stand out: need for uniqueness is the cognitive component, and nonconformity is the behavioral component. Imhoff and Erb (2009) make an important contribution to this case by arguing that need for uniqueness motivates nonconformism. A literature review and research implications are discussed.

Hanan Davis '23, Randolph College, Children's understanding of familiar song lyrics: A thematic analysis, Advisor: Sara Beck
Our research group is interested in how children construct meaning from familiar songs. In the current study, children are listening to the song "Let it Go" from the Disney movie Frozen. We ask them how Elsa is feeling and how they know, and we are interested in what cues they use to construct their understanding. After listening to the song, we ask each child a series of open-ended questions about vocabulary and specific phrases from the song lyrics. We are developing a thematic analysis of their responses, and I will be reporting preliminary outcomes associated with this analysis.

Session 1b: Psychology Room 101, 10:15am-11:45am

Teresa Jones '22, Virginia Wesleyan University, Characterizing autonomic dysfunction using mathematical modeling, sensitivity analysis and machine learning, Additional authors: Perry Beamer, University of Maryland, Nicole Gallegos, Boston University; Caroline Hammond, University of Delaware; Justen Geddes and Mette Olufsen, North Carolina State University; Ben Randall, University of Michigan, Advisor: Audrey Malagon

Patients with Postural Orthostatic Tachycardia Syndrome (POTS) experience autonomic nervous dysfunction manifested by an excessive heart rate increase in response to postural change but its underlying physiological mechanisms are unknown. POTS is normally diagnosed with a tilt-test which can only be performed in a hospital. This study examines the Valsalva maneuver (VM), a fast and low-risk alternative test for autonolindamic function, using mathematical modeling, parameter estimation, and machine learning using data from ~700 patients. Our delay differential equations model uses blood pressure, respiration, and electrocardiogram data as inputs to predict heart rate and autonomic function. Using sensitivity analysis and subset selection, we determine a set of identifiable parameters. Optimization is used to estimate these parameters minimizing the least squares error between model predictions and data. Using machine learning, we test (i) if the VM data and patient-specific model parameters can identify POTS, and (ii) which markers best characterize the syndrome.

Johnathan Watters '22, Randolph College and Florida Atlantic University, Investigating the effects of amyloid beta expression on taste and feeding in Drosophila melanogaster, Advisor: Alex Keene, Florida Atlantic University
Alzheimer's Disease is the most common degenerative disease. A major question in the field of neuroscience that has yet to be answered is which nerves of the brain are the first to degenerate and what are the effects of this degeneration. In the experiments conducted, we were attempting to discover the relationship between specific taste neurons and the buildup of amyloid beta within drosophila, a common model organism in the field of neuroscience. The present study used genotypes that involved the targeting of taste neurons (Gr64fgal4) in relation to the buildup of amyloid beta (UAs-Abeta42-arctic) to test how the amount of food they consumed and the response of the proboscis were altered. More specifically, we were testing Gr64f, a taste neuron that is crucial for the tasting of sweet foods as the loss of taste and smell is a major predictor of Alzheimer's Disease.

Linda Ma '22, College of William & Mary, Modeling control of hippocampal gamma oscillations in CA3 via NMDAR activation, Advisor: Mainak Patel
Hippocampal gamma oscillations occur at frequency bands spanning 30 120 Hz, and are observed to be activated by populations of excitatory pyramidal neurons and inhibitory interneurons firing in synchrony, mediated by AMPA and GABA currents in CA3. Such oscillations induced by application of the cholinergic agonist carbachol in mouse CA3 slices in vivo show, on average, an oscillation frequency of 40 Hz. Genetic knockout of delta-GABA receptors reveals an underlying NMDA current that mediates oscillation frequency, which increases base oscillation frequencies from 40 Hz to ~60 Hz and yields decreased phase difference between PN and IN peaks. This is hypothesized to occur due to a shift in the mechanism generating these oscillations; in the intact network, interneurons are driven by excitation from pyramidal neurons, and subsequently shut down the pyramidal neurons in a periodic pattern, whereas in the NMDA mediated network, inhibitory interneurons are sustained by NMDA currents and can oscillate autonomously. Here, we construct a model of the network using integrate and fire neuron models, and examine population firing rates, properties of the local field potential, and differences between excitatory and inhibitory peaks when NMDARs are activated on either all neurons, pyramidal neurons only, or interneurons only, and characterize the dynamics of these subpopulations as coupled oscillators.

Ruth Borges Bispo de Souza '23, Sweet Briar College, Influence of different synthesis methods in the photoluminescence response of ZnO, Advisor: Michelle Gervasio

Zinc Oxide (ZnO) nanoparticles were synthesized by three different methods, solution combustion, sol-gel, and chemical precipitation. The effect of preparation process and precursors on the structural and optical properties of the resulting nanoparticles was investigated by means of X-ray diffraction (XRD) and photoluminescence (PL) spectroscopy. The PL spectra of the obtained ZnO nanoparticles excited at 323 nm and 333 nm, exhibits three emission peaks for the combustion method one at around 390 nm corresponding to the UV emission band gap, one around 420 at the blue emission band and another located at 455 nm due to the green emission band. The sol-gel method revealed peaks at 361 nm, 420 nm and 521 nm. And the chemical precipitation method showed peaks at 361 nm, 423 nm and 521 nm.

Session Ic: Psychology Room 102, 10:15am-11:45am

Kaitlyn Ann Gorodnick '22, Radford University, A Marxist in Venice: representations of class conflict and commodification in The Merchant of Venice, Advisor: Amanda Kellogg

This presentation describes the Marxist ideas present in Shakespeare's play *The Merchant of Venice*. This presentation helps establish the influence Shakespeare and his play had on Karl Marx's Communist Manifesto. In the presentation, scholarly articles from Academic Journals as well as evidence from Shakespeare's text are used to establish a connection between the two authors. In the presentation, examples of economic power and class conflict in the play are presented to show Marxist origins. Class conflict between the bourgeoisie Antonio and proletariat Shylock are identified, as well as historical contexts that allow Antonio to have socio-economic power over Shylock. By examining the proto-Marxist concepts in *Merchant of Venice*, this presentation demonstrates the persistent influence and relevancy of Shakespeare and his works across a plethora of time periods and cultures.

Mitchell Gary Masterson '21, Virginia Military Institute, Reporting on Civil War: How newspapers explained township violence, 1990-1994, Advisor: MAJ Jochen Arndt

South Africa's transition from apartheid to non-racial democratic rule was not bloodless. In Johannesburg, it was accompanied by civil war-like violence that killed and traumatized thousands. With the benefit of historical distance, historians have recently argued that the violence was caused by the complex interplay of political, ethnic, and other forces. My paper seeks to understand to which extent the media recognized these same forces while the violence was still going on. Gaining a better understanding of the media's coverage of the violent history is important because the coverage established the proverbial baseline understanding that probably influenced all subsequent narratives. Based on a close analysis of local and international newspapers, the essay concludes that the media's reporting initially labelled the violence as a tribal war, then a political power struggle, and eventually as driven by a Third Force comprised of undercover government forces and white supremacists.

Michael Van Citters '22, Hampden-Sydney College, The master argument: Berkeley on mind-independent extension, Advisor: Marc A. Hight

In section 22 of his Principles of Human Knowledge, George Berkeley attempts to prove that the existence of an extended and mind-independent entity entails a contradiction. While he claims he can refute the existence of matter in only a few lines, many scholars disagree, and his argument has been roundly criticized. Interpreters of the argument often focus on Berkeley's use of the word "conceive" and with it attempt to construct a self-refuting statement that materialists are alleged to endorse. On the contrary, I contend that the argument should be read as a reductio ad absurdum invoking earlier conclusions and other parts of the Berkeleyan corpus in order to refute the possibility of an extended and unperceived thing. Read as such, the argument poses a formidable challenge to materialism.

Mary Katherine Baker '22, Sweet Briar College, A debt we owe Shylock: Historical resonance in Shakespeare's Merchant of Venice, Advisors: Lynn Laufenberg, Susannah Nevison

Shakespeare establishes his Christian characters' religious hypocrisy and subverts the audience's expectations that Shylock is the true villain while the others are redeemed. The Christian characters fail to attribute misfortune to religious hypocrisy or profligacy and do not experience growth by the end of the play. In fact, their good fortune at the end of the play rewards their anti-Semitism and subversion of the legal system. As a result, Shakespeare condemns anti-Semitism by making it impossible for his audience to defend the morality of those who engage in it. Furthermore, Shakespeare subverts the audience's expectations by making the Jewish character humane and sympathetic as Shylock endures misfortune and anti-Semitism. Finally, the abrupt manner in which the play is resolved makes it difficult for the audience to separate Shylock's demise from the Christian characters' celebration; seemingly emphasizing the Christian characters' lack of growth by the end of the play.

Poster Session I, Hampson Commons, 1:00-2:00pm

1. Gabriela Coronel Hernandez '21, Louisiana State University, Artificial molecular motors modulate the structure and dynamics of plasma membranes, Advisor: Victor Garcia Lopez

The structure and dynamics of Plasma Membranes (PMs) regulate, in a way, its functions. It is crucial to understand how PMs' structure and dynamics are affected by physical perturbations caused by nanoscale objects. We demonstrated that Artificial Molecular Motors (AMMs) generate mechanical forces and irreversibly damage the PM by rotating at ultrafast speed (3 MHz) upon light activation, which was employed to kill cancer cells. It is unclear how PMs respond to forces localized at specific depths and of different strengths. We then synthesized AMMs that rotate between 0.14 mHz and 30 MHz. The motors resemble natural phospholipids as they have a polar group and a hydrophobic tail, which controls their localization at specific depths of the PM. We will study how AMMs affect the structure and dynamics of synthetic bilayers by cryo-TEM, SAXS, SANS, and NSE. Afterward, we will investigate these AMMs in live cells.

2. Mikayla Quinn '23, University of Richmond, Bryophytes of Goochland county, VA, Advisor: W.John Hayden

The county-by-county documentation of bryophyte diversity in Virginia is an emerging area of knowledge. Within the Piedmont region, some counties have been well studied; Prince Edward County has 170 documented bryophyte species, the result of many years of effort by David A. Breil. On the other hand, Goochland County had only 16 bryophyte species reported as of February 2020. As part of our efforts to improve knowledge of the bryoflora of the central Virginia Piedmont, we have focused recent efforts on Goochland County. We report here the results of recent bryophyte collections in Goochland County from a variety of habitats found in county parks (Hidden Rock Park, Leakes Mill Park, Matthews Park, Tucker Park), two properties owned by the University of Richmond, and the woodland portion of the Collegiate School's Robins Campus. To date we have collected 548 bryophyte specimens from Goochland County, 126 of which prove to be new county records, bringing the cumulative total of bryophyte species known to exist in the county to 142. Specimens have been deposited in the University of Richmond Herbarium (URV).

3. Caroline Tryfiates '22, Virginia Wesleyan University, Chemical analysis of novel gland in hispid cotton rat, Additional authors: Kevin Kittredge, Robert Rose, Old Dominion University

Within the animal kingdom, reproductive success is vital for species survival. To aid in success rate, species have developed means to indicate reproductive viability, including chemical signals. These signals pass information, including reproductive status, health, and sex. In 2018, the novel perianal gland of Sogmodon hispidus was discovered and hypothesized to be related to mating, due to its seasonal growth, present only during the mating season. This gland follows the same pattern as the other male reproductive organs, indiscernible during non-mating season and highly developed during mating season. The chemical contents of this gland, along with other reproductive organs were investigated by Gas chromatography–mass spectrometry (GC-MS) to determine the compounds present. Direct injection of the contents and headspace analysis showed that long-chain carbon molecules and oxygenated organic compounds were present in the glands. These were then compared to determine any differences between the reproductive organs and the perianal glands secretions.

4. R. Paul Mahaffy '22, Hampden-Sydney College, Creation of two survey networks at Hampden-Sydney College to survey snakes for ranavirus, Additional author: Henry Carma '23, Advisor: Rachel Goodman

Despite the large impact ranavirus has on ectothermic vertebrates, little is known of its effects on snakes. In June 2021, two old survey networks on the campus of Hampden-Sydney College were restored and reconstructed, specifically near the Wilson Trail and the Observatory. We placed and replaced Artificial Cover Objects(ACO) such that a total of, 50 plywoods and 50 tins, were placed at each site. In June and July, the sites were checked twice per week, with 48 hours between each survey. Any snake caught was brought to the lab to be measured, marked, and tissue sampled for ranavirus. Seventeen snakes were caught this summer, including 15 Carphophis amoenus and two Diadophis punctatus. We observed lesions in snakes, which has initiated a study surveying for a potential fungal pathogen. All tissue samples are being stored for future genetic testing for ranavirus.

5. Claire Beard '22, Roanoke College, Femoral bone mineral density of mice in response to three weeks of exercise-induced loading, Advisor: Amanda Smolinsky

Bone is continuously adapting to various stressors throughout an individual's life, changing shape and composition to prevent fractures. Physicians prescribe exercise to improve bone strength to patients at risk of fractures; the best exercise for that purpose is still debated. To study the effect of various exercises on bone properties, mice were exposed to forces from dropping, swimming, or running for three weeks; controls did no exercise (n=80). Micro-CT scans of the femur were analyzed for relative bone mineral density (BMD) and group means were compared. No statistically significant differences were produced in three weeks, however the running and swimming mice had the lowest average BMDs. This trend suggests that, while three weeks of exercise cannot produce significant BMD changes, muscle-dominated activities may be less beneficial for improving bone mineral properties. Future studies will measure the effect of activity on other bones.

6. Annika Kuleba '22, Sweet Briar College and Baruch Institute of Coastal Ecology & Forest Science, Role of phenology in switch grass carbon fluxes, Advisor: Michelle Gervasio, Additional authors: Tom O'Halloran Baruch Institute of Coastal Ecology & Forest Science and Department of Forestry & Environmental Conservation; Joshua Rady, Department of Forest Resources & Environmental Conservation, Virginia Polytechnic Institute & State University; Lisa Powell, Sweet Briar College; Jeremy Forsythe, Baruch Institute of Coastal Ecology & Forest Science and Department of Forestry & Environmental Conservation

Climate change is currently affecting humans and agriculture, with anthropogenic greenhouse gas emissions being the primary cause. This study examined the potential for mitigating climate change through agricultural landscape management, specifically looking at the capacity of bioenergy plantations to sequester carbon. This project used and analyzed carbon flux and phenology data collected from atmospheric research towers located in a switch grass field on the Sweet Briar College campus. Additionally, research activities included collecting field measurements to observe how indicators of plant growth such as switch grass height and leaf area align with the same data collected from the towers and establish any correlations between this data and carbon flux. The project concluded by comparing remotely sensed data and direct measurements to determine the quality of the data about photosynthesis provided by each at different times during the growing season.

7. Aleighson Robertson '24, Abby Whitlock '23, Randolph College, Small but mighty: Characterizing benthic microalgal diversity in restored seagrass beds and adjacent bare sediments, Advisor: Sarah Sojka

The team researched and characterized benthic microalgae found on the Eastern Shore of Virginia in both seagrass beds and adjacent bare sediment throughout the summer of 2021. Two types of samples from the Eastern Shore of Virginia were obtained in this project: one sample was taken from the shallow first layer of sediment, exactly where the sediment and water meet; the other, a sediment core that consisted of the top 1-inch layer of sediment at the ocean floor and was used to quantify how much chlorophyll was present. The sediment and water mixture was used to observe and characterize the different benthic microalgae found. Upon looking at the microscope slides, it was noted that the same diatom species were present in every sample taken, but relative abundance of each species varied. The top three most commonly seen diatoms were Navicula, Cylindrotheca, and Tabellaria fenestrata. This research project is still in progress, and plans are to obtain more samples from different times of the year to compare the results. The results acquired in the summer of 2021 was that cyanobacteria presence was meager while the presence of diatoms was abundant, especially the three most common diatoms found.

8. Henry Carman '23, Hampden-Sydney College, Surveying turtles for ranavirus in Hampden-Sydney ponds using non-lethal tissue sampling and PCR sampling, Additional authors: Paul Mahaffy '22, Advisor: Rachel Goodman

Ranavirus are emerging infectious diseases that have a broad host range. There are studies tying ranavirus to die-off events in amphibians, turtles, and fish, but research of ranavirus into turtles is limited. We captured two species, Chrysemys picta picta (Eastern Painted Turtles) and Sternotherus odoratus (Common Musk Turtles), in two water bodies on the campus of Hampden-Sydney College in central Virginia. We captured 102 turtles from 6 June to 23 July and took skin samples to later test for ranavirus using quantitative polymerase chain reaction.

9. Emma Leaseburg '22, Sweet Briar College, The environmental and agronomic effects of animal and plant based manures on vegetable crops, Advisor: Lili Lei

The use of organic composts has gained popularity in agricultural operations due to their ability to enhance soil fertility, increase crop production, and reduce environmental pollution and waste. The goal of this study is to understand and compare the effects of plant green compost and cow manure on soil health and the growth of romaine lettuce and turnip. Plant biomass, protein, starch, and pigment concentration will be measured to assess crop health and production. Total carbon and nitrogen, ammonium, nitrate, and other Meliche 1 extractable nutrients in soil with different compost application will be determined on a biweekly basis. Finally, nitrate (N) leachate will be tested to record the amount of N lost from each type of amended soil to assess environmental effects of compost application. This study intends to show the effects of compost application on overall soil and plant health to aid appropriate and efficient fertilizer management in agricultural operations.

10. Sarah Nicole Mihelic '22, Sweet Briar College, Restoration of the Sweet Briar museum, Advisors: Erin Pitt and Shawn O'Connor

Presentation of the work done over the summer of 2021, including photographs of the objects and explanations, as well as samples from the new archival system.

11. Sheena Kron '23, Molly Nolan '22, Christopher Newport University, Predictors of the fading affect bias in regards to the presidential election and non-election events, Additional author: Kaylee Harris, Advisor: Jeffrey Gibbonsbuch

Fading Affect Bias (FAB; Walker et al., 2003a) is a phenomenon in which negative emotions fade faster from autobiographical memory than positive emotions (Walker et al., 1997). The literature on election and emotions suggests that losing voters show unpleasant emotions (Anderson, 2005; Cigler & Getter, 1977; Singh, 2014). Therefore, we expected losing voters to show a smaller FAB for election events than non-election events and we expected the opposite finding for winning voters. As a democratic candidate won the election, we expected conservatism to be negatively related to the FAB. Participants filled out questionnaires including a section where participants were asked to self-report hours spent consuming general and political media. Participants then provided initial and test affect ratings as well as rehearsal ratings for pleasant and unpleasant election and non-election events. The FAB was negatively related to negative mental health outcomes and event type, which extended past findings.

12. K. Taylor Denny '22, James Madison University, Soil sciences in anthropological archaeology, Advisors: Matthew Chamberlin, Philip L. Frana

13. Lauren Chadwick '22, Rachel Pitts '22, Christopher Newport University, Coronavirus anxiety scale ratings across the pandemic in blue and non-blue states, Additional authors: Lauren Chadwick '22, Emma Friedmann '22, Kaylee Harris '22, Francesca Pandolfe '22, Advisor: Jeffrey Gibbons

The current study examined COVID-19 Anxiety Scale (CAS) ratings for participants from blue and non-blue states across 14 time intervals ranging from April 18, 2020 to January 23, 2021. CAS ratings were higher with knowing and caring for an individual with COVID-19, following social distancing guidelines, hours talking and thinking about Covid-19, hypochondria, neuroticism, depression, anxiety, stress, negative PANAS (Positive and Negative Affect Schedule) and time, whereas they were lower with positive PANAS. Additionally, CAS ratings were higher for blue states than non-blue states, and there was only significance for the positive relation between CAS ratings and time for participants from blue states. Upon investigating high CAS ratings, we were able to connect them to concurrent media events. We found that spikes in CAS ratings were due to increasing Covid-19 contagion, liberal reactions to protests for slain African Americans, and the actions of Republicans in office concerning financial and vaccination efforts.

14. Emma Friedmann '22, Catherine Pechie '22, John Tucker '24, Christopher Newport University, Do source and priming impact believability and recognition of believable and unbelievable media headlines?, Additional authors: Jodi Cleaver '22, Kaylee Harris '22, Stephanie Leroy '22, Molly Nolan '22, Emily Peterson '22, Gabriella Rocha '23, Matthew Traversa '23, Advisor: Jeffrey Gibbons

Gibbons et al. (2005) found that unbelievable news headlines become believable over time and were recognized more than believable headlines. Experiment 1 (n = 506) investigated whether priming participants with believable and unbelievable news sources affected recognition and believability of headlines. Participants were shown headlines with various sources at time 1, with sources removed at time 2. The control group did not have sources at time 1 or 2. Participants recognized headlines from the control group the most. To further this research, the aim of the second study is to examine levels of recognition and believability of headlines when sources are/are not present between time 1 and 2. Encoding specificity suggests that participants would retrieve information from their memory at a later time if the cue presented at learning is also presented at test (Santa & Lamwers, 1974). Therefore, we expect the strongest recognition for consistently sourced and non-sourced headlines.

Poster Session II, Hampson Commons 2:15-3:15pm

15. Morgan Rhudy '24, James Madison University, The rise of actionable public relations and the fall of humbugging: A timeline, Advisors: Matthew Chamberlin, Philip L. Frana

In 1841, P. T. Barnum created the circus, one of the most unethical and deceptive businesses in American history. Barnum's hype-driven communication style, rooted in early public relations principles, paved the way for an industry that now promotes values of ethics, truth, and advocacy. This change reflects a shift in societal standards, consumer expectations, and communications channels. There is today a new demand for Environmental Social Governance (ESG). New digital technologies and infinite ways to connect and communicate have sparked an insatiable psychological need for speed and transparency: two major elements of the modern two-way symmetrical public relations model. Barnum's corrupt showmanship methods and performative Corporate Social Responsibility (CSR) efforts simply do not cut it anymore. The public demands that sustainability, diversity, equity, inclusion, and philanthropic efforts are measurable and actionable. This poster will explore this complicated timeline from Barnum to CSR and now ESG.

16. Alexandra Danilowicz '24, Matthew Traversa '23 , Christopher Newport University, The relation between the fading affect bias and falsely recalled memories, Additional authors: Elizabeth Mazzello '21, Lauren Chadwick '22, Francesca Pandolfe '22, Rachel Pitts '22, Emily Peterson '22, Gabriela Rocha '23, Emma Friedmann '22, Advisor: Jeffrey Gibbons

The Fading Affect Bias (FAB; Walker et al., 1997) is a phenomenon in which unpleasant emotions fade faster than pleasant emotions. Based on the fact that the Deese-Roediger-McDermott (DRM) procedure demonstrated a positive relation between false alarms and negative emotional states (Dasse et al. 2015; Joormann et al., 2009), we hypothesized that FAB would be positively predicted by rehearsals and negatively predicted by falsely recalled words. We also expected the negative relation of falsely recalled words and FAB to be mediated by rehearsals. Participants completed demographics questionnaires and listed 3 personal pleasant events and 3 personal unpleasant events, rating affect during the event and during the experiment, as well as three types of rehearsal frequency. The results indicated that falsely recalled words positively predicted the FAB. Thinking rehearsals mediated the relation between lures and FAB at high lure levels, whereas talking rehearsals mediated the relation at every level.

17. Snigdha Somani '22, Roanoke College, The first year: Determinants of infant nutrition and marketing solutions for community stakeholders in the Roanoke Valley, Advisor: Andreea S. Mihalache-O'Keef

This project identifies infant nutrition patterns in Roanoke and the surrounding area, as well as some of the socioeconomic, demographic, and policy-related determinants of infant nutrition decisions. It is a unique data collection initiative intended to serve a variety of local stakeholders, ranging from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to breastfeeding support groups like Breastfeeding: Rights, Education, Advocacy Support Team (B.R.E.A.S.T.) Roanoke, VA. The main contribution of the project is to fill a gap in data on infant feeding in our area and on challenges and resources for mothers during baby's first year of life. Additionally, the project tests a set of hypotheses regarding determinants of infant nutrition outcomes, with a focus on two broad categories: (1) socio-demographics; and (2) community culture and resources.

18. Sophia J. Christian '22, Christopher Newport University, The relationship between cyberbullying behaviors and opinions on masks and vaccines during the COVID-19 pandemic, Advisor: Gayle Dow

Throughout the COVID-19 pandemic, disputes over mask and vaccine mandates have developed, especially in the form of cyberbullying. The purpose of this study was to analyze Twitter comments of articles from major news outlets possessing conservative, liberal, and neutral perspectives. Hypotheses stated that Twitter users would be more likely to engage with news outlets supporting their views and would exhibit increased severity of cyberbullying, moderated by anonymity. Bivariate correlations were conducted to analyze relations between news outlet commenters and commenters' opinions on masks and vaccines; the correlation between Twitter users' opinions and severity of cyberbullying behaviors; and whether anonymity would moderate these variables. Results found a significant relationship between mask and vaccine views and the level of engagement with the news outlet supporting those views. Groups for and against masks and vaccines both exhibited equal rates of cyberbullying behaviors; however anonymity did not appear to affect this relationship.

19. Michael Agren '24, James Madison University, Effectiveness of musical collaboration: A comparison of remote and in-person relationships Advisors: Matthew Chamberlin, Philip L. Frana

With the growth in the quantity and effectiveness of digital methods to communicate musical ideas, an increasing number of remote creative relationships have blossomed. Individuals are now able to synchronize their works and ideas to create any sized creative projects without ever meeting in person. However, many artists are still willing to pay hourly for in-person studio sessions with their peers or be selective about who they work with due to constraints of physical distance. This inquiry will examine the key differences between in person and digital musical collaboration. What are the advantages and disadvantages of each mode, and how does the shift in nature of the relationship mold the creative product?

20. Kaylee Harris '22, Christopher Newport University, The role of the COVID-19 pandemic on the fading affect bias, Additional authors: Lauren Chadwick '22, Emma Friedmann '22, Rachel Pitts '22, Francesca Pandolfe '22, Advisor: Jeffery Gibbons

The Fading Affect Bias (FAB) occurs when negative emotions fade faster than positive emotions (Walker et al., 1997.) The current study examined the relation between the FAB and COVID-19. The FAB was expected to be larger for non-Coronavirus events than for Coronavirus events, and to be related to healthy and unhealthy variables. The final sample included 868 online participants over the age of 18. Participants were asked to fill out a variety of questionnaires and four different Self Reported Events. The FAB was significant for both Coronavirus and non-Coronavirus events, but event type did not moderate the FAB. Healthy variables positively predicted the FAB, and unhealthy variables negatively predicted the FAB. Coronaphobia moderated the relations of two healthy variables and five unhealthy variables to the FAB. Healthy variables overrode the effects of Coronaphobia on the FAB, and unhealthy variables combined with Coronaphobia to cancel out negative effects on the FAB.

21. Gabika Watson '24, James Madison University, The complex environmental problem feedback loop and consumer culture, Advisors: Matthew Chamberlin, Philip L. Frana

This inquiry will examine the role consumer culture plays as a factor in driving systemic environment problems. Consumer culture is a common lifestyle choice where the masses participate in excessive consumption because of a perceived need for continuous buying perpetrated by market forces. In our society, people are taught to consume more than what they need, which encourages mass production. To meet this demand, businesses search for the cheapest and most efficient means of production, which often also means the most unsustainable. The methods of production along with resources used create massive amounts of waste and pollution. When these products are distributed to the public, they are often in use for a short period of time before being deemed unusable. They are thrown out, creating the need to buy even more. We must value thrift and sustainability over the desire to simply have more.

22. Gabriela Rocha '23, Christopher Newport University, Do false alarms for marijuana events from a diary predict the fading affect bias (FAB)?, Additional Author: Kelsey Gardner '22, Advisor: Jeffrey Gibbons

The Fading Affect Bias (FAB; Walker et al., 2003) is the faster fading of negative emotions than positive emotions (Walker et al., 1997), which has been positively linked to healthy coping responses (e.g., Walker et al., 2003b). Although Pillersdorf and Scoboria (2019) found that non-marijuana consumers demonstrated higher FAB than marijuana consumers for non-marijuana events, Fernandez et al. (2021) found that marijuana consumers demonstrate higher FAB than non-marijuana consumers for marijuana events. In the current diary study, we expected to replicate the past marijuana findings, and, based on Friedmann et al. (2020), we expected that false memories of marijuana and non-marijuana events would negatively predict the FAB. We also expected these results to be mediated by rehearsal ratings.

23. Alexander Dumouchelle '23, James Madison University, Modern music software and obstacles to creativity, Advisors: Matthew Chamberlin, Philip L. Frana

The novice producer no longer needs thousands of dollars of audio equipment to create competent musical work. Hundreds of big names got their start on free software like Audacity and GarageBand. Apple's Logic Pro X, the choice digital audio workstation (DAW) for artists like Taylor Swift, Jacob Collier, and Ed Sheeran, is only $200 for a standard license. These programs have caverns of buttons, plugins, and features that can help a creator make their music exactly how they want it to sound. Yet Orson Welles once warned that "the enemy of art is the absence of limitations." Not only may there be too many buttons, but too many designers are claiming software shortcuts to musicianship. Plugin makers promise creators they will sound "like a top 100 artist in a matter of weeks." This poster will explain what these programs do well and do poorly, and their challenges for young musicians and producers.

24. Grace Warren '22, James Madison University, Integration of core values into leadership practices, Advisors: Matthew Chamberlin, Philip L. Frana

Over the past century, scholars have debated the true definition of leadership, and how society awards the power to lead. Recent research has moved away from trait-based leadership and focused instead on the transformational model. Trait-based leadership focuses on the intellectual, physical, and personality features that encourage followers to contribute to goal attainment. Transformational leadership focuses on the leader's ability to motivate followers to adopt a shared goal and collaborate to reach goals. Current studies place emphasis on the elements of transformational leadership to determine leaders' contributions to society and how those being led influence the leader's leadership techniques. Investigators have identified a variety of principles rooted in themes relating to open communication, integrity, and empathy. Leadership practices grounded in these core values have been observed to produce positive outcomes regarding employee satisfaction and the overall ability of organizations to reach their goals.

25. Aimee Buchanan '24, Francesca Pandolfe '22, William Ward '21, Christopher Newport University, Problem solving in relation to the fading affect bias, Additional authors: Lauren Chadwick '22, Luke Fernandez '22, Emma Friedmann '22, Sheena Kron '23, Stephanie Leroy '22, Elizabeth Mazzello '22, Catherine Pechie '22, Emily Peterson '22, Rachel Pitts '22, Matthew Traversa '23, Advisor: Jeffrey Gibbons

The Fading Affect Bias (FAB; Walker et al., 2003) is an emotional regulation phenomenon that describes the tendency for unpleasant emotions to fade faster than pleasant ones (Walker et al., 1997). The current study examines the relation between problem solving events and the FAB, building off previous research that has shown an association between emotional regulation and problem solving ability (Spering et al., 2005). First, participants filled out several general demographic questions examining their affect levels and problem solving abilities. Participants then recalled and described 2 pleasant and 2 unpleasant problem solving and non-problem solving events by rating their previous and current emotions and rehearsal frequency. Problem solving ability and emotional intelligence were predicted and found to be positively related to the FAB. Furthermore, the positive relation between emotional regulation and the FAB was larger for problem solving events than for non-problem solving events.

26. Hope Young '22, James Madison University, What is authenticity? Preservation efforts in historic homes and sites, Advisors: Matthew Chamberlin, Philip L. Frana

Over the past century, historic preservationists have developed and implemented many path breaking restoration techniques. However, sometimes old things are made "new" in the restoration process. Some argue the best way to preserve a historic home is to leave it alone. So, then what qualifies as authentic? In theory, authenticity depends more on maintaining the original architectural idea than on how the combination of use, materials, space, and time are applied. When rehabilitation techniques affect the baseline understanding of preservation, the idea of authenticity can no longer be applied to the structure. Modernism gives us a reference point for what we consider historical. Is preserving culture more important than the physical structure? My research on philosophical realism and the idea of architecture will provide insight to what qualifies as authentic.

27. Benjamin Ailsworth '22, Hannah Edwards '22, Brooklyn Ford '22, Hailey Gilman '22, Jedi Kauanui '23, Eva Pontius '23, Gabriel Quintero '23, Olivia Richards '23, Michelle Starks '22, Abby Whitlock '23, Randolph College, Virginia Heat Watch: Heat mapping to assess vulnerability and address inequity in Virginia communities, Advisor: Karin Warren

Twelve institutions in the Virginia Foundation of Independent College along with Virginia State University are collaborating on "Virginia Heat Watch", a project launched in summer 2021 to map and analyze heat islands and climate vulnerabilities in our communities. We used the procedure and equipment developed by Climate Adaptation and Planning Analytics (CAPA) Strategies to measure temperature throughout our city during a high heat day on July 15, 2021, with volunteers contributing to data collection. Points of interest were identified to help ensure that sampling routes incorporated locations deemed likely to be significant and/or vulnerable, and these locations were included in the route determination process. Volunteers drove, rode bicycles, or walked prescribed routes on the designated Heat Watch Day. Temperature, humidity, and location data were collected with sensors attached to the vehicles, and data was processed by CAPA Strategies. Heat mapping studies in other cities have demonstrated that historically red-lined areas are disproportionately at risk of heat, and require prioritized strategies to address these risks. We will display our Lynchburg GIS Story Map of this project, and discuss our efforts to collaborate with community stakeholders to develop equitable community-based initiatives for mitigating health impacts of heat. "Virginia Heat Watch" received support from CAPA Strategies, Capital One, the Science Museum of Virginia, Virginia Department of Forestry, and the Virginia Foundation of Independent Colleges.

28. Veronica Nelson '22, Extraction and Synthesis of Betulin, Advisor: Abraham Yousef

Betulin is a natural pentacyclic compound found in birch bark and sap. Betulin has natural antifungal and antibacterialproperties that may help birch trees defend against bacterial and fungal attack. During research, one of the goals wasto determine the amount of time in the Soxhlet extraction would produce the most amount of betulin from birch tree bark. The independent variables for this experiment were one hour, two hours, and three for birch bark in the Soxhlet extraction. The data was inconclusive as to which time period was better between two hours and three hours, but both had more product than one hour. Theother goal was to test if betulin and betulin derivatives were capable of inhibiting bacterial growth. Using plates with growing E. coli, a disk of ampicillin, for the control, and 3 0.5 mg/ml, 0.005, and 0.00005 mg/ml diluted pure betulin and diacetylated betulin disks were placed on the plates. The betulin and diacetylated betulin had no zones of inhibition. The ampicillin, or control, did have a zone of inhibition.

7a. Allison Wandling '23, Microplastic Agglomeration Simulation, Sweet Briar College, Advisor: Dr. Michelle Gervasio

Microplastic agglomeration in water depends on solution pH, particle size, and particle concentration [1]. Typical wastewater treatment plant coagulation methods produce low microplastic removal rates. This study created a Monte Carlo simulation of microplastic coagulation in wastewater treatment plants using FeCl3. Particle radius (10 nm, 50 nm, 500 nm, 1 m, and 2.5 m) and solution pH (2.5, 3, 3.5, 4, and 4.5) were the test parameters. The best parameter combination, 3.5 pH and 10 nm radius, produced an average 38.4 agglomerates and a 1.92% agglomeration rate. pH had a slight influence on agglomerates. However, larger particle sizes decreased agglomerates. Particle radii of 500 nm, 1 m, and 2.5 m produced one agglomerate. Therefore, a correlation between particle size and stability could be assumed. An improvement on removing particles larger than 10nm, would improve microplastic removal from water.

Special Thanks

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