

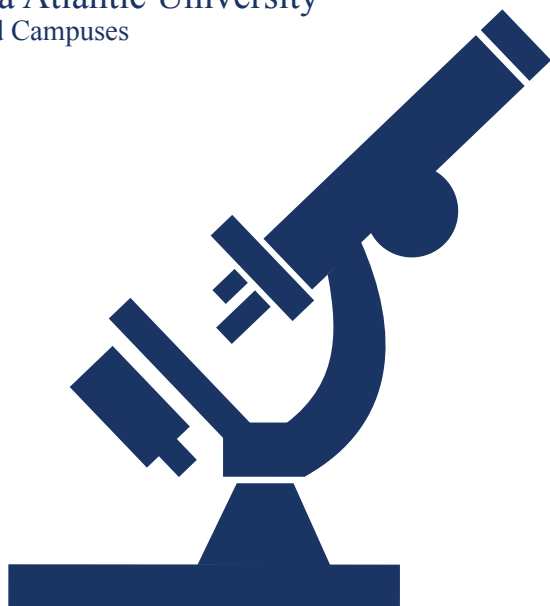
7th Annual FAU Broward Student Research Symposium



FLORIDA ATLANTIC
UNIVERSITY

New
research
Ongoing
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Faculty
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Florida Atlantic University
Broward Campuses



Annual Research Symposium

Friday
March 17, 2017
8:00AM-1:00PM

Davie West Auditorium/Breezeway

Seventh Annual FAU Broward Student Research Symposium Schedule:

DOCTORAL POSTERS 8:00-9:30 (Authors Present 8:15-9:30)

D1: DEVELOPMENTAL ECOLOGY OF THE BACHMAN'S SPARROW

J. M. Niederhauser, jniederhauser2015@fau.edu, doctoral student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. R. Anderson

Due to human-induced rapid environmental change, many species are exploring new environments. Thus, understanding what constitutes a "quality" habitat is crucial to determine the persistence of species and populations, in particular if they are threatened or endangered. Habitats are often evaluated based on demographics, but surprisingly, many population estimates do not consider how developmental ecology interacts with individual factors such as social behavior and physiology to impact population growth. Although little is known about the development of Bachman's sparrows (*Peucaea aestivalis*), they are good models to determine how the physical and social environment may impact development and survival because they are a non-migratory songbird. My objectives are to determine how habitat and social interactions interact with growth, body condition, and physiological stress to influence juvenile survival, and to determine how the physical and social environment impacts song development in this species. During the first stage of this research, I banded 50 breeding adult and 13 juvenile Bachman's sparrows, recorded songs from 40 adult males, and monitored 6 nests. Four of the six nests monitored produced fledglings, which were tracked visually for several weeks. Additionally, I measured the habitat characteristics of each nest site, noting that the habitat surrounding nests varied considerably. These preliminary results confirm that a developmental ecology study would be feasible, and that the environment may have an impact on the development and survival of juveniles in this species.

D2: Dual Inhibition Of Energy Metabolism In Prostate Cancer Stem Cells Prevents Prostate Microtumor Recurrence In Vitro

Saheed Oluwasina Oseni, soseni2013@fau.edu, Doctoral Student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. James Kumi-Diaka

Purpose: More than 35% of prostate cancer survivors experience an aggressive reoccurrence within 5-10 years of remission. One way by which prostate tumor reoccur is by the revitalization of prostate cancer stem cells (PCSCs) that could initiate new tumors by many mechanisms, which include resistance to chemotherapy and radiotherapy, self-renewal, and reprogramming of their metabolic pathways. Hence, justifying the need for studies that elucidate the potential benefits of energy metabolism modulators in prevention of prostate cancer recurrence. Here, we investigated the synergistic effects of two metabolic pathway modulators - 3-bromopyruvate (3-BrPA) and genistein - on irradiated PCSCs. **Methods:** Irradiated PCSCs were treated with varying doses of 3-BrPA and genistein in single and/or combination regimens. Cell viability, lactate dehydrogenase (LDH) release and reactive oxygen species (ROS) levels, as well as the mode of cell death, were determined using various bioassays. **Results:** Our results revealed that irradiation only moderately inhibits PCSCs and that ROS generation in PCSCs decreases in a dose-dependent pattern. Autophagy was the most common morphological feature observed in PCSCs after a prolonged period of irradiation. 3-BrPA, as well as its combination with genistein, triggered apoptosis in irradiated PCSCs. However, the combination treatments showed synergistic and significant inhibition of the energy metabolism (glycolytic and mitochondrial pathways) resulting in induction of apoptosis in irradiated PCSCs. **Conclusion:** Despite resistance to irradiation, this study shows that prior exposure of PCSCs to irradiation enhanced the chemotherapeutic or chemopreventive effects of both metabolic modulators, demonstrating their potential benefit in selectively inhibiting PCSCs as well as prostate tumor recurrence prevention.

D3: Efficacy Of 3Bromopyruvate And SC-514 Combination In Prostate Cancer Treatment Co-Delivered With Nanoparticle

Toluleke Famuyiwa, tfamuyiwa2014@fau.edu, doctoral student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Kumi Diaka

Stage IV prostate cancer spreads to the lymph nodes and bone, leading to a non-curable bone metastasis in 65–75% of prostate cancer cases. Current research focuses on preventing metastasis of prostate cancer to the bone and other tissues, by using nanocarrier to deliver chemotherapeutic agents such as 3BromoPyruvate (3BPA). 3BPA completely regressed advance abdominal tumor. Another molecule of importance is SC-514. SC-514 is a reactive oxygen species -inducing IKK β inhibitor. Activated IKK- β (inhibitor of nuclear factor kappa-B kinase subunit beta) phosphorylates a protein called the inhibitor of nuclear factor kappa-light-chain-enhancer of activated B cells (NF-KB), I κ B α which binds NF- κ B to inhibit its function. The goal of this project is to investigate the potential synergy between 3bromopyruvate and SC-514 and to determine whether the nanoparticle delivery of these two molecules will further reduce cytotoxicity and prostate cancer metastasis to the bone and other tissues. In vitro and in vivo studies will be carried out to assess the efficacy of the antitumor activity in the target prostate cancer cells. Conclusion: Findings from this study will give further insight on how inhibition of NF-KB can impact the carcinogenesis of prostate cancer.

D4: The Effects Of Willow Encroachment On The Resilience Of Peat Carbon Storage In An Herbaceous Wetland

Jessica Dell, jdell2014@fau.edu, doctoral, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Brian Benscoter

Purpose: Anthropogenic activity and climate change promote the growth and expansion of woody shrub vegetation into historically herbaceous wetlands. This shrub encroachment may threaten wetland ecosystem services including carbon storage, flood mitigation, and wildlife habitat due to differences in functional traits between shrubs and herbaceous species. Reduced water levels through water management and anthropogenic activity have promoted encroachment by the woody shrub Carolina willow (*Salix caroliniana*) into sawgrass (*Cladium jamaicense*) dominated wetlands of South Florida. Differences in morphology and physiology between sawgrass and willow could alter the processes of peat accumulation and reduce soil carbon storage. This project will examine the impacts of willow encroachment on the resilience of peat soil carbon storage in a sawgrass-dominated, herbaceous wetland following fire and drainage. Methods: Peat accumulation processes including primary production, leaf litter input, and decomposition will be compared between sawgrass and willow in the Blue Cypress Marsh Conservation Area (BCMCA) over time following fire and drainage. Production and biomass stocks will be estimated with nondestructive allometric equations and fine root ingrowth bags. Leaf gas exchange and chlorophyll fluorescence will be examined to estimate photosynthetic carbon assimilation and water-related stress. Carbon input to soil will be estimated with leaf litter traps. Decomposition rates of sawgrass and willow leaf litter will be compared with reciprocal site-source conditions. Results: We expect willow to increase aboveground carbon storage through greater primary production while decreasing soil carbon storage through greater decomposition rates. Sawgrass and willow will both experience water-related stress that reduces photosynthetic carbon assimilation. Willow has lower water use efficiency compared to sawgrass but will be able to reach deeper water sources due to longer roots. Willow will likely contribute more leaf material to peat soil; however, willow leaves will decompose at a greater rate than sawgrass. Decomposition rates will be further enhanced if drainage exposes the soil surface and allows for aerobic oxidation of the peat. Conclusions: Willow encroachment could ultimately affect carbon cycling and

storage in BCMCA. This study will provide insight into the vulnerability of wetlands to disturbances and can be applied to land management practices. Shrub encroachment could have global consequences if carbon stored within wetlands is released into the atmosphere and promotes further climate change effects.

D5: SELF-ESTEEM MEDIATES THE LONGITUDINAL ASSOCIATION BETWEEN PARENTAL PRACTICES AND ADOLESCENT ADJUSTMENT

Melissa Huey, mhuey2014@fau.edu, doctoral student, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Brett Laursen

Purpose Adverse parenting practices have adverse effects on child outcomes, ranging from lower academic success (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987) to delinquency behavior (Steinberg, Fletcher & Darling, 1994) to adjustment difficulties (Shumow & Lomax, 2009). There is even evidence linking parenting to internalizing symptoms and alcohol use (Ge, Best, Conger, & Simons, 1996). It is likely that there is an explanatory mechanism driving the relationship between parenting and adolescents' adjustment. Adolescents who display internalizing symptoms are likely to experience decreased levels of self-esteem (Trzesniewski et al., 2006), and therefore self-esteem may be the mechanism driving said relationship. The current study tests the hypotheses that associations between adverse parenting behaviors are indirectly associated with adolescent adjustment via changes in self-esteem. **Method** A staggered cohort longitudinal design was employed that included a total of 453 (215 boys, 238 girls) 9th graders and 464 (231 boys, 233 girls) 10th graders at the first assessment in spring, 2013. At the onset of the study, adolescents completed scales describing parental monitoring (Small & Kerns, 1993), parental psychological control (Barber, 1996), and parental connectedness (Arnold, Nott, & Meinhold, 2012). Adolescents also described indices of self-esteem (Rosenberg, 1965), internalizing symptoms (Achenbach, 1991), and alcohol use (e.g. Dickson, Laursen, Stattin, & Kerr, 2015). **Results** A mediation model was tested with Mplus v7.3 (Muthén & Muthén, 1998-2014) to explore the indirect association between parent practices and adolescent adjustment via self-esteem. The model revealed indirect links between maternal psychological control and children adjustment such that self-esteem mediated the association between these two variables. Greater maternal psychological control was linked to decreases in self-esteem one year later, and lower levels of self-esteem were in turn, associated with greater decreases in adolescent adjustment one year later. In subsequent analyses, maternal psychological control was replaced with paternal psychological control, parental connectedness and parental monitoring. **Conclusions** This study elucidates the fact that self-esteem may be the explanatory mechanism driving the impact of adverse parenting on adolescent adjustment. Parental psychological control inhibits children's ability to socialize normally, creating feelings of low self-worth and value, and in turn, higher levels of depression, withdraw and an increased likelihood to engage in alcohol use. The results offer insight into how the parent world impacts adolescent adjustment, and helps to better understand that adolescents who experience emotionally controlling parenting need adequate social support to buffer the effects of low self-esteem, in order to ensure the vulnerability does not transpire into alcohol usage and depression.

D6: CHANGES IN SALINITY IN ST. LUCIE IN RESPONSE TO HIGH PULSE DISCHARGES FROM LAKE OKEECHOBEE

Lauren Kircher, lkircher2015@fau.edu, doctoral student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Baldwin

Purpose: Freshwater flow is a likely spawning cue for common snook (*Centropomus undecimalis*), a euryhaline sportfish, to move between freshwater rivers and nearshore

marine environments during the summer months. Higher salinity waters ensure egg buoyancy and sperm motility. During drought years, snook will spawn within a river instead of moving to ocean inlets. In wet years, Lake Okeechobee releases large pulse discharges of freshwater to avoid flooding during storm events. While common snook are relatively tolerant to salinity (0-40ppt), there are osmoregulatory costs associated with changing salinities and movement. Methods: In order to understand the effects of these disturbances, we will compare changes in salinity patterns in St. Lucie River before, during, and after high pulse events using South Florida Water Management's DBHYDRO and EPA's STORET environmental open-source databases, over multiple years. Results: Decreases in salinity coincided with increased total freshwater flow, flow from Lake Okeechobee, and rainfall. Conclusion: Flow from Lake Okeechobee may be disturbing natural cues for snook movement. Future research will relate these salinity data patterns to other databases of common snook movement to further inform management.

Undergraduate Posters U1-U2 (Authors present 8:15-9:30)

U1: TEACHER OPINIONS AND PERCEPTIONS OF NEW LITERACIES INSTRUCTIONAL PRACTICES IN SCHOOLS

Tiffany Manbodh, tmanbodh@fau.edu, undergraduate student, Department of Teaching and Learning, College of Education, Mentor: Dr. Marinaccio

Purpose: Clinical educators from the 6th largest school district in the country were surveyed to gather teacher self-perceptions of the frequency of the knowledge processes of NL (New Literacies). NL refers to the view that reading and writing only make sense when studied in the context of social and cultural practices (Gee, 1996). NL propose multimodal teaching of all representations of meaning including linguistic, visual, audio, spatial, and gestural (The New London Group, 1996). As co-investigator, I conducted case studies of two of the teachers who completed quantitative surveys. Methods: The case studies participants first completed the online New Literacies survey and was contacted via email by the principal investigator to schedule a focus group interview. The subjects were chosen for further interview and a classroom visit because her answers on the survey indicated that she was more experienced than most teachers were in teaching through a New Literacies's curriculum. The volunteers accepted and a timeline was created. Co-investigator Tiffany Manbodh in an elementary classroom after school, interviewed the volunteers. The qualitative data includes the case studies questions designed by the investigators along with the elaboration needed based on questions in the survey. Findings/Results: An analysis of the interview data collected aligned with a comprehensive review of the literature. The researcher identified themes, recurring ideas or language, and patterns of belief that link people and settings together. (Marshall and Ross, 1995, p. 114). The findings are organized according to the following: Critical Thinking skills, Collaboration skills, Communication skills, Global Connection skills, Local Connection skills, and Information and Communication Technologies (ICT).

Conclusion: Teachers and pre-service educators need workshops early and ongoing trainings about new literacies and how to teach diverse students through the different modes. In addition, teachers and pre-service educators need to understand:

1. The breadth of new literacies and their active role in the classroom.
2. That Multiliteracies usage in the classroom can empower students who may be marginalized.
3. How to integrate a wide variety of multimodal approaches in learning.
4. That ELA education goes beyond remediation practices based on deficit and difference theories and expanded concepts of literacy and texts.
5. That multiliteracies and new literacies that enable equal access and empower discourses from struggling and marginalized students.

U2: THE INFLUENCE OF LANGUAGE PROFICIENCY ON THE APPRAISAL OF VALENCE OF VERBAL CONTENT IN SPANISH-ENGLISH BILINGUALS

Vannia Arana, varana@fau.edu, Caitlyn Montero, Idaly Velez-Urbe, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Monica Rosselli

Research on differences in perception of emotion words in bilinguals has suggested a processing discrepancy between their first (L1), and second (L2) languages when emotional content is involved. Language proficiency has been proposed to be one of the factors influencing these differences. The purpose of the present study was to analyze the influence of Spanish-English bilinguals' proficiency on the perception of emotional words in both languages. Since the overall proficiency in our sample was higher for L2 (English), It was hypothesized that proficiency in L2 would be the highest contributing factor to the differential scores. Two variables (Spanish and English proficiency) were included as predictors in six regression models, with the purpose of analyzing their predictive value for the differences in emotional valence scores between Spanish and English words; presented in two sensory modalities (visual and auditory), and in three valence categories (positive, negative and taboo). An index of differences in word valence scores was obtained by subtracting English scores from Spanish scores and analyzed as a dependent measure. The models for positive and negative words in both sensory modalities were significant, but not significant for taboo words in any sensory modality. Proficiency in L1 had significant predictive value for the visual positive and auditory positive categories. Proficiency in L2 was a significant predictor for the difference in valence scores for the visual positive, visual negative, auditory positive and auditory negative. The significant influence of proficiency level in both languages is consistent with previous findings. However, while L1 proficiency had an influence only over the positive word category, the effect of L2 proficiency extended to the positive and negative word categories. We suggest that the extended influence of L2 over L1 proficiency could be related to the overall highest English proficiency on our sample.

9:30-10:00 AM Doctoral Oral Presentations: D7 & D8

D7: Cultivating Partnerships For Professional Development In Schools

Brianna Joseph, b josep28@fau.edu, Doctoral Student, Kathleen Randolph, krandolph2013@fau.edu, Doctoral Candidate, Department of Exceptional Student Education, College of Education, Mentor: Dr. Cynthia Wilson

This session will highlight and reflect on our experience offering professional development to schools. We approached schools where we had relationships with special education teachers currently employed there. By having access to the administration, we were able to get an initial meeting where we proposed conducting a needs assessment survey to teachers and gauged the interest of administration. Using a large, high-need public elementary school as a pilot, we embarked on a professional development plan to "Unravel the Common Core Standards", align other content areas to the English/Language Arts standards, and provide tangible activity examples for standards in all content areas. We administered a needs assessment to the teachers and aligned the needs of the teachers with the requests from administration. We developed specific trainings and gave individual teachers options for follow-up support. We collaborated with the literacy and math coaches, and were given a student monitoring system to implement by the school, and had to break down each activity in order to make it teacher friendly. We found that there was a disconnect between the administration and teachers, and helped bridge the gap between them by providing additional support and instruction to the teachers. Several lessons were learned in this experience. We found that administration can be hesitant to accept help from outside of the school district. We found that there is a

communication gap between administration, coaches, and teachers. What we were being told were expected of the teachers, was not being relayed to the teachers. There is a discrepancy between administration's perception of teacher needs, and what the teachers actually say they need. Teachers were not aware of evidence-based practices. Teachers were often resistant to the help at first. Teachers expected to earn professional development credits for the trainings. Thus, we had to follow-up with the coordinator to ensure that happened. We also found that building a positive rapport with the school, the teachers were more inclined to participate in each professional development workshop as well as asking for assistance with specified students of concern in their classroom.

D8: WHY NOT BOTH? EXAMINING THE EFFECTS OF BILINGUALISM ON THE SOCIAL AND LANGUAGE DEVELOPMENT OF CHILDREN WITH AUTISM

Sylvia Collazo, M.Ed.; scollaz2@fau.edu; Doctoral Student, Graduate Assistant, & Toppel Scholar; Department of Exceptional Student Education; College of Education; Mentor: Dr. Peggy Goldstein

Purpose: The impact of bilingualism in the language and social development of children with autism spectrum disorder (ASD) was examined. Methods: Research literature across multiple disciplines was reviewed to evaluate the positive and negative effects of a family's use of their non-English home language when communicating with their child with autism. Results: Despite a lack of evidence, professionals and service providers often recommend families to speak only English "regardless of their proficiency" with their children on the spectrum. However, the research shows children with autism demonstrate increased verbalizations, conversations, and vocabularies as well as improved social exchanges when their families use both English and their home language. Conclusions: The examination of the literature suggests clear benefits of bilingual exposure in supporting the social development of children with ASD and the need to encourage families to use their home language to help their children build their communication and socialization skills.

10:00-10:30 AM Undergraduate Oral Presentations: U3 & U4

U3: Accelerated Solar Energy Research

Philip Carhart, Pcarhart2016@fau.edu, undergraduate student, College of Design and Social Inquiry, Mentor; Professor Mate Thitiswat, Mthitis@fau.edu

With Florida being the sunshine state there should be solar energy systems on every roof, to reduce the carbon footprint on our planet, and the use of fossil fuel. The main reason people are not buying solar systems is the high cost of systems to the return (yield in Kilowatts output of the system), the solution is quite clear to me to increase the output of the system, thereby increasing the return, in a formula of, $\text{Output yield} / \text{Cost of installation of system}$. My plan is to continue my online research, read the previous FAU students past research project on the solar system currently installed on the roof of the Ft Lauderdale campus bldg 33, check the system for proper operation, study the solar path to see if system is properly aligned. During my current online research I have learned how a Photo voltaic cell works. B.A.S.F corporation is conducting research on the pol-emirs that the panels are made of that creates the photo-voltaic reaction that generates electricity I would experiment with creating a process to create these polymers from recycled water bottles I would then draft diagrams and experiment with making a Dual sided panel in a oval shape with a reflector beneath it with a several strategic bends in the metal so as the azimuth of the sun increases and decreases during the day it would still reflect the sunlight on to the underside of the panel. It is a further idea to fabricate a carbon core coil with a series of primary and secondary winding, surrounded by a series of electromagnets surrounding coils similar to a Neutron accelerator as created and studied by Brookhaven laboratories in New York back in the 1980's (my Father worked on that project), I would

also study the possibilities of making these coils out of "E" waste as older computers contain transformers and IC chips are made of similar polymers, with copper wire and gold terminals and then fabricate a working small scale model and put I would then test it for its yield in voltage. During the time I am working on this project I will continue my online research and also seek out Other students to work on this project as a Team, as more minds can think critically and achieve better results, and I am a team player, but the military has taught me to be able to stand alone when necessary

U4: Residential- Defensive Towers in the Balkans: Where Christianity and Islam Shared Roof

Stefka Kuneva, skuneva2016@fau.edu, undergraduate student, School of Architecture, College of Design & Inquiry, Mentor: Dr. Vladimir Kulic

This study discusses the architectural properties of residential-defensive towers, or kule in Turkish, constructed in the Balkans during the Ottoman rule between the 14th and 19th centuries. The kule are unique as examples of single family fortified houses built independently of fortresses or monastery complexes. My work examines their origins and use as a way of studying the cultural entanglements between the Ottomans and the native Christian populations. It is usually assumed that dominant cultures and religions tend to assimilate the marginal ones. I argue that the residential defensive towers exemplify an opposite process, in which a native Balkan culture decisively influenced the dominant Ottoman one. After the Balkans were conquered by the Ottoman Empire, parts of the native Christian populations were forcibly converted to Islam. The residential defensive towers were built to protect the Ottoman officials and feudal lords from the local Christian population. However, they were constructed and financed by the Ottomans' Christian subjects, revealing the tensions and stratification in the newly formed multicultural society. Identifying their prototypes, I argue in favor of the Christian origins of the kule, which differed from the Islamic modes of inhabitation, thus indicating cultural interactions with an unconventional direction. Over time, the kule underwent significant evolution. Between the 14th and 16th centuries, their defensive purpose and appearance dominated, but their function subsequently became more residential, leading to more complex floor plans. They also became more representational, serving to project an image of power and wealth. I discuss this transformation as a result of the changes in the socio-political climate and cultural interactions, which led to increased cultural collaboration and decreased stratification between the Ottomans and Christians. In my paper, I thoroughly analyze existing architectural and historical scholarship, including detailed descriptions, photographs, and technical drawings. In addition, I rely on literary sources about the period, including the famous novel *The Bridge on the Drina* by the Nobel Prize winner Ivo Andric. I also argue for the great historical significance of the kule and for their inclusion into the body of the recognized heritage, from which they are currently excluded because of the persistently negative views of the Ottoman period in the Balkan states. Ultimately, the kule reveal the deep and long-standing entanglements of Christian and Islamic cultures in Europe.

M1-M7: MASTER'S POSTERS 10:45-12:00 (Authors Present 10:45-12:00)

M1: ACOUSTIC STRUCTURE AND VOCAL PERFORMANCE TRADE-OFFS IN THE NORTHERN CARDINAL (CARDINALIS CARDINALIS)

Rachel Saless, rsaless2015@fau.edu, graduate student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Rindy Anderson

Purpose: Bird song has been a model system for studying behavioral mechanisms and evolution. Research on temperate songbird species has primarily focused on male song, despite several species displaying dual-sex song. As such, differences in usage and

structure between the sexes is not well understood. I will be studying the song structure and singing behavior in Northern cardinals (*Cardinalis cardinalis*), a common temperate species. My primary objective is to determine if cardinals modulate their vocal performance, an index that describes how challenging a song is to produce. A high performance indicates that a bird is capable of performing physically challenging songs by repeating syllables at fast rates while maintaining a wide range of frequencies. Vocal performance has been documented in male songbirds as a signal of an individual's quality or intent, but has not been well-studied in female birds. Methods: I will simulate intrusions onto the territories of cardinal pairs using high and low performance song playbacks. I will record vocalizations made by the resident pair and measure aggressive responses. I will analyze recorded songs to determine differences in vocal performance, song duration, song type switching, syllable repetition, harmonic amplitude difference (HAD), and the degree of syllable stereotypy. HAD is indicative of a bird's ability to produce pure tonal songs, and stereotypy is defined as the ability to accurately reproduce consecutive syllables. Predictions: I predict that male and female birds will have stronger responses to high vocal performance playbacks. Birds will use high performance song in the presence of a high performance singer. They will sing longer, use more syllables, and switch song types more often. A trade-off may exist between vocal performance and stereotypy, as it may be difficult to maintain identical notes while singing quickly.

M2: Corrosion Propagation and Monitoring of Reinforcing Steel in Concrete

Manzurul Nazim, mnazim2015@fau.edu, Mechanical Engineering, College of Engineering & Computer Science, Dr. Francisco Presuel Moreno

The corrosion of the reinforcing steel is sometimes accelerated (via applied potential or applied current) as to assess the amount of corrosion products that would cause cracks. The time to corrosion initiation under not accelerated conditions occur over several decades. Morris and collaborators studied corrosion propagation using admixed chloride in the concrete specimens (to initiate corrosion right away), whereas Oelssner and collaborators considered incipient cracks in concrete samples and observed how the corrosion initiates and propagates. In this study, chloride was not added while preparing the samples. To gain additional insight on the propagation stage, both mature (2008) and recently prepared (April/2016) reinforced concrete samples were used. Matured samples concrete mixtures: 1) ordinary portland cement (OPC), 2) OPC and fly ash, and 3) OPC, fly ash and silica-fume. The 2016 samples had 1) OPC and 50% slag or 2) OPC and 20% fly ash composition. All specimens had a w/cm ratio of .41 and 390 kg/m³ of cementitious material. The mature specimens had either single rebar embedded or four rebars (# 5 rebar/2 inch cover). Recently prepared samples had one rebar (#3 rebar/0.75 inch cover) or three rebars (#4 rebar/1 inch cover) embedded in them. Chloride transport was expedited by electro-migration but the embedded rebar was not used as an electrode. A reservoir was installed on the concrete specimens (10%NaCl). A modified migration process was used to drive the chloride into the concrete so that chlorides reach the rebar surface and start the rebar corrosion once the chloride threshold is exceeded. Experiment parameters investigated were: length of the reservoir, concrete cover and concrete composition. Different size of solution reservoir was installed (from 2.5 cm to 17.5 cm) on the top surface of each specific samples in order to vary the anode length. Rebar potential, LPR and EIS values were taken at regular intervals during and after the electro-migration process to observe the corrosion propagation. Electromigration was suspended at least two days before the measurements were done (for monitoring while electro-migration was on-going). Based on experimental observations via R_c and E_{corr} values, at least (5520-7680) volt-hours were needed to initiate corrosion in mature concrete specimens. Corrosion propagation is on-going on many samples, and continue to be monitored.

M3: Dual Language Proficiencies of Second Generation Immigrants in Adulthood

David Giguere (dgiguere2014@fau.edu) , Kriselli Castro (kcastro7@fau.edu), Anna-Lesa Penas (apenas2014@fau.edu), Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Erika Hoff

Purpose: The purpose of this project is to document the English and Spanish proficiencies of adults who are second generation immigrants, with one or both of their parents born in a Spanish speaking country, and who were exposed to Spanish and English from infancy.

Method: Seven tests will be administered in each language covering a broad range of linguistic skill. The aims are threefold: 1) to compare the bilingual adults' English and Spanish proficiencies to those of monolinguals, 2) to identify correlates of individual differences in English and Spanish proficiencies in the bilingual participants, and 3) to describe and identify correlates of individual differences of degree of bilingualism independent of language proficiency. Results: Data is currently being collected and results of receptive language skill should be analyzed before the conference. Conclusions: The study hopes to shed light on bilingual language development in simultaneous bilinguals.

M4: EVALUATING ENTHESEAL CHANGES(EC) FROM THE REPUBLIC GROVES POPULATION OF SOUTH FLORIDA

Jennifer Dewey, jdewey2015@fau.edu, graduate student, Department of Anthropology, College of Arts & Letters, Mentor: Dr. Meredith Ellis.

Purpose: The proposed objectives of this research are to discern whether the Coimbra method of measuring enthesal changes as they relate to activity patterns is an appropriate method for estimating the activity patterns of the Republic Groves population. Studies have utilized this methodology in known skeletal samples and have had success in discerning minute inferences into past behavior. With the added presence of archaeological material culture and ethnohistorical accounts, the goal of this research is to question whether this approach can be applied to a more typical skeletal analysis, one that is fraught with commingled and fragmentary remains. Materials: The Republic Groves population consists of a minimum number of 37 individuals, 31 adults, and 6 juveniles. The site has been dated to the Middle to Late Archaic Occupation of West Central Florida, 4600 B.C. to 500 B.C. The artifacts recovered include: projectile points/knives, drills, flake scrape/ knives, a flake chopper, flakes, a waller knife, a micro-core, a grinding/anvil stone, a honing stone, beads, wooden stakes (radiocarbon dated), an atlatl hook, a grooved plummet, incised pendants/ ornaments, bone awls, a flesher, pins, knives, shark's teeth, and faunal remains. Ethnohistoric accounts of this time and area suggest a subsistence pattern of hunting, gathering, and fishing. Therefore the results of the application of the Coimbra method should render a pattern of enthesal changes consistent with these activities. Results: The application of the method will indicate a grade of change associated with a particular muscular or ligament involvement, however, the effect of confounder variables has the potential to distort the interpretation of the findings, such as age, sex, and body size. Therefore, use of additional lines of evidence will be used to interpret the patterns presented by the skeletal remains.

M5: COMPARING VOCABULARY DEVELOPMENT IN CHILDREN FROM BILINGUAL & MONOLINGUAL HOMES AT 48 MONTHS

Richard Quiroga, rquiroga2012@fau.edu, graduate student, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Erika Hoff

Purpose: The purpose of the present study is to compare children from bilingual homes with children from monolingual homes in their language skills with respect to their expressive vocabulary abilities in each language collected separately and together at 48

months. Another purpose is to provide evidence that native input has a greater effect on children's expressive vocabulary skills than non-native language input at 48 months. Past studies have provided some evidence that the quantity of parental input can have a profound effect on brain responses on bilingual and monolingual infants (Garcia-Sierra, A., Ramirez-Esparza, N., & Kuhl, P. 2016). The quality of parental input can also influence children's language exposure. This can be seen in (Place, S., & Hoff, E. 2011)'s study where children with two native speaking parents heard and acquired significantly more Spanish than children with only one native English speaking and one native Spanish speaking parent. Timing is also critical to language development. When a child reaches 48 months, this period represents a very important stage in their language development. In this stage, names of familiar animals are typically known, common objects in picture books or magazines can be named, they can sometimes repeat four digit numbers if given to them slowly, and they may be able to repeat words of four syllables (Villiers, J. D., & Davidson, T. 2011). The present study also aims to answer two important research questions raised by Hoff et al. 2014: at 48 months, do the children from bilingual homes differ from monolingual norms and/or from the SES equivalent monolingual comparison group in their English expressive vocabularies, and what is the relation of home language use to children's English and Spanish vocabulary at 48 months? Methods: Demographic data was collected on the parents of children aged 48 months. This background data included critical information that helps shed some light on how their children developed their language skills such as parents native language and parents country of origin.

M6: RESISTIVITY, SORPTIVITY AND POROSITY OF CONCRETES CONTAINING SUPPLEMENTARY CEMENTITIOUS MATERIALS

Sanjoy Barman, sbarman2015@fau.edu, graduate student, Department of Ocean & Mechanical Engineering, College of Engineering and Computer Science, Mentor: Dr. Francisco Presuel-Moreno

Supplementary cementitious materials (SCMs), are beneficial in concrete mixtures, blended with portland cement (binary or ternary mixes), provides a durability improved when exposed in harsh marine environments. Purpose: The purpose of this research consists of testing concrete specimens with a range of different mix designs: 1) to evaluate rate of water absorption due to capillary suction, referred to as sorptivity, 2) to evaluate the surface resistivity, 3) to compare the total porosity of specimens with different mixes, and 4) to obtain correlations between resistivity and sorptivity. Methods: Ordinary portland cement was partially replaced with supplementary cementitious materials such as fly ash (20-40%), silica fume (8%) and blast furnace slag (50-70%), along with water-to-cement (w/cm) ratios of 0.35, 0.41 and 0.47. The experimental tests, consisted of surface resistivity vs. time, water absorption, volume of voids, carried out according to ASTM standards, but at various ages. Moreover, their correlations were investigated. Results: The test results were then plotted with those for a reference concrete following exactly the same SCM composition. The test results obtained indicate that the inclusion of silica fume greatly reduced water penetration depth. The mixes containing slag also showed favorable pore volumes and water absorption result, when compared to specimens containing fly ash only. Also, as w/cm was reduced, the water absorption decreased where SCMs were used. Higher surface resistivity values were observed by decreasing w/cm ratio. Conclusions: These results suggest that increasing the duration of moist curing, reducing w/cm ratio, adding SCMs to concrete mixtures proliferated/improved concrete durability. Supported by a Grant from Florida Department of Transportation (FDOT)

M7: PATTERNS OF DUAL LANGUAGE OUTCOMES AND THEIR CONCURRENT CORRELATES

Nicolette Ramirez, nicoletteram2014@fau.edu, doctoral student, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Erika Hoff

Current research indicates that there are numerous factors related to dual language proficiency. Furthermore, research suggests that the language skills of bilingual children are very heterogeneous. In this study, we will focus on four possible outcomes for those receiving dual language input. Those four patterns of outcome are as follows: bilingual children can have high levels of dual language proficiency, dominant skills in one language over the other or vice versa, or low levels of dual language skills. The present study will focus on the prevalence of these four patterns and their concurrent correlates amongst 30 month old (N = 87, 48 females, 39 males) simultaneous English-Spanish bilinguals with special emphasis on the distinguishing factors related to those with high dual language skills.

Seventh Annual FAU Broward Student Research Symposium Schedule:

D1-D8: DOCTORAL Submissions

D1) DEVELOPMENTAL ECOLOGY OF THE BACHMAN'S SPARROW

Joseph M. Niederhauser, jniederhauser2015@fau.edu, doctoral student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Rindy Anderson

D2) DUAL INHIBITION OF ENERGY METABOLISM IN PROSTATE CANCER STEM CELLS PREVENTS PROSTATE MICROTUMOR RECURRENCE IN VITRO

Saheed Oluwasina Oseni, soseni2013@fau.edu, Doctoral Student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. James Kumi-Diaka

D3) EFFICACY OF 3BROMOPYRUVATE AND SC-514 COMBINATION IN PROSTATE CANCER TREATMENT CO-DELIVERED WITH NANOPARTICLE

Toluleke Famuyiwa, tfamuyiwa2014@fau.edu, doctoral student, Department of Biological Sciences Charles E. Schmidt College of Science, Mentor: Dr. James Kumi Diaka

D4) THE EFFECTS OF WILLOW ENCROACHMENT ON THE RESILIENCE OF PEAT CARBON STORAGE IN AN HERBACEOUS WETLAND

Jessica Dell, jdell2014@fau.edu, doctoral student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Brian Benscoter

D5) SELF-ESTEEM MEDIATES THE LONGITUDINAL ASSOCIATION BETWEEN PARENTAL PRACTICES AND ADOLESCENT ADJUSTMENT

Melissa Huey, mhuey2014@fau.edu, doctoral student, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Brett Laursen

D6) CHANGES IN SALINITY IN ST. LUCIE IN RESPONSE TO HIGH PULSE DISCHARGES FROM LAKE OKEECHOBEE

Lauren Kircher, lkircher2015@fau.edu, doctoral student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. John Baldwin

D7) CULTIVATING PARTNERSHIPS FOR PROFESSIONAL DEVELOPMENT IN SCHOOLS

Brianna Joseph, bjosep28@fau.edu, Doctoral Student, Kathleen Randolph, krandolph2013@fau.edu, Doctoral Candidate, Department of Exceptional Student Education, College of Education, Mentor: Dr. Cynthia Wilson

D8) WHY NOT BOTH? EXAMINING THE EFFECTS OF BILINGUALISM ON THE SOCIAL AND LANGUAGE DEVELOPMENT OF CHILDREN WITH AUTISM

Sylvia Collazo, M.Ed.; scollaz2@fau.edu; Doctoral Student & Toppel Scholar; Department of Exceptional Student Education; College of Education; Mentor: Dr. Peggy Goldstein

M1-M7: MASTER'S Submissions

M1) ACOUSTIC STRUCTURE AND VOCAL PERFORMANCE TRADE-OFFS IN THE NORTHERN CARDINAL (CARDINALIS CARDINALIS)

Rachel Saleess, rsaleess2015@fau.edu, graduate student, Department of Biological Sciences, Charles E. Schmidt College of Science, Mentor: Dr. Rindy Anderson

M2) Corrosion Propagation and Monitoring of Reinforcing Steel in Concrete

Manzurul Nazim, mnazim2015@fau.edu, Department of Mechanical Engineering, College of Engineering & Computer Science, Dr. Francisco Presuel Moreno

M3) Dual Language Proficiencies of Second Generation Immigrants in Adulthood

David Giguere, dgiguere2014@fau.edu, graduate student, Kriselli Castro (kcastro7@fau.edu), Anna-Lesa Penas (apenas2014@fau.edu), Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Erika Hoff

M4) EVALUATING ENTHESEAL CHANGES(EC) FROM THE REPUBLIC GROVES POPULATION OF SOUTH FLORIDA

Jennifer Dewey, jdewey2015@fau.edu, graduate student, Department of Anthropology, College of Arts & Letters, Mentor: Dr. Meredith Ellis.

M5) COMPARING VOCABULARY DEVELOPMENT IN CHILDREN FROM BILINGUAL & MONOLINGUAL HOMES AT 48 MONTHS

Richard Quiroga, rquiroga2012@fau.edu, graduate student, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Erika Hoff

M6) RESISTIVITY, SORPTIVITY AND POROSITY OF CONCRETES CONTAINING SUPPLEMENTARY CEMENTITIOUS MATERIALS

Sanjoy Barman, sbarman2015@fau.edu, graduate student, Department of Ocean & Mechanical Engineering, College of Engineering and Computer Science, Mentor: Dr. Francisco Presuel-Moreno

M7) PATTERNS OF DUAL LANGUAGE OUTCOMES AND THEIR CONCURRENT CORRELATES

Nicolette Ramirez, nicoletteram2014@fau.edu, graduate student, Department of Psychology, Charles E. Schmidt College of Science, Mentor: Dr. Erika Hoff

U1-U4: UNDERGRADUATE Submissions

U1: TEACHER OPINIONS AND PERCEPTIONS OF NEW LITERACIES INSTRUCTIONAL PRACTICES IN SCHOOLS

Tiffany Manbodh, tmanbodh@fau.edu, undergraduate student, Department of Teaching and Learning, College of Education, Mentor: Dr. Marinaccio

U2: THE INFLUENCE OF LANGUAGE PROFICIENCY ON THE APPRAISAL OF VALENCE OF VERBAL CONTENT IN SPANISH-ENGLISH BILINGUALS

Vannia Arana, varana@fau.edu, undergraduate student, Caitlyn Montero, Idaly Velez-Urbe
Mentor: Dr. Monica Rosselli Department of Psychology, Charles E. Schmidt College of Science

U3: Accelerated Solar Energy Research

Philip Carhart, Pcarhart2016@fau.edu, undergraduate student, College of Design and Social Inquiry, Mentor; Professor Mate Thitiswat, Mthitis@fau.edu

U4: Residential- Defensive Towers in the Balkans: Where Christianity and Islam Shared Roof

Stefka Kuneva, skuneva2016@fau.edu, undergraduate student, School of Architecture, College of Design & Inquiry, Mentor: Dr. Vladimir Kulic

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Judges & Reviewers

Jennie Soberon, Finance Manager and Program Coordinator-Office of Undergraduate Research and Inquiry (OURI): General Classroom South-2 209F, jsoberon@fau.edu; Shireen Lalla, College of Education, Educational Leadership & Research Methodology; PhD. Student: Liberal Arts Building BC49 243A, slalla@fau.edu; Dr. James Kumi-Diaka, Charles E. Schmidt College of Science. Schmidt College of Science, Biological Sciences: Davie West BC90 442, jdiaka@fau.edu; Dr. Cynthia Archibald, Christine E. Lynn College of Nursing, BC49 226B, archibal@health.fau.edu; Dr. Philomena Marinaccio, College of Education, Teaching and Learning, Education & Science BC52 214 marinacc@fau.edu; Michael Gauci, College of Business, School of Accounting, LA477, mgauci@fau.edu; Andrew Dutka, Archives/Special Collections Librarian, University/College Library, Broward College Central Campus, adutka@broward.edu; Tariq Rahaman, Reference Librarian, University/College Library, Broward College Central Campus, trahaman@broward.edu; Dr. Don Torok, College of Education, Associate Dean, Education & Science BC52 205, torok@fau.edu; Dr. Anthony Ambrosio-Director of Undergraduate Assessment Education: aambrosio@fau.edu; Myron Davis, Assistant University Registrar, BC49 LA112, mdavi119@fau.edu; Miguel Hernandez- Academic & Enrollment Management Support Services: Liberal Arts Building BC49-Administration, hernandezm@fau.edu;

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***Thank you to the Faculty Mentors for their research assistance, guidance, and mentorship to the 2017 FAU Broward Research Symposium. Numbers in parenthesis represents the number of different student projects the faculty member was a mentor.**

Past Research Symposium Winners

6th Annual Broward Student Research Symposium Winners-2016

Doctoral: Saheed Oluwasina Oseni, Mentor: Dr. James Kumi-Diaka

Master's: Douglas Holmes, Chad Coarsey, Reen Varghese, Mentor: Dr. Nwadiuto Esiobu

Undergraduate: Jessica Brandwein, Marina Shehata, and Adrianne Dias, Mentor: Dr. Nwadiuto Esiobu

5th Annual Broward Student Research Symposium Winners-2015

Doctoral: Idaly Velez Uribe, Mentor: Dr. Monica Rosselli

Master's: Stephanie Coradin, Olufunmilayo Akinpelu, Jasmin Evangelista, and Elizabeth Bockstege, Mentor: Dr. Vanessa Johnson

Undergraduate: Harris David Goldsmith, Stephanie Khoury, Nora Alnoury, and George Kaldas, Mentor: Dr. James Kumi Diaka

4th Annual Broward Student Research Symposium Winners-2014

Doctoral: Gesulla Cavanaugh, Mentor: Dr. Dianne Wright

Master's: AmberRose Reale, Mentor: Dr. Monica Rosselli

Undergraduate: Victor Benavides, Mentor: Dr. Brian Benscoter

3rd Annual Broward Student Research Symposium Winners-2013

Doctoral: Idaly Velez-Urbe and Brian Dixson, Mentor: Dr. Monica Rosselli, Dr. Ruth Tappen, and Dr. Christine Williams

Master's: Natalie Korp Mentor: Dr. Nathan J. Dorn

Undergraduate: Emelia Fischer: Dr. Vladimir Kulic

2nd Annual Broward Student Research Symposium Winners-2012

Doctoral: Laxmi Laiwani Mentor: Dr. Monica Rosselli

Master's: Alfonso, Danielle Fulayter, Johnson, and Pierre Mentor: Dr. Angela Rhone

Undergraduate: Henry Marroquin, Mentor: Mate Thitisawat

1st Annual Broward Student Research Symposium Winners-2011

Doctoral: Vanessa Hormann, Mentor: Dr. James Kumi Diaka

Master's: Caroline Efstathion, Mentor: Dr. Nwadiuto Esiobu

Undergraduate: Danielle Medellin, Mentor: Dr. John Baldwin

A SPECIAL THANKS to our wonderful Faculty, Staff, and Student volunteers who dedicated their time to assist with the Seventh Annual Broward Research Symposium!

2017 FAU Broward Research Symposium Volunteers

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