

43rd Annual



**Student Research Conference**  
Wednesday, April 5, 2017 | Campus Union (CUB) Ballroom

**EASTERN  
NEW MEXICO  
UNIVERSITY**

**Student Success**  
that's what it's all about



**Eastern New Mexico University**

**Student Research Conference**

**2017**

**Conference Proceedings**

Portales, New Mexico  
April 2017



## **About the Student Research Conference**

Eastern New Mexico University's annual Student Research Conference is designed to showcase research projects being done by undergraduate and graduate students. Students present their work in professional poster and paper sessions and are judged and critiqued by an inter-disciplinary group of faculty members. Through this process students can see how their work compares with that of other students, get feedback on their work and presentations, and practice their professional presentation skills. Students, faculty, staff and community members are invited to attend the poster and paper sessions. Cash awards are presented at an evening banquet.

The Eastern New Mexico University Student Research Conference began in 1974 with a grant from the ENMU chapter of Sigma Xi, the Scientific Research Society. While the conference was originally for students in the sciences, students from all academic disciplines are now eligible and encouraged to participate. A poster session was added to the conference in 2011. For the 2017 conference, 200 submissions were received representing 16 different academic disciplines.

The first director of the conference was Dr. Ram Sharma who held the position for 25 years. He was followed by Dr. Anthony Schroeder, then by Dr. David Hemley and Dr. Suzanne Swift as co-directors. Current directors of the conference are Dr. David Hemley and Dr. Stéphanie Borios.

### **For More Information**

[www.enmu.edu/src](http://www.enmu.edu/src)

[www.facebook.com/enmusrc](https://www.facebook.com/enmusrc)

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Stéphanie Borios: [stephanie.borios@enmu.edu](mailto:stephanie.borios@enmu.edu)

**Student Research Conference Committee  
2016-2017**

Dr. Stéphanie Borios, Co-Chair

Dr. David Hemley, Co-Chair

Dr. Mary Ayala

Dr. Thomas Brown

Dr. R. T. Ervin

Dr. Matthew Haney

Dr. Ivana Mali

Dr. John Montgomery

Dr. Andy Nazario

Dr. Darron Smith

Dr. Kathleen Wagner

Dr. Juchao Yan

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Ms. Kathie Rolston

Ms. Barbara Senn

## **Special Thanks**

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Ms. Susan Bassett	Dr. John Montgomery
Dr. Gary Bond	Dr. Andy Nazario
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Mr. Nhat Ho	Dr. Linda Weems
Dr. Valerie Kyle	Mr. Dwayne Wilkerson
Dr. ShinHwa Lee	Dr. Wlamir Xavier

**2017 Conference Schedule  
Wednesday, April 5**

- 9:00 - 11:00 a.m.      Poster session in the Campus Union Building Ballroom
- 1:00 - 3:30 p.m.      Paper session in rooms across campus
- 6:30 p.m.              Banquet in the Campus Union Building Ballroom

**2017 Conference Banquet Speakers**

Dr. David Hemley, Professor of Finance  
Introductions and Thanks

Dr. Steven Gamble, President  
Opening Remarks

Dr. Thomas Brown, Professor of Computer Science  
Dr. Brian Pasko, Associate Professor of Mathematics

Modeling Racquetball and Sex-Changing Fish

Modeling is a systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon itself. Mathematical models can take different forms and play an important part in advancing understanding in many disciplines. We present the work that we have done modeling the sport of racquetball and the swimming behavior of sex-changing fishes using formulaic models and computer simulation. Using these models we have been able to gain a deeper understanding of the effect of player ability on the probability of winning a racquetball match and how a fish can effect encounter rates with other fish by changing its swimming behavior.

Dr. Stéphanie Borios, Assistant Professor of Anthropology  
Presentation of Awards

## 2017 Conference Award Winners

### Poster Presentations

**Gabriel Ayala**

Advisor: Mr. Dwayne Wilkerson

**Veronica Ayala**

Advisor: Dr. Suzanne Swift

**Jennifer Bodley**

Advisor: Dr. Sue Stockly

**Sarah Eilert**

Advisor: Dr. Suzanne Swift

**Christie Fowler**

Advisor: Dr. Karen Cople

**Rebecca Freas**

Advisor: Dr. Kerriann Marden

**Benjamin Lantz**

Advisor: Dr. Elliott Stollar

**Nicole Leahy**

Advisor: Ms. Nicole Bougie

**Emma Moyer**

Advisor: Dr. Leslie Gill

**Dominique Ratto**

Advisor: Dr. Adrienne Bratcher

**Leslie Sanford**

Advisor: Dr. Manuel Varela

**Shannon Swingle**

Advisor: Dr. Adrienne Bratcher

### Paper Presentations

**Gabriel Ayala**

Advisor: Mr. Dwayne Wilkerson

**Veronica Ayala**

Advisor: Dr. Suzanne Swift

**Matthew Carwile**

Advisor: Dr. David Hemley

**Jessica Curtis**

Advisor: Dr. Ivana Mali

**Tanner Faver**

Advisor: Dr. Sue Stockly

**Christie Fowler**

Advisor: Dr. Karen Cople

**Rebecca Gonzalez**

Advisor: Dr. Karen Cople

**Miel Johnson**

Advisor: Dr. Kenwyn Cradock

**Nicole Leahy**

Advisor: Ms. Nicole Bougie

**Megan Padron**

Advisor: Dr. Adrienne Bratcher

**Rebecca Rhode**

Advisor: Dr. Elliott Stollar

**Dominique Ratto**

Advisor: Dr. Adrienne Bratcher

**Jean Roland**

Advisor: Ms. Gloria Jurado

**Mara Smith**

Advisor: Dr. Kerriann Marden

## **Poster Abstracts**

### **Poster Presentation Group 1**

#### **Rebuilding Vietnam and the American Intervention**

Presenters: Lori Coerber, Josef Rojo  
Authors: Lori Coerber, Josef Rojo  
Research Advisor: Dr. Stéphanie Borios

The Vietnam War was an outstanding point in history which left a major scar for the Vietnamese people. This left some to wonder, "How will the people ever recuperate from this major catastrophe?" The country itself was left to rebuild after such an event. The souls of the wounded and emotionally distraught were smothered to ashes and spread over the horizon. Our main question is, how the US involvement during Vietnam affect their development for future generations.

Over the course of the project, we analyzed a variety of sources including books and articles. We found that these articles include some interesting insights on the disastrous situations that these people had to endure both physically and mentally. We also discovered that the United States did have an involvement during and after the war in trying to help their development, however it was not an effective attempt to help the Vietnamese.

One of the projects that America came up with is called the Civic Aid Program or CAP, this program included health care, sanitation, well construction, and agriculture help in the hopes of helping the Vietnamese. Some of the other help that was offered to the people were basic Red Cross for those that were refugees of the war, these actions helped the Vietnamese. The third action taken by the U.S. was we tried to help rebuild the Nation of Vietnam to make amends what we had done. This failed for the fact that the United States thought that their way of nation building was the only way.

#### **The Role of Forensic Anthropologist During Disaster Victim Identificatio (DVI)**

Presenters: Rene Duran, Omar Zamarripa  
Authors: Rene Duran, Omar Zamarripa  
Research Advisor: Dr. Stéphanie Borios

This research looks at different works on the role of Anthropologists during Disasters (natural or by human hand), specially during the steps of identification

(Acronym: DVI). Anthropologists have different roles during disasters, however they become especially important during identification. Their duty is not only to clarify how many people perished during the disaster, but to help bring those bodies to their families. We'd also like to present some international programs which employ different specialties of medics during disasters; "Medics without frontiers". A social program (and a personal objective) which sends medics to different war/disaster areas to help (not protect) the citizens.

## **A Survey of Cultural Resilience Through Ritual Practices in the Face of Climate Change**

Presenters: Justin Falls, Susan Hartfelder  
Authors: Justin Falls, Susan Hartfelder  
Research Advisor: Dr. Stéphanie Borios

As climate change alters the world, it also profoundly affects the people who live in it. Weather, harvest, and migration patterns are changing globally and resources that used to be plentiful are now scarce or unreliable. All of this change and instability in the environment is reflected in the human experience as well. This instability, and the ways in which people adapt to it, can be best understood through the observation of ritual and cultural practices of various groups and populations. Through a review of relevant literature, we have determined that people use culture and rituals in various ways to define and re-define who they are as a group and how they fit into an ever changing world and its shifting environments. Some re-define traditional practices for use in a modern and ever changing age, others create or adopt new practices. Still others create new practices that did not exist previously. By comparing how several groups including the Inupiat of the Arctic, Muslim groups in Africa, and others have coped with climate change through the use of ritual practices we hope to demonstrate the resilience of humans and their cultures in the face of global climate change.

## **Indigenous Knowledge versus Scientific Knowledge in Agriculture Development**

Presenter: DeJohn Burns  
Authors: Omar Legarda, DeJohn Burns  
Research Advisor: Dr. Stéphanie Borios

How can scientific knowledge help the indigenous people? The agriculture development of indigenous knowledge versus scientific knowledge. The method we used is literature review, which we reviewed a few articles that helped us

understand indigenous knowledge and scientific knowledge. One of the things we found out that there is a program that help sustain wetlands but if the indigenous people manages to sustain it, then the program would go on and help others who are in need. Another thing we found out was indigenous knowledge appears to be becoming ever more complicit as it becomes appropriated by developing, a process which will only harden as indigenous knowledge becomes increasingly institutionalized.

### **Development Made Sexy**

Presenter: Daley Woodard

Author: Daley Woodard

Research Advisor: Dr. Stéphanie Borios

Our presentation will be about the comparison of development projects that used celebrities and pictures of these poverty children, to help promote their project, to projects who did not. Many of the projects who used celebrities were to be unsuccessful, compared to those who did not use celebrities. We found that pictures of sad, skinny children were more effective than celebrities wanting others help. People said that they did not help the project because of the celebrity, but because they had a connection or relation to what organization was needing their help. To back up our research we used peer reviewed articles.

### **Contextualization of Pathological Conditions in Archaeological Canid Remains**

Presenter: Rebecca Freas

Author: Rebecca Freas

Research Advisor: Dr. Kerriann Marden

Award Winner

This project examines pathological and traumatic changes present on the postcranial remains of a canid, identified as a domestic dog, from Guadalupe Ruin. The specimen is than compared with ten additional canid specimens from northwest New Mexico and southwest Colorado. Each of the canid specimens was examined for pathological changes and traumatic injuries, and a complete set of postcranial measurements were taken. The goal of the research is to utilize the comparative specimens to determine if the pathological change present on the Guadalupe Ruin specimen is unique or common among Southwestern dogs. Examining the physical condition of the Guadalupe Ruin specimen and the comparative specimens is utilized to assess the health of the animals and allows

for interpretations regarding the human intervention in the life of the animal. The study provides a context for understanding the health of the Guadalupe Ruin specimen in relation to other specimens from the prehistoric Southwest. This research is significant because of the long lasting nature of the relationship between humans and canids, and the importance of understanding how that relationship developed and changed through time.

## Poster Presentation Group 2

### **Flow Mediated Dilation Assessment of Limb Specific Vascular Health in Young Metabolic Syndrome Women**

Presenter: Ariel Gomez

Author: Ariel Gomez

Research Advisor: Dr. Matthew Barlow

Sedentary behavior and increased daily sitting are increased and the metabolic and cardiovascular effects are increased in women compared with men. Prolonged sitting in young and old has dire effects on shear rate and decreased vascular function as measured by Flow Mediated Dilation (FMD) in the arms and legs in which the legs are more effected. Although improving shear rate response through heating and intermittent exercise bouts including walking and cycling attenuates the distress, the characteristic mechanism(s) effecting the vascular decline function in women with progressive degrees of the co-morbidities associated with sedentary lifestyles has not been measured. Thus we aimed to study the mechanisms associated with endothelial dysfunction in young women that present with Metabolic Syndrome and age matched controls. Resting blood pressure, arterial tonometry, reactive hyperemia to 5 min cuff occlusion and FMD were assessed in the popliteal and brachial arteries. Venous blood samples were collected in the 12 hour fasted state for the measurement of glucose, insulin, HDL, LDL, and total Cholesterol, and the bio-availability of Nitric Oxide. Additional samples were collected after a 75 g oral glucose challenge test for the measurement of calculated Insulin Sensitivity Index. Percent Dilation and shear in the legs was decreased data from the lab in an age matched overweight population. Time to peak was also declined indicating a depressed vascular mechanical (endothelial response to the shear or ischemic stress). Group differences in weight, BMI, OBF, Fasting glucose, HDL, waist circumference, ISI and NO bio-availability were significant. Endothelial function has been indicated in diabetes including causative mechanisms becoming prevalent during the developed pathogenesis. These same mechanisms are prevalent in these young

MetSyn women at an age in which therapeutic potential is high enough to gain a quantity and quality of life.

### **Searching for a ghost: soft tick surveys among black-tailed prairie dog burrows**

Presenters: Cameron Madsen, Jeremiah Olivas  
Authors: Cameron Madsen, Jeremiah Olivas  
Research Advisor: Dr. Ivana Mali

Humans come into contact with ticks quite often; these are known as hard ticks. However, there is another type of tick that does not get very much attention, soft ticks. Soft ticks are known as vectors of relapsing fever, a disease caused by certain species of bacteria (*Borrelia*) carried by the ticks. Because their bodies lack hard cuticle, soft ticks are sensitive to desiccation and are not generally found in open areas like hard ticks. Therefore, soft ticks usually hide in caves, holes, or burrows of mammals. Despite their importance, soft ticks are understudied because they are very hard to locate due to the habitat they occur in. In fall 2016, we began to survey black-tailed prairie dog (*Cynomys ludovicianus*) burrows in Roosevelt County. We identified 12 prairie dog towns and within each town we randomly selected 30 burrows to survey. Thus far, we collected 27 ticks out of two burrows. The ticks were identified as *Ornithodoros turicata*. Once tick positive burrows were identified, we employed game cameras in order to find out which animals use the burrows. So far, we identified burrowing owls and cottontail rabbits as occupants of the burrows. This research is important in understanding the distribution and occupancy of soft ticks in eastern New Mexico, and moreover identifying which vertebrate animals are also affected by the soft ticks.

### **Shrimp vs Sardine: Bait Preference of Western River Cooters**

Presenter: Jazmin Mirabal  
Author: Jazmin Mirabal  
Research Advisor: Dr. Ivana Mali

The western river cooter, *Pseudemys gorzugi*, is a turtle species occurring in parts of Texas, New Mexico, and Mexico. *Pseudemys gorzugi* is listed as near threatened by the IUCN and state threatened by the NMDGF. More research is needed to expand available information on this species. Understanding bait preference of *P. gorzugi* is important for maximizing capture rates in future studies. Our study examined preferences between sardine and shrimp bait.

During 2016 field season, 50 baited hoopnet traps were set for six days at 4 different locations along the Black River near Carlsbad, NM. We alternated the traps between shrimp and sardine bait and checked the traps once a day. We measured, marked, and released all captures and recorded information on both the trap location and bait. We conducted chi square analyses to test overall bait preference as well as preferences among different sex/age classes. We collected 181 western river cooters, with 40 of these being recaptures. Overall, 77 turtles were caught with sardine and 104 with shrimp bait, showing significant overall preference for shrimp ( $P = 0.04$ ). Although each group preferred shrimp bait, statistically there were no significant preferences among males ( $P = 0.24$ ), females ( $P = 0.76$ ), juveniles ( $P = 0.62$ ), or hatchlings ( $P = 0.08$ ). Our results suggest that shrimp could be used to help maximize capture rates of *P. gorzugi*.

### **Absorption of Zinc in Dairy Effluent by Algae**

Presenter: Emily Peterson

Author: Emily Peterson

Research Advisor: Dr. James Constantopoulos

ENMU has been operating an Algal Turf Scrubber (ATS) for the dual purpose of dairy wastewater treatment and algal biofuel production. There are several components to the ATS system. The carbon recovery unit (pond) contains ~10,000 gallons of scrubber effluent consisting of dairy manure effluent and fresh well water. The effluent is continuously recycled to an inclined flowway at precisely controlled flow rates. The flowway itself is 100-feet long and 1-foot wide. Last year we began chemical analysis of the dried algae using X-ray fluorescence spectrometry primarily to look at the  $\text{SiO}_2$  and  $\text{CaCO}_3$  concentration as these may be components of the cell walls of the algae or may be indicative of wind-blown contamination. During the routine chemical analysis we detected elevated levels of zinc in the algae with a maximum concentration of more than 4800 mg/L and an average of more than 1500 mg/L. Zinc is a necessary nutrient added to the feed for dairy cows and is vital for various metabolic functions, increasing milk production, reducing somatic cell count and improving hoof hardness. Absorption of zinc is reportedly related to the physiological need of the animal and the excess is excreted. This is a potential environmental pollutant because the EPA's Secondary Maximum Contaminant Level for zinc in domestic water is 5 mg/L. The results of this study show that zinc present in the dairy effluent is absorbed by the algae thereby making it an effective mechanism for the removal of zinc from dairy effluent.

## **Visitor Effect with the Influence of Shelters on Mosquitofish (*Gambusia affinis*) and Green Sunfish (*Lepomis cyanellus*)**

Presenter: Rachael Keeney

Author: Rachael Keeney

Research Advisor: Dr. Darren Pollock

The visitor effect describes the relationship between the visitors at zoos and the animals within the exhibits, and has been traditionally classified as positive, negative, or neutral to the animals' stress. Most relationships have been classified as negative, and most of the research has focused on primates with limited research into other mammals. There has been no research into fish taxa with the visitor effect, which leaves aquaria unaware of the possible effects visitors have on their captive species. I will be observing the effects visitors have on *Gambusia affinis* (Western Mosquitofish) and *Lepomis cyanellus* (Green Sunfish) with the influence of shelters. Environmental complexity, such as the addition of shelters, has been shown to decrease animal's stress, and could be a factor in decreasing the negative effects visitors may have on captive species. My research will involve displaying *G. affinis* and *L. cyanellus* in the Dr. Antonio Gennaro Natural History Museum and observing the frequency of chase-and-flee behaviors in the presence and absence of visitors in combination of with and without shelters located within the tank. There will be three ten gallon tanks per fish species, and will include eight *G. affinis* per tank and two *L. cyanellus* per tank. I hypothesize that there will be an increase in chase-and-flee behavior during visitor presence in both species of fishes compared to when no visitors are present. Furthermore, I hypothesize that the addition of shelters will increase shelter use when visitors are present compared to when visitors are absent, and the addition of shelters will decrease the chase-and-flee behavior in both species. If chase-and-flee behaviors increase with visitor presence, it could represent a negative visitor effect relationship that would require aquaria to relocate these species to low foot-traffic areas of facilities. If shelters decrease chase-and-flee behaviors, aquaria may also be able to use complex exhibits with shelters to reduce the negative visitor effects. If chase-and-flee behaviors are unaffected by visitor or shelter presence, then aquaria can allow more interactive exhibits with these fish species without negative effects to the welfare and can include more complexity to the exhibit for visitors without affecting the welfare of the fish species. The results of this experiment can be very versatile and useful to aquaria in creating awareness of the effect visitors may have on fish species and providing options for how to decrease or increase the interactions visitors may have with *G. affinis* and *L. cyanellus*. Research into visitor effects into fish species may also be stimulated by this study.

## **Antimicrobial Effects of Tannic Acid**

Presenter: Leslie Sanford

Author: Leslie Sanford

Research Advisor: Dr. Manuel Varela

Award Winner

Tannic acid—a polyphenol compound found in many species of plants including grapes—has antimicrobial tendencies and has demonstrated inhibition of growth on a number of bacterial species, including numerous coliforms and oral bacteria. Multidrug resistance (MDR) is becoming increasingly prevalent throughout all species of bacteria, including those that are pathogenic. Even so, the effects of tannic acid have been tested on very few MDR species, especially those possessing multidrug efflux pumps. Based on previous studies, I hypothesized that exposure to tannic acid would dramatically reduce the growth of toxigenic O1-Vibrio cholerae, as well as the KAM32 wildtype Escherichia coli, and mutants of KAM32 that have the pSP72 cloning plasmid and the EmrD-3 efflux pump from V. cholerae. Minimum inhibitory concentrations (MICs) were performed in octet and, using a 95% confidence interval, a two-tail t-test with 7 degrees of freedom was done which determined that there were significant differences of the mean light absorption in the “Growth” and “No Growth” wells. This indicates that tannic acid can inhibit drug-resistant strains of Vibrio cholerae. In addition, further studies may be done to examine whether or not tannic acid can be used as a modulator of the EmrD-3 efflux pump.

## **Mechanical and Vascular Responses of Young Women with Metabolic Syndrome: Association of PWA**

Presenter: Klaudia Szych

Author: Klaudia Szych

Research Advisor: Dr. Matthew Barlow

Metabolic Syndrome (MetSyn) is a physiological state highly correlated to the co-morbidities of cancer, hypertension, stroke and cardiovascular disease. As seen previously in this lab there is a vascular dysfunction transition from normal sedentary controls to overweight participants and the progression of this vascular decline is undetermined as the metabolic decline progresses. In this study we measured the vascular mechanical characteristics through the aortic augmentation index from Pulse Wave Analysis and compared it to the percent dilation, percent conductance, Systolic and Diastolic BP, radial PP, and the resting diameter. We measured these vascular parameters during the graded

dynamic hand grip exercise, between rest and two watts work load. In this study we compared the females diagnosed with MetSyn (n=11) to age matched sedentary controls (n=32). Correlations between these vascular functions and augmentation index were produced to identify if we could predict endothelial dysfunction in the control versus MetSyn women. Beat to beat blood pressure was recorded with CNAP tonometry at the fingers and blood flow was measured using the Doppler ultrasound (GE Vivid e12) with a 4-12 MHz linear vascular probe. PWA and PWV was measured on the carotid and radial arteries during supine rest using a SphygmoCor tonometry device and the vascular augmentation index was calculated. Patients diagnosed with MetSyn were categorized with meeting 3 of the 5 characteristics as determined by the American Heart Association and the NHANES III guidelines: waist circumference >38in, HDL< 50mg/dL, blood pressure higher 130/90 mmHg, fasting glucose >100mg/dL, and tri-glycerides >100mg/dL. We hypothesized that the MetSyn participants will have a higher vascular Augmentation Index and that this would be correlated to declining peripheral artery dilation during graded hand grip exercise. Thus the continual decline of endothelial function in this population may be identified using the non-invasive technique of arterial tonometry.

### **Poster Presentation Group 3**

#### **Bioremediation of High-Nutrient Dairy Wastewater in Indoor Air-Lift Photo-Bioreactors**

Presenter: Shaleen Gearhart

Author: Shaleen Gearhart

Research Advisor: Dr. Juchao Yan

We cultivate microalgae in eight sets of indoor Air-Lift Photo-Bioreactors to increase the algal morphology for easy harvesting and dewatering as well as for recycling and reuse of the purified water. The following cultures are used: a polyculture from the Algal Turf Scrubber® (ATS) site (freshwater), a polyculture consisting of half saltwater and half freshwater, and three pure cultures from UTEX of both freshwater and saltwater species. Three algal strains are selected: *Skeletonema costatum* (saltwater), *Dunaliella salina* (high-brackish saltwater), and *Chlorella* sp. (freshwater). By altering the concentration of the effluents, the algal processing will theoretically remove organic substances from the water that are otherwise inhibitory to the reuse prospects for the water. Our goal in the indoor cultivation in conjunction with the ENMU ATS project is to create a proof of concept. Do the algae in fact purify the wastewater? If so, what data can we collect to prove it? The nutrients that the algae will be consuming from

the wastewater set the upper limit for biomass production. The daily rate of biomass production should be hyperbolically related to the external nutrient supply rates. We have focused on testing organic weight, dry ash (silt) weight, pH, concentration of nutrients/effluent, total dissolved solids, conductivity, light intensity, light dark cycle, flow of air, and temperature. We have used a UV-vis spectrophotometer to determine an ideal optical density of the culture. All these tests and data will then come together to help support our argument that bioremediation could theoretically increase the morphology of the algae for the above purposes.

### **The Role of Electrostatic Interactions in Protein Stability for the AbpSH3 Domain**

Presenter: Benjamin Lantz  
Author: Benjamin Lantz  
Research Advisor: Dr. Elliott Stollar  
Award Winner

### **Pest Management in Organic Farming Using Coccinellidae and Chrysopidae**

Presenter: Heidy Ramirez  
Author: Heidy Ramirez  
Research Advisor: Dr. Lesley Judd

In organic greenhouse settings, it is possible for Aphidoidea to survive and reproduce year long. After a failed attempt of assessing the problem by exposing the plants to natural environment, pest management using predatory beetles was attempted. By having two controlled groups, one which contained plants with Coccinellidae, the other contained plants with Chrysopidae, an observation was able to be made as to which predatory beetle assessed the Aphidoidea problem the fastest. Observations and Aphidoidea counts were taken every week until there was an insignificant amount of Aphidoidea on the plants. Chrysopidae larvae proved to be fastest in minimizing the amounts of Aphidoidea on plants.

### **Assessing Uranium Concentration in Stream Sediment on the Laguna and Isleta Pueblos**

Presenter: Brianne Willis  
Author: Brianne Willis  
Research Advisor: Dr. James Constantopoulos

As a summer internship through a New Mexico EPSCoR funded STEMAP program. Myself and another intern worked with the uranium team at New Mexico Tech. We collected sediment samples above and below uranium mines from streams and washes on Laguna and Isleta Pueblo lands. Samples were collected from the Rio Puerco, San Jose, Del Valle, and Paguete washes to analyze the heavy metal content washing down from upstream uranium mines. Knowing the type and quantity of heavy metals washing down these washes, could help with further clean up or reclamation efforts in the area.

The samples were dried, sieved, ground into a fine powder, then digesting in acid. Analysis of heavy metals was done using an ICP-MS for heavy metal content. We also performed a mass fraction of grain size on each sample to get a course sand content vs. the finer grain content.

Our hypothesis being that uranium particle adheres to the larger surface area by volume of the clay material better than course sand, due to surface charge and geochemical processes.

Uranium concentrations were present on samples we collected from the washes downstream of the main uranium mines. Our data also supported our hypothesis when we correlated the amount of finer grained material a sample contained with the concentrations of uranium that was present in that same sample. Sites G,H,I the fine grain fraction of C and the course grain fraction of B held the highest concentration of uranium. Which was above the average Earth's background uranium concentration of 3 mg/kg.

Natural uranium and the environment. (n.d.). Retrieved March 02, 2017, from <http://www.irsn.fr/EN/Research/publications-documentation/radionuclides-sheets/environment/Pages/Natural-uranium-environment.aspx>

## **Can we adopt spring canola with critical stage based irrigation in Southern High Plains**

Presenter: Krishna Katuwal

Author: Krishna Katuwal

Research Advisor: Dr. Young Cho

The U.S. Southern Great Plains (SGP)' irrigated agriculture heavily depends on the Ogallala aquifer. However, extensive use of ground water for irrigation has significantly depleted the Ogallala aquifer, leading the system to be unsustainable. There is a need for identifying alternative crops with less water requirement compared to traditional crops. The objective of the study was to assess growth and yield of spring canola (*Brassica napus* L.) under deficit irrigation. Three diverse spring canola cultivars were grown under four different irrigation treatments; fully irrigated (FI), stress at vegetative stage (VS), stress at

reproductive stage (RS) and dryland (DL). Aboveground biomass partitioning into reproductive structures including flowers and pods was greatest in VS followed by FI, RS and DL. It led highest harvest index in VS. High plant biomass as FI, but low plant height as DL was observed in VS. Seed yields of FI and VS did not differ significantly and remained higher compared to RS and DL in both years; similar trend was observed in oil yield. The seed and oil yields did not significantly differ among the cultivars in 2015; however, L140 recoded the highest seed and oil yields in 2016. Plant biomass, leaf area index (LAI), 1000-seed weight, pods plant<sup>-1</sup> and seeds pod<sup>-1</sup> were the drivers of high seed and oil yields. The results of the study indicated that adoption of spring canola as an alternative crop with skipping irrigation at vegetative stage can save water without significantly reducing crop products, thereby good for growers in SGP.

### **Structural studies of AbpSH3 complexes**

Presenter: Valeria Jaramillo Martinez  
Author: Valeria Jaramillo Martinez  
Research Advisor: Dr. Elliott Stollar

Proteins are the workhorses of the cell and the most common function they perform involves binding to other proteins to relay signals in a pathway, to modify each other's behavior or contribute to a specific supramolecular complex. Most proteins contain independently folded domains that perform a distinct function, and a major class of these domains are called protein interaction domains. The most common interaction domain in animals is the SH3 domain that contains over 300 family members in humans and yet it is unknown how these repeated domains encode specific information for each family member. Our lab has studied the SH3 domain from the yeast protein Abp1p (AbpSH3) as a model for extended peptide interactions and the subject of our directed evolution studies. In order to obtain structural insights into these complexes, we have optimized a domain-peptide hybrid to solve its structure by NMR.

Over-expression/purification of the isotopically labeled hybrid will lead to a structure using automated methods in collaboration with the Texas Tech facilities in Lubbock, Texas. We hope that this study will form the basis for other structure determinations using NMR.

## Poster Presentation Group 4

### **New Mexico's Infrastructure and Economic Growth**

Presenter: Jennifer Bodley  
Author: Jennifer Bodley  
Research Advisor: Dr. Sue Stockly  
Award Winner

After events such as the Flint, Michigan water crisis and flooding caused by the Oroville Dam, infrastructure in the United States has become a controversial topic. Many lawmakers are pushing to restore infrastructure to avoid further damages and harm. This research project was conducted to determine how state spending on infrastructure has affected New Mexico's GDP from 1963 to 2014. The correlation between the two aforementioned variables will be tested by performing a multilinear regression. The dependent variable is New Mexico's GDP and the primary independent variable is the state's spending on infrastructure. The control variable is New Mexico's population growth during the specified time period. If state spending on infrastructure increased in large enough increments when taking into account population growth, then the New Mexico's GDP will be positively affected and will grow in response. This will show that money spent on infrastructure stimulates the economy and encourages economic growth. The policy implication of this is that larger sums of money in state budgets should be allocated to infrastructure.

### **Federal Debt: How it Affects Long Term GDP**

Presenter: Jared Gay  
Author: Jared Gay  
Research Advisor: Dr. Sue Stockly

The federal debt has been a topic that comes with a lot of concern and speculation. Debt is how the United States funds a lot of their production. So that bring in the question, how does the federal debt affect GDP growth over time? There will be a multilinear regression computed in order to see how all of the factors of GDP are impacted by the federal debt. The dependent variable in this case will be five year GDP, or the real GDP per capita growth rate. The independent variable is the real debt, technology and the unemployment rate. As a result of this research, it is expected to be found that the independent variables, which are real debt, technology and the unemployment will have a positive effect on the

dependent variable. There should be an increase in those three variables, and as a result an increase in GDP should also be seen. The federal debt is that it is not something that last for years and years at a time. It is something that starts over each year, as the U.S uses its debt to increase their production and it is paid back rather quickly. It will be determined which factors play a bigger role on how much the GDP increases or decreases. As a result of that we will know which areas to increase in order to increase our GDP. The possible policy implications for these topic will include increasing or decreasing the number of issued T-bills. If the federal debt helps GDP growth then the borrowing will be supported and if GDP goes down over time then borrowing will be discouraged.

### **Health Insurance Influence on Employment**

Presenter: Hannah Gomez

Author: Hannah Gomez

Research Advisor: Dr. Sue Stockly

Over the past 15 years, the topic of health care coverage has become a very controversial topic in the United States. Some lawmakers are pushing to increase the amount of coverage for government funded programs to ensure everyone has access to the care needed to become healthy. This research study is being conducted to determine how insurance coverage has affected employment from 1999-2016. The relationship between these two variables will be tested through a multiple regression analysis. The dependent variable is the unemployment rate and the primary independent variable is the uninsured percentage. The control variables will be the level of education and gross domestic product per capita. If the amount of uninsured people decline, then the unemployment rate will also decline. This will show that as people become insured, they become healthy enough to seek employment and help stimulate the economy. The policy implication of this is that more government funded coverage should be provided so that people can gain access to the care needed to contribute to society in a significant way.

### **Minimum wages effect on Job Market Discrimination**

Presenter: Caroline Rousculp

Author: Caroline Rousculp

Research Advisor: Dr. Sue Stockly

In today's economy the general public is concerned that the minimum wage is too low, especially for minorities. This research will look into how

changes in the minimum wage affect job market discrimination. Data between 1965 and 2015 will be analyzed to look at if the level of unemployment changes when the minimum wage changes. These data will be analyzed using a multi-linear regression model. The dependent variable for this research will be the unemployment rate by race and the primary independent variable will be the minimum wage. This research also contains two independent control variables which are the U.S. Real GDP per capita and the second is average education attainment, also by race. The results are expected to show that a positive relationship is shown from the data collected. The higher the minimum wage the higher the unemployment rate. With the data results the light that should be shed on this important problem would be that as minimum wage increases job market discrimination decreases. The policy implications could include changes in minimum wage either increasing or decreasing how much the average person makes changes the outcome of job market discrimination. Policy decision makers could use this research to improve current programs or develop new ones so that people are happy with the lifestyle that is put in front of them.

### **Does Health Insurance Coverage affect the Rate of Abortions?**

Presenter: Casandra Torres

Author: Casandra Torres

Research Advisor: Dr. Sue Stockly

Over the span of several decades the United States has come to face with a topic of high controversy and conflict, abortion. In more recent years, the matter of health insurance has also come under fire, threatening policies such as the Affordable Care Act. Women are particularly alarmed as it allows for easier and cheaper access to birth control and other preventative services, as it eliminates co-pays and deductibles.

This study focuses on the relationship between health insurance coverage and the number of abortions performed within the United States. The methodology utilized is multivariable regression, with data ranging from 1998-2013. Accessed through the CDC is the dependent variable, the number of abortions performed. Via the U.S. Census Bureau, the percentage of Americans covered under insurance policies, the independent variable, was found. In addition to this, two control variables were applied. The first, real GDP per capita, retrieved from the Bureau of Economic Analysis, represents changes in both the population and business cycle. The second, the average age in the U.S., found with the U.S. Census Bureau, epitomizes the presumption that as the average American ages, the rate of abortions will decrease. Results of this research are expected to demonstrate an inverse relationship between the health insurance coverage and

the abortion rate. Policy implications are targeted toward policy makers focused on decreasing the quantity of abortions performed by increasing the standards of health care.

### **Poster Presentation Group 5**

#### **Survival and Emotions in Natural Disaster Victims**

Presenters: Jamie-Ann Eggert, Kohlby McInnes  
Authors: Jamie-Ann Eggert, Kohlby McInnes  
Research Advisor: Dr. Gary Bond

Few studies have focused on behaviors of people who anticipate and face threat in real disasters, and few have used qualitative methods to examine experiences of victims of natural disasters before, during, and after the threat. A transcendental phenomenological investigation assessed experiences of Filipino survivors who were residents of central Philippines (ages 27-84) 2.4 months after the Philippines' strongest super-typhoon. Memory accounts for the typhoon were detailed. The essence of survival focused on avoiding threats such as flying debris, uprooted trees, and accumulations of water; family and community anticipating and facing the threat, and striving to find resources and rebuild together. Appraisals of changing threats and contexts placed anxiety, fear, and surprise at the essence of emotional experiences. Implications are that survival in a typhoon, hurricane, or tornado event requires central focus on objects moving through space and accumulations of water, and securing strong shelter against the storm.

#### **Effects of walking vs sitting on working memory and verbal recall memory functioning**

Presenters: Troy Hardy, Rylie Lee  
Authors: Troy Hardy, Rylie Lee, Destiny Quezada, Jessica Montgomery, Matthew Fuss, Victoria Stroud, Leah Taylor  
Research Advisor: Dr. Leslie Gill

This research is intended to determine if there is a statistically significant difference in memory recall and verbal functioning between subjects while walking and sitting.

Experiment procedures involved assigning test subjects to either group based on random assignment process. Testing was performed by two separate

tests that involved: Answering a series of true/false questions and recalling the last words of each sentence, and repeating a series of sentences and non-associated target words. On each test, sentences were grouped, starting with two and increasing one sentence at a time.

Scoring involved correctly answering the true/false questions and recalling the target words in the correct order on the first test. At the point where the subject correctly answered the true/false question, and correctly recalled the final words in the sentences, the number of sentences in that set is the individual's result. On the second test, subjects were scored by repeating the sentences and the non-associated target word. Again, the last set of correctly recalled sentences and target words was subject's final result.

Our expectations are inline with previous research which has determined that exercise, even as simple as walking, exhibits a positive impact on working memory.

Researchers involved in performing this study include: Troy Hardy, Rylie Lee, Destiny Quezada, Jessica Montgomery, Matthew Fuss, Victoria Stroud, and Leah Taylor.

## **Political Deception in 2016 Presidential Debate**

Presenters: Rebecka Holman, Rebecca Rustige

Authors: Rebecka Holman, Rebecca Rustige

Research Advisor: Dr. Gary Bond

The language of the 2016 U.S. presidential primary campaign season was contentious, filled with name calling, personal attacks and insults. Whether spontaneous or premeditated, deceptive language in the primary debates served at least three political functions: for personal image-making and to devalue other candidates' images; to imagine possible realities currently not real; and to challenge and disavow facts. Several research studies have shown that the Reality Monitoring (RM) framework discriminates accurately between accounts that are truthful and deceptive, where truthful accounts should show greater sensory-perceptual information, contextual time and space information, and affective information, with little evidence of cognitive operations. An algorithm was constructed based on RM and used with Linguistic Inquiry and Word Count (LIWC) software to automatically code debate statements. Those statements were contrasted with fact-checked ground truth and lie statements from two Democratic and six Republican candidates for U.S. President in the 2016 primary. Results showed that RM scores were significantly higher in fact-checked truth statements than lies and that candidates' debate language in the 2016 primaries was as deceptive as fact-checked lies. The RM framework reliably distinguished

truth from lies and debate language in this research. Classification rates were 75.65% for truth statements, and 64.0% for lie statements.

### **The Effects of Walking or Sitting on Recall**

Presenters: Angelica Martinez, Michelle Bailey Thetford  
Authors: Angelica Martinez, Michelle Bailey Thetford  
Research Advisor: Dr. Leslie Gill

With so many people in the work force and obesity and health issues on the rise, it is crucial to attempt to aid this situation. The majority of our nation has long work hours, and for a large percentage that means being in the sitting position. Health benefits of walking during work hours are apparent, but it would be counter-productive for companies if work performance is hindered by allotting time during the work day to walk. Labonté-LeMoyné, Santhanam, Léger, Courtemanche, Fredette, & Sénécal (2015) report that there have been three studies conducted using psychometric tests to investigate the cognitive processes during the use of a treadmill desk, where it was found that walking while working has no deleterious effects. The work cited above led the researchers to this study, in efforts to determine if there is a difference in recall in either walking or sitting exercises.

### **Vegetable Exposure as a Function of Vegetable Acceptance in Preschoolers**

Presenters: Estephanie Mendes, Amanda Gonzales  
Authors: Estephanie Mendes, Amanda Gonzales  
Research Advisor: Dr. Charles Broz

Because of the benefits of eating fruits and vegetables, and because childhood dietary patterns are associated with food patterns later in life, encouraging children to eat more fruits and vegetables is a public health priority (Kim, 2014). Attention has focused on the Hispanic population, of which Mexican-Americans are a subset, because they are the fastest-growing ethnic minority in the United States and remain understudied. Studies of Hispanic children have found that dietary intakes of vitamin A, vitamin C, calcium, and iron were below the Recommended Dietary Allowances (RDAs) (Zine, 1995). In addition, studies have shown that over half of obese Hispanic children are dangerously lacking in vitamin D (Turer, et al, 2013).

This experiment was designed to test if exposure to vegetables can increase vegetable consumption in children. Such an increase could have a positive impact

on preschoolers' development, as well as the potential to alter their food choices later in life.

Preschoolers' acceptance of the test formulations was measured by qualitative and quantitative methods. Researchers utilized direct observation of meal consumption from a mirrored observation room, thus allowing them to gauge children's acceptance of the foods. Each lunch service was also filmed, for the same purpose. Qualitative data were analyzed verbatim, by independent researchers, with an inter rater reliability of 87.6%.

In addition, all foods were measured by weight before service, and uneaten portions were weighed post-service to quantitatively determine acceptance. Preschoolers who participated were exposed to vegetable formulations during the course of their typical lunch meal. Participants were not informed that lunches contained test formulations.

### **Eating Attitudes and Behaviors in Female College Athletes and Non-Athletes**

Presenter: Emma Moyer

Author: Emma Moyer

Research Advisor: Dr. Leslie Gill

Award Winner

The purpose of this study is to examine the relationship between participation in college athletics and eating attitudes/behaviors. Most previous research in this area focuses on other contributing factors of, or the success of recovery from negative eating attitudes only in college athletes. There is far less research comparing the athlete versus non-athlete demographics, and the results of such research are conflicting. One goal of this study is to help to provide more information in that specific area. Eating disorder risk among the two groups was assessed using the Eating Attitudes Test 26. Nonathletes had higher average scores on the Eating Attitudes Test than athletes. The difference in scores could indicate that participation in college athletics does have a positive effect on improving behaviors and attitudes towards eating. This type of comparison of demographic groups can provide new insight to possible factors contributing to eating disorder risk.

### **Creativity Enhancement**

Presenters: Brook Steen, Mary Smith

Authors: Brook Steen, Mary Smith

Research Advisor: Dr. Leslie Gill

The purpose of this study is to get a general idea of what helps in improving creativity. This study is designed to test whether walking vs. sitting and being outside vs. inside affects creativity. It is based on physical activity and its effectiveness on creative ideation. Observing how physical activity and the simple action of a brisk walk can enhance the creative aspect and help those looking for a new perspective and creative ideas of knowledge expand past their mental blockage. This could be used as a tool to help with tasks requiring creative thinking.

### **Poster Presentation Group 6**

#### **Analysis of the Effects of Student Performance to their Success**

Presenters: Ernestina Guzman, Christel Barnett

Authors: Ernestina Guzman, Christel Barnett

Research Advisor: Dr. Weizhong Tian

Using data from the Psychology Department for students who attended Eastern New Mexico University between 2006 and 2014 a computer program was written to determine the effects of student's performance through identifying high risk courses. High risk courses are defined as courses that students traditionally do poorly in and can be used to predict a student's GPA based on the grade earned in the course. The data has been divided into two groups, one data set for first generation students made up of 80 students and the other data set for non-first generation students made up of 68 students. Information was gathered for students with GPAs of Great Success (3.0-4.0), Success (2.0-2.9), and Unsuccessful (1.9 and below) and high risk courses were evaluated for each category. High risk courses were evaluated at the 200 and 300 course levels. This method can be used to help instructors identify and reach out to students who do poorly in a high risk course in order to preserve a student's GPA.

The high risk courses for both first generation and non-first generation students with GPAs in the Great Success category are PSY 202 and PSY 335. The 200-level high risk course for both first generation and non-first generation students with GPAs in the Success category is PSY 202. The 300-level high risk course for first generation students in the Success category is PSY 335, while non-first generation students in the same category have the high risk courses PSY 302, PSY 337, and PSY 338. First generation students with GPAs in the Unsuccessful category did poorest in PSY 312, while there was no appreciable difference in the grades of the 200-level courses taken for this category.

## **Solar Energy Overview and Maximizing Power Output of a Solar Array using Sun Trackers**

Presenters: Davi Mondragon, Jose Mondragon

Authors: Davi Mondragon, Jose Mondragon

Research Advisor: Dr. Hamid Allamehzadeh

An overview of solar energy technology is discussed briefly. To increase the energy efficiency of a solar array, maximum power output is desired. There are three major approaches for maximizing power extraction from a solar array. They are sun tracking, maximum power point (MPP) tracking or a combination of both. The sun-tracking design can increase energy yield up to 50% over the year compared to the fixed-array design. The purpose of this paper is to present a dual-axis sun tracker motor. A similar approach is used to track the sun movement from North to South over the period of a year. To ensure both motors are not activated at the same time, a logic circuit is created to allow voltage and current flow to one motor through switch controls. Finally, the design circuits are implemented in laboratory and the overall performance of the composite system are evaluated.

## **Solar Powered Golf cart with Speech Recognition**

Presenters: Karen Gutierrez, Alan Garcia

Authors: Karen Gutierrez, Alan Garcia

Research Advisor: Dr. Hamid Allamehzadeh

In this report, we document the research and engineering practices that were used to design a solar powered golf cart with speech recognition. We also discuss the construction of the solar panels on the cart, as well as the software involved in speech recognition design. We then will use these techniques to do some basic functions, for example one will be to turn on a light at first and eventually working our way to turning on other aspects of the golf cart. The main components of the system include a speech recognition board that will be used to recognize individual voices. A SpeakUp Click board will be set up which will allow us to personalize codes to certain individual voices that will then turn on specific sections of the golf cart.

## **Media Use in Education: Enhancement or Distraction?**

Presenter: Christie Fowler

Author: Christie Fowler

Research Advisor: Dr. Karen Copple

Award Winner

With the invention of the smart phone, students are capable of receiving streaming information from around the world 24 hours a day. Entertainment is always available. Educators feel the pressure to incorporate more media in the classroom in order to enhance the relevance of the information being presented and compete with the multimedia interests of the students and their shortened attention spans. Is it possible, due to the media needs of today's student, that they are becoming more passive rather than active learners? Active learning has been defined as "meaningful learning activities that require students to think about what they are doing," and there is empirical evidence supporting an active learning approach in the classroom. If media use contributes to making students passive learners, what affect is this having on their learning and retention of information? The purpose of this study was to determine whether students who read in preparation for a quiz will learn or retain more than students who watch a video. Thirty-eight undergraduate college students were randomly divided into two groups. Twenty-three students watched a video and fifteen students read the transcript of the video. Each participant took a short quiz immediately afterward, and then took the same quiz again one week later. The group who watched the video scored significantly lower on the initial quiz than the reading group. The reading group showed a greater difference in mean scores on the second quiz, but still scored a higher average than the video group. However, the difference in scores between the groups on the second quiz was not significantly different. It appears that students reading the information were active learners and were able to learn more than the video group. This implies that educators should continue to look for ways to enable students to become active learners and avoid methods that make students passive consumers of classroom information.

## **Exploring the Effects of Economic Hardship (Poverty) on Children and their Academic Performance**

Presenter: Kris-Ann Walters

Author: Kris-Ann Walters

Research Advisor: Dr. ShinHwa Lee

Previous research asserted that socioeconomic background is one of the strongest and best established predictors of academic performance. It indicated that the economic disadvantage can depress student's academic achievement through multiple mechanisms including (but not limited to) reduced access to educational resources, higher levels of stress, poorer nutrition and reduced access to health care. Despite an increase in the number of children in poverty and significance of issues they have, research exploring their difficulties is limited. Thus, this research aims to:

Explore the qualitative aspect of this issue.

Provide in-depth qualitative data of difficulties that students in poverty experience.

### **Poster Presentation Group 7**

#### **Food for Thought**

Presenter: Kacie Bartlett

Author: Kacie Bartlett

Research Advisor: Ms. Nicole Bougie

The purpose of this study is to determine the impact of low glycemic foods and drinks versus high glycemic foods and drinks on a child's short-term memory. The Glycemic Index is a rating scale used to determine the impact food or drinks have on the body's blood glucose levels. The Glycemic Index can be rated as high, medium, or low based on the scores they receive. Low Glycemic is considered as score of 55 or lower (e.g. fruits), medium is considered as scores between 56 and 69 (e.g. oat bran & raisins) and high glycemic is considered as a score of 70 or higher (white rice & fruit drinks). Higher scores on the Glycemic Index cause glucose levels to spike rapidly. This study will compare high glycemic foods and drinks and low glycemic foods and drinks and determine which is most optimal for a student's performance during activities that require short-term memory. This study is important because memory can be linked to a child's school performance and can provide valuable information to teachers, school administrators, speech therapists, and parents. This study consisted of two sessions, one week apart and included 30 participants who attended Gateway Christian School in Roswell, New Mexico; participants grade levels ranged from 4th to 6th grade. On the first day of the study, half of the students consumed high glycemic foods/drinks and the other half consumed low glycemic foods/drinks. Thirty minutes after consumption the students were administered three short-term memory tasks. One week later the same procedure was implemented but the

students who first consumed high glycemic foods were given low glycemic foods and students who first received low glycemic foods were given high glycemic foods. The memory tasks were scored and a repeated measures t-test was used to determine if there was significant difference between high glycemic foods and drinks and low glycemic foods and drinks on the participant's memory.

## **IEP What? Parental Knowledge & Understanding of IEP Processes**

Presenter: Liliana Borunda

Author: Liliana Borunda

Research Advisor: Ms. Nicole Bougie

Parents are increasingly being exposed to special education due to an increase of students receiving individualized education plan (IEP) services under the federal law, Individual with Disabilities Education Act (IDEA, 2004). Data from the United States Department of Education states that during the 2013-2014 school year, approximately 6.5 million (12.9%) of students in public schools received special education services under IDEA. These students come from backgrounds that include parents with different educational levels, ages, and socioeconomic status. This study aimed to understand parents' knowledge of IEP processes and how they relate to speech therapy services. The study also explored overall understanding of the IEP procedures. A survey collected demographic information with a total of 10 questions about the IEP and its association to speech therapy. There were five questions over IEP processes that included procedural safeguards and parental rights. The five speech therapy services questions on the survey included eligibility criteria and service delivery. Participants were 18 and older and had a child currently receiving special education in the public schools. The number of surveys completed totaled 102 with a completion rate of 69%. A Pearson's  $r$  assessed the relationship between the five questions of IEP procedures and the five questions of the IEP as it relates to speech therapy services. Knowledge of IEP procedures and speech therapy services were moderately positively correlated,  $r(100) = +.45$ ,  $p < .05$ , two tails. It appears that the more parents knew about the IEP procedure, the more they knew about speech therapy services. Parents in Group A had five or more years of experience with an IEP and those in Group B had 1-4 years of experience. A t-test for independent measures was used to compare overall survey results between the groups and revealed no significant difference,  $t(100) = .68$ ,  $p = .49$ .

## **The Effects of Watching Between the Lions on Phonological Awareness.**

Presenter: Alejandra Del Hierro

Author: Alejandra Del Hierro

Research Advisor: Ms. Nicole Bougie

There are many educational television shows that help children learn skills that will benefit them in their academic life. The objective of this study is to demonstrate how the series "Between the Lions" (BTL) promotes phonologic awareness to potentially help children ages 5-8 increase their literacy skills. Four participants were assessed using The Phonological Awareness Test (PAT-2) to establish baseline of the participant's phonological awareness skills. The participants were then exposed to 30 episodes of BTL in the span of 30 weekdays. During this time parents were asked to fill out a weekly survey to rate the participant's attention to the show. Overall attention was rated as 75% "attentive, no re-direction needed" and 25% as "attentive, but had to redirect once or twice to pay attention to the show" during the 5-week study period. After the participants were exposed to the show, the PAT-2 was re-administered to determine any gain scores. The scores obtained were compared using a paired t-test, to see if there was statistical significance, and where the significance lies. The results demonstrated that watching Between the Lions does have a positive effect on phonological awareness skills, as all the participants demonstrated improvement after watching the show. A repeated-paired measure t-test, was also used to measure improvements in the subtests scores. The subtest included six important phonological awareness skills; rhyming, segmentation, isolation, deletion, substitution and blending. Only two subtest demonstrated significant difference, Rhyming pre-test scores (M=66.75, SD=5.19) and post-test scores (M=87.00, SD=8.41);  $t(3)=3.50, p<.05$ , and Substitution pre-test scores (M=85.00, SD=6.38) and post-test scores (M=102.00, SD=8.41);  $t(3)=2.13, p<.05$ . These results suggest that BTL had the most impact on these two phonological awareness skills. These results are promising, as they suggest that print presented through television can have a positive change in early literacy skills. Teachers, parents, and therapist can use BTL as a tool to help the struggling reader with their early literacy skills.

## **Sit Up to Speak Up!**

Presenter: Sarah Eilert

Author: Sarah Eilert

Research Advisor: Dr. Suzanne Swift

Award Winner

Speech-language pathologists have historically considered traditional articulation therapy to be the best method to correct articulation disorders; however, research studies have documented the success of gross motor flexion exercises to facilitate /r/ phoneme production in elementary-age participants who are delayed in their acquisition of the /r/ phoneme (Swift & Havens, 2013; Swift & Plummer, 2011). Yet, no previous study has investigated if gross motor flexion exercises will facilitate correct /r/ production in a young preschool-age participant who is unable to produce the /r/, but is not “delayed” in the acquisition of the /r/ phoneme (i.e., the child does not yet produce the /r/ phoneme but is young enough that this is not an age appropriate expectation). This research study purposed to answer the following research questions: Will gross motor flexion exercises establish /r/ production in a three-year-old participant who is not developmentally ready to produce /r/, and do these findings complement previous research for /r/ flexion exercises?

In a single subject experimental withdrawal research design, a three-year-old participant completed gross-motor movement exercises (e.g., sit-ups and crunches) to facilitate fine-motor movements in the tongue necessary to produce /r/. The study lasted a total of nine weeks with six weeks of treatment and three weeks for baseline, withdrawal, and observation. Results indicated that gross-motor flexion exercises were not successful in stimulating consistent /r/ production in the three-year-old participant, yet the participant demonstrated some success producing the /r/ phoneme with the /gr/ and /kr/ blends when her gross-motor flexion movements were coordinated with her /r/ vocalizations. These findings suggest that /gr/ and /kr/ are excellent phonemes to begin /r/ therapy, and also that no amount of stimulation will “speed up” the development of a physiologically immature motor system. Overall, the study’s results indicate that gross motor flexion therapy is not effective for participants who are not developmentally primed to complete elevated retroflexed phonemes, and participation in therapy does not give preschool children a head start in their phoneme production. Future research should seek to establish the youngest age where gross motor flexion exercises are effective and additional gross motor flexion movements which can stimulate the development of other speech sounds. These findings provide valuable implications for future research and speech articulation therapy.

## **Reading “Blooms” with SQ4R**

Presenter: Shelby Halcomb

Author: Shelby Halcomb

Research Advisor: Dr. Suzanne Swift

The practice of assigning various reading materials is very common in school settings across all grade level. Reading comprehension plays a crucial role in a person's life experiences and academic/professional successes. Students who cannot comprehend what they read are at risk for failure and are typically identified for remedial instruction and/or intervention. The purpose of this study was to examine the effectiveness of one such intervention in facilitating increased reading success.

This study investigated the effectiveness of the SQ4R reading comprehension technique coupled with Bloom's Taxonomy questions on improving the reading comprehension of three elementary school-aged children. Three subjects aged 10-12 identified by their parents as struggling with reading comprehension completed this quantitative single subject experimental A-B-A study. Subjects were pre-tested with both standardized and criterion-referenced assessments, received intervention four times a week for five weeks, and then post-tested with the same measures used for pre-test. During the treatment phase, each child was provided with a reading passage at the beginning of each session and then asked to develop six questions about the passage using the Bloom's Taxonomy hierarchy as a session pre-test. The researcher and participant then reviewed the same reading passage and re-read it while implementing the SQ4R program. At the end of the session, the child then answered the same six questions created at the beginning to measure their progress from the session.

Results of this study were analyzed with descriptive statistics by using percentage of correct response (PCR) and standard deviation comparisons. Additionally, results were analyzed with inferential statistics using gain scores, t-tests, and a one-way ANOVA for repeated measures. Statistical analysis revealed significant improvement in reading comprehension across all subjects and significant improvement in oral reading accuracy for one subject. While each subject in this study made significant improvement in reading comprehension, future research with larger sample sizes would be beneficial to determine the generalization of results to other children of similar backgrounds as well as other populations.

### **Living with autism: the impact of SES**

Presenter: Andres Haro

Author: Andres Haro

Research Advisor: Mr. Dwayne Wilkerson

Research has shown that autism causes parental stress and has an influence on different aspects of family life. This qualitative study examines

the influence that socio-economic status has on the family experiences when raising a child with Autism. This study sampled from two communities in California: Manhattan Beach and Lennox. The Manhattan Beach community is predominantly Caucasian with a median household income of 139,259. The Lennox community is predominantly Hispanic with a median household income of \$37,659. Twenty-three families were sampled from focus groups. Key-informant interviews were conducted in the participants' homes to gain a better understanding of the family perspectives. The main question was driven by a set of sub-questions: How does SES affect family relationships with a child with autism? How does SES affect employment with a child with autism? How does SES affect schooling choices with a child with autism? How does SES affect community involvement with a child with autism? How does SES affect income with a child with autism? The major themes of this study included family, education, money, and time. The outcomes of the study demonstrate the influence that SES has on the daily lives of families with a child with autism. Extended family dynamics in the Manhattan Beach community are not as important as it is in the Lennox community. Employment in both communities is vastly different and because of it time and money are viewed differently. Community involvement in the Manhattan Beach case is important because results show that the community is the "extended family." On the other hand, the Lennox community uses their extended family as their community. Income is what drove this study. Income affects both communities greatly, although there were some families that thought it was not a factor. These findings have relevant implications that can help service providers understand the environments of two very different communities. Further research is needed in order to better understand the dynamics of the diverse communities that exist in the United States. This will not only help service providers the dynamics of income but also class and race/ethnicity.

### **Word Art: Learning Vocabulary in Style**

Presenter: Noori Mulji

Author: Noori Mulji

Research Advisor: Mr. Dwayne Wilkerson

Previous research has shown that vocabulary knowledge has an impact on reading comprehension and overall academic success on formal testing in schools. Currently, there are several methods used to learn vocabulary including reading aloud, word mapping, embedded definitions (context-based), etc, but using stylized words is not one of them. Students may better retain vocabulary knowledge they learn with additional graphic cues. "Stylized words" refer to

words that have added pictures or graphics that pertain to the word's meaning. The goal of this study was to examine the effect of teaching stylized words compared to traditional typed words on vocabulary test scores. The results of this study may benefit educators and speech-language pathologists to use stylized words as a tool to help improve students' vocabulary acquisition. This quantitative post-test experimental study involved thirty third- and fourth-grade students divided into two groups and taught vocabulary words using either traditional or stylized word flashcards. A screening was conducted using vocabulary words two grade levels above their current grades to eliminate test score data of subjects who are already familiar with most of the words; however, no subjects were familiar with more than half the words. No pre-test was given to eliminate influence on the post-test scores. Six teaching sessions were conducted at an afterschool program facility to teach both groups a set of twenty vocabulary words using the two different flashcard methods. Afterward, a post-test was given to all students and scored by the researcher and an inter-rater. The results indicate that there was no significant difference between the scores of the two groups and the stylized words were just as efficient as traditional words; however, the subjects expressed that the stylized word flashcards were more interesting than traditional ones. Additionally, confounding variables such as the number of subjects, location, time of year (this study was conducted in fall semester), and motivation level may have influenced the post-test performance. The availability of stylized words for teaching is another influential factor—for this study, the flashcards were handmade by the researcher. In other settings, teachers and speech-language pathologists may not be able to easily or quickly create stylized words as a potential tool for improving vocabulary acquisition. Further research of added graphic cues on vocabulary learning is recommended to fully understand the effects on a larger scale.

### **Don't DIS my ABILITY: Student Academic Performance**

Presenter: Collin Oswald

Author: Collin Oswald

Research Advisor: Dr. Suzanne Swift

Introduction: Speech-language pathology (SLP) graduate programs are highly competitive and academically challenging. They require that students achieve "entry level competence" in a large number of objectively measured academic knowledge and practicum skills outcomes, as well as passing a national exam in speech language pathology content across the scope of practice and lifespan. This presents a notable challenge for all students, but perhaps is even more formidable for students with disabilities (SWD). This research was

designed to investigate this question. Determining the number of disabled SLP students, detecting any differences in academic performance between students without disabilities (SWOD) and SWD, and identifying type/effectiveness of accommodations commonly used were the primary focus of survey questions. Methods: This quantitative study utilized 2 electronic surveys: one for SLP graduate students/alumni and one for faculty and program administrators. The student/alumni survey presented 19 objective and subjective questions, while the faculty survey contained 12 questions regarding accommodations and progress of students with disabilities in SLP graduate programs across the United States. Both surveys were pilot-tested, then emailed to Program Directors of all accredited SLP academic programs (n=263) for distribution to both students and faculty. Student surveys were additionally posted on Facebook to increase availability to interested students.

Results: Survey responses were analyzed using descriptive statistics and ANOVAs. 714 student/alumni and 113 faculty members provided responses. Data showed that 22.27% of respondents were SWD, with 91.19% of those disabilities being permanent. The most common disabilities identified were ADHD, mental/psychiatric, and learning disorders. An ANOVA to determine difference in GPA and practicum/internship grades found no significant difference  $F(3, 4) = .01, p = 0.998524$ . Another ANOVA revealed there was significant difference between SWOD and SWD in the number of repeated courses, extended length of matriculation, and the incidence of academic probation, with SWD showing significantly higher frequencies in all of these identified areas -  $F(1, 5) = 8.54, p = 0.032925, \eta^2 = .1295$ . In addition, 61.88% of SLP graduate SWD did not use accommodations. Those who did use accommodations reported that extended time was the most common (27.50%). Though this was the most frequent response, only 19.50% of students/alumni with disabilities rated accommodations as "very effective," while the most frequent rating for faculty (39.82%) was merely "effective."

Conclusion: 22.27% of SLP students responding to this survey had disabilities. This study revealed that these students achieved the same GPA and internship/practicum grades as non-disabled students, but that they were required to repeat courses, extend their matriculation, and were placed on academic probation more often than SWOD. The most commonly used accommodation was extended time.

## Poster Presentation Group 8

### **Language Up! Effects of Pragmatic Instruction and Reinforcement Language Styles on Player Performance**

Presenter: Lindsey Barron

Author: Lindsey Barron

Research Advisor: Dr. Karen Copple

Previous research has shown a positive correlation between different coaching styles and an athlete's emotional well-being and performance level. The purpose of this study is to examine the effects that positive, negative, and non-committal language styles had on a baseball player's performance during batting practice and the effect that these different styles had on the perception of self-efficacy of the athletes. This study used a quasi-experimental, between-group design without a pretest. Forty-five male baseball players between the ages of 12-14 were randomly assigned to three different groups, each being coached with a different language style during batting practice, and then immediately interviewed on their perception of the coaching style. Results concluded that no significant difference exists in batting performance between positive, negative, and non-committal language styles ( $p > 0.05$ ) and that no significance exists in the effect of those language styles on perception of self-efficacy ( $p > 0.05$ ).

### **Social and Ready to Mingle**

Presenter: TymberLee Durham

Author: TymberLee Durham

Research Advisor: Dr. Adrienne Bratcher

The use of social stories for children who have autism is a common form of speech and behavior therapy. Social stories are said to improve behavior and pragmatics conjointly in children who are preschool to school aged. This study examined the effects of social stories and whether or not they would improve pragmatic/social skills in a child who has autism and was under the age of four. There is limited research regarding social stories and their effectiveness outside of the school aged population. This study assessed the comprehension and generalization of pragmatic skills through social stories. The participant completed baseline testing prior to intervention to determine his social interaction skills and post-testing following the intervention to determine if his social skills improved. Testing was completed using the Autism Diagnostic

Observation Scale (ADOS), an informal protocol used to diagnose Autism. Intervention focused on the use of social stories. Specific social stories were selected based on the results of the ADOS and discussion with the participant's parents. Each week a new story was presented and read to the participant. Games were played and scenarios were presented to the participant during sessions to help further understanding. At the end of every session, comprehension questions were asked to determine the participant's understanding. On the last session of the week, the researcher determined if the participant demonstrated generalization of the story. The participant had to demonstrate understanding of the social scenario and implement an aspect from the story to determine generalization. This was done by completing the story scenario in the participant's community with peers, adults, and community helpers. During the last week of intervention, each story was repeated, per participant parent request, to help with maintenance and generalization. It was hypothesized that the participant would comprehend and generalize the social stories appropriately into everyday social situations. Long term generalization was also measured through follow-up interviews with participant and his parents.

### **The Effect of Background Color Cues on the Accuracy and Response Time of Graphic Symbol Selection**

Presenter: Rebecca Gonzalez

Author: Rebecca Gonzalez

Research Advisor: Dr. Karen Copple

Graphic symbols have been used in augmentative and alternative communication (AAC) devices to facilitate communication for children with complex communication needs. To convey messages accurately and effectively, visual cues are often explored to increase rate and accuracy of symbol selection. Most of the evidence provides inconsistent results to support the addition of cues to facilitate communication for children who use an AAC device due to limitations in natural speech. When applied to augmentative and alternative communication displays, the Fitzgerald Key has been used to provide a color-coded system based on grammatical category to improve visual access of graphic symbols. The purpose of this study was to examine the color-coding scheme of the Fitzgerald Key and its effect on the accuracy of symbol selection by young children using a quasi-experimental independent measures design. The relation of word-class category and background color was analyzed using graphic symbols taken from picture communication symbols (PCS). An examination of the latency of accurate responses were also explored. A total of 12 symbols were used with 4 symbols representing each of the following word-class categories: nouns, verbs and

adjectives. Kindergarten children (n=30) were presented with an auditory label of the target symbol and then required to choose the matching symbol from an array of 12 pictures arranged in a 4x3 grid. Half of the kindergartners were randomly assigned to the colored condition based on the Fitzgerald Key. The other half received an array against a white background. The speed at which the subjects could locate a targeted stimulus picture under both conditions did not result in a significant difference. In addition, the color cue did not increase accuracy of symbol selection. Limitations of the current study, clinical implications, and recommendations for future research are also discussed.

## **Combating the Reading Crisis**

Presenter: George McKamy

Author: George McKamy

Research Advisor: Dr. Adrienne Bratcher

**ABSTRACT:** Purpose: The purpose of this research paper was to discuss how using the two strategies impacted reading comprehension. In addition, the researcher wanted to add to the existing body of research on this topic. Reading comprehension is crucial for fourth grade students who are no longer “learning to read,” but rather “reading to learn.” The literature review indicated that two strategies, previewing vocabulary and questions before reading increased reading comprehension. These two strategies have never been included in a research study together. Method: A convenience sampling was used to obtain the sixty subjects where fifteen subjects were randomly assigned into a no preview group, preview of vocabulary terms group, preview of comprehension questions group, and preview of both preview of comprehension questions and vocabulary terms group. The researcher typed out a reading passage from the book *Charlie and the Chocolate Factory* by Roald Dahl. Comprehension and vocabulary terms were developed from the typed passage. A post-test control group design was used. A one-way analysis of variance (ANOVA), F-ratio was calculated to determine if there was a significant difference. Results: The results indicated that there was a significant difference between the previewing vocabulary group and the no previewing group, and between previewing the vocabulary and comprehension questions group and the no previewing group. The results can only be generalized to the fourth-grade subjects in this study. Implications from the research indicated speech-language pathologists can use previewing vocabulary to target vocabulary instruction. The results also indicated that the general education teachers can also use this strategy to teach vocabulary as part of the literacy instruction as well as other content areas. There were four confounding variables which the researcher could control for which were reading grade level, reading

comprehension, previous exposure to the text in the academic setting, and gender. Further research studies are warranted in this area with fourth grade students that include larger sample size, multiple schools, multiple school districts, learning style, and gender.

### **Does One Size Fit All? Examining Reading Comprehension Among Text Genres**

Presenter: Megan Padron

Author: Megan Padron

Research Advisor: Dr. Adrienne Bratcher

This study aimed to investigate the effects of text genre on subjects' reading comprehension. The underlying mechanisms for comprehension differences across the two different genres, narrative and expository, were explored. Children are widely exposed to these two styles of text throughout their education, and many students who are language impaired have poor reading comprehension. Students are required to meet Common Core Standards, and difficulty with comprehension of different text structures will affect their ability to do this. This study examined the differences that occur in students' reading comprehension in order to enable improved teaching and learning strategies for teachers, speech-language pathologists, and students. Thirty eighth-grade students from a Midwestern school district read separate passages of both expository and narrative prose, and their comprehension in regards to specific and general information about the texts were measured through a local comprehension assessment. Inferential data was collected and analyzed using a t-test for independent measures to determine statistical significance regarding subjects' comprehension levels of the passages. Descriptive data, using raw scores and percentage of correct response, was used to determine and describe themes that occurred in subjects' comprehension among common reading macrostructures. Results indicated a significant difference in subjects' comprehension of the two genres. Additionally, the macrostructures of inferencing, cause-effect, and summarizing were identified with more precision in the narrative passage, while subjects were more successful at identifying the main idea in the expository passage. This study concluded that text structure does have an effect on readers' comprehension, with narrative structures facilitating higher comprehension than expository structures. These findings could be useful for speech-language pathologists and educators in order to tailor reading comprehension instruction to the specific text structure in order to facilitate improved understanding, especially with those students who have language delays.

## **The 8-Step Ladder to Success: Articulation Treatment for a Child with Apraxia of Speech**

Presenter: Dominique Ratto

Author: Dominique Ratto

Research Advisor: Dr. Adrienne Bratcher

Award Winner

This study examined the effectiveness of an articulation treatment known as Dynamic Temporal and Tactile Cueing (DTTC). This treatment was administered to a 6-year-old male diagnosed with moderate childhood apraxia of speech (CAS). The purpose of this study was not only to determine the effectiveness of DTTC, but also to increase the client's intelligibility. The clinician hypothesized that data collection from pre- and post-test articulation measures, would indicate efficacy for the use of the DTTC treatment as an intervention tool for a child with apraxia of speech (AOS). The problem is that not much research has been completed on DTTC. In addition, there is no "cookie cutter" way of treating CAS. Therefore, this study was conducted in order to examine if DTTC can lead to success with a client with CAS. A quantitative ABA Single Subject Modified Withdrawal Design was used to determine the validity of this approach with the client. Throughout this study, the clinician conducted 50-minute therapy sessions for a total of 8 weeks. The DTTC treatment consists of an eight-step cueing procedure that incorporates imitation, auditory, and visual models. This treatment required the client to imitate words beginning with different phonemes, as modeled by the clinician. Throughout this study, a high level of support was used, and then gradually faded as the steps progressed. Statistical analysis was completed through the use of a Pearson Correlation and Sign Test. Pre and post-test data revealed strength in the use of DTTC during intervention for CAS. Results from this study provide evidence, which indicates strong validity of DTTC in articulation therapy for CAS. The client's parents reported satisfaction with the quality of treatment, results, and overall process. This study proves that DTTC can be used as a helpful resource for professionals working with apraxic individuals. In addition, this study highlights limitations and some suggestions for future research implications.

## **Childhood Apraxia of Speech: A Combined Treatment Intervention**

Presenter: Michelle Sassman

Author: Michelle Sassman

Research Advisor: Dr. Karen Copple

Childhood Apraxia of Speech (CAS) is a motor speech disorder. Children with Apraxia of Speech have inconsistent production of sounds, oral motor difficulties and poor sequencing of sounds into words. CAS affects 3.4%-4.3% of children diagnosed with speech disorders (Delaney & Kent; 2004). The purpose of this research was to determine the effects of two therapy approaches: Melodic Intonation Therapy (MIT) and Apraxia Words iPad app. Both interventions have research demonstrating their efficacy in treating CAS. This single subject research design attempted to determine an evidence based guideline for an effective therapy treatment for CAS by combining two different interventions. The participants in this study included two males who were 8-9 years old and were considered to have moderate to severe CAS. Pre and post test data was taken during the first and last weeks of the study, utilizing an elicited speech sample. The setting took place at the participants' school, in Austin Texas. Participants were seen for 20 minutes twice per week for 8 weeks totaling 16 sessions. Each therapy intervention was randomly alternated for each session. Targeted words for both interventions were presented with visual cues. Words consisted of consonant-vowel- consonant (CVC) words and were made up of sounds that the participants demonstrated the most difficulty in producing accurate placement during pretesting. Results from this study included treatment interventions for targeting intelligible speech when treating CAS. The data indicated a significant difference between pre and post test scores for participant 2 but not for participant 1. Treatment data revealed that, the iPad app was more effective than MIT in obtaining a higher average number of words produced correctly. Results from this study provide insight into contrasting treatment options for CAS and the overall effectiveness of such treatments. Future studies can provide further evidence based guidelines into the efficacy of treatments for CAS.

### **If You've Got it, Font it**

Presenter: Ana Stotlemeyer

Author: Ana Stotlemeyer

Research Advisor: Dr. Adrienne Bratcher

Dyslexie font was created by Christian Boer to help children and adults with dyslexia. This font was designed based on the assumption of the magnocellular or visuo-spatial theory of dyslexia. The font has longer stems and wider bases which are believed to help prevent reversing and rotating letters during reading. Children who do not meet age appropriate reading fluency scores may be struggling with reading comprehension and academic reading. It is believed that Dyslexie font can improve reading fluency scores, but previous research on Dyslexie font is mostly survey research. No norm scores for correct words per

minute with Dyslexie font are available. Thirty-five students were selected from school districts in Denver, CO to participate in a quantitative, quasi-experimental study about font type and reading fluency. These participants were enrolled in 1st and 2nd grades and were chosen because of their status as emerging readers. The purpose of this study was to determine if Dyslexie font improves reading fluency and reading speed in emerging readers. The participants were baselined using the Informal Reading Inventory (IRI) by Burns and Roe and then tested using grade-normed reading passages for the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) standardized test. Participants were not randomly assigned to a control and experimental group, but were all given the same independent variables. DIBELS passages were presented in random order in Times New Roman, Dyslexie, and Courier fonts. Reading fluency scores were determined by the amount of time it took to complete each passage and the number of words in error in each passage. Descriptive statistics revealed that 1st grade students had greater reading fluency scores with Courier font and 2nd grade students had greater reading fluency scores with Dyslexie font. Inferential statistics with multiple 2x3 ANOVAs revealed that there was no significant difference between reading fluency scores and font type. Changing font type is not a solution for reading difficulties, but this study reveals that using new fonts will not be detrimental to the reader.

### **Poster Presentation Group 9**

#### **Straight Talk: Perceptions of Effeminate Speech in Adult Males**

Presenter: Veronica Ayala

Author: Veronica Ayala

Research Advisor: Dr. Suzanne Swift

Award Winner

**Purpose** The purpose of this study was to investigate possible associations between effeminate speech in men and negative listener perceptions. Furthermore, this study was intended to provide evidence to support medical coverage for services provided to speakers with gender-atypical speech who seek to modify their speech characteristics for personal or professional reasons. **Method** 20 inter-raters were used to select the 3 most masculine and the 3 most effeminate speech samples from among 20 recordings made by adult male volunteers. Respondents (N = 383) were randomly presented the six selected recordings of adult males (3 with effeminate speech, 3 with masculine speech) reading the Rainbow Passage. Every participant was required to express

agreement or disagreement with 10 statements regarding their perceptions of the speakers in each of the 6 recordings. Demographic information was also collected for each respondent.

Results Data collected was analyzed using a t-test for correlated means to determine any difference between listeners' perceptions of adult males with effeminate speech and adult males with masculine speech. Results of the study suggest that listeners have a more negative perception of adult males who exhibit effeminate speech when compared to their perception of adult males who exhibit masculine speech. Demographic data and listener perceptions were analyzed using a series of two-way ANOVAs which found that negative perceptions towards effeminate speech were observed across all listener groups, irrespective of differences in age, gender, income, education, and/or sexual orientation. Discussion/Conclusion Results suggest that listeners are biased against males with effeminate speech. Because this bias could have a negative personal and professional impact, this lends support for the justification of medical coverage for services provided to adult males with effeminate speech who elect to partake in voice modification services.

### **Differences in Perceptions of Stuttering Between Individuals Who Do and Do Not Stutter**

Presenter: Mary Lento

Author: Mary Lento

Research Advisor: Dr. Suzanne Swift

The purpose of this study was to determine the differences in perceptions of people who stutter (PWS) and people who do not stutter (PWOS) when listening to a stuttered speech sample. A quantitative Likert scale survey design was used to gather information from each group regarding their perceptions of three speech samples (mild stuttering, moderate stuttering, and severe stuttering). Non-identical speech sample monologues were obtained from the University College London Archive of Stuttered Speech (UCLASS), each being a general description of school subjects, hobbies, etc. Respondents were instructed to listen to the speech sample and then agree or disagree (using a 5-point Likert scale) to a series of statements about the stuttered speech. Respondents were also asked to rate the severity of each speech sample on a ten-point rating scale.

A two-factor ANOVA was used to identify any significant differences between PWS and PWOS groups on each question. Results revealed significant differences in their judgements of "distractibility" and in their overall severity ratings, with interaction effects also positively noted. This indicates that

perceptual ratings of stuttering may be influenced by the fluency of the listener (vs. the fluency of the speaker), especially when the listener identifies themselves as a PWS.

Future research should seek to clarify why PWS find stuttering less distracting, and if they view other PWS with more empathy than the general population. Future research should also include using videotaped samples (vs. audio only) to determine if perceptual ratings are impacted by this feedback, as well as to identify any differences in listener perceptions of stuttered speakers when secondary characteristics are involved.

### **Learning Lessons: Interactive Applications vs. Classroom Lectures**

Presenter: Timothy Lewis

Author: Timothy Lewis

Research Advisor: Dr. Suzanne Swift

Technology advances quickly...but is it useful for learning? Are interactive iPad applications more effective than lectures in teaching lessons and gaining knowledge? Some research indicates that iPad applications are better used as a supplement and may cause more distraction than benefit. Others suggest that the novelty of devices does encourage some increase in interaction from students, but results show varied effectiveness. This study investigated the effective use of these devices in learning.

This research used a pretest-posttest comparison group design to investigate these questions. Sixty adult participants were randomly placed into two groups. Each group was given an introductory lesson: one in a classroom lecture format and the other using an interactive iPad application. Using a correlated samples t-test, pre-tests and post-test were compared for significant difference. Results indicated that each intervention was equally effective and that one was neither better nor worse than the other. This indicates that, at an introductory level, interactive applications can be as effective as classroom lectures. It should be stressed that these results are related to a single simple lesson, but may indicate that teachers and clinicians can use these applications along with other strategies as effective teaching tools.

### **If I Had a Dollar For Every Time I Got Distracted**

Presenter: Hannah Mesman

Author: Hannah Mesman

Research Advisor: Dr. Suzanne Swift

Distractions are common in daily life. These can negatively impact task performance as the brain's processing resources are limited. Cognitive tasks require an adequate amount of attention in order to appropriately process and encode the desired information. This means that the type and strength of attention devoted to a stimulus or task may influence task performance. This results in the need to make decisions regarding which stimuli receive these resources, and to what extent.

In order to facilitate better outcomes, it is important to understand the relationship between variables of attention and task performance, as well as environmental manipulations that can be made when teaching or learning new concepts. This study investigates the effect of competing stimuli, or distractions, on task performance outcomes, measured as percentage of correct response (PCR) and time to complete tasks. An experimental pre-test-post-test control group design was used to compare the performance of individuals completing tasks with, and without, an imposed distraction. Sixty subjects between 18-30 years of age were recruited through undergraduate classes at Eastern New Mexico University. Subjects were asked to complete a series of tasks requiring them to follow written multi-step directions, involving a locational concept (e.g., on top of, nearest to). The experimental group completed post-test tasks while a video, composed of mixed "funny" clips, was imposed as a distraction. Control and experimental groups were matched for gender.

The study aimed to discover whether distractions have an effect on task performance, and how well individuals are able to selectively attend to a desired task in the presence of a distraction. Using an alpha level of .05 and a two-tailed hypothesis, there was a significant difference in performance, as measured by PCR, between males and females, control and experimental groups, and the interaction of these two variables, though it was not consistently in one direction or the other. When measuring performance by time to complete task, there was a significant increase in time, or decrease in performance, in the experimental group as compared to the control group. Within both the control and experimental groups, some subjects were found to experience a decrease in performance, while others experienced an increase in performance. Differences in performance may have been influenced by confounding variables such as processing abilities, reading abilities, ability to selectively attend, practice effect, John Henry effect, etc., and it is unclear as to what extent the distraction itself impacted performance, and why it seemed detrimental to some, while advantageous to others.

## So You Think You're Ready?

Presenter: Marc Nez

Author: Marc Nez

Research Advisor: Dr. Suzanne Swift

Some SLPs have anecdotally reported minimal preparation in behavioral management strategies, and have expressed feelings of unpreparedness when working with clients who may have behavioral intervention needs. As the literature base is largely silent on this matter, this research was designed to gather information about SLPs and their personnel preparation to work with clients presenting with behavioral challenges. This study specifically investigated the degree of training and education that speech-language pathologists (SLPs) receive in behavior management strategies, where they received this training, how they develop new strategies, and how they implement intervention techniques in the classroom and therapy setting. Questions specific to the development and use of evidence-based practice (EBP) were also administered. A quantitative 15-question internet based survey was completed by 110 participants who had been working in the profession for various years (less than a year to more than 10 years). Results were analyzed using descriptive statistics and a series of ANOVAs, revealing that years of SLP experience, the age of the respondent, and the amount of training received in behavior strategies did significantly impact the responses given by participants. Those with more experience were significantly more likely to feel effective in managing behaviors as well as to use EBP when choosing and implementing behavioral strategies. Recently graduated respondents received slightly less training during studies than did other respondent groups, and they were also significantly less likely to develop their own intervention strategies than groups who had been practicing for 5+ years. This must be interpreted with consideration given to the findings that younger respondents (21-39) reported significantly more training in graduate school, and also reported that they felt more confident in devising, implementing, and using their own EBP strategies than did respondents who were 40+ years. This indicates that both training and years of experience are significant factors in self-perceived competence for behavior management strategy development and use. This suggests that the best practitioners will be those SLPs who receive formal training first, and then on-the-job practice.

It was also noted that a good number of respondents reported they received little practical information about effective behavior management strategies when they were in college, and that they felt unprepared for the realities of conducting therapy with clients who need this guidance. Unprepared SLPs experience many disruptions in the therapy room and the classroom, decreasing therapy time and reducing the effectiveness of classroom learning for the student(s).

These findings indicate a need for SLP programs to incorporate more classes that sufficiently train future SLPs for their career. Instruction specific to behavior management integrated into future coursework will allow SLPs to be more effective therapists.

## **Do You Smell That? The Effect of Scents on Short-term and Long-term Memory Recall in Adults**

Presenter: Lisa Nickolenko

Author: Lisa Nickolenko

Research Advisor: Dr. Suzanne Swift

There is little research available on the effectiveness of aromatherapy. Claims of energy renewal, increased focus, and improved memory have not been addressed using scientific research principles in current rehabilitative literature. This study was designed to investigate the impact of aromatherapy on short and long-term memory.

Forty-five adult subjects were randomly assigned to one of 3 groups: lemon-scent, peppermint scent, or no scent (control). All participants completed a memory pre-test (baseline) in a closed room with no applied scent. The memory recall materials used included 10 words (obtained from random word generator), 10 numbers (obtained from a random number generator), and five questions about a phonetically balanced speech passage. The baseline and experimental stages used similar (but not identical) materials to avoid pretest sensitization. The procedure for assessing memory recall was the same during pre-test baseline and post-test experimental stages, except for the implementation of the experimental scent variable.

All groups completed memory recall tasks. The control group received no scent. The experimental groups were established with lemon and peppermint scent as the independent variable. These subjects were placed in a closed room with two drops of essential oil of lemon or peppermint placed on a piece of paper that they were instructed to smell every three minutes while completing memory recall tasks (dependent variable). Subjects were given 10 words, asked to read a short passage, and then recall the 10 words. They were next given 10 numbers, and then asked to take a 10-minute break. After the time lapse, they were asked 5 questions about the reading passage. Finally, subjects were asked to recall as many of the 10 numbers as they could remember. The subjects were then released from the short-term memory phase. Four to seven days later, subjects were again asked to recall the words and numbers from the tasks above, as well as to answer the same five questions about the reading passage.

The results of this study revealed that the lemon scent had a negative

effect on both short-term and long-term memory recall. The peppermint scent had no effect on memory recall at all. Further, there was no significant difference between any group when the differences between short-term and long-term memory recall were compared for lemon, peppermint, and control groups. These results indicate that neither scent of lemon or peppermint had an effect on memory recall when compared to the control group.

## **Effects of Nonverbal Cues on How We Interpret Messages**

Presenter: Roxanna Rubio

Author: Roxanna Rubio

Research Advisor: Dr. Suzanne Swift

This research study investigated the impact of nonverbal cueing (i.e., tone, prosody, and facial expression) on message interpretation, and also sought to determine if males and females interpret this information (or lack thereof) differently.

The study used a quasi-experimental components. The study was conducted across various settings using 69 adult participants (42 females and 27 males). Each participant was required to complete a total of two different sessions that were scheduled two weeks apart, in which they were asked to listen to a series of 16 recorded sentences and then answer multiple choice questions about the meaning of each sentence. During one session, subjects would complete the questionnaire with audio recordings only. During the second session, subjects would complete this same questionnaire now presented via audio and video.

Results for audio and video questionnaires were compared for significant difference. This was to determine if participants would interpret recorded messages differently when facial expressions augmented the utterance. Inferential results indicated there was no significant difference between how individuals interpreted the messages between the two conditions. This may indicate that tone and prosody convey more meaning for a listener than do facial expressions. There was no significant difference between how males and females interpreted these messages.

## **You've Been Strooped! The Effects of Interior Color on Stroop Related Rapid Automatic Naming Tasks**

Presenter: Alexandra Steyer

Author: Alexandra Steyer

Research Advisor: Dr. Suzanne Swift

Color has been shown to effect human mood, emotion, behavior, and performance. Little research has been done to examine the effects that interior color has on Stroop related rapid automatic naming (RAN) tasks. It is important to consider the role environmental color plays when making inferences about performance results. This study explores the potential role interior color has on such tasks.

A one shot quasi experimental design was used to examine the scores, time taken, and stress levels of sixty Eastern New Mexico University students and peers when given the tasks in red, blue, and neutral colored rooms. Four groups of fifteen participants completed three Stroop related tasks in two of the three different colored rooms. The first task was comprised of a Stroop task in which participants were asked to name aloud the color ink words were written in as quickly as possible. The second task was comprised of a shape task in which participants were to name aloud the name of the shape, not the word written below, as quickly as possible. The third task was comprised of a shape Stroop task in which the participants were to name aloud the shape and color of the picture presented, not the words written below, as quickly as possible. Each participant completed a Likert scale of 1-5 indicating their stress levels before completing the tasks, after completing the tasks in the first room, and after completing the task in the final room. A two-way analysis of variance for independent measures was conducted to determine whether there was significant difference. Results indicated there was significant difference in the effect interior color has on stress levels and in determined the effect interior color has on the amount of errors, or accuracy, of a task. Results further indicated no significant difference in the effect interior color has on the amount of time taken to complete each task. Further research is needed to solidify these findings. Future studies should focus on the effects differing colors may play in testing environments, different tests, and larger samples. Based on these findings, it is important for therapists performing testing on clients to take interior color of the testing environments into consideration when drawing conclusions from test results.

### **Poster Presentation Group 10**

#### **Professional Interactions of a Speech Language Pathologist in the Medical Setting**

Presenter: Gregory Code

Author: Gregory Code

Research Advisor: Mr. Jesse Martin

**Abstract.** The aim of this study is to provide information on what responsibilities SLPs encounter in a medical setting, which medical professionals the SLP interact with the most, and how this information is disseminated to other professionals. The study also looked at different means of collaboration such as morning rounds and multidisciplinary, interdisciplinary and transdisciplinary approaches.

The SLPs serve the adult population the most, at 54%, followed by infants, toddlers and preschoolers at 16%, and school age children at 15%. The most common areas of intervention seen with the adult population was swallowing at 41% followed by Aphasia at 16% and Dementia at 13%. The most common areas of intervention seen with the pediatric population was language at 29%, articulation and phonology at 22% and Autism at 16% (ASHA, 2015). The professionals we interact with the most are Physicians, Nurses and Nurses' Aides, Physical Therapists, Occupational Therapists, Respiratory Therapists and Registered Dieticians (Martin, J., 2017). The study examines three of the most common etiologies a SLP is likely to encounter in a medical setting, swallowing, aphasia, and dementia (ASHA, 2015). It describes how the SLPs interact with the other professionals listed above when caring for a patient during diagnostic /evaluative and therapeutic services. It discusses the types of documentation an SLP might encounter and breaks down the most common type into categories so the reader may know the location of each written communication. The study looks at how SLPs communicate their services to other professionals in both oral and written form. Lastly, this study discusses collaboration with other disciplines and various approaches to provide the best care to the patient.

## **Vocal Effects of Electronic Cigarettes versus Conventional Cigarette**

Presenter: Gabriella Garcia

Author: Gabriella Garcia

Research Advisor: Dr. Karen Copple

The purpose of this study was to investigate the difference in vocal effects between smokers of e-cigarettes (i.e., electronic cigarettes) and conventional cigarettes. This quasi-experimental, one-shot group design compared data from two groups (n=50): e-cigarette smokers (n=25), and conventional smokers (n=25). All participants were current consumers of these products. They were assigned a number on the participant profile matching their voice recording sample in order to maintain confidentiality. Initial data was collected through a preliminary participant profile sheet which included: when individuals began consuming nicotine through e-cigarettes or how long they smoked conventional cigarettes prior to the study. A participant profile was given to everyone to exclude any

participants who would increase the chance of confounding variables within this study, such as: caffeine intake over 3 cups daily, experiencing allergies/illness at time of experiment, on medication (antihistamines), pregnant, or menstruating. Acoustic speech signals were obtained through a voice analysis of a sustained /a/ using the PRAAT software. Voice recording analysis included: fundamental frequency, jitter, shimmer, and harmonics-to-noise ratio. The Voice Handicap Index (VHI) was also used as a tool to measure the participant's perspective on their voice within their daily lives. Specifically, the VHI examined the participants physical, functional, and emotional qualities acquired from smoking using a rank order scale [0 (never), 1 (almost never), 2 (sometimes), 3 (almost always), 4 (always)]. Results indicated a large significant difference between conventional cigarette and electronic cigarette consumers within the VHI, revealing electronic cigarette consumers reported having more difficulties with their voice than conventional consumers. PRAAT software results indicated no significant difference between e-cigarette consumers and conventional consumers in the analysis of harmonics-to-noise ratio, fundamental frequency, and shimmer; however, jitter did reveal a significant difference. Ultimately, the results of this study will provide speech-language pathologist with insight for where to begin when creating therapeutic strategies on vocal hygiene for clients who smoke either electronic or conventional cigarettes who are seeking voice rehabilitation.

## **Background Babble**

Presenter: Kaitlyn Johnson

Author: Kaitlyn Johnson

Research Advisor: Ms. Nicole Bougie

The purpose of this study was to explore the abilities of males and females in environments with and without the presence of background noise. More specifically, the study focused on reading comprehension abilities of the participants in the different environments and exploring if gender differences are present. Using a quantitative and one shot-quasi experimental paradigm, this study analyzed the reading comprehension abilities between male and females in an environment containing background noise and in an environment with an absence of background noise. The reading passages used were two 8th grade nonfiction passages. The background noise that was used in this study was a recording of someone reading the same passages the participants read in the foreign language of Persian. Descriptive and inferential statistical methods were used to compute data. For each gender group, change score, mean, median, and mode were computer. An ANOVA was conducted for each gender group to identify if differences in scores were present. An ANOVA based on each genders

change scores was used to identify if differences between genders were present. Statistical findings indicate there is no significant difference between the performance of males versus females when comparing their change scores on the reading comprehension tasks performed in the two different environments. It was also concluded there is no significant difference within each gender when comparing their scores in each conditions. Confounding variables present in this study include the time of day the tasks were completed, the ages and education levels of the participants, natural memory abilities of participants, and unknown hearing impairments. The importance of these findings are relevant to professionals who may need to make accommodations had there been significant difference among the genders. More research still needs to be conducted in the area of gender differences performance in environments which contain background noise.

### **Impact of Support Groups on Stroke Survivors' Quality of Life**

Presenter: Nicole Leahy

Author: Nicole Leahy

Research Advisor: Ms. Nicole Bougie

Award Winner

This study was designed to evaluate the impact of participation or nonparticipation in a stroke support group on an individual's quality of life, and to determine what factors influence participation or nonparticipation in a support group following a stroke. The study employed a mixed methods design combining quantitative data gathered from a survey with qualitative data gathered from participant interviews. Quality of life, a multidimensional concept accounting for both subjective and objective evaluations of multiple facets of life, was measured in five domains: social participation, memory, emotion, mobility, and communication. Participants completed an adapted version of the Stroke Impact Scale (SIS) survey and participated in a semi-structured interview to gather additional insight into their perceptions of recovery variables. Interviews were transcribed and coded to develop themes and categories, and survey data was analyzed to determine the correlation between participation and nonparticipation in a support group with overall quality of life scores. Results indicated that participation in a support group positively impacted quality of life as measured by the SIS, but scores were only 3% higher for support group participants. However, strong positive correlations existed between quality of life and communication ( $r = 0.912$ ) and social engagement ( $r = 0.815$ ). Data from qualitative interviews was in concurrence with survey data, and suggested that support group participants cited availability, awareness, and similarity of recovery goals as their primary

motivation for participating in a support group. Nonparticipants cited group composition, lack of availability, and other health conditions as factors that influenced their decision not to participate. Additionally, incidental findings from the interviews suggest that future research be conducted on mental health support following discharge from acute care, awareness of variability in recovery, and awareness about communication disorders. Results indicated that participation in a support group positively impacted overall quality of life scores, but not as significantly as anticipated.

### **Current Voice Perceptions: The New Normal?**

Presenter: Leah Simmons

Author: Leah Simmons

Research Advisor: Dr. Karen Copple

Vocal fry, also known as glottal fry or pulse register, is a way of speaking that results in a creaky-sounding voice. While vocal fry can signify a possible underlying vocal pathology, most of the time it is used voluntarily and habitually. Recent studies have focused on the increase of vocal fry use in young people, particularly in females, and the negative social and economic implications of continually using vocal fry when speaking. The purpose of this study was to investigate the possibility that vocal perceptions by the general public have shifted toward accepting abnormal voice quality as “normal.” Data from this experiment were used to answer the following questions: Do people perceive vocal fry as normal? Is there a difference between how younger vs older people perceive vocal fry? Do people rate female use of vocal fry more severely than that of a male? The experiment was a one-shot group design comprised of 98 subjects, 51 female and 47 male ages 18 and older. The subjects were presented with 10 short audio clips and rated each of them on a 5-point Likert scale with 1 being normal through 5 being abnormal. The audio clips contained individual speakers having different vocal features, and included the following: 3 clips each of female and male vocal fry, 1 clip each of female and male medically disordered voices, and 1 clip each of female and male normal voice (interrater reliability = 100%). Results of the experiment revealed that people rated normal voices more favorably than voices with vocal fry, but less severely than medically disordered voices. There was no statistically significant difference on how men rated normal voices compared to vocal fry, while women rated male vocal fry more harshly than female vocal fry. Results also revealed that younger people rated vocal fry more severely than older people. Contrary to recent studies suggesting that female vocal fry is rated more harshly than male, this study found that both males and females rated female vocal fry as less severe than male. Recent alarm surrounding

the negative economic and social implications of overusing vocal fry needs more study considering the results obtained in this experiment.

### **Speech Language Pathologist Perceptions on Working with Transgender or Transsexual Clients**

Presenter: Catherine Walters

Author: Catherine Walters

Research Advisor: Dr. Karen Copple

Previous researchers have identified various clinical perspectives toward people with communication disorders and differences; however, very few studies have explored professional attitudes toward working with the transgender (TG) and transsexual (TS) population. This study aimed to explore self-disclosed perceptions held by speech language pathology (SLP) graduate students and licensed professionals toward TG and TS clients who seek therapy to feminize or masculinize their voices and/or communication styles. Using a mixed methods design, this study involved two phases of research. During stage one, 111 students and clinicians completed an online survey. Participants were asked to provide level of agreement scores for various statements and optional, open-ended responses. The second phase involved follow-up, semi-structured interviews with 5 participants to explore the personal and professional experiences that influence student and clinician-held perspectives. The following research objectives were achieved: 1. SLP clinicians and students held various perspectives toward TG/TS individuals who seek voice and communication services, 2. Underlying experiences and contexts that influenced these perspectives were identified and discussed. The majority of participants during both phases of this study expressed interest in providing culturally competent care; however, they felt that they had a lack of introductory knowledge with which to provide quality services for TG/TS clients. There were statistically significant differences between demographic characteristics and self-disclosed agreement ratings. Participants who indicated having personal relationships with LGBT individuals and experience as a licensed clinician were significantly more inclined to provide statement ratings in favor of social, cultural, and educational awareness related to TG/TS voice and communication services. Directions for increased clinical preparation with this population were discussed. Graduate programs can help students develop cultural competency skills by providing a preliminary understanding of gender identity and basic services offered by our profession for the TG/TS population. Future research should explore TG/TS client perspectives to gain insight on their experiences related to intervention, service accessibility, and provider competency.

## **Let's Talk Voice**

Presenter: Dene White

Author: Dene White

Research Advisor: Dr. Karen Copple

Abstract. Research has been limited on the long-term, negative effects cheerleading may have on the voice as measured by an objective, acoustic program such as the PRAAT. This study was a quasi-experimental, mixed method, group design which utilized qualitative and quantitative measurements. The purpose of this study was to explore the specific negative long-term effects of cheerleading on the voice by analyzing objective, acoustic measurements, and through a collection of patient profiles, including the Voice Handicap Index (VHI). A total of sixty participants were recruited from Lewis and Clark College, Portland State University, and Grant High School in Portland, Oregon. Participants were placed into four different groups: high school cheerleaders, high school non-cheerleaders, college cheerleaders, and college non-cheerleaders. There was a total of fifteen females placed in each of the four groups ranging in age from fourteen to twenty-four years of age. Each participant completed a patient profile which included questions about daily living activities that may have had a negative effect on their voice. The participants were also asked to complete the VHI, a questionnaire which requested personal reflections on the impact of their voiced disorder. These answers were then placed in three categories: functional, physical, and emotional impacts. The researcher gathered a total of nine voice recordings from all sixty participants over the course of four weeks. Each participant was asked to sustain "ah" while the researcher recorded their voice using the PRAAT program. Groups and data samples were compared in the following areas: fundamental frequency, harmonics to noise ratio, jitter, and shimmer across the four groups. An ANOVA was run and results indicated significant differences between the four different groups. Specifically, the two cheerleading groups were characterized with more negative effects on their voice when compared to their non-cheerleading peers. An additional finding was that cheering beyond high school did not result in any increase in the negative effects on voice.

## **Speaking of Memories: The Effects of Using a Remnant Book on Communication Skills for an Elderly Adult with Alzheimer's Disease**

Presenter: Sarah Wrede

Author: Sarah Wrede

Research Advisor: Dr. Karen Copple

The primary aim of this study was to investigate the impact of a remnant book, as an augmentative and alternative communication (ACC) device (Bourgeois, Dijkstra, Burgio, & Allen-Burge, 2001) on pragmatic discourse-level communication skills and quality of life (QOL) for the elderly adult with Dementia of the Alzheimer's Type (DAT). Secondly, the remnant book served to strengthen principals of the theory of cognitive communication disorders of dementia (Bayles & Tomoeda, 2007). A quasi-experimental single-subject A-B-A/B design was used in an Adult Day Care setting to determine the effect of a multisensory and thematic remnant book on QOL and the following measures of discourse: topic maintenance (total duration of minutes and average number of minutes per topic that the patient could maintain a topic), topic elaboration (total elaboration of sentences and average number of sentences per topic that the patient could elaborate upon a topic) and appropriate topic shifting (total number of times that the patient could appropriately shift topics per session). Percentage of Non-Overlapping Data (PND) indicated that remnant book therapy was highly effective in increasing average topic maintenance per topic, moderately effective in increasing average topic elaboration per topic, and only minimally effective in increasing the frequency of appropriate topic shifts per session. A closer look at the specific remnant book themes indicated that favorite things and family themes were more effective at increasing topic maintenance and topic elaboration than were hobbies. One-tailed hypothesis testing using repeated measures t-tests showed no significant difference in QOL for caregiver or patient; however, these results should be interpreted with caution. Credence should be given to social validity given the family stated that remnant book therapy was highly beneficial for both the patient and the family.

### **Poster Presentation Group 11**

#### **Reading with Dad: Strategies for a Spanish Speaking Individual Experiencing Oral Reading Difficulties After a Right Hemisphere Stroke**

Presenter: Michelle Aguilar

Author: Michelle Aguilar

Research Advisor: Dr. Adrienne Bratcher

The purpose of this study was to investigate the impact of reading strategies on an individual experiencing aphasic like symptoms following a right hemisphere stroke. A quantitative experimental single subject design treatment (ABA) was used to measure participant gain scores. In the first phase (A), pretest, the researcher recorded the subject reading two newspaper articles which were

audio-recorded and analyzed for error count. During treatment phase (B), the following strategies were implemented: enlarging the text from a font size 10 to 14, chunking words together and moving the subject to an environment with less sensory input distractions. During the withdrawal phase (A), re-administration of the newspaper articles took place without the use of the strategies. A purposeful convenient sample was used with the participant meeting the criteria for participation. The participant suffered a mild right hemisphere stroke 11 months prior to the start of participation. He was competent and was cleared by his Neurologist to make all personal decisions. An inter-rater was used to review 50% of therapy session data and 100% of pre-test/post-test data in order to eliminate any possible bias by the experimenter with combined agreement of 98.5% obtained.

To determine any positive statistical gains between oral reading strategies compared to the pretest and posttest phases, a one-tailed t-test for repeated measures statistic was used. The error types frequently seen were graphophonemic errors, an error that preserves some important phonetics of the written word, even if it does not make sense. The percentage of error was calculated by dividing the number of errors by the total number of words. By enlarging the font, moving the subject to a room with few distractions, and chunking the words into smaller portions it did not decrease the amount of errors observed. Therefore, it was concluded that there was not enough evidence to determine that the treatment strategies helped the subject's oral reading errors,  $t(4) = 1.19, p > .05$ , one-tail,  $d = .53$ . Incidental findings were observed of potential clinical significance. Of importance to note is the participant's oral reading confidence. The researcher perceived the change from pretest to posttest, a louder voice was observed as well as less timidity while reading. It was noted that his confidence transferred over to his functional activities. Oral reading errors were observed but did not seem to affect the participant's self-esteem negatively. Future research would benefit from using a larger sample size, using both sexes, and a longer treatment phase. Exploring a qualitative research design that focuses on attitudes and the effects of self-confidence in functional activities of daily living and how we as clinicians can target it in treatment practice would be beneficial.

## **What does the SLP do? Teacher perceptions and knowledge before and after training**

Presenter: Leticia Corral

Author: Leticia Corral

Research Advisor: Dr. Adrienne Bratcher

**Abstract.** The American Speech and Hearing Association states that, it's the responsibility of the SLP to provide staff members with information on their roles and responsibilities. It is critical for teachers to understand the role of the SLP in the school setting in order to enhance the quality of services being provided. Previous literature states that professional development and in-service trainings are very popular in the school setting, but they rarely address the roles and responsibilities of the Speech Language Pathologist. The purpose of this study was to investigate teacher's knowledge of the speech language pathologist's roles and responsibilities in the school setting and perceptions. Specifically, to determine whether providing teachers with training on the roles and responsibilities increases their knowledge of our scope of practice and how the training contributed to creating more positive perceptions of speech language pathologists. A total of 90 teachers employed at Hobbs Municipal Schools and certified in the State of New Mexico participated in this experimental study. The participants' knowledge before training about the SLP's roles and responsibilities was measured using a questionnaire developed by the principal investigator. Immediately after the pre-test, a presentation was conducted to inform teachers about the role of the SLP in the schools. Perceptions were measured using the Scale of Educators' Attitudes Toward Speech Pathology (SEATS). A post-test using both the questionnaire and SEATS were used to measure gains. Results indicated a significant difference from pre-test to post test among all participants. Data results indicated that there was a significant improvement across all teachers and that both the Speech Language Pathologist and teacher would benefit from in-service training on information about SLPs in the school setting. Future research should focus on including teachers from different geographical areas and increasing the number of participants.

### **Dress for Success**

Presenter: Eryn Harman

Author: Eryn Harman

Research Advisor: Dr. Adrienne Bratcher

To demonstrate the effect that clothes have on performance, college students between 18 and 30 years old were asked to participate in a version of the Stroop test. Students were recruited from El Camino College in Torrance, California. The researcher approached student's in the library and asked if they could spare a few minutes to participate in a research project. Participants who agreed accompanied the researcher to a private study room. All participants were told they would be completing an attention task in order to develop averages for time and accuracy. Participants assigned to group one were then

given the Stroop word color test. Participants assigned to group two were told that role play was a part of the research and they were asked to put on a doctor's coat before beginning the Stroop word color test. The doctor's coat symbolizes professionalism and was therefore expected to enhance speed and accuracy. Results of the experiment showed statistical significance between the groups in both accuracy and time, though unlike the original hypothesis, it was the group not wearing the doctor's coat that performed better. Possible explanations for this outcome include comfort levels, the age of the participants, that students may be conditioned to quickly attend during tests, or that participants may have been at a heightened attention state before beginning the test due to being recruited from the school library. The most prominent limitations to this study were a small sample size, obtaining a convenience sample, and the site of both recruitment and data collection. Future research is recommended to be conducted on differences based on how the researcher is dressed compared to the participants. It would be interesting to determine if dressing toward the environment you are in is a larger determiner on one's ability to perform better on an attention task or other work related task. It would also be interesting to see if different college majors or careers would affect the results. There are many other factors to be studied in order to gain a more comprehensive view of how clothes affect us but this study did demonstrate that clothes affect individual performance on an attention task.

### **Playing Mind Games: The Effect of Repetitive Chess Playing on Episodic Memory in Aging Adults**

Presenter: Rebecca Hertz

Author: Rebecca Hertz

Research Advisor: Dr. Adrienne Bratcher

One of the most common cognitive complaints among older adults is a change in their memory. Understanding brain health is imperative for future treatment of cognitive impairment in aging adults. Age related memory change may be related to slow processing of speech, reduced ability to ignore irrelevant information, and decreased use of strategies to improve learning and memory. Previous studies suggest that activities associated to high cognitive function can improve various domains of cognition including speech, attention, memory, language visuospatial abilities and executive functioning and reasoning. This study will determine the effect of repetitive chess playing on episodic memory in aging adults. This study consists of a two single subject A-B experimental quantitative design. Assessment procedures include the administration of the Wechsler Memory Scale- IV and a criterion assessment task designed by the researcher using randomly generated word lists. Based on the scores yielded from

the criterion tasks, both subjects showed significant difference in performance on the criterion Immediate Recall Task and Delayed Recall Task. However, the pretest and posttest index scores of the Wechsler Memory Scale-IV (WMS-IV) yielded no statistical significance in neither subjects. One of the two subjects showed increased episodic memory performance based on the WMS-IV Subtest Scores. The statistical analysis of data collected concludes that episodic memory performance yielded inconsistent results based on the standardized scores of the WMS-IV. Therefore, results are not definitive, although previous studies have shown that game playing can improve memory.

### **Care + Cooperation: Professional Differences in the Treatment of Food Refusal in Patients with Dementia**

Presenter: Chelsea Romero

Author: Chelsea Romero

Research Advisor: Dr. Adrienne Bratcher

The purpose of this study is to explore the differences between speech language pathologists' and nurses' interpretation and treatment of food refusal in patients with dementia. Feeding difficulties occur in 80 percent of individuals with dementia, and food refusal is the most common disordered feeding behavior in the elderly population, often leading to undernutrition and the implementation of artificial feeding methods, which have a negative impact on these patients' quality of life and life expectancy. Research indicates that many nurses are unsure or in disagreement over what methods should be used to treat these patients, as well as what the underlying cause of this behavior might be. There is very little data regarding speech language pathologists' treatment of this feeding behavior, and no studies being conducted comparing nurses and SLPs. Information for comparison was gathered using a likert style survey which was distributed online through Google Forms. Questions were divided into four content areas during analysis: treatment methods, treatment priority, interpretation of the food refusal behavior, and treatment timing. 87 SLPs and 46 nurses responded to the survey. The disparity in response required that a comparison of proportions of agree/disagree answers be compared rather than raw scores; a Chi-Square statistic was run on each question comparing nurses and SLPs. There was significant difference on 4 questions: 1 in treatment methods, 2 in treatment priority, and 1 in treatment timing. There was not a significant difference on any questions in the interpretation portion. Increased disagreement was noted in the priority question group. In a treatment context, increased disagreement is most likely to occur when deciding: whether or not to treat the patient with cognitive therapy, whether determining the cause or getting the

patient to eat is more important to do first, and when a full swallowing evaluation should be completed.

## **Differing Perspectives in Shaping Echolalia into Intentional Communication**

Presenter: Katherine Smith Harris

Author: Katherine Smith Harris

Research Advisor: Dr. Adrienne Bratcher

Individuals with Autism Spectrum Disorder frequently exhibit echolalia, an immediate or delayed repeated speech that is rooted in outside verbal sources. The individuals are often provided services by Speech Language Pathologists with a linguistic training framework, and Board Certified Behavior Analyst with a behavioral developmental framework. Both professionals are trained to treat the disorder, but often use different methods of providing services. The goal of the study was to find a treatment method that both professionals could utilize to shape echolalia into appropriate expressive communication for the individual with ASD. A mixed method qualitative study with open-ended interviews and a comparison of the frequencies of particular semantic responses was analyzed with descriptive statistics and non-parametric inferential statistics. The participants were Speech-Language Pathologist (SLP), Board Certified Behavior Analyst (BCBA), and dual certified Speech-Language Pathologist-Board Certified Behavior Analyst (SLP-BCBA). The interviews were transcribed with the content analyzed to determine the frequencies of particular semantic responses. The responses were put into categories. Each category was put into a nominal code, and the total number of responses in each category was used in descriptive and inferential statistical analysis. The results were put into a Chi-Square. The Chi-Square showed a significant difference in treatment method and the generalization for each clinician group. After reviewing the results, each discipline chose a different treatment, for varying reasons, though not every treatment method reached generalization in practice. The method, Pivotal Response Training (PRT), that was generalized the most was the one chosen by the dual certified Speech-Language Pathologist-Board Certified Behavior Analyst. The SLP-BCB stated that they had previously used PRT with young children age 3 to 8 to decrease echolalia, and generalized the results of the treatment method. There needs to be a greater collaboration and terms need to be defined between the two disciplines.

## Problems in Practice

Presenter: Shannon Swingle

Author: Shannon Swingle

Research Advisor: Dr. Adrienne Bratcher

Award Winner

This study examines whether massed or distributed practice has an effect on the retention of Spanish vocabulary in adults. Distributed practice has been previously found to result in better short-term and long-term retention. Subjects have previously believed massed practice to be most effective in prior studies. Four middle-aged adult subjects were asked to participate in the study. Using an experimental alternating-treatment design, the participants were pretested on 280 Spanish vocabulary words. The participants were randomly assigned to begin the experiment on a practice strategy group of either massed or distributed practice. The participants practiced 35 new Spanish vocabulary words each week. The massed practice group practiced for one hour for one day a week at the participant's own pace given all 35 words. The distributed practice group practiced for twelve minutes each day for five days at the participant's own pace given all 35 words. Immediately after all material had been practiced for the week, participants took a posttest to measure short-term retention. The participants alternated practice strategies each week. After eight weeks of practice, the participants stopped and were not to practice the vocabulary. One month later, the participants were asked via verbal survey which practice strategy they believed worked best for their retention of the vocabulary. Additionally, the participants took a posttest to measure their long-term retention of the Spanish vocabulary. Results revealed that there was no difference between massed and distributed practice in terms of short-term or long-term retention. Therefore, neither practice type proved most effective in this experiment. All participants believed that distributed practice was the best practice strategy for their retention of the Spanish vocabulary, however their performance on the long term retention post-test did not coincide with everyone's beliefs. The results from this study are useful for the decisions of adults when trying to retain novel information in order to have a job, improve efficiency, advance performance, and communicate with others. The results may also have clinical relevance to a patient in speech therapy who might benefit from massed practice, which allows for a more focused therapy session and more opportunities to practice. Lastly, the results support a therapist or patient who cannot travel to therapy for more than one time a week due to long distance or financial restriction.

## Poster Presentation Group 12

### **Practicum Makes Perfect: Tracking Student Clinician Growth Across the Initial Practicum Experience**

Presenter: Gabriel Ayala

Author: Gabriel Ayala

Research Advisor: Mr. Dwayne Wilkerson

Award Winner

This study tracked the growth of graduate student clinicians in the field of speech-language pathology, determined areas of strength and weakness in the student's development of clinical competency, and provided an alternative to the current trend of use of clinician productivity standards within the field. Fifteen graduate student clinicians enrolled in practicum at Eastern New Mexico University's Speech and Hearing Rehabilitation Outreach Center were included for this study. Clinical skills and clinical effectiveness were collected at two separate points and measured using a rubric. The rubric used was developed specifically for this study by determination of indicators of effective clinical attributes and efficient practices, which were identified through clinical observations. Video recordings of initial and final therapy sessions of the graduate students were collected and the researcher rated clinical performance using the rubric that was developed. Specific gains, both in terms of degree and areas of performance, were identified and compared of the fifteen student clinicians. The results of the study support the notion that clinicians do indeed grow significantly during their beginning practicum experience; however, not all students grew equally or in the same areas of clinical competency. While there were areas of clinical competency in which more student growth was observed than in other areas, it is difficult to determine what factors may have contributed to and/or accounted for these growth patterns. Parameters of this study did not account for individual clinician differences that could have affected clinical competency growth, such as client absences, supervisor differences, independent study, etc., and this should be taken into account when considering the validity of the study. While there was no formal measure of the effectiveness of the specific rubric used in this study to measure clinical competencies, it is the researcher's opinion that this instrument or similar rubrics could potentially offer a useful alternative to productivity ratings as the primary tool for charting clinical effectiveness during therapy. Furthermore, the results of this study should be considered by Speech-Language Pathologists and healthcare professionals when considering viable alternatives to the current focus on productivity ratings, as these ratings do not account for the quality of therapy given. Productivity ratings take into account time spent with

the client, under the assumption that the time spent is used effectively; moreover, such measurements do not account for the time spent to prepare and/or properly document for an effective therapy session.

### **See What I'm Saying: The Effects of Age, Gender, and Hearing Ability on Speechreading**

Presenter: Deanna Diaz

Author: Deanna Diaz

Research Advisor: Mr. Dwayne Wilkerson

Speechreading is a valuable but underutilized tool for increasing the comprehension of spoken communication, especially for individuals with a hearing loss. Successful speechreading can help an individual reduce their own perception of a handicap and increase assertiveness as well as increase educational, career, and social opportunities. With the rise of technological devices such as hearing aids and cochlear implants, speechreading has fallen out of favor due to the amount of time and training it takes to become moderately competent. Speechreading remains a viable option for clients who do not want a device that may be difficult or expensive to acquire and maintain. For this reason, it is helpful for speech-language pathologists to know what characteristics determine whether their client would be an ideal candidate for speechreading training to decide if it would be an effective and efficient goal. This causal-comparative research explored the demographics of successful speechreaders based on age, gender, and residual hearing to support the hypothesis that females between eighteen and thirty-five years of age with a hearing loss make the best untrained speechreaders. Ninety-seven participants aged eighteen years and older of various hearing abilities volunteered for an online survey. The survey tested their ability to correctly identify thirty video recorded words and phrases using visual speech information only. The resulting data showed that overall, women showed higher accuracy on the speechreading task than men did and that the participants who were fifty-five years of age and younger had a higher accuracy on the speechreading task than the participants who were older than fifty-five years of age. As hypothesized, the youngest female group had the highest mean score and the oldest male group had the lowest mean score. More data is needed on how hearing ability affects speechreading comprehension. High attrition of less successful groups may be a major confounding variable in this study. Future research can correct for this by creating a shorter and less difficult survey. Other future research might also gather more information about participants such as personality and cognitive traits. The results are relevant for speech-language pathologists in determining how likely a given client would benefit from speechreading training.

## **TRANScending Voice: A Survey of Perception**

Presenter: Alana Dickinson

Author: Alana Dickinson

Research Advisor: Dr. Linda Weems

Transgender voice and communication therapy is becoming more recognized and practiced in the field of speech language pathology, creating the need for increased evidence regarding efficacy since it is currently lacking. The majority of current studies in this area focus primarily on a single vocal characteristic: pitch. These studies indicate that transgender people who have vocal characteristic disconnect from their physical appearance can have a lowered quality of life. Some studies have indicated that other factors play a role, yet there is little research on listeners' perceptions of transgender people based on their speech. Using cisgender and transgender speech samples to determine personality perceptions, this study aims to add definition to the disconnect and add additional research to transgender voice and communication therapy. The intention of this study is to determine if transgender people are perceived more similar to their birth gender or their identified gender. A survey containing speech samples from cisgender and transgender men and women was conducted in order to answer that question. The speech samples were rated on 12 different personality characteristics. ANOVAs run on each characteristic showed significant difference on eleven out of the twelve characteristics. A Tukey's honest significant difference test was run on the eleven characteristics that showed significant difference to determine where the difference lies. The results showed that the transfemale group was judged to be most similar to the transmale group. The results also showed that the transmale group was judged to be most similar to the transfemale group. Transwomen were found to have the most significant difference most from their birth gender. Transmen, however, had equal significant difference from both their biological and their birth gender. These results indicate that there is a need for transgender voice and communication therapy for transmen. Transmen are generally not included in research in this area because hormone therapy deepens their voice. This study shows that further research should be conducted on the benefits of transgender voice and communication therapy for transmen. Further study can be done by incorporating video with the voice samples to see how seeing the person changes perception. Pitch could also be incorporated into future study to determine if pitch plays a role in the perception of transgender speakers.

## **Student Outcomes and Attitudes in the New Online Classroom**

Presenter: Wafa Haddad

Author: Wafa Haddad

Research Advisor: Dr. Linda Weems

This research investigates how computer-mediated communication impacts instructional quality, student performance, and students' classroom experience in a simultaneous video-based classroom. This study used a quasi-experimental design in which Communicative Disorders graduate students attended an hour-long lecture at Eastern New Mexico University. The control group in this study consisted of 25 female graduate students attending the lecture in-person in a traditional classroom setting. The experimental group consisted 41 female graduate students attending the same lecture via a simultaneous video-based classroom. Participants were compared according to their performance on a multiple choice and free response exam based on the content of this lecture. Participants also completed a survey about their experience of the lecture; trends in perceptions of online and in-person participants were also compared. The results of this study showed that students who attended the lecture in-person performed better academically on the content based quiz following the lecture. In-person traditional classroom participants (control group) also gave more positive ratings in the perception categories "lecturer's fairness" and "lecturer's helpfulness." No significant difference was found in other perception categories ("lecturer's expertise", "lecturer's approachability", and "overall value of the lecture.")

## **Something Wong? How Native English Speakers Understand and Perceive Asian Accents**

Presenter: Keralyn Kadir

Author: Keralyn Kadir

Research Advisor: Ms. Laura Bucknell

The Asian population is the fastest growing ethnic group in the U.S. where successful social integration is associated with English speaking proficiency. While intelligibility and perception are often used as measures of foreign accented speech in research, there has been little research examining the relationship between these two variables. The purpose of this study is to determine whether intelligibility is associated with perception in Asian accented speech including Japanese, Korean, and Mandarin accents and to determine whether any significant differences exist between these accents. In

an online survey, 55 native English speakers listened to 30 speech samples of three speakers with Japanese, Korean, and Mandarin accents then transcribed and rated each sample on an 11-point scale based on how difficult it was to understand the speaker. Results indicate that no strong relationships exist between intelligibility and perception and that there are significant differences in intelligibility and perception of Japanese, Korean, and Mandarin accents. Japanese and Korean accents were found to be significantly less intelligible than Mandarin and were perceived by native English speakers as more difficult to understand even when speech was intelligible. Japanese accents were perceived as most difficult for native speakers to understand overall. These findings suggest that perceptual ratings may vary independent of actual levels of intelligibility meaning that increasing intelligibility might not decrease perceived level of difficulty in understanding Asian accents for all native English speakers; however, intelligibility can still be used as an indicator of significant improvement in individuals receiving accent instruction. For individuals who are generally perceived by native speakers as more difficult to understand such as native Japanese speakers, speech-language pathologists might consider adjusting goals by increasing intelligibility criteria while considering both articulatory placement and prosody. Further examination of how language-specific phonetic and prosodic features influence intelligibility and perception as well as how differences in perception affect communication such as negative attitudes and length of interaction is recommended.

### **Does Encouragement Make an Impact?**

Presenter: Rachel Osterhues

Author: Rachel Osterhues

Research Advisor: Ms. Laura Bucknell

This study was conducted to see if written encouragement increased the test results and confidence levels of the experimental group compared to the control group. The hypothesis was written encouragement would increase quiz scores and confidence levels. Previous research suggests encouragement makes a positive impact in the educational world. This study used a post-test only control group design. The participants consisted of 21 college freshmen in the experimental group and 17 college freshmen in the control group. The experimental group participants were given written encouragement before taking a quiz on a passage read to them. Then, the experimental group participants rated their confidence regarding how well they would perform on the quiz on a 1 to 5 Likert scale with 1 being the lowest and 5 being the highest. The control group participants were not given written encouragement before taking the same quiz

on the same passage read to them as the experimental group. Then, the control group participants rated their confidence regarding their test performance on the same Likert scale as the experimental group. The quiz scores and Likert scale ratings were analyzed separately using a t-test for independent measures. The results of this experiment show no significant difference between the quiz scores in the experimental and control group. However, the results of the Likert scale ratings show the experimental group has significantly higher confidence ratings compared to the control group. The results suggest that written encouragement does have a positive impact on confidence before test-taking, but not on test performance. In the future, it is recommended experiments of this nature be conducted in more realistic scenarios in which students receive an actual grade on the quiz. It is also recommended the Likert confident scale ratings are perhaps more specified than just 1 being the lowest and 5 being the highest confidence rating.

## **The Power of Breath**

Presenter: Melissa Scheller

Author: Melissa Scheller

Research Advisor: Dr. Linda Weems

This study investigated the effects of a four week expiratory muscle strength training (EMST) on a subject's vocal quality with multiple sclerosis. The subject was a 52 year old female with multiple sclerosis that had persisting concerns with her vocal quality (i.e harshness, breathiness, tremor, overall vocal instability). The investigator was interested in analyzing the vocal performance of this subject before and after EMST treatment. EMST (expiratory muscle strength training) is a device used to strengthen expiratory muscles, which are crucial for a strong cough, swallow, and vocal quality. This study was conducted using the EMST 150. The EMST 150 is a spring loaded device used for elicitation of expiratory muscle strength training. It is easily calibrated to the user's ability and is very user friendly. The user simply holds the device to the mouth and blows with maximum force until the valve inside the device opens and allows air to flow freely through. The valve inside the device was calibrated to only open once the air pressure inside the device is great enough to allow the valve to open and air to flow through. Treatment took place according to the "power of five"; a commonly used frequency of EMST treatment method. This method has the subject use the device for five repetitions for five sets of breaths. Specific voice parameters (fundamental frequency, jitter, shimmer, harmonics to noise ratio: HNR) were analyzed using the PRAAT program by way of sustained vowel production (i.e /ah/). These parameters were analyzed before and after treatment

was administered. The posttest results were then compared to the results obtained during the baseline. The subject's maximum phonation times were taken before and after treatment. The subject's results were analyzed for an increase in maximum phonation time average. The PRAAT parameters are measures of vocal quality and maximum phonation averages are used to measure glottic efficiency. The subject's fundamental frequency and HNR results were not statistically significant; however, the subject's maximum phonation time average, jitter and shimmer results were statistically significant when baseline and posttest results were compared using a t-test for repeated measures.

### **A word-of-the-day keeps the SLP away: the effect of direct instruction vs. independent study on English-language competency with English-language speakers with an L1 of Tagalog**

Presenter: Lawrence Valentin

Author: Lawrence Valentin

Research Advisor: Mr. Dwayne Wilkerson

Language consists of two components. Receptive language is the ability to comprehend language while expressive language is the ability to express thoughts and concepts verbally, in writing, and/or gesturally. When acquiring a second language, learners can have difficulty understanding and expressing more complicated information in the new language. In the case of Filipinos who grew up in the Philippines and acquired Tagalog as their first language, many receive formal instruction in English in primary and secondary school in the process of learning English as a second language. Despite formal instruction in English, there is often a language barrier between Filipinos that speak English as a second language and native English speakers. The purpose of this study is to examine the effect of direct vocabulary instruction in English as compared to independent study in English on the ability of adult second-language learners with an L1 of Tagalog to demonstrate greater English-language competency. The subjects in this study included a Filipino couple that completed all of their schooling in the Philippines and speak English as a second language. One participant used a word of the day program to learn new English vocabulary while the other worked on the same vocabulary words with the graduate researcher in direct teaching sessions. Both subjects completed pretest and posttest measures using the Peabody Picture Vocabulary Test (PPVT-4), the Expressive Vocabulary Test (EVT-2), and the Nonliteral Language subtest of the Comprehensive Assessment of Spoken Language (CASL). Results comparing pretest with posttest scores demonstrated that neither direct instruction or independent study was more successful with increasing English-language competency, nor was either

approach more successful with increasing English-language competency than no intervention when compared to a control group. From this study, we can conclude that studying arbitrary vocabulary words does not generally contribute toward English-language competency.

## **Paper Presentation Abstracts**

### **Paper Presentation Group 1**

#### **The Effects of Avian Decomposition on Sunflower Vegetation at 20°C**

Presenter: Shaleen Gearhart

Author: Shaleen Gearhart

Research Advisor: Dr. Kenwyn Cradock

Decomposition can affect not only the soils micro organismal communities but also the vegetation. The depth of decomposition influenced physical and chemical features of the sunflowers. Changes were noted in plant height, chlorophyll content and pH, and leaf and bud morphology. Plant height was retarded by decomposition, yet leaf breadth was increased. Chlorophyll pH decreased but overall chlorophyll content increased in the presence of decomposition. These changes may have significance in a practical sense by providing a tool to identify potential clandestine burial sites, either by direct observation or by remote sensing sensitive to differences in chlorophyll content.

#### **Unknown Origins: Analysis of Skeletal Cranial Remains with Non-Invasive Techniques**

Presenter: Trysha Parker

Author: Trysha Parker

Research Advisor: Dr. Kerriann Marden

The purpose of this study is to use techniques currently utilized within skeletal analysis to assist with ancestry, antiquity, and sex identification of this skull of unknown origin. This cranium was brought to Eastern New Mexico University Anthropology Department 2 years ago after storage for an unknown span of time in the evidence locker of the local police department. Ancestry will be determined through craniometrics, non-metric traits, and dental traits identified on this skull. Antiquity will be determined through these same traits

and paleopathology compared to ranges anthropologists have implemented for distinguishing between prehistoric, historic, and modern humans. Sex identification will be made using craniometrics and non-metric traits. Age estimation will be made through craniometrics, non-metric traits, and dentition. Any anomalies identified within this study will be taken into consideration in determining the origins of these remains. Upon completion of analysis and the determination of biological profile, protocols will be followed for proper disposition of the remains.

### **Social Dynamics of Farmers' Markets in New Mexico and Texas**

Presenter: Layne Wilson

Author: Layne Wilson

Research Advisor: Dr. Stéphanie Borios

The benefits growers and consumers gain from participating in farmers' markets might be different in small rural communities, especially in areas considered as food deserts like the ones under study, and large cities. When people have low access to a healthy food retail outlet, farmers' markets play critical roles at different levels. For instance, they might be the only place where local people can get fresh produce. This on-going study is part of a broader project between the Department of Anthropology and the College of Business at Eastern New Mexico University (ENMU). While the collaborative study focuses on understanding the socio-economic interactions that exist at farmers' markets and how these interactions benefit both growers and consumers in different markets' size, in this presentation we will only look at social dynamics of farmers' markets. Using methods such as participant observation and interviews conducted at farmers' markets in New Mexico and Texas, we are answering the following questions: (1) What roles are farmers' markets playing in creating and/or maintaining relationships among community members? (2) What is the future of these markets? This research also serves as a training tool for undergraduate ENMU students who are involved in the development of questionnaires and surveys, collection of data, and data analysis. Some of our preliminary results are showing that for small-scale growers, attending the market is important for the comradery that they find there and their community's well-being. For consumers, the market is a place where they can get fresher produce and interact with other community members.

## **Archaic Subsistence: An Analysis of Faunal Remains Collected by the Anasazi Origins Project**

Presenter: Patricia Byers

Author: Patricia Byers

Research Advisor: Dr. Kathy Roler Durand

The Anasazi Origins Project, conducted by Cynthia Irwin-Williams in the late 1960s through the 1980s, collected information about the Archaic Period in northern New Mexico. Her goal was to better understand this time period in Southwestern prehistory. The main purpose of this study is to determine the primary prey type for the Archaic Period peoples in the American Southwest. This will be achieved through the analysis of faunal remains collected by the Anasazi Origins Project (AOP) and through the faunal analysis of five other sites in the New Mexico region. Studying the faunal remains from this research project will shed light on Archaic subsistence patterns in New Mexico. The secondary purpose of this study is to prevent the loss of important archaeological information by examining the collection of faunal remains from the AOP that have been virtually untouched since their excavation. Analysis of these remains will help determine how much information can be gathered from the collection and if the AOP faunal collection is useful for future researchers. All the information gathered during the study will be permanently preserved in the Digital Archaeological Record (tDar) for future research.

## **Aeolian Displacement of Lithic Debitage**

Presenters: Erick Martinez, Lincoln Harschlip

Authors: Erick Martinez, Lincoln Harschlip

Research Advisor: Dr. John Montgomery

This experiment was a continuation of Laura Hronec (2015), AN INVESTIGATION OF EOLIAN PROCESSES ON AN ARCHAEOLOGICAL SITE, BLACKWATER LOCALITY NO. 1'S LOCALITY X, researching "lithic artifact displacement by eolian processes, [through] wind tunnel experiments" (Hronec 2015: iv), along with conceptual help from Dr. Marden: (Dr. Kay Marden, personal communication, February 2016). Our focus was to recreate natural open air sites to monitor natural wind conditions and their effect on surface lithic scatters. The goal of the experiment was to test for any possible eolian displacement of lithic debris flakes as a site formation process.

## **Hanfu: the search for ethnic identity by China's millennial generation**

Presenter: Leon Natker

Author: Leon Natker

Research Advisor: Dr. Stéphanie Borios

In 2008 modern China ascended the world stage during the Beijing Olympics, appearing as a confident, economically growing, united country of 1.3 billion people. Zhongguo, the central kingdom, has survived a century of revolutions both political and cultural. Despite regional unrest, its borders have remained constant since becoming the People's Republic of China in 1949. It contains 56 officially recognized 'minzu' or ethnicities, all now labeled as 'Chinese' or Zhongguo Ren. Yet just beneath the pageantry, spectacle, and theatrical smiles lurks an identity crisis among China's majority minzu, Hanzu. 55 of China's minzu are considered shaoshu minzu, or ethnic minorities; in total they account for only 8% of China's total population. The remaining 92% are considered Hanzu, ethnically Han. Among this majority minzu, many people, particularly those born after 1980, feel their ethnicity has been lost in a combination of nearly 400 years of political repression, internal turmoil, and China's rush to prosperity through western style market economics. The near total adoption of western dress, western cars, and the preference in the business world to conduct business in English, has left an identity vacuum for millions of young middle class Chinese. One answer to this dilemma has been the "Hanfu" movement; the wearing of ancient dress and performing of ancient rituals as a means of re-establishing or assuring their minzu. Rituals are often tied to tradition; they are cultural products which when tied to identity equal ethnicity or in the case of the Han their minzu. Regardless of how much practitioners of the Hanfu movement may talk about how wearing the clothes and participating in the rituals makes them feel, it would be a mistake to dismiss the movement as mere sentimentality.

In this paper I will ask if participating in the Hanfu movement can be a means of recapturing the ethnicity of the Han. First I will contextualizing China and the Han historically. This will include a discussion of the origins and usage of the term Han and its journey to becoming an ethnonym. I will follow this by examining the Hanfu movement, its practitioners and practices, as well as its critics. I will argue that it is within the critical debate, from scholars and intellectuals as well as the on-line community, that the Han identity can truly be found, and that this identity combined with the ritual practices creates the Han minzu. This paper will conclude with a discussion of the movement and whether or not its attempt at revival and renewal for the Han can be considered successful.

## **A Paleopathological Analysis of Turkey Remains from the Archaeological Site of Salmon Ruins, NM**

Presenter: Mara Smith

Author: Mara Smith

Research Advisor: Dr. Kerriann Marden

Award Winner

Although literature regarding animal paleopathology is lacking and not as advanced as the related discipline of human paleopathology, the benefit of the study of animal bones and their abnormalities is beginning to be recognized by the archaeological community. The research in the following pages is a small part of the greater understanding of the interactions between people in prehistory and the animals they relied upon for food and ritual items. Using the methods of paleopathology, this study will analyze the turkey remains from the northwestern New Mexico site of Salmon Ruins. Cultural shifts, environmental changes and a catastrophic fire have impacted this site over the 200 years it was occupied. This research will focus on the paleopathological change and osteometrics of turkeys at Salmon Ruin across space and time. Kept turkeys, being influenced by the hand of humans, are unique cases of paleopathology that could potentially provide insight into the husbandry, utilization and care of the animals that the local populations came to rely on so heavily.

## **Mobility of Folsom and Late Paleoindian Occupations at Blackwater Draw Locality No. 1**

Presenter: Tawnya Waggle

Author: Tawnya Waggle

Research Advisor: Dr. John Montgomery

Research and excavations conducted at the Blackwater Draw Site have largely contributed to our understanding of Paleoindian era life. This study addresses Folsom and Late Paleoindian mobility by conducting a lithic attribute analysis on Blackwater Draw artifact assemblages curated at Eastern New Mexico University and the Texas Archaeological Research Laboratory. A lithic attribute analysis of the technology and raw materials provides insight to artifact origin and curation until discard. This research contributes to the existing knowledge of Paleoindian mobility at Blackwater Draw while highlighting new information concerning artifacts recovered at the site.

## Paper Presentation Group 2

### **Crude Oil Price Vs. United States Gross Domestic Product**

Presenter: Hayley Teague

Author: Hayley Teague

Research Advisor: Dr. Sue Stockly

The perceived viewpoint from the common household is that low oil prices are good for the overall economy even though they are bad for smaller economic areas that depend on the oil industry. However, this viewpoint does not take into account the growth of gross domestic product in the United States. This research will analyze the relationship between crude oil prices and gross domestic product growth through a correlation study. The dependent variable is United States gross domestic product. The primary independent variable is crude oil prices. The control variables are the function in the Dow Jones Industrial Average and the growth of the United States population. This study will demonstrate how higher crude oil prices can help bring further economic growth.

### **Are gasoline prices affected by domestic v. foreign petroleum consumption?**

Presenter: Lindsey Adcock

Author: Lindsey Adcock

Research Advisor: Dr. Sue Stockly

“There has been much discussion over the idea on whether the United States is too dependent on foreign oil but there has also been the controversial issue that producing oil domestically in the United States can cause environmental harm to the land involved with the process of extracting oil. With the use of a multilinear regression model, this study will determine if gasoline prices were affected by domestic vs. foreign oil consumption during the period from 1992 to 2016. The dependent variable for this study will be the percent change in real GDP while the primary independent variable will be net exports of oil during the twenty-four year period in the United States. There will be two control variables used which gasoline prices and renewable energy consumption. If gas prices and net exports of petroleum are negatively related, it will show that real GDP will be positively stimulated by domestic oil production. This will then help decision makers determine what programs would best fit to increase domestic production of oil.”

## **Do agricultural subsidies affect exports?**

Presenter: Coby Carter

Author: Coby Carter

Research Advisor: Dr. Sue Stockly

Subsidies can be a major concern in today's economy. Do farm subsidies affect agricultural exports? There can be a lot of subsidies used in agriculture, so would be helpful to know how those subsidies are affecting the agricultural exports. There will be a multilinear regression used to interpret these results. The dependent variable is wheat exports, with the independent variables being: population, real GDP, and subsidies. If policy makers knew how these subsidies were affecting the exports, they would be better equipped to make policy, and may be able to design policy that is based around agriculture, with exports in mind. Since ag is the largest exporter of products, the expected results are that more subsidies are going to mean more exports.

## **The Determinants of Auto, Mortgage, and Student Loan Delinquencies**

Presenter: Matthew Carwile

Author: Matthew Carwile

Research Advisor: Dr. David Hemley

Award Winner

The United States has reached all time highs in student loans outstanding and auto loans outstanding. Mortgages outstanding are nearing pre-recession highs, as well. It is not uncommon for an American to be paying off all three of these loans and credit cards at one time. The 90+ delinquency rates on these outstanding loan balances fluctuate year after year and are worth analyzing. Could there be any insight as to why these delinquency rates move in these ways? Developing insight about these determinants will aid in keeping these loans manageable for those who decide they want to pursue higher education, home-ownership, or owning a car. This paper will analyze economic trends in GDP, unemployment rates, and the amount of student loans, auto loans, and mortgages outstanding from the St. Louis Federal Reserve database, relative to the 90+ delinquency rates gathered by the New York Federal Reserve to determine if these rates are correlated. This investigation will consist of multiple regression analysis and time trend analysis.

## **Firm Performance: Determining Which Financial Ratio Impacts Stock Price the Most**

Presenter: Jared Gay

Author: Jared Gay

Research Advisor: Dr. David Hemley

One of the best indicators of firm performance is the stock price. Therefore it is important to determine which financial ratio is the best indicator of stock price. There are many different factors that influence the stock price of a firm. These factors are the inputs for the ratios that affect stock price. The ratios that impact the stock prices are the liquidity ratios, debt ratio, profitability ratios, asset management ratios, price to earnings ratio and earnings per share. There will be thirty firms chosen randomly but categorized by market value. The data for the ratios will be found using Yahoo Finance and the Securities and Exchange Commission. The methodology used will be estimating several regression equations to find the relationship between the stock price and the given ratios. The three different classifications of firms are small, intermediate and large capitalization.

## **CAPM With Differing Periodicities**

Presenter: Hannah Gomez

Author: Hannah Gomez

Research Advisor: Dr. David Hemley

This paper examines and analyzes how the periodicity used to find the required rate of return of a company affects the derivation of the beta of the company. By examining three companies, one small-cap, one mid-cap, and one large-cap, all within the same sector we will see if the changes in beta are significantly different when calculated annually, quarterly and biannually. We will also discuss the variability of the different market caps to examine if this variable affects the stability of the beta.

By using the historical data of Exxon Mobil, Patterson Energy Inc., and Wilbros Group, from yahoo finance, we will calculate the betas through a regression analysis for the three periods (annual, biannual, and quarterly) of the past 20 years. We will input these betas in the CAPM and determine if the difference is substantial.

## **The Price of Leadership: CEO Compensation & Share Price**

Presenter: Rick Ornelas

Author: Rick Ornelas

Research Advisor: Dr. David Hemley

This paper is cross-sectional analysis that investigates the pragmatic relationship between CEO compensation and the constant fluctuating in the company's share price. The analysis will be using data collected from 30 randomly selected Standard and Poor's 500 companies. The two years of data was collected through Yahoo finance, Insider Morningstar and the 30 companies' individual websites; The data driving this examination is two years of CEO compensation from 2014-2015, and two years of past share prices from 2013-2014. The hypothesis of the cross-sectional analysis is that the company share price from the past year and the CEO compensation for the following year has no direct relation to one another.

The evaluation of these 30 companies will take place in the form of four separate regressions. The first regression will compare 2014 CEO Compensation vs. 2013 share price. The second regression will compare 2015 CEO Compensation vs. 2014 share prices. The third regression will look at the first difference of CEO compensation vs. the first difference share price. The fourth and final regression will look at the percentage change of CEO compensation vs. the change in share price. The findings from these regressions will illustrate how companies value CEO performance year to year in terms of compensation in relation to each respective company's share price the year before.

## **Economic and Financial Determinants of Corporate Bankruptcies**

Presenter: Casandra Torres

Author: Casandra Torres

Research Advisor: Dr. David Hemley

In the business world, there are three types of corporate bankruptcies that may be filed: chapter 7, chapter 11 and chapter 12. Of these three, chapter 12 is the rarest as it focus on the self-made man, if you will. This being said, it allow for the reorganization of debt, and applies to only the "family farmer" and "family fisherman". Similarly, chapter 11 encourages the reorganization of both the corporate assets and debt in an effort to keep the company alive. However, when it is believed a company is unsalvageable, a liquidity bankruptcy is filed under chapter 7.

The research conducted here focuses on deriving the determinants of the various forms of bankruptcy using regression analysis. Independent variables incorporated into the regression include: real GDP, unemployment rates, and inflation rates. There are 16 years of data, divided by each type of bankruptcy. The information compiled was accessed through the Bureau of Economic Analysis, the U.S. Courts, and the Bureau of Labor Statistics.

### **Paper Presentation Group 3**

#### **Synthesis of Oligofluorenes for Applications to Organic Solar Cells**

Presenter: Chase Bryant

Author: Chase Bryant

Research Advisor: Dr. Juchao Yan

While many think of silica based solar panels as the main medium used for solar energy, conjugated organic polymers can also be used in these applications. Conjugated polymers can be used for solar energy because of electron delocalization in the pi orbitals that allows for electron transfer along their structures. While electron delocalization opens many possibilities because it allows for the production of flexible, durable, and low cost printing of organic solar cells which leads to renewable and sustainable energy for our society; the efficiency of such cells still need improvement. To complete this research, we must first synthesize rigid, planar oligomers and then use Fourier Transform Infrared analysis and cyclic voltammetry to provide possible conclusions on the structure-property relationships of electron delocalization. Nitrile groups have shown to be effective probes for electron delocalization in terms of infrared vibrations and must be added onto oligomers. Determining redox potentials in low dielectric constant will aid in establishing a structure property relationship of electron transfer. Suzuki-cross coupling, cyclization, bromination, alkylation, and nitrilization were used for synthesis. In addition, extraction, rotoevaporation, thin-layer chromatography, and column chromatography were used to isolate each product in the multi-step synthesis. Bromination, cyclization, and alkylation were confirmed with NMR. This research can provide data to assist in the optimization of organic solar cell efficiency by providing information about what structural properties aid in maximizing electron delocalization.

## **Optimizing affinity chromatography using a novel vacuum approach**

Presenter: Krysten Finney

Author: Krysten Finney

Research Advisor: Dr. Elliott Stollar

Protein purification is essential in the study of protein structure and function both of which are critical for the development of novel therapeutics. Many studies require purifying multiple proteins at once, increasing the demand of economical and time efficient methods. The novel vacuum manifold method presented allows the user to have modularity while still maintaining an economical and time efficient, high-throughput method. Our system is easy to operate, low cost, requires minimal user effort, and requires less time than other methods. This method handles up to 24 small columns or 12 large columns in a single unit. The use of a single unit allows for easy optimization of purification by testing multiple conditions at once. We hope by increasing imidazole concentrations residual protein contaminants can be removed. Additionally, with our vacuum approach we can implement ion exchange purification for removal of trace proteases from the initial purification step. The high-throughput and versatile nature of this method should prove to be useful in obtaining adequate amounts of protein for analysis.

## **Binding insights from yeast SH3 domain-peptide hybrids**

Presenter: Andi Johnson

Author: Andi Johnson

Research Advisor: Dr. Elliott Stollar

The SH3 domain is one of the most common protein-peptide interaction domains and are a key component in regulating cell signaling pathways. The SH3 domain interactions with an extended peptide are modeled using a domain-peptide hybrid system. This hybrid system allows us to easily purify one molecule and compare intra-molecular stability of the complex to the stability of only the domain. Our lab has previously characterized a domain-peptide hybrid using Abp1, but to investigate new domain-peptide hybrids will we attempt to characterize 7 new hybrids. Chemical denaturation equilibrium assay will be used to probe for increased intramolecular stability. By comparing one SH3 domain alone and in a domain-peptide hybrid, a binding constant can be obtained for new peptides. 7 domain members with their domain-peptide hybrid counterparts have been expressed and purified. Preliminary chemical denaturation results indicate it is possible to extend our hybrid system to other SH3 domains which

will help in the characterization of novel peptides. This system allows us the potential to easily investigate mutations in peptides and compliments an ongoing bioinformatics study. The characterization of new peptides would allow for new structures either in our hybrid system or an intermolecular complex between a domain and peptide.

### **Exploring two adjacent segments in an extended binding peptide**

Presenter: Brett Marshall  
Author: Brett Marshall  
Research Advisor: Dr. Elliott Stollar

### **Structural Studies of the SH3 domain family of yeast**

Presenter: Rebecca Rhode  
Author: Rebecca Rhode  
Research Advisor: Dr. Elliott Stollar  
Award Winner

The SH3 domain family is a group of proteins with key parts in protein-protein interactions. There are 28 Domains in the Yeast SH3 domain family, which is a good model for the approximately 300 human SH3 domains. In order to study how these domains interact, we will therefore purify each domain and conduct secondary structure and stability analysis. Using CD, we can measure secondary structure for all SH3 domains to compare between the various members. This experimental data can be compared to known or predicted models. Simultaneously, melting temperatures can be measured to determine thermal stability, using different salt concentrations. Preliminary results show a variety of melting temperatures and secondary structure folds. We did not expect the secondary structure to change as drastically because the family has a common fold. Combining structure and stability data will help in determining the ideal conditions to study each domain.

### **Growing Microalgae in Dairy Manure Effluents for Sustainable Biofuel Production**

Presenter: Bin Bai  
Author: Bin Bai  
Research Advisor: Dr. Juchao Yan

The gradual global depletion of fossil reserves has made it imperative for most countries to seek viable alternative sources of energy. Algae as a renewable energy have grown in importance as environmental and economically sustainable fuels. Adapt microalgae cultivation on an algal turf scrubber to local conditions for maximizing the productivity is a new chance to pollution abatement and enhance economic performance. We use aquiculture system to collect data and spectrophotometer to trace the quality of culture water. We have also used high performance liquid chromatography and gas chromatography-mass spectrometry to characterize the separation fractions which form Soxhlet extraction of lipids. Combine all the analysis, we want find the best condition in local for product industrialization.

### **Separation and Analysis of Produced Water for Osmotic Power Development**

Presenter: Elizabeth Jackson

Author: Elizabeth Jackson

Research Advisor: Dr. Juchao Yan

Produced water is water trapped in underground formations that is brought to the surface during oil and gas production. In the field surrounding osmotic power, produced water has become an area of interest pertaining to the establishment of a renewable energy source driven by the high salt concentrations found within produced water. Through analyses, aided by GC, GC-MS, and GC-FID, it has been established that the hydrocarbons that make up oil and the industrial chemicals used during the extraction process depend entirely upon geographical region. To better understand produced water and the properties that allow for the generation of such a high salinity concentration, produced water will be analyzed at the ionic level through the use of potentiometry and UV-Vis spectrophotometry.

### **Optimization of lipid extraction from algae cultivated on dairy waste-water**

Presenter: Tanaka Pfupajena

Author: Tanaka Pfupajena

Research Advisor: Dr. Juchao Yan

The majority of the fuels we use in our vehicles and other equipment on a daily basis are nonrenewable. As a result, the world is going to eventually run out of supplies of fuels. In addition, the current fuel sources are environmentally unfriendly, releasing greenhouse gases into the atmosphere. Many alternatives

to using natural reservoirs as sources of fuels have been exploited, among which, the use of algal feedstock as a source of biofuel has received enormous attention. Algal biofuel was studied for a long time, and has recently gained popularity again due to the global demand for transportation fuels, the greenhouse gas effects, and the energy security risks. Funded by the NSF, at Eastern, we are cultivating algae on an outdoor pilot unit ( Algal Turf Scrubber( ( in dairy manure effluent for wastewater treatment and sustainable biofuel production. Algae offer an inexhaustible source of energy, nutrients and raw materials. When microalgae are grown and harvested, the biomass obtained contains lipids, which can be converted into biodiesels through chemical transformations. One of the main difficulties in implementing the use of algae for biofuel on a wider scale, is the inefficient methods of lipid extraction, and the current methods used do not exhaustively extract all the lipids, and are costly, thereby making the wide scale production of algae not economically feasible compared to the current natural fuels being used. In this project I investigated ways to maximize the amount of lipids extracted and develop simple extraction procedures that do not require a lot of energy to successfully extract the lipids required for the production of the biofuels. I used Gas Chromatography - Mass Spectrometry to characterize the extracted lipids. In addition, I will also investigate how to utilize the remaining material after the extraction is completed.

#### **Paper Presentation Group 4**

##### **Accuracy in Malaria Diagnosis:Comparing Microscopy and PCR-Based Methods**

Presenter: Jones Adjei

Author: Jones Adjei

Research Advisor: Dr. Manuel Varela

Accuracy in *P. falciparum* malaria diagnosis is an important issue in preventing and eradicating the disease in sub-Saharan Africa. Accurate diagnostic techniques are needed to avoid false negatives which lead to greater disease burden, as well as cases of false positives where unnecessary treatment can result in needless expense and the development of drug resistance. There are multiple considerations that arise when selecting a particular diagnostic method. These include cost, expertise required, time to diagnosis and, most importantly, sensitivity and specificity. Two diagnostic methods (thick smear Giemsa stain and nested PCR for the *Pfprt* gene) were compared in terms of diagnosis obtained. In addition, the chloroquine sensitivity or resistance of the samples showing positive by PCR was determined using *XapI* restriction digestion. Out of the 89 samples collected at the Clinical Analysis Laboratory in the Dept. of Biochemistry,

KNUST, microscopy identified 42 as positive while 39 were identified positive by PCR. Of the positives identified by PCR, 19 were negative by microscopy while 20 were also positive by thick smear. There were, however, 22 samples that showed positive by microscopy, but were identified as negative in the PCR. Thus, 20 samples were positive by both methods and 28 samples were negative by both methods. The higher sensitivity of PCR makes it more reliable than microscopy, which is highly operator and protocol dependent. Overall, taking nested PCR as the gold standard, diagnostic accuracy by thick smear at the lab was 54%, which is in line with numerous results reported in the literature. Of the parasites detected in the patient samples, 97% were chloroquine resistant. Thus, sensitivity to the drug does not appear to be returning in Kumasi, as has been observed elsewhere on the continent. Overall resistance may even be increasing, as this value is higher than the ~87% reported in Kumasi by Abruquah et al. (Ghana Med J.2010 June;44(2): 52–58). Additional samples are being tested to augment the numbers and validate this preliminary finding.

### **Dairy Wastewater Remediation: The Algal Turf Scrubber Project**

Presenter: David Arellano

Author: David Arellano

Research Advisor: Dr. Juchao Yan

The Algal Turf Scrubber (ATS) Project at Eastern New Mexico University (ENMU) has had an exceptionally productive year. By changing construction and influencing certain parameters, a correction in pH has been achieved; from a daily pH cycle of approximately 9.5 – 11.0 to approximately 7.3 – 7.6 reliably, regular testing done using YSI 5200A Water Monitoring System. This change in pH has led to distinctive improvements to the overall project goals of algal biomass production and bioremediation of readily available wastewater. The biomass productivity has increased significantly over previous year's data, from a peak of 4.96 g AFDW m<sup>-2</sup> day<sup>-1</sup> in 2015 to a peak of 13.6 g AFDW m<sup>-2</sup> day<sup>-1</sup> in 2016, with an organic content increasing by as much as 30%, using a modified method derived from NREL. Bioremediation became quantifiable, with removal rates of ca. 3.68 x 10<sup>-2</sup> mg L<sup>-1</sup> h<sup>-1</sup> for s-TKN (i.e., simplified-Total Kjeldahl Nitrogen) and 8.99 x 10<sup>-3</sup> mg L<sup>-1</sup> h<sup>-1</sup> for ortho-phosphorus using methods established by Hach, with a Hach DR 6000 UV-Vis spectrometer.

## **Hantavirus in Eastern New Mexico: Rodent Diversity Impact on Prevalence of a Deadly Zoonosis**

Presenter: Jessica Curtis

Author: Jessica Curtis

Research Advisor: Dr. Ivana Mali

Award Winner

Certain hantaviruses are zoonotic that, when contracted by humans, can cause the often fatal hantavirus cardiopulmonary syndrome (HCPS). Several rodent reservoir species serve as biological vectors. In northwest New Mexico in 1993, the initial outbreak of HCPS occurred and was caused by the Sin Nombre strain (SNV). Since then, studies of prevalence and distribution of hantaviruses in rodent populations have been conducted in northwest New Mexico, Texas and Arizona, but little is known about its occurrence in eastern New Mexico. In 2015, Eastern New Mexico University students trapped small mammals on the university Natural History Preserve in Portales and the Bottomless Lakes State Park in Roswell. Blood samples were collected and tested for antibodies to hantaviruses via enzyme-linked immunosorbent assay (ELISA). Of the 103 blood samples across eight rodent species, five species tested positive, with an overall prevalence of ~8%. Southern plains woodrats (*Neotoma micropus*) had the highest prevalence of ~40%. Previous studies have mainly examined prevalence of SNV in its primary reservoir, the deer mouse (*Peromyscus maniculatus*). This thesis research provides a more in-depth assessment of eastern New Mexico small mammal community members and the prevalence of hantavirus antibodies in each representative species. Sampling continues at various sites in Roosevelt County, in order to further observe the possible impact of rodent assemblages and other explanatory variables on hantavirus prevalence. By analyzing the possible hantavirus dependence on rodent community dynamics, we may hone predictive tools concerning this dangerous zoonosis.

## **Solar Powered Golf Cart with Speech Recognition**

Presenters: Karen Gutierrez, Dana Becker

Authors: Karen Gutierrez, Dana Becker

Research Advisor: Dr. Hamid Allamehzadeh

**Abstract:** In this report, we document the research and engineering practices that were used to design a solar powered golf cart with speech recognition. We also discuss the construction of the solar panels on the cart, as well as the software involved in speech recognition design. We then will use these

techniques to do some basic functions, for example one will be to turn on a light at first and eventually working our way to turning on other aspects of the golf cart. The main components of the system include a speech recognition board that will be used to recognize individual voices. A SpeakUp Click board will be set up which will allow us to personalize codes to certain individual voices that will then turn on specific sections of the golf cart.

Introduction: Numerous technologies are constantly emerging with widespread applications concerning the field of human machine interaction in Speech recognition. The process on how it works is by converting speech signals into a sequence of words or other linguistics in a form of an algorithm implemented into a computer program. To better understand on how speech signals work we must first break them down into two types of information. One is what is the user speech content and the other being the speaker's identity. Speech recognition aims to remove the lexical information from the user's speech signal by reducing the inter-speaker variability. Speech recognition main goal is to extract the identity of who the person is. [1]

The speaker's identification allows the use of speech to verify one's identity to control, command, and access certain objects or services. Speech Recognition offers greater liberty to service the physically handicapped in many applications. For example, manufacturing process, telephone service, and medicine are all very good examples.

Demand for alternative energy sources has increased dramatically over the last few years. The oil demand is high with many countries depleting their resources faster than expected. In addition, there is a greater concern on the emission of carbon dioxide. The carbon dioxide is gradually crating a warming environment in the planet. The need for renewable energy sources is of the utmost importance. Solar energy has been in the forefront, the material in the solar panels absorb photons to convert it into electrical energy. The current electric golf cart will be modified with solar panels and as the solar panels charge from the sun, the panels will charge the golf carts battery pack. [3]

## **Assessing Spring Canola Adoptability to Southern High Plains Using Critical Stage Based Irrigation**

Presenter: Krishna Katuwal

Author: Krishna Katuwal

Research Advisor: Dr. Young Cho

The Southern High Plains mainly depend on Ogallala aquifer for irrigation due to low and uncertain precipitation. However, an extensive use of ground water resources for irrigation has significantly depleted the Ogallala aquifer. It

is estimated that if current rate of water withdrawal continued, nearly 35% of the Ogallala irrigated area of the Southern High Plains will not be able to irrigate in the next 30 years. Therefore, there is a need for identifying alternative crops with less water requirement as compared to traditional crops, which is the major objective of this research. Three different canola cultivars (930, 955 and L140) were grown under four different irrigation treatments [fully irrigated, stress at vegetative stage (VS), stress at reproductive stage (RS) and dryland (DL)]. The result indicated that total aboveground biomass partitioning into reproductive structures including flowers and pods is greatest in VS, followed by IR, RS and DL. It eventually led highest harvest index in VS, which was not significantly differed from IR. High plant biomass and seed yield were observed for both IR and VS. IR and VS had on an average 51% and 125% higher plant biomass than RS and DL, while 125% higher seed yield than both RS and DL in 2015, respectively. In 2016, IR had 17%, 30% and 81% higher plant biomass than VS, RS and DL, while both IR and VS had 105% and 238% higher seed yield than RS and DL, respectively. The plants were taller for IR and RS than VS and DL. The peak values of LAI varying in the range of 3-4 were observed for IR and VS during reproductive stage. Among cultivars, cultivar L140 had taller plants with more plant biomass and seed yield as compared to cultivars 930 and 955. Further, water use efficiency was higher for VS as compared to IR, RS and DL.

## **Differential Demographics of Rio Grande Cooter in Two Populations from New Mexico and Texas**

Presenter: Andrew Letter

Author: Andrew Letter

Research Advisor: Dr. Ivana Mali

The Rio Grande cooter (*Pseudemys gorzugi*) is a riverine turtle occurring in New Mexico and Texas within the United States. The species is listed as state threatened in New Mexico and a species of greatest conservation need in Texas. With a distribution in the semi-arid American Southwest, this species is often overlooked and very little is known about its biology, ecology, and natural history. Methodical surveys are necessary in order to determine its current status. In this paper, we present the results of the most recent surveys from two distinct populations in New Mexico and Texas. The results show fundamental differences in demographics of these two populations. Turtles from the Texas population were significantly larger and had higher body condition indices. In contrast to those metrics, the population in New Mexico had a considerable proportion of hatchling turtles while Texas population lacked both juvenile and hatchling turtles. This study opens doors for further more specific studies and hypotheses

testing on why such differences exist, the causative factors creating the disparity, and evaluating the consequences to the Texas population.

**Intracellular accumulation of astaxanthin within *Haematococcus pluvialis*, in response to environmental stress.**

Presenter: Allison Minter

Author: Allison Minter

Research Advisor: Dr. Zhiming Liu

*Haematococcus pluvialis* is a single celled eukaryotic green alga and belongs to the Haematococcaceae family. It is known for its synthesis of a pigmented antioxidant called astaxanthin. Astaxanthin is an important protein used for various commercial applications (e.g., food processing and cosmetics). In response to various environmental stresses *H. pluvialis* transforms itself into vegetative non-motile encysted cells and rapidly synthesizes a large amount of astaxanthin intracellularly. Astaxanthin then protects the cells from harmful oxidization caused by other cellular compounds. The objective of our project was to develop a new method to induce an accelerated production of astaxanthin in *H. pluvialis* cells by manipulating a series of environmental factors (light, temperature, pH, and hypoxic stress). *H. pluvialis* was initially cultured under a standard laboratory condition, and then treated under a series of modified environmental conditions (high light intensity, high temperature, low pH and low oxygen concentration) to illicit stress responses in the cells. After the treatments the cells were harvested. The quantity of the astaxanthin accumulated in the cells was quickly quantified. Our preliminary results supported a high growth rate and an accelerated accumulation of astaxanthin in the cells of *H. pluvialis* cultured under a high light intensity. Other experiments are currently in progress according our experimental designs.

**Paper Presentation Group 5**

**Dietary Preference of Four Amphibian Species Native to New Mexico; *Bufo cognatus*, *Bufo woodhousii*, *Scaphiopus couchii* and *Lithobates berlandieri***

Presenters: Daniel Gallegos, Jeremiah Olivas

Authors: Daniel Gallegos, Jeremiah Olivas

Research Advisor: Dr. Kenwyn Cradock

Studies for feeding preference typically involve the anaesthetizing and removal of the stomach contents to observe what diets the species had been selecting for. This study was conducted to investigate feeding preference of *Bufo cognatus*, *Bufo woodhousii*, *Scaphiopus couchii* and *Lithobates berlandieri* which are all specimens from the Dr. Gennaro Natural History Museum at Eastern New Mexico University. The specimens were all fed a diet that consisted of crickets, mealworms and earthworms and were fed three times a week. We returned the following day after each feeding event to visually observe and record what each specimen ate overnight. We are expecting that the specimens will select for crickets because this has been their primary diet since they've been in captivity at the museum and mealworms and earthworms were introduced to their diets when we began our study. We believe that this will give a base line on how long the transition period will take for amphibian species to adjust to introduced diets when brought in from the wild. We are investigating whether we can maximize their diets so these techniques can be replicated in captive breeding programs to optimize diets of threatened and endangered amphibians to maximize survival rates once returned to the wild.

### **Physiological Plasticity of Plants After Fire: Determining Differences in Plant Germination and Plant Establishment in Communities After a Fire Disturbance**

Presenters: Wendy Hendrick, Eddwinia Rodriguez  
Authors: Wendy Hendrick, Eddwinia Rodriguez  
Research Advisor: Dr. Kenwyn Cradock

In this study, we will be determining differences in plant germination and plant establishment in communities after a fire disturbance. Fire severity is the loss or change in organic matter above and below ground. This study was conducted to investigate the effects of fire on the germination rates of new plants. We expected that there would be a greater abundance of nutrients in the soil that had the fire versus the control that was unaffected. We predicted that the germination rate in the variable pots would be greater than in the control sample. Our samples came from Ned Houk Park, just north of Clovis NM at 34.5626°N and 103.188° W. On February 11, at approximately 1:04p.m., area was burned because of an accidental fire. The fire started from a grill and because of the high winds, ignited the surrounding grass. Upon investigation and some preliminary data, we discovered that the variable sample (soil that was burned) did contain more nutrients however, despite the added nutrients, germination rate was slower in the variable samples. Our variable soil, when tested, showed pH was 7.5 alkaline, Nitrogen, Phosphorous, and Potash were in surplus Our control soil, when tested, showed the pH at 7.0 neutral, and Nitrogen, Phosphorous, and Potash as deficient.

Further investigation needs to take place investigating which added nutrient from the fire is affecting the slower germination rate.

### **How Well Do College Students Understand Proper Antibiotic Use?**

Presenter: Miel Johnson

Author: Miel Johnson

Research Advisor: Dr. Kenwyn Cradock

Award Winner

Antibiotics have been used to treat bacterial infections for decades. Unfortunately, the overuse and improper use of these drugs over time has allowed for dozens of bacterial strains to adapt against these medications. Antibiotics are less effective than they were, and resistant infections are becoming more prominent all over the world. The lack of public knowledge is a key factor of this rising epidemic because there is little information about antibiotic resistance publicized. Even individuals who have heard of antibiotic resistance still do not understand the severity of not being able to treat a multitude of infectious diseases. Additionally, many people do not understand how to properly take antibiotics, which is crucial to preventing antibiotic resistance. The purpose of this study was to see how well undergraduate college students understand proper antibiotic use. Sample classes from each college department were randomly selected and the students were given a one-page survey to take. Surveys contained a demographics and a knowledge-based section. Once all surveys were complete, statistical analyses, including chi-square and percentage calculations, were done to compare how well college students could answer antibiotic-related questions depending on their department and demographics. The data collection and results are still in progress.

### **Landing Rates of Birds in Correlation to Wind Speeds**

Presenters: Kyle Logan, Abigail Rockett

Authors: Kyle Logan, Abigail Rockett

Research Advisor: Dr. Kenwyn Cradock

Our study was conducted to investigate the landing rates of birds in correlation to wind speeds. Our hypothesis is more birds will be perched during times of high wind speed and less birds will be perched during times of low wind speed. Preliminary results show medium and small birds are more likely to be perched during times of high wind speeds. The study will provide more insight

into birds' behavior in relation to wind speeds, and more information on flight patterns during high winds.

### **Vegetation Analysis of ENMU Preserve Versus Surrounding Managed Land**

Presenters: Alissa Boissiere Nemmers, Paul Bright  
Authors: Alissa Boissiere Nemmers, Paul Bright  
Research Advisor: Dr. Kenwyn Cradock

**Abstract** Grasslands have become increasingly endangered throughout North America. Human influence has had great negative impacts on grassland ecosystems, due largely to clearing and utilization for crop production, ranching, and settlement. It is important for grasslands throughout the country to be monitored and surveyed, to provide useful data for continuing research and protection. There is little research available regarding vegetation analysis within eastern New Mexico, especially within Roosevelt County. This study seeks to provide data on the vegetation of the Eastern New Mexico University preserve and the surrounding managed land of the old ENMU stadium. This study was conducted to determine vegetation diversity, cover, and plant height of the two study sites using the line-intercept method of vegetation sampling. With the data collected from the two sites, we will also compare the results between unmanaged and managed grasslands within Roosevelt County, NM. Based on past grassland studies, we expect the managed area to have lower diversity, but similar cover, when compared to the preserve land. This study will provide preliminary data on vegetation diversity, cover, and height of grasslands within Roosevelt County, New Mexico, and what differences resulted between the preserved and managed lands.

### **How temperature and wind conditions affect the behavior of black-tailed prairie dogs (Cynomys ludovicianus)**

Presenters: Emily Peterson, Jay Hargrove  
Authors: Emily Peterson, Jay Hargrove  
Research Advisor: Dr. Kenwyn Cradock

**Abstract** Black-tailed prairie dogs (*Cynomys ludovicianus*) are burrowing rodents that live in colonies and populate western North America. Instead of hibernating and uncharacteristic of other prairie dog species, black-tailed prairie dogs stay active throughout the year and enter torpor. They are important to the short grass ecosystem. The present study examined the behavior of black-tailed prairie dogs in relation to fluctuating temperatures and wind intensity levels.

We performed aboveground counts of the black-tailed prairie dogs on random days and random times during the day over a period of several months (from last week of January to first week of April 2017). We monitored six colonies in three different counties (Curry, Roosevelt, and Lea) in eastern New Mexico to generate a larger sample and to reduce bias. We predicted the black-tailed prairie dogs will remain in their burrows when temperature is below 10 degrees Celsius ( C) with wind intensity greater than 64.4 kilometer per hour ( $\text{km} \cdot \text{h}^{-1}$ ). The aboveground counts of black-tailed prairie dogs during warmer temperature (between 15.6 and 23.9 C) with minimum (less than  $8.0 \text{ km} \cdot \text{h}^{-1}$ ) to no wind intensity to result with high counts. We deduced that temperature had more affect on black-tailed prairie dog's behavior than wind. There were fewer black-tailed prairie dogs counted aboveground during colder temperature (less than 10 C) and there was no significant difference in the aboveground counts associated with wind intensity levels.

### **Toxic Invaders**

Presenters: Kodi Waddell, Curtis Madsen

Authors: Kodi Waddell, Curtis Madsen

Research Advisor: Dr. Kenwyn Cradock

The silverleaf nightshade, *Solanum elaeagnifolium*, is a deep-rooted plant featuring star shaped blossoms with prominent petals and yellow stamens. The fruits produced by the plant are toxic. The silverleaf nightshade is toxic to livestock and humans and can be lethal if ingested. We are studying the density of the Silverleaf nightshade in the Portales, New Mexico area; we are using transect lines to help give us an idea of the population density. This study was conducted to inform the public and local livestock owners of the abundance of the toxic plant. After conducting research, we predict that we will observe a greater abundance of Silverleaf nightshade plants on disturbed land. Based on preliminary research we were able to determine that the silverleaf nightshade is more abundant on disturbed lands. Increased awareness that disturbed areas are likely to support larger populations of thus plant should enable the public and local farmers to minimize the risks posed by silverleaf nightshade.

### **Bird Densitys of ENMU**

Presenters: Korry Waldon, Janet Ponce

Authors: Korry Waldon, Janet Ponce

Research Advisor: Dr. Kenwyn Cradock

Our research is a point count survey of birds in three locations. Two are on the Eastern New Mexico University campus and one is at a nearby park. The materials used are a pair of binoculars, and a phone for a timer. The method used are to sit at each location for ten minutes and begin counting and recording birds when the timer started. The surveys are done between 9am-12pm. The order of the spots we visited change each time. Only species within a 50-meter radius are counted and only if the species was identified. Birds of prey are not counted but noted if in the study area. The purpose for our study is to understand what birds are located around our campus and how dense their populations are.

### **Paper Presentation Group 6**

#### **La soledad sin Dios en El Túnel**

Presenter: Karla Moriel Abduljabbar  
Author: Karla Moriel Abduljabbar  
Research Advisor: Ms. Gloria Jurado

La soledad sin Dios en El Túnel will cover an analysis based on the loneliness of Juan Pablo Castel due to a lack of God in his life. The paper will be read in Spanish. I chose this topic for my analysis due to my background in religion. I supported my analysis with external research in the form of books. After reading the novel and taking a closer look at the character Juan Pablo Castel, I discovered that his attitude and behavior showed the absence of God in his life. My research will support this argument.

#### **El amor en los empeños de una casa**

Presenter: Catalina Arana  
Author: Catalina Arana  
Research Advisor: Ms. Gloria Jurado

This essay will discuss the different kind of loves found in Los Empeños de una Casa by Sor Juana Ines de la Cruz. The different kind of loves being self-interest, real, and forced. This essay will provide evidence from the story, showing the different scenarios of love.

## **El Honor**

Presenter: Cruz Exiga

Author: Cruz Exiga

Research Advisor: Ms. Gloria Jurado

Honor plays a vital role in Gabriel García Márquez's novel, *Chronicle of a Death Foretold* (*Crónica de una muerte anunciada*). In *Chronicle of a Death Foretold* García Márquez talked about two different meanings of honor. One, honor from a man's point of view and two, honor from a woman's point of view. Both, a man's and a woman's honor depend on how the towns people see them. Their honor also depends on each other. In *Cronica de una muerte anunciada* Ángela Vicario is getting married to Bayardo San Roman. The night of their wedding, Bayardo found out that his wife was not a virgin. He returned her back to her parents' house. It would be dishonorable if he knew about and decided to stay with her. It was believed that a woman should be married a virgin. This would give men honor. If they married a virgin woman, this meant that they married an honest, pure and honorable. Which then gave the men more honor. When the Vicario Brothers, Ángela's brothers, found out they demanded the name of the person who had taken her virginity. Ángela told them that it was Santiago Nasar. The brothers were determined to kill Nasar for taking away her sister's honor and by killing him they were going to restore Ángela's honor. There are other traits that characterized honor in both, men and women in García Marquez's work.

## **La indentidad mexicana**

Presenter: Marle Exiga

Author: Marle Exiga

Research Advisor: Ms. Gloria Jurado

In the book *'The Labyrinth of Solitude'* by Octavio comes with nine chapters where Paz talks about the personalities/characteristics of Mexicans by going through the history, social, cultural, and other aspects of the Mexicans. The main focus of this paper are on three chapters, *"El pachuco y otros extremos,"* *"Mascaras mexicanas,"* and *"Todos santos el día de muertos."* The main subject in the paper is the focus of the description of Mexican identity describe by Paz in the chapters. In the chapter *"El pachuco y otros extremos,"* Paz uses the image of the *"pachuco"* otherwise known as *chicano* to describe one part of the identity of the Mexicans. In the chapter *"Mascaras mexicanas,"* Paz talks about character and language of Mexican by discussing about manhood and the image of the Mexican women. And in the chapter *"Todos santos el dia de los muertos,"* Paz focuses on

the characteristics of the Mexican cultural and discusses about the identity of the Mexican in a general sense. The purpose of the paper is the discussion of the description of the Mexican identity done by Paz in those three chapters.

### **Analysis of El Tunel**

Presenter: Stephanie Misangyi  
Author: Stephanie Misangyi  
Research Advisor: Ms. Gloria Jurado

My paper is an analysis of the protagonist, Juan Pablo Castel, from Ernesto Sabato's, *El Tunel*. My paper analyzes the conscious and unconscious desires of Castel throughout the book, as well as how he expresses these desires without knowing. His greatest desire is to be understood by someone but he is unable to convey his thoughts and emotions in a rational way for others to understand and as a result lashes out and isolates himself.

### **Crítica a los estadounidenses inspirada por "Vuelva usted mañana" de Larra**

Presenter: Anabel Muniz-Abdo  
Author: Anabel Muniz-Abdo  
Research Advisor: Ms. Gloria Jurado

Tomando "Vuelva usted mañana" de Mariano José de Larra como patrón, crítico la discriminación que hay hacia los inmigrantes y las minorías en los EE.UU. Hablo de algunas teorías que nos dan una idea de cómo podrían ser tratados en el futuro.

### **El Túnel**

Presenter: Brayan Parra  
Author: Brayan Parra  
Research Advisor: Ms. Gloria Jurado

Esta presentación tratara de la confession de un hombre llamado Juan Pablo Castel, un pintor Argentino que está en la carcel por el intento de asesinato de una dama llamada María Iribarne. El estaba perdidamente enamorado de ella y lo que yo analyse fue como el amor se convirtió en obsesión de selos.

## **La Muerte**

Presenter: Sandra Reed

Author: Sandra Reed

Research Advisor: Ms. Gloria Jurado

I read the book Pedro Paramo. I did a research paper on death in the book and used examples from the book to explain the theme death. I found out that this book has a lot of death in it and I tell you this in my paper.

## **Anti-Americanism in Latin American Modernism**

Presenter: Jean Roland

Author: Jean Roland

Research Advisor: Ms. Gloria Jurado

Award Winner

History has a tendency to be reflected in literature. A phenomena that does not skip Latin American literary movements. Anti-Americanism is a sentiment that can be seen in many cultures, however it is especially cyclical in Latin America.

In the early 1900s, the "modernista" literary movement showcases the political climate in works such as the poem "A Roosevelt" by Ruben Dario and the essay "Nuestra América" by José Martí. With the use of historical context, biographies of the authors, and literary analysis' the sentiment expressed by these literary giants was studied to understand the political climate of the era.

## **Paper Presentation Group 7**

### **Economic Dynamics in Local Farmers' Markets**

Presenter: Jackie Chi

Author: Jackie Chi

Research Advisor: Dr. Jean-Marc Gandonou

The number of farmers' markets continue to rapidly increase throughout the United States. They are being created in urban and rural towns and often directly compete against local grocery stores. This paper explores the determinants of price formation in farmers' markets both in urban and rural

areas. It compares market prices to grocery stores' to assess the level of competition between these two types of suppliers. The study is limited to fruit and vegetables. Prices from each location surveyed are compared and analyzed. Vendors and customers' surveys are used to assess the determinants of price differential between markets and grocery stores. It is expected that there is less price differential in larger cities' farmers' markets where the competition with grocery stores is more vibrant, compared to rural markets.

### **Do Gun Restrictions Affect Crime Rates**

Presenter: Tanner Faver  
Author: Tanner Faver  
Research Advisor: Dr. Sue Stockly  
Award Winner

Do gun control laws affect crime rates? In today's society, there are many controversial issues with gun control laws. Some people are for gun control laws hoping to stop violence, and some people are against them with the belief that it will disarm honest individuals. Finding the dependent variable with firearm related crime rates for each state on [www.FBI.org](http://www.FBI.org), and the primary independent variable being the basic gun laws all found on [www.nra.org](http://www.nra.org) for each state. These basic gun laws include the right to conceal carry (with or without a permit), permit to purchase, general possession regulations, long arm restrictions, handgun restrictions, and machine gun regulations. The ratio was found for each state by simply creating a number for each state for the laws in that particular state for example, 1:7 for one law, and 7:7 for all 7 laws in the research. The control variable GDP was included because crime rates tend to rise during a recession. In addition to the control variable GDP, the population of all 50 states is included. The expected results are the more firearm restrictions, the higher the crime rate with firearms could be in that particular state regardless of the regulations. This panel data set will be analyzed with multi variable regression. These results can help policy decision makers better analyze the effect of gun restrictions on crime rates.

### **Men In the System of Modern Society**

Presenter: Savannah Fulgham  
Author: Savannah Fulgham  
Research Advisor: Dr. Daniel Acheson-Brown

My presentation is on the issues that men face in our modern society today. Specifically the bias towards women they face in the court system, the trend of emotional suppression and hyper-masculinity, the trend of men being depended on more for financial support, and work related stress of any kind that can cause health problems.

I researched through many well-printed, good quality sources both digital and physical to find the evidence I needed to back up my statement that it is not just women being held to a certain standard in society, that men also face struggles that are difficult to overcome.

I have found through my research that there are still many men's issues left in society that need to be fixed, and if we as a society want to be truly equal as individuals, we need to fix them

## **The Atomic Bomb Spies**

Presenter: Taylor Hill

Author: Taylor Hill

Research Advisor: Dr. Daniel Acheson-Brown

Espionage and nuclear fallout. Words that have described much that has happened in the world of security especially in that of the 1940's. After the death of President Roosevelt, President Truman entered office on April 12th 1945. Upon entering office he had learned about Roosevelt's Manhattan Project. The Manhattan project was led by the United States with support of Canada and the United Kingdom. However there was quite the amount of interest by the Soviet Union.

My presentation will show the effectiveness of the Soviet Union's use espionage and tradecraft that allowed many men and women such as the Rosenberg's help leak information about the Manhattan Project back to Soviet Russia, and what the intelligence that they were able to leak back to Russia had helped in their nuclear program.

I will be using much quantitative and qualitative research including the depth investigation of speeches, media, and court cases. Which also leads into the methods of content analysis and case studies.

After looking into much of the reports on this field I will show just how many people were involved in the use of extracting information from one of the United States most top secret projects and their successful transfer of that information to the Soviet Union and how the Soviet Union was able to take that information and develop their very own nuclear program.

## **What is ISIS?**

Presenter: Jennifer Martinez

Author: Jennifer Martinez

Research Advisor: Dr. Daniel Acheson-Brown

My presentation will focus on an ideological analysis of the Islamic State in Iraq and Syria, also known as ISIS. As ISIS becomes an escalating threat to nations across the world and issues and attacks involving the United States continue to increase, it is extremely important for all citizens to be knowledgeable and well-informed about this group and the threat that they pose upon the US. My presentation will delve into the history of ISIS and address the specifics of their ideology; i.e. what they believe and what they are aiming to promote. I will address how ISIS originated and how they have grown and continue to grow. Finally, I will address a large number of the terrorist attacks that ISIS has claimed responsibility for occurring in the United States.

## **An Analysis of the Impact of Environmental Quality on Agricultural Productivity and Economic Development**

Presenter: Caroline Rousculp

Author: Caroline Rousculp

Research Advisor: Dr. Jean-Marc Gandonou

Poverty is evident in every corner of the world and has an either a direct or indirect impact on the whole population. The term poverty has evolved from a single dimensional concept to the multidimensional concept understood today. Environment is one of the many factors included in this concept and is comprised of areas such as poverty, soil infertility, water quality, biodiversity of a region, air quality, and weather. Many of these environmental factors could be reduced with education and proper supplies, such as fertilizers for the soil, water cleaning systems to have better access to clean drinking water, and air quality management, however, most communities refuse change because of new and unknown qualities to the culture. All of these environmental factors contribute to the detriment of agriculture productivity in a given community, which can hurt the economic value of the community. Agriculture is a driving force of a prosperous economy and without a healthy environment, successful agriculture is not possible. This study is an effort to bridge the gap in available literature relating to environment, poverty and agriculture that could be causing such inequalities.

## **Cyber State: A Concept of a Nation State in the Cyber Domain**

Presenter: David Sanchez

Author: David Sanchez

Research Advisor: Dr. Daniel Acheson-Brown

An organized conceptual structure of cyber space entities for physical Nation-States to utilize in interactions within cyber domains is imperative, and the necessity will only increase in the future.

One methodology to achieve such an organized conceptual structure is to view cyber entities utilizing the Political Science tool of Nation-States, and the paper will apply this methodology to cyber entities to determine if such a methodology does indeed work for the above stated conceptual purpose, and if successful, elaborate further on implications of applying the concept of Nation-State to cyber entities, such as trade, sanctions, and war.

## **What is the effect of immigration on U.S on real wages?**

Presenter: Shujie Li

Author: Shujie Li

Research Advisor: Dr. Sue Stockly

The United States has always been a migrant country, and every year many immigrants come to study, work, and live in the United States, this affects population growth, the economy, investments, and wages. Some people think that while a large number of immigrants come to the United States, the labor force greatly increases, resulting in a reduction in wages. Other people think that as immigrants come to the United States, there is an increase in productivity and efficiency economic growth, leading economic growth and higher wages. This study presents research on immigration and wages. Data on the number of immigrants each year, annual population growth rate, investment, and the U.S. real wage each year (all from 1997-2015) were collected. The method used is multiple linear regression. The dependent variable is the U.S. real average wage each year, the independent variable is the number of immigrants who come to the United States each year, and the control variable is the annual population growth rate and investment each year. Investment is a measure of business activities. The expected result of this research is that an increase in immigration does increase the U.S. real wage. This finding will be useful to policy makers who can encourage more immigration for increased prosperity.

## **Paper Presentation Group 8**

### **Positive Reinforcement in Autistic Children**

Presenter: Jodi Collins

Author: Jodi Collins

Research Advisor: Dr. Dawn Browder

I have been working on a presentation about the effect positive reinforcement has on children with autism. I am using checklists while I'm observing in the classroom to complete my presentation. I am finding that positive reinforcement has a great impact on these children.

### **Sluts, Sissies and Eunuchs: Gay Archetypes in Film and Television**

Presenter: Anna George

Author: Anna George

Research Advisor: Mr. Jon Barr

Advances in civil rights for the lesbian and gay populations in the United States of America occurred during an increase in their representations in media such as television and film. While it is easy for audiences to assume increased representation leads to more accurate representations, the creation of homosexual archetypes has led to gay and lesbian characters being easily dismissed and over-sexualized while, ironically, never showing their sex life on screen. Archetypes are dangerous because they allow media to further a normative culture while subliminally rejecting the idea of inclusion. According to articles and analysis of television shows over the last three decades, several archetypes float to the top including The Stereotype (butch or sissy representations of lesbians and gay men such as the nightclub owner Albert Goldman in *The Birdcage* or Carrie Black from Netflix's *Orange is the New Black*), The Slut (characters that struggle with steady relationships and jump from sexual partner to sexual partner such as Connor Walsh in ABC's *How To Get Away With Murder*) and The Eunuch (characters who are never shown in sexual acts, no matter the promiscuity or sexual activeness of the character such as Ian Gallagher in Showtime's *Shameless*). Brian C. Johnson identifies other archetypes in his article *Breaking Brokeback: Exposing Hollywood's Heterosexual Preference*, splitting The Stereotype into individual archetypes entitled The Butch and The Sissy and including a female archetype called The Heterosexual Male Fantasy. But those archetypes have evolved in light of the advances in the gay

rights movement. After watching and analyzing twenty four television shows featuring gay characters and twelve films containing gay characters, I discovered the evolution of the archetypes from Johnson's 2011 article. The new archetypes, however, cause the same problem as Johnson's, they include similar traits that lead to similar portrayals. This can be problematic due to Melinda Kanner's definition of queerness, "(defying) binary and fixed categories." Queer life remains diverse and outside of conventions, making an accurate representation near impossible to pinpoint. However, an archetypal representation puts the fight for gay rights in jeopardy and thus must be surpassed.

### **Assisted Reproduction: A World of Possibility**

Presenter: Shannon Jackson

Author: Shannon Jackson

Research Advisor: Ms. Maureen Smith

In-vitro fertilization and pre-implantation genetic diagnosis and advanced types of assisted reproduction that are helping infertile and genetically high-risk couples safely start a family. Infertility is not as final as it was historically for the more than 15% of reproductive-aged couples worldwide who experience infertility at some point in their lives (Inhorn & Birenbaum-Carmeli, 2008, p.11). Although in-vitro fertilization and pre-implantation genetic diagnosis are both intricate and complicated procedures that can be very expensive, they are becoming more widely used and have a long list of benefits with relatively few risks. The most current positive medical advances made possible by pre-implantation genetic diagnosis include medical sex selection and the possibility of "savior siblings". In-vitro fertilization and pre-implantation genetic diagnosis have been key advances in the world of reproductive medicine and should be accepted because they have, and will continue to positively change the lives of so many people.

### **Media Use in Education: Enhancement or Detraction?**

Presenter: Christie Fowler

Author: Christie Fowler

Research Advisor: Dr. Karen Copple

Award Winner

With the invention of the smart phone, students are capable of receiving streaming information from around the world 24 hours a day. Entertainment is always available. Educators feel the pressure to incorporate more media in the

classroom in order to enhance the relevance of the information being presented and compete with the multimedia interests of the students and their shortened attention spans. Is it possible, due to the media needs of today's student, that they are becoming more passive rather than active learners? Active learning has been defined as "meaningful learning activities that require students to think about what they are doing," and there is empirical evidence supporting an active learning approach in the classroom. If media use contributes to making students passive learners, what affect is this having on their learning and retention of information? The purpose of this study was to determine whether students who read in preparation for a quiz will learn or retain more than students who watch a video. Thirty-eight undergraduate college students were randomly divided into two groups. Twenty-three students watched a video and fifteen students read the transcript of the video. Each participant took a short quiz immediately afterward, and then took the same quiz again one week later. The group who watched the video scored significantly lower on the initial quiz than the reading group. The reading group showed a greater difference in mean scores on the second quiz, but still scored a higher average than the video group. However, the difference in scores between the groups on the second quiz was not significantly different. It appears that students reading the information were active learners and were able to learn more than the video group. This implies that educators should continue to look for ways to enable students to become active learners and avoid methods that make students passive consumers of classroom information.

### **A Descent into Madness**

Presenter: Jessica Gilmore

Author: Jessica Gilmore

Research Advisor: Dr. Linda Sumption

In her piece *The Yellow Wall-Paper*, Charlotte Perkins Gilman presents the idea that female hysteria and the involuntary confinement of women to the home will ultimately lead to the loss of free will, followed by the eventual collapse of the mind. As a result of being medically misdiagnosed and forcefully subjected to detrimental treatments, the author feared that women would forever remain second-class citizens; voiceless, mindless, and submissive. By further exploring Gilman's work, it is possible to perceive the dangers of mental oppression and the author's cautionary message behind an otherwise curious narrative.

## Paper Presentation Group 9

### **Straight Talk: Perceptions of Effeminate Speech in Adult Males**

Presenter: Veronica Ayala

Author: Veronica Ayala

Research Advisor: Dr. Suzanne Swift

Award Winner

**Purpose** The purpose of this study was investigate possible associations between effeminate speech in men and negative listener perceptions. Furthermore, this study was intended to provide evidence to support medical coverage for services provided to speakers with gender-atypical speech who seek to modify their speech characteristics for personal or professional reasons. **Method** 20 inter-raters were used to select the 3 most masculine and the 3 most effeminate speech samples from among 20 recordings made by adult male volunteers. Respondents (N = 383) were randomly presented the six selected recordings of adult males (3 with effeminate speech, 3 with masculine speech) reading the Rainbow Passage. Every participant was required to express agreement or disagreement with 10 statements regarding their perceptions of the speakers in each of the 6 recordings. Demographic information was also collected for each respondent.

**Results** Data collected was analyzed using a t-test for correlated means to determine any difference between listeners' perceptions of adult males with effeminate speech and adult males with masculine speech. Results of the study suggest that listeners have a more negative perception of adult males who exhibit effeminate speech when compared to their perception of adult males who exhibit masculine speech. Demographic data and listener perceptions were analyzed using a series of two-way ANOVAs which found that negative perceptions towards effeminate speech were observed across all listener groups, irrespective of differences in age, gender, income, education, and/or sexual orientation. **Discussion/Conclusion** Results suggest that listeners are biased against males with effeminate speech. Because this bias could have a negative personal and professional impact, this lends support for the justification of medical coverage for services provided to adult males with effeminate speech who elect to partake in voice modification services.

## **Lesson Learned: Interactive Applications vs. Classroom Lectures**

Presenter: Timothy Lewis

Author: Timothy Lewis

Research Advisor: Dr. Suzanne Swift

Technology advances quickly...but is it useful for learning? Are interactive iPad applications more effective than lectures in teaching lessons and gaining knowledge? Some research indicates that iPad applications are better used as a supplement and may cause more distraction than benefit. Others suggest that the novelty of devices does encourage some increase in interaction from students, but results show varied effectiveness. This study investigated the effective use of these devices in learning.

This research used a pretest-posttest comparison group design to investigate these questions. Sixty adult participants were randomly placed into two groups. Each group was given an introductory lesson: one in a classroom lecture format and the other using an interactive iPad application. Using a correlated samples t-test, pre-tests and post-test were compared for significant difference. Results indicated that each intervention was equally effective and that one was neither better nor worse than the other. This indicates that, at an introductory level, interactive applications can be as effective as classroom lectures. It should be stressed that these results are related to a single simple lesson, but may indicate that teachers and clinicians can use these applications along with other strategies as effective teaching tools.

## **If I Had a Dollar For Every Time I Got Distracted**

Presenter: Hannah Mesman

Author: Hannah Mesman

Research Advisor: Dr. Suzanne Swift

Distractions are common in daily life. These can negatively impact task performance as the brain's processing resources are limited. Cognitive tasks require an adequate amount of attention in order to appropriately process and encode the desired information. This means that the type and strength of attention devoted to a stimulus or task may influence task performance. This results in the need to make decisions regarding which stimuli receive these resources, and to what extent.

In order to facilitate better outcomes, it is important to understand the relationship between variables of attention and task performance, as well as environmental manipulations that can be made when teaching or learning new

concepts. This study investigates the effect of competing stimuli, or distractions, on task performance outcomes, measured as percentage of correct response (PCR) and time to complete tasks. An experimental pre-test-post-test control group design was used to compare the performance of individuals completing tasks with, and without, an imposed distraction. Sixty subjects between 18-30 years of age were recruited through undergraduate classes at Eastern New Mexico University. Subjects were asked to complete a series of tasks requiring them to follow written multi-step directions, involving a locational concept (e.g., on top of, nearest to). The experimental group completed post-test tasks while a video, composed of mixed “funny” clips, was imposed as a distraction. Control and experimental groups were matched for gender.

The study aimed to discover whether distractions have an effect on task performance, and how well individuals are able to selectively attend to a desired task in the presence of a distraction. Using an alpha level of .05 and a two-tailed hypothesis, there was a significant difference in performance, as measured by PCR, between males and females, control and experimental groups, and the interaction of these two variables, though it was not consistently in one direction or the other. When measuring performance by time to complete task, there was a significant increase in time, or decrease in performance, in the experimental group as compared to the control group. Within both the control and experimental groups, some subjects were found to experience a decrease in performance, while others experienced an increase in performance. Differences in performance may have been influenced by confounding variables such as processing abilities, reading abilities, ability to selectively attend, practice effect, John Henry effect, etc., and it is unclear as to what extent the distraction itself impacted performance, and why it seemed detrimental to some, while advantageous to others.

### **So You Think You're Ready?**

Presenter: Marc Nez

Author: Marc Nez

Research Advisor: Dr. Suzanne Swift

Some SLPs have anecdotally reported minimal preparation in behavioral management strategies, and have expressed feelings of unpreparedness when working with clients who may have behavioral intervention needs. As the literature base is largely silent on this matter, this research was designed to gather information about SLPs and their personnel preparation to work with clients presenting with behavioral challenges. This study specifically investigated the degree of training and education that speech-language pathologists (SLPs)

receive in behavior management strategies, where they received this training, how they develop new strategies, and how they implement intervention techniques in the classroom and therapy setting. Questions specific to the development and use of evidence-based practice (EBP) were also administered. A quantitative 15-question internet based survey was completed by 110 participants who had been working in the profession for various years (less than a year to more than 10 years). Results were analyzed using descriptive statistics and a series of ANOVAs, revealing that years of SLP experience, the age of the respondent, and the amount of training received in behavior strategies did significantly impact the responses given by participants. Those with more experience were significantly more likely to feel effective in managing behaviors as well as to use EBP when choosing and implementing behavioral strategies. Recently graduated respondents received slightly less training during studies than did other respondent groups, and they were also significantly less likely to develop their own intervention strategies than groups who had been practicing for 5+ years. This must be interpreted with consideration given to the findings that younger respondents (21-39) reported significantly more training in graduate school, and also reported that they felt more confident in devising, implementing, and using their own EBP strategies than did respondents who were 40+ years. This indicates that both training and years of experience are significant factors in self-perceived competence for behavior management strategy development and use. This suggests that the best practitioners will be those SLPs who receive formal training first, and then on-the-job practice.

It was also noted that a good number of respondents reported they received little practical information about effective behavior management strategies when they were in college, and that they felt unprepared for the realities of conducting therapy with clients who need this guidance. Unprepared SLPs experience many disruptions in the therapy room and the classroom, decreasing therapy time and reducing the effectiveness of classroom learning for the student(s). These findings indicate a need for SLP programs to incorporate more classes that sufficiently train future SLPs for their career. Instruction specific to behavior management integrated into future coursework will allow SLPs to be more effective therapists.

## **Do You Smell That? The Effect of Scents on Short-term and Long-term Memory Recall in Adults**

Presenter: Lisa Nickolenko

Author: Lisa Nickolenko

Research Advisor: Dr. Suzanne Swift

There is little research available on the effectiveness of aromatherapy. Claims of energy renewal, increased focus, and improved memory have not been addressed using scientific research principles in current rehabilitative literature. This study was designed to investigate the impact of aromatherapy on short and long-term memory.

Forty-five adult subjects were randomly assigned to one of 3 groups: lemon-scent, peppermint scent, or no scent (control). All participants completed a memory pre-test (baseline) in a closed room with no applied scent. The memory recall materials used included 10 words (obtained from random word generator), 10 numbers (obtained from a random number generator), and five questions about a phonetically balanced speech passage. The baseline and experimental stages used similar (but not identical) materials to avoid pretest sensitization. The procedure for assessing memory recall was the same during pre-test baseline and post-test experimental stages, except for the implementation of the experimental scent variable.

All groups completed memory recall tasks. The control group received no scent. The experimental groups were established with lemon and peppermint scent as the independent variable. These subjects were placed in a closed room with two drops of essential oil of lemon or peppermint placed on a piece of paper that they were instructed to smell every three minutes while completing memory recall tasks (dependent variable). Subjects were given 10 words, asked to read a short passage, and then recall the 10 words. They were next given 10 numbers, and then asked to take a 10-minute break. After the time lapse, they were asked 5 questions about the reading passage. Finally, subjects were asked to recall as many of the 10 numbers as they could remember. The subjects were then released from the short-term memory phase. Four to seven days later, subjects were again asked to recall the words and numbers from the tasks above, as well as to answer the same five questions about the reading passage.

The results of this study revealed that the lemon scent had a negative effect on both short-term and long-term memory recall. The peppermint scent had no effect on memory recall at all. Further, there was no significant difference between any group when the differences between short-term and long-term memory recall were compared for lemon, peppermint, and control groups. These results indicate that neither scent of lemon or peppermint had an effect on memory recall when compared to the control group.

## **Don't DIS my ABILITY: Student Academic Performance**

Presenter: Collin Oswald

Author: Collin Oswald

Research Advisor: Dr. Suzanne Swift

**Introduction:** Speech-language pathology (SLP) graduate programs are highly competitive and academically challenging. They require that students achieve “entry level competence” in a large number of objectively measured academic knowledge and practicum skills outcomes, as well as passing a national exam in speech language pathology content across the scope of practice and lifespan. This presents a notable challenge for all students, but perhaps is even more formidable for students with disabilities (SWD). This research was designed to investigate this question. Determining the number of disabled SLP students, detecting any differences in academic performance between students without disabilities (SWOD) and SWD, and identifying type/effectiveness of accommodations commonly used were the primary focus of survey questions.

**Methods:** This quantitative study utilized 2 electronic surveys: one for SLP graduate students/alumni and one for faculty and program administrators. The student/alumni survey presented 19 objective and subjective questions, while the faculty survey contained 12 questions regarding accommodations and progress of students with disabilities in SLP graduate programs across the United States. Both surveys were pilot-tested, then emailed to Program Directors of all accredited SLP academic programs (n=263) for distribution to both students and faculty. Student surveys were additionally posted on Facebook to increase availability to interested students.

**Results:** Survey responses were analyzed using descriptive statistics and ANOVAs. 714 student/alumni and 113 faculty members provided responses. Data showed that 22.27% of respondents were SWD, with 91.19% of those disabilities being permanent. The most common disabilities identified were ADHD, mental/psychiatric, and learning disorders. An ANOVA to determine difference in GPA and practicum/internship grades found no significant difference  $F(3, 4) = .01, p = 0.998524$ . Another ANOVA revealed there was significant difference between SWOD and SWD in the number of repeated courses, extended length of matriculation, and the incidence of academic probation, with SWD showing significantly higher frequencies in all of these identified areas -  $F(1, 5) = 8.54, p = 0.032925, \eta^2 = .1295$ . In addition, 61.88% of SLP graduate SWD did not use accommodations. Those who did use accommodations reported that extended time was the most common (27.50%). Though this was the most frequent response, only 19.50% of students/alumni with disabilities rated accommodations as “very effective,” while the most frequent rating for faculty (39.82%) was merely “effective.”

**Conclusion:** 22.27% of SLP students responding to this survey had disabilities. This study revealed that these students achieved the same GPA and internship/practicum grades as non-disabled students, but that they were required to repeat courses, extend their matriculation, and were placed on academic probation more often than SWOD. The most commonly used accommodation was extended time.

## **Effects of Nonverbal Cues on How We Interpret Messages**

Presenter: Roxanna Rubio

Author: Roxanna Rubio

Research Advisor: Dr. Suzanne Swift

This research study investigated the impact of nonverbal cueing (i.e., tone, prosody, and facial expression) on message interpretation, and also sought to determine if males and females interpret this information (or lack thereof) differently.

The study used a quasi-experimental components. The study was conducted across various settings using 69 adult participants (42 females and 27 males). Each participant was required to complete a total of two different sessions that were scheduled two weeks apart, in which they were asked to listen to a series of 16 recorded sentences and then answer multiple choice questions about the meaning of each sentence. During one session, subjects would complete the questionnaire with audio recordings only. During the second session, subjects would complete this same questionnaire now presented via audio and video.

Results for audio and video questionnaires were compared for significant difference. This was to determine if participants would interpret recorded messages differently when facial expressions augmented the utterance. Inferential results indicated there was no significant difference between how individuals interpreted the messages between the two conditions. This may indicate that tone and prosody convey more meaning for a listener than do facial expressions. There was no significant difference between how males and females interpreted these messages.

## **You've Been Strooped! The Effects of Interior Color on Stroop Related Rapid Automatic Naming Tasks**

Presenter: Alexandra Steyer

Author: Alexandra Steyer

Research Advisor: Dr. Suzanne Swift

Color has been shown to effect human mood, emotion, behavior, and performance. Little research has been done to examine the effects that interior color has on Stroop related rapid automatic naming (RAN) tasks. It is important to consider the role environmental color plays when making inferences about performance results. This study explores the potential role interior color has on such tasks.

A one shot quasi experimental design was used to examine the scores, time taken, and stress levels of sixty Eastern New Mexico University students and peers when given the tasks in red, blue, and neutral colored rooms. Four groups of fifteen participants completed three Stroop related tasks in two of the three different colored rooms. The first task was comprised of a Stroop task in which participants were asked to name aloud the color ink words were written in as quickly as possible. The second task was comprised of a shape task in which participants were to name aloud the name of the shape, not the word written below, as quickly as possible. The third task was comprised of a shape Stroop task in which the participants were to name aloud the shape and color of the picture presented, not the words written below, as quickly as possible. Each participant completed a Likert scale of 1-5 indicating their stress levels before completing the tasks, after completing the tasks in the first room, and after completing the task in the final room. A two-way analysis of variance for independent measures was conducted to determine whether there was significant difference. Results indicated there was significant difference in the effect interior color has on stress levels and in determined the effect interior color has on the amount of errors, or accuracy, of a task. Results further indicated no significant difference in the effect interior color has on the amount of time taken to complete each task. Further research is needed to solidify these findings. Future studies should focus on the effects differing colors may play in testing environments, different tests, and larger samples. Based on these findings, it is important for therapists performing testing on clients to take interior color of the testing environments into consideration when drawing conclusions from test results.

### **Paper Presentation Group 10**

#### **Reading with Dad: Strategies for a Spanish Speaking Individual Experiencing Oral Reading Difficulties After a Right Hemisphere Stroke**

Presenter: Michelle Aguilar

Author: Michelle Aguilar

Research Advisor: Dr. Adrienne Bratcher

The purpose of this study was to investigate the impact of reading strategies on an individual experiencing aphasic like symptoms following a right hemisphere stroke. A quantitative experimental single subject design treatment (ABA) was used to measure participant gain scores. In the first phase (A), pretest, the researcher recorded the subject reading two newspaper articles which were audio-recorded and analyzed for error count. During treatment phase (B), the

following strategies were implemented: enlarging the text from a font size 10 to 14, chunking words together and moving the subject to an environment with less sensory input distractions. During the withdrawal phase (A), re-administration of the newspaper articles took place without the use of the strategies. A purposeful convenient sample was used with the participant meeting the criteria for participation. The participant suffered a mild right hemisphere stroke 11 months prior to the start of participation. He was competent and was cleared by his Neurologist to make all personal decisions. An inter-rater was used to review 50% of therapy session data and 100% of pre-test/post-test data in order to eliminate any possible bias by the experimenter with combined agreement of 98.5% obtained.

To determine any positive statistical gains between oral reading strategies compared to the pretest and posttest phases, a one-tailed t-test for repeated measures statistic was used. The error types frequently seen were graphophonemic errors, an error that preserves some important phonetics of the written word, even if it does not make sense. The percentage of error was calculated by dividing the number of errors by the total number of words. By enlarging the font, moving the subject to a room with few distractions, and chunking the words into smaller portions it did not decrease the amount of errors observed. Therefore, it was concluded that there was not enough evidence to determine that the treatment strategies helped the subject's oral reading errors,  $t(4) = 1.19, p > .05$ , one-tail,  $d = .53$ . Incidental findings were observed of potential clinical significance. Of importance to note is the participant's oral reading confidence. The researcher perceived the change from pretest to posttest, a louder voice was observed as well as less timidity while reading. It was noted that his confidence transferred over to his functional activities. Oral reading errors were observed but did not seem to affect the participant's self-esteem negatively. Future research would benefit from using a larger sample size, using both sexes, and a longer treatment phase. Exploring a qualitative research design that focuses on attitudes and the effects of self-confidence in functional activities of daily living and how we as clinicians can target it in treatment practice would be beneficial.

### **What does the SLP do? Teacher perceptions and knowledge before and after training**

Presenter: Leticia Corral

Author: Leticia Corral

Research Advisor: Dr. Adrienne Bratcher

The American Speech and Hearing Association states that, it's the responsibility of the SLP to provide staff members with information on their

roles and responsibilities. It is critical for teachers to understand the role of the SLP in the school setting in order to enhance the quality of services being provided. Previous literature states that professional development and in-service trainings are very popular in the school setting, but they rarely address the roles and responsibilities of the Speech Language Pathologist. The purpose of this study was to investigate teacher's knowledge of the speech language pathologist's roles and responsibilities in the school setting and perceptions. Specifically, to determine whether providing teachers with training on the roles and responsibilities increases their knowledge of our scope of practice and how the training contributed to creating more positive perceptions of speech language pathologists. A total of 90 teachers employed at Hobbs Municipal Schools and certified in the State of New Mexico participated in this experimental study. The participants' knowledge before training about the SLP's roles and responsibilities was measured using a questionnaire developed by the principal investigator. Immediately after the pre-test, a presentation was conducted to inform teachers about the role of the SLP in the schools. Perceptions were measured using the Scale of Educators' Attitudes Toward Speech Pathology (SEATS). A post-test using both the questionnaire and SEATS were used to measure gains. Results indicated a significant difference from pre-test to post test among all participants. Data results indicated that there was a significant improvement across all teachers and that both the Speech Language Pathologist and teacher would benefit from in-service training on information about SLPs in the school setting. Future research should focus on including teachers from different geographical areas and increasing the number of participants.

### **Social and Ready to Mingle**

Presenter: TymberLee Durham

Author: TymberLee Durham

Research Advisor: Dr. Adrienne Bratcher

The use of social stories for children who have autism is a common form of speech and behavior therapy. Social stories are said to improve behavior and pragmatics conjointly in children who are preschool to school aged. This study examined the effects of social stories and whether or not they would improve pragmatic/social skills in a child who has autism and was under the age of four. There is limited research regarding social stories and their effectiveness outside of the school aged population. This study assessed the comprehension and generalization of pragmatic skills through social stories. The participant completed baseline testing prior to intervention to determine his social interaction skills and post-testing following the intervention to determine if

his social skills improved. Testing was completed using the Autism Diagnostic Observation Scale (ADOS), an informal protocol used to diagnose Autism. Intervention focused on the use of social stories. Specific social stories were selected based on the results of the ADOS and discussion with the participant's parents. Each week a new story was presented and read to the participant. Games were played and scenarios were presented to the participant during sessions to help further understanding. At the end of every session, comprehension questions were asked to determine the participant's understanding. On the last session of the week, the researcher determined if the participant demonstrated generalization of the story. The participant had to demonstrate understanding of the social scenario and implement an aspect from the story to determine generalization. This was done by completing the story scenario in the participant's community with peers, adults, and community helpers. During the last week of intervention, each story was repeated, per participant parent request, to help with maintenance and generalization. It was hypothesized that the participant would comprehend and generalize the social stories appropriately into everyday social situations. Long term generalization was also measured through follow-up interviews with participant and his parents.

### **Dress for Success**

Presenter: Eryn Harman

Author: Eryn Harman

Research Advisor: Dr. Adrienne Bratcher

To demonstrate the effect that clothes have on performance, college students between 18 and 30 years old were asked to participate in a version of the Stroop test. Students were recruited from El Camino College in Torrance, California. The researcher approached students in the library and asked if they could spare a few minutes to participate in a research project. Participants who agreed accompanied the researcher to a private study room. All participants were told they would be completing an attention task in order to develop averages for time and accuracy. Participants assigned to group one were then given the Stroop word color test. Participants assigned to group two were told that role play was a part of the research and they were asked to put on a doctor's coat before beginning the Stroop word color test. The doctor's coat symbolizes professionalism and was therefore expected to enhance speed and accuracy. Results of the experiment showed statistical significance between the groups in both accuracy and time, though unlike the original hypothesis, it was the group not wearing the doctor's coat that performed better. Possible explanations for this outcome include comfort levels, the age of the participants, that students may be

conditioned to quickly attend during tests, or that participants may have been at a heightened attention state before beginning the test due to being recruited from the school library. The most prominent limitations to this study were a small sample size, obtaining a convenience sample, and the site of both recruitment and data collection. Future research is recommended to be conducted on differences based on how the researcher is dressed compared to the participants. It would be interesting to determine if dressing toward the environment you are in is a larger determiner on one's ability to perform better on an attention task or other work related task. It would also be interesting to see if different college majors or careers would affect the results. There are many other factors to be studied in order to gain a more comprehensive view of how clothes affect us but this study did demonstrate that clothes affect individual performance on an attention task.

### **Playing Mind Games: The Effect of Repetitive Chess Playing on Episodic Memory in Aging Adults**

Presenter: Rebecca Hertz

Author: Rebecca Hertz

Research Advisor: Dr. Adrienne Bratcher

One of the most common cognitive complaints among older adults is a change in their memory. Understanding brain health is imperative for future treatment of cognitive impairment in aging adults. Age related memory change may be related to slow processing of speech, reduced ability to ignore irrelevant information, and decreased use of strategies to improve learning and memory. Previous studies suggest that activities associated to high cognitive function can improve various domains of cognition including speech, attention, memory, language visuospatial abilities and executive functioning and reasoning. This study will determine the effect of repetitive chess playing on episodic memory in aging adults. This study consists of a two single subject A-B experimental quantitative design. Assessment procedures include the administration of the Wechsler Memory Scale- IV and a criterion assessment task designed by the researcher using randomly generated word lists. Based on the scores yielded from the criterion tasks, both subjects showed significant difference in performance on the criterion Immediate Recall Task and Delayed Recall Task. However, the pretest and posttest index scores of the Wechsler Memory Scale-IV (WMS-IV) yielded no statistical significance in neither subjects. One of the two subjects showed increased episodic memory performance based on the WMS-IV Subtest Scores. The statistical analysis of data collected concludes that episodic memory performance yielded inconsistent results based on the standardized scores of the WMS-IV. Therefore, results are not definitive, although previous studies have shown that game playing can improve memory.

## **The 8-Step Ladder to Success: Articulation Treatment for a Child with Apraxia of Speech**

Presenter: Dominique Ratto

Author: Dominique Ratto

Research Advisor: Dr. Adrienne Bratcher

Award Winner

This study examined the effectiveness of an articulation treatment known as Dynamic Temporal and Tactile Cueing (DTTC). This treatment was administered to a 6-year-old male diagnosed with moderate childhood apraxia of speech (CAS). The purpose of this study was not only to determine the effectiveness of DTTC, but also to increase the client's intelligibility. The clinician hypothesized that data collection from pre- and post-test articulation measures, would indicate efficacy for the use of the DTTC treatment as an intervention tool for a child with apraxia of speech (AOS). The problem is that not much research has been completed on DTTC. In addition, there is no "cookie cutter" way of treating CAS. Therefore, this study was conducted in order to examine if DTTC can lead to success with a client with CAS. A quantitative ABA Single Subject Modified Withdrawal Design was used to determine the validity of this approach with the client. Throughout this study, the clinician conducted 50-minute therapy sessions for a total of 8 weeks. The DTTC treatment consists of an eight-step cueing procedure that incorporates imitation, auditory, and visual models. This treatment required the client to imitate words beginning with different phonemes, as modeled by the clinician. Throughout this study, a high level of support was used, and then gradually faded as the steps progressed. Statistical analysis was completed through the use of a Pearson Correlation and Sign Test. Pre and post-test data revealed strength in the use of DTTC during intervention for CAS. Results from this study provide evidence, which indicates strong validity of DTTC in articulation therapy for CAS. The client's parents reported satisfaction with the quality of treatment, results, and overall process. This study proves that DTTC can be used as a helpful resource for professionals working with apraxic individuals. In addition, this study highlights limitations and some suggestions for future research implications.

## **Care + Cooperation: Professional Differences in the Treatment of Food Refusal in Patients with Dementia**

Presenter: Chelsea Romero

Author: Chelsea Romero

Research Advisor: Dr. Adrienne Bratcher

The purpose of this study is to explore the differences between speech language pathologists' and nurses' interpretation and treatment of food refusal in patients with dementia. Feeding difficulties occur in 80 percent of individuals with dementia, and food refusal is the most common disordered feeding behavior in the elderly population, often leading to undernutrition and the implementation of artificial feeding methods, which have a negative impact on these patients' quality of life and life expectancy. Research indicates that many nurses are unsure or in disagreement over what methods should be used to treat these patients, as well as what the underlying cause of this behavior might be. There is very little data regarding speech language pathologists' treatment of this feeding behavior, and no studies being conducted comparing nurses and SLPs. Information for comparison was gathered using a likert style survey which was distributed online through Google Forms. Questions were divided into four content areas during analysis: treatment methods, treatment priority, interpretation of the food refusal behavior, and treatment timing. 87 SLPs and 46 nurses responded to the survey. The disparity in response required that a comparison of proportions of agree/disagree answers be compared rather than raw scores; a Chi-Square statistic was run on each question comparing nurses and SLPs. There was significant difference on 4 questions: 1 in treatment methods, 2 in treatment priority, and 1 in treatment timing. There was not a significant difference on any questions in the interpretation portion. Increased disagreement was noted in the priority question group. In a treatment context, increased disagreement is most likely to occur when deciding: whether or not to treat the patient with cognitive therapy, whether determining the cause or getting the patient to eat is more important to do first, and when a full swallowing evaluation should be completed.

### **Paper Presentation Group 11**

#### **Language Up! Effects of Pragmatic Instruction and Reinforcement Language Styles on Player Performance**

Presenter: Lindsey Barron

Author: Lindsey Barron

Research Advisor: Dr. Karen Copple

Previous research has shown a positive correlation between different coaching styles and an athlete's emotional well-being and performance level. The purpose of this study is to examine the effects that positive, negative, and non-committal language styles had on a baseball player's performance during

batting practice and the effect that these different styles had on the perception of self-efficacy of the athletes. This study used a quasi-experimental, between-group design without a pretest. Forty-five male baseball players between the ages of 12-14 were randomly assigned to three different groups, each being coached with a different language style during batting practice, and then immediately interviewed on their perception of the coaching style. Results concluded that no significant difference exists in batting performance between positive, negative, and non-committal language styles ( $p > 0.05$ ) and that no significance exists in the effect of those language styles on perception of self-efficacy ( $p > 0.05$ ).

### **Vocal Effects of Electronic Cigarettes versus Conventional Cigarette**

Presenter: Gabriella Garcia

Author: Gabriella Garcia

Research Advisor: Dr. Karen Copple

The purpose of this study was to investigate the difference in vocal effects between smokers of e-cigarettes (i.e., electronic cigarettes) and conventional cigarettes. This quasi-experimental, one-shot group design compared data from two groups ( $n=50$ ): e-cigarette smokers ( $n=25$ ), and conventional smokers ( $n=25$ ). All participants were current consumers of these products. They were assigned a number on the participant profile matching their voice recording sample in order to maintain confidentiality. Initial data was collected through a preliminary participant profile sheet which included: when individuals began consuming nicotine through e-cigarettes or how long they smoked conventional cigarettes prior to the study. A participant profile was given to everyone to exclude any participants who would increase the chance of confounding variables within this study, such as: caffeine intake over 3 cups daily, experiencing allergies/illness at time of experiment, on medication (antihistamines), pregnant, or menstruating. Acoustic speech signals were obtained through a voice analysis of a sustained /a/ using the PRAAT software. Voice recording analysis included: fundamental frequency, jitter, shimmer, and harmonics-to-noise ratio. The Voice Handicap Index (VHI) was also used as a tool to measure the participant's perspective on their voice within their daily lives. Specifically, the VHI examined the participants physical, functional, and emotional qualities acquired from smoking using a rank order scale [0 (never), 1 (almost never), 2 (sometimes), 3 (almost always), 4 (always)]. Results indicated a large significant difference between conventional cigarette and electronic cigarette consumers within the VHI, revealing electronic cigarette consumers reported having more difficulties with their voice than conventional consumers. PRAAT software results indicated no significant difference between e-cigarette consumers and conventional

consumers in the analysis of harmonics-to-noise ratio, fundamental frequency, and shimmer; however, jitter did reveal a significant difference. Ultimately, the results of this study will provide speech-language pathologist with insight for where to begin when creating therapeutic strategies on vocal hygiene for clients who smoke either electronic or conventional cigarettes who are seeking voice rehabilitation.

## **The Effect of Background Color Cues on the Accuracy and Response Time of Graphic Symbol Selection**

Presenter: Rebecca Gonzalez

Author: Rebecca Gonzalez

Research Advisor: Dr. Karen Copple

Award Winner

Graphic symbols have been used in augmentative and alternative communication (AAC) devices to facilitate communication for children with complex communication needs. To convey messages accurately and effectively, visual cues are often explored to increase rate and accuracy of symbol selection. Most of the evidence provides inconsistent results to support the addition of cues to facilitate communication for children who use an AAC device due to limitations in natural speech. When applied to augmentative and alternative communication displays, the Fitzgerald Key has been used to provide a color-coded system based on grammatical category to improve visual access of graphic symbols. The purpose of this study was to examine the color-coding scheme of the Fitzgerald Key and its effect on the accuracy of symbol selection by young children using a quasi-experimental independent measures design. The relation of word-class category and background color was analyzed using graphic symbols taken from picture communication symbols (PCS). An examination of the latency of accurate responses were also explored. A total of 12 symbols were used with 4 symbols representing each of the following word-class categories: nouns, verbs and adjectives. Kindergarten children (n=30) were presented with an auditory label of the target symbol and then required to choose the matching symbol from an array of 12 pictures arranged in a 4x3 grid. Half of the kindergartners were randomly assigned to the colored condition based on the Fitzgerald Key. The other half received an array against a white background. The speed at which the subjects could locate a targeted stimulus picture under both conditions did not result in a significant difference. In addition, the color cue did not increase accuracy of symbol selection. Limitations of the current study, clinical implications, and recommendations for future research are also discussed.

## **Childhood Apraxia of Speech: A Combined Treatment Intervention**

Presenter: Michelle Sassman

Author: Michelle Sassman

Research Advisor: Dr. Karen Copple

Childhood Apraxia of Speech (CAS) is a motor speech disorder. Children with Apraxia of Speech have inconsistent production of sounds, oral motor difficulties and poor sequencing of sounds into words. CAS affects 3.4%-4.3% of children diagnosed with speech disorders (Delaney & Kent; 2004). The purpose of this research was to determine the effects of two therapy approaches: Melodic Intonation Therapy (MIT) and Apraxia Words iPad app. Both interventions have research demonstrating their efficacy in treating CAS. This single subject research design attempted to determine an evidence based guideline for an effective therapy treatment for CAS by combining two different interventions. The participants in this study included two males who were 8-9 years old and were considered to have moderate to severe CAS. Pre and post test data was taken during the first and last weeks of the study, utilizing an elicited speech sample. The setting took place at the participants' school, in Austin Texas. Participants were seen for 20 minutes twice per week for 8 weeks totaling 16 sessions. Each therapy intervention was randomly alternated for each session. Targeted words for both interventions were presented with visual cues. Words consisted of consonant-vowel- consonant (CVC) words and were made up of sounds that the participants demonstrated the most difficulty in producing accurate placement during pretesting. Results from this study included treatment interventions for targeting intelligible speech when treating CAS. The data indicated a significant difference between pre and post test scores for participant 2 but not for participant 1. Treatment data revealed that, the iPad app was more effective than MIT in obtaining a higher average number of words produced correctly. Results from this study provide insight into contrasting treatment options for CAS and the overall effectiveness of such treatments. Future studies can provide further evidence based guidelines into the efficacy of treatments for CAS.

## **Current Voice Perceptions: The New Normal?**

Presenter: Leah Simmons

Author: Leah Simmons

Research Advisor: Dr. Karen Copple

Vocal fry, also known as glottal fry or pulse register, is a way of speaking that results in a creaky-sounding voice. While vocal fry can signify a possible

underlying vocal pathology, most of the time it is used voluntarily and habitually. Recent studies have focused on the increase of vocal fry use in young people, particularly in females, and the negative social and economic implications of continually using vocal fry when speaking. The purpose of this study was to investigate the possibility that vocal perceptions by the general public have shifted toward accepting abnormal voice quality as “normal.” Data from this experiment were used to answer the following questions: Do people perceive vocal fry as normal? Is there a difference between how younger vs older people perceive vocal fry? Do people rate female use of vocal fry more severely than that of a male? The experiment was a one-shot group design comprised of 98 subjects, 51 female and 47 male ages 18 and older. The subjects were presented with 10 short audio clips and rated each of them on a 5-point Likert scale with 1 being normal through 5 being abnormal. The audio clips contained individual speakers having different vocal features, and included the following: 3 clips each of female and male vocal fry, 1 clip each of female and male medically disordered voices, and 1 clip each of female and male normal voice (interrater reliability = 100%). Results of the experiment revealed that people rated normal voices more favorably than voices with vocal fry, but less severely than medically disordered voices. There was no statistically significant difference on how men rated normal voices compared to vocal fry, while women rated male vocal fry more harshly than female vocal fry. Results also revealed that younger people rated vocal fry more severely than older people. Contrary to recent studies suggesting that female vocal fry is rated more harshly than male, this study found that both males and females rated female vocal fry as less severe than male. Recent alarm surrounding the negative economic and social implications of overusing vocal fry needs more study considering the results obtained in this experiment.

### **Speech Language Pathologist Perceptions on Working with Transgender or Transsexual Clients**

Presenter: Catherine Walters

Author: Catherine Walters

Research Advisor: Dr. Karen Copple

Previous researchers have identified various clinical perspectives toward people with communication disorders and differences; however, very few studies have explored professional attitudes toward working with the transgender (TG) and transsexual (TS) population. This study aimed to explore self-disclosed perceptions held by speech language pathology (SLP) graduate students and licensed professionals toward TG and TS clients who seek therapy to feminize or masculinize their voices and/or communication styles. Using a mixed methods

design, this study involved two phases of research. During stage one, 111 students and clinicians completed an online survey. Participants were asked to provide level of agreement scores for various statements and optional, open-ended responses. The second phase involved follow-up, semi-structured interviews with 5 participants to explore the personal and professional experiences that influence student and clinician-held perspectives. The following research objectives were achieved: 1. SLP clinicians and students held various perspectives toward TG/TS individuals who seek voice and communication services, 2. Underlying experiences and contexts that influenced these perspectives were identified and discussed. The majority of participants during both phases of this study expressed interest in providing culturally competent care; however, they felt that they had a lack of introductory knowledge with which to provide quality services for TG/TS clients. There were statistically significant differences between demographic characteristics and self-disclosed agreement ratings. Participants who indicated having personal relationships with LGBT individuals and experience as a licensed clinician were significantly more inclined to provide statement ratings in favor of social, cultural, and educational awareness related to TG/TS voice and communication services. Directions for increased clinical preparation with this population were discussed. Graduate programs can help students develop cultural competency skills by providing a preliminary understanding of gender identity and basic services offered by our profession for the TG/TS population. Future research should explore TG/TS client perspectives to gain insight on their experiences related to intervention, service accessibility, and provider competency.

## **Let's Talk Voice**

Presenter: Dene White

Author: Dene White

Research Advisor: Dr. Karen Copple

Abstract Research has been limited on the long-term, negative effects cheerleading may have on the voice as measured by an objective, acoustic program such as the PRAAT. This study was a quasi-experimental, mixed method, group design which utilized qualitative and quantitative measurements. The purpose of this study was to explore the specific negative long-term effects of cheerleading on the voice by analyzing objective, acoustic measurements, and through a collection of patient profiles, including the Voice Handicap Index (VHI). A total of sixty participants were recruited from Lewis and Clark College, Portland State University, and Grant High School in Portland, Oregon. Participants were placed into four different groups: high school cheerleaders, high school

non-cheerleaders, college cheerleaders, and college non-cheerleaders. There was a total of fifteen females placed in each of the four groups ranging in age from fourteen to twenty-four years of age. Each participant completed a patient profile which included questions about daily living activities that may have had a negative effect on their voice. The participants were also asked to complete the VHI, a questionnaire which requested personal reflections on the impact of their voiced disorder. These answers were then placed in three categories: functional, physical, and emotional impacts. The researcher gathered a total of nine voice recordings from all sixty participants over the course of four weeks. Each participant was asked to sustain "ah" while the researcher recorded their voice using the PRAAT program. Groups and data samples were compared in the following areas: fundamental frequency, harmonics to noise ratio, jitter, and shimmer across the four groups. An ANOVA was run and results indicated significant differences between the four different groups. Specifically, the two cheerleading groups were characterized with more negative effects on their voice when compared to their non-cheerleading peers. An additional finding was that cheering beyond high school did not result in any increase in the negative effects on voice.

### **Speaking of Memories: The Effects of Using a Remnant Book on Communication Skills for an Elderly Adult with Alzheimer's Disease**

Presenter: Sarah Wrede

Author: Sarah Wrede

Research Advisor: Dr. Karen Copple

The primary aim of this study was to investigate the impact of a remnant book, as an augmentative and alternative communication (ACC) device (Bourgeois, Dijkstra, Burgio, & Allen-Burge, 2001) on pragmatic discourse-level communication skills and quality of life (QOL) for the elderly adult with Dementia of the Alzheimer's Type (DAT). Secondly, the remnant book served to strengthen principals of the theory of cognitive communication disorders of dementia (Bayles & Tomoeda, 2007). A quasi-experimental single-subject A-B-A/B design was used in an Adult Day Care setting to determine the effect of a multisensory and thematic remnant book on QOL and the following measures of discourse: topic maintenance (total duration of minutes and average number of minutes per topic that the patient could maintain a topic), topic elaboration (total elaboration of sentences and average number of sentences per topic that the patient could elaborate upon a topic) and appropriate topic shifting (total number of times that the patient could appropriately shift topics per session). Percentage of Non-Overlapping Data (PND) indicated that remnant book therapy was highly

effective in increasing average topic maintenance per topic, moderately effective in increasing average topic elaboration per topic, and only minimally effective in increasing the frequency of appropriate topic shifts per session. A closer look at the specific remnant book themes indicated that favorite things and family themes were more effective at increasing topic maintenance and topic elaboration than were hobbies. One-tailed hypothesis testing using repeated measures t-tests showed no significant difference in QOL for caregiver or patient; however, these results should be interpreted with caution. Credence should be given to social validity given the family stated that remnant book therapy was highly beneficial for both the patient and the family.

## **Paper Presentation Group 12**

### **Practicum Makes Perfect: Tracking Student Clinician Growth Across the Initial Practicum Experience**

Presenter: Gabriel Ayala

Author: Gabriel Ayala

Research Advisor: Mr. Dwayne Wilkerson

Award Winner

This study tracked the growth of graduate student clinicians in the field of speech-language pathology, determined areas of strength and weakness in the student's development of clinical competency, and provided an alternative to the current trend of use of clinician productivity standards within the field. Fifteen graduate student clinicians enrolled in practicum at Eastern New Mexico University's Speech and Hearing Rehabilitation Outreach Center were included for this study. Clinical skills and clinical effectiveness were collected at two separate points and measured using a rubric. The rubric used was developed specifically for this study by determination of indicators of effective clinical attributes and efficient practices, which were identified through clinical observations. Video recordings of initial and final therapy sessions of the graduate students were collected and the researcher rated clinical performance using the rubric that was developed. Specific gains, both in terms of degree and areas of performance, were identified and compared of the fifteen student clinicians. The results of the study support the notion that clinicians do indeed grow significantly during their beginning practicum experience; however, not all students grew equally or in the same areas of clinical competency. While there were areas of clinical competency in which more student growth was observed than in other areas, it is difficult to determine what factors may have contributed to and/or accounted for these

growth patterns. Parameters of this study did not account for individual clinician differences that could have affected clinical competency growth, such as client absences, supervisor differences, independent study, etc., and this should be taken into account when considering the validity of the study. While there was no formal measure of the effectiveness of the specific rubric used in this study to measure clinical competencies, it is the researcher's opinion that this instrument or similar rubrics could potentially offer a useful alternative to productivity ratings as the primary tool for charting clinical effectiveness during therapy. Furthermore, the results of this study should be considered by Speech-Language Pathologists and healthcare professionals when considering viable alternatives to the current focus on productivity ratings, as these ratings do not account for the quality of therapy given. Productivity ratings take into account time spent with the client, under the assumption that the time spent is used effectively; moreover, such measurements do not account for the time spent to prepare and/or properly document for an effective therapy session.

### **See What I'm Saying: The Effects of Age, Gender, and Hearing Ability on Speechreading**

Presenter: Deanna Diaz

Author: Deanna Diaz

Research Advisor: Mr. Dwayne Wilkerson

Speechreading is a valuable but underutilized tool for increasing the comprehension of spoken communication, especially for individuals with a hearing loss. Successful speechreading can help an individual reduce their own perception of a handicap and increase assertiveness as well as increase educational, career, and social opportunities. With the rise of technological devices such as hearing aids and cochlear implants, speechreading has fallen out of favor due to the amount of time and training it takes to become moderately competent. Speechreading remains a viable option for clients who do not want a device that may be difficult or expensive to acquire and maintain. For this reason, it is helpful for speech-language pathologists to know what characteristics determine whether their client would be an ideal candidate for speechreading training to decide if it would be an effective and efficient goal. This causal-comparative research explored the demographics of successful speechreaders based on age, gender, and residual hearing to support the hypothesis that females between eighteen and thirty-five years of age with a hearing loss make the best untrained speechreaders. Ninety-seven participants aged eighteen years and older of various hearing abilities volunteered for an online survey. The survey tested their ability to correctly identify thirty video recorded words and phrases using visual speech information only. The resulting data showed that overall,

women showed higher accuracy on the speechreading task than men did and that the participants who were fifty-five years of age and younger had a higher accuracy on the speechreading task than the participants who were older than fifty-five years of age. As hypothesized, the youngest female group had the highest mean score and the oldest male group had the lowest mean score. More data is needed on how hearing ability affects speechreading comprehension. High attrition of less successful groups may be a major confounding variable in this study. Future research can correct for this by creating a shorter and less difficult survey. Other future research might also gather more information about participants such as personality and cognitive traits. The results are relevant for speech-language pathologists in determining how likely a given client would benefit from speechreading training.

### **Living with autism: the impact of SES**

Presenter: Andres Haro

Author: Andres Haro

Research Advisor: Mr. Dwayne Wilkerson

Research has shown that autism causes parental stress and has an influence on different aspects of family life. This qualitative study examines the influence that socio-economic status has on the family experiences when raising a child with Autism. This study sampled from two communities in California: Manhattan Beach and Lennox. The Manhattan Beach community is predominantly Caucasian with a median household income of 139,259. The Lennox community is predominantly Hispanic with a median household income of \$37,659. Twenty-three families were sampled from focus groups. Key-informant interviews were conducted in the participants' homes to gain a better understanding of the family perspectives. The main question was driven by a set of sub-questions: How does SES affect family relationships with a child with autism? How does SES affect employment with a child with autism? How does SES affect schooling choices with a child with autism? How does SES affect community involvement with a child with autism? How does SES affect income with a child with autism? The major themes of this study included family, education, money, and time. The outcomes of the study demonstrate the influence that SES has on the daily lives of families with a child with autism. Extended family dynamics in the Manhattan Beach community are not as important as it is in the Lennox community. Employment in both communities is vastly different and because of it time and money are viewed differently. Community involvement in the Manhattan Beach case is important because results show that the community is the "extended family." On the other hand, the Lennox community

uses their extended family as their community. Income is what drove this study. Income affects both communities greatly, although there were some families that thought it was not a factor. These findings have relevant implications that can help service providers understand the environments of two very different communities. Further research is needed in order to better understand the dynamics of the diverse communities that exist in the United States. This will not only help service providers the dynamics of income but also class and race/ethnicity.

### **Something Wong? How Native English Speakers Understand and Perceive Asian Accents**

Presenter: Keralyn Kadir

Author: Keralyn Kadir

Research Advisor: Ms. Laura Bucknell

The Asian population is the fastest growing ethnic group in the U.S. where successful social integration is associated with English speaking proficiency. While intelligibility and perception are often used as measures of foreign accented speech in research, there has been little research examining the relationship between these two variables. The purpose of this study is to determine whether intelligibility is associated with perception in Asian accented speech including Japanese, Korean, and Mandarin accents and to determine whether any significant differences exist between these accents. In an online survey, 55 native English speakers listened to 30 speech samples of three speakers with Japanese, Korean, and Mandarin accents then transcribed and rated each sample on an 11-point scale based on how difficult it was to understand the speaker. Results indicate that no strong relationships exist between intelligibility and perception and that there are significant differences in intelligibility and perception of Japanese, Korean, and Mandarin accents. Japanese and Korean accents were found to be significantly less intelligible than Mandarin and were perceived by native English speakers as more difficult to understand even when speech was intelligible. Japanese accents were perceived as most difficult for native speakers to understand overall. These findings suggest that perceptual ratings may vary independent of actual levels of intelligibility meaning that increasing intelligibility might not decrease perceived level of difficulty in understanding Asian accents for all native English speakers; however, intelligibility can still be used as an indicator of significant improvement in individuals receiving accent instruction. For individuals who are generally perceived by native speakers as more difficult to understand such as native Japanese speakers, speech-language pathologists might consider adjusting

goals by increasing intelligibility criteria while considering both articulatory placement and prosody. Further examination of how language-specific phonetic and prosodic features influence intelligibility and perception as well as how differences in perception affect communication such as negative attitudes and length of interaction is recommended.

### **Word Art: Learning Vocabulary in Style**

Presenter: Noori Mulji

Author: Noori Mulji

Research Advisor: Mr. Dwayne Wilkerson

Previous research has shown that vocabulary knowledge has an impact on reading comprehension and overall academic success on formal testing in schools. Currently, there are several methods used to learn vocabulary including reading aloud, word mapping, embedded definitions (context-based), etc, but using stylized words is not one of them. Students may better retain vocabulary knowledge they learn with additional graphic cues. "Stylized words" refer to words that have added pictures or graphics that pertain to the word's meaning. The goal of this study was to examine the effect of teaching stylized words compared to traditional typed words on vocabulary test scores. The results of this study may benefit educators and speech-language pathologists to use stylized words as a tool to help improve students' vocabulary acquisition. This quantitative post-test experimental study involved thirty third- and fourth-grade students divided into two groups and taught vocabulary words using either traditional or stylized word flashcards. A screening was conducted using vocabulary words two grade levels above their current grades to eliminate test score data of subjects who are already familiar with most of the words; however, no subjects were familiar with more than half the words. No pre-test was given to eliminate influence on the post-test scores. Six teaching sessions were conducted at an afterschool program facility to teach both groups a set of twenty vocabulary words using the two different flashcard methods. Afterward, a post-test was given to all students and scored by the researcher and an inter-rater. The results indicate that there was no significant difference between the scores of the two groups and the stylized words were just as efficient as traditional words; however, the subjects expressed that the stylized word flashcards were more interesting than traditional ones. Additionally, confounding variables such as the number of subjects, location, time of year (this study was conducted in fall semester), and motivation level may have influenced the posttest performance. The availability of stylized words for teaching is another influential factor—for this study, the flashcards were handmade by the researcher. In other settings, teachers and

speech-language pathologists may not be able to easily or quickly create stylized words as a potential tool for improving vocabulary acquisition. Further research of added graphic cues on vocabulary learning is recommended to fully understand the effects on a larger scale.

### **Does Encouragement Make an Impact?**

Presenter: Rachel Osterhues

Author: Rachel Osterhues

Research Advisor: Ms. Laura Bucknell

This study was conducted to see if written encouragement increased the test results and confidence levels of the experimental group compared to the control group. The hypothesis was written encouragement would increase quiz scores and confidence levels. Previous research suggests encouragement makes a positive impact in the educational world. This study used a post-test only control group design. The participants consisted of 21 college freshmen in the experimental group and 17 college freshmen in the control group. The experimental group participants were given written encouragement before taking a quiz on a passage read to them. Then, the experimental group participants rated their confidence regarding how well they would perform on the quiz on a 1 to 5 Likert scale with 1 being the lowest and 5 being the highest. The control group participants were not given written encouragement before taking the same quiz on the same passage read to them as the experimental group. Then, the control group participants rated their confidence regarding their test performance on the same Likert scale as the experimental group. The quiz scores and Likert scale ratings were analyzed separately using a t-test for independent measures. The results of this experiment show no significant difference between the quiz scores in the experimental and control group. However, the results of the Likert scale ratings show the experimental group has significantly higher confidence ratings compared to the control group. The results suggest that written encouragement does have a positive impact on confidence before test-taking, but not on test performance. In the future, it is recommended experiments of this nature be conducted in more realistic scenarios in which students receive an actual grade on the quiz. It is also recommended the Likert confident scale ratings are perhaps more specified than just 1 being the lowest and 5 being the highest confidence rating.

## **The effect of direct instruction vs. independent study on English-language competency with English-language speakers with an L1 of Tagalog**

Presenter: Lawrence Valentin

Author: Lawrence Valentin

Research Advisor: Mr. Dwayne Wilkerson

Language consists of two components. Receptive language is the ability to comprehend language while expressive language is the ability to express thoughts and concepts verbally, in writing, and/or gesturally. When acquiring a second language, learners can have difficulty understanding and expressing more complicated information in the new language. In the case of Filipinos who grew up in the Philippines and acquired Tagalog as their first language, many receive formal instruction in English in primary and secondary school in the process of learning English as a second language. Despite formal instruction in English, there is often a language barrier between Filipinos that speak English as a second language and native English speakers. The purpose of this study is to examine the effect of direct vocabulary instruction in English as compared to independent study in English on the ability of adult second-language learners with an L1 of Tagalog to demonstrate greater English-language competency. The subjects in this study included a Filipino couple that completed all of their schooling in the Philippines and speak English as a second language. One participant used a word of the day program to learn new English vocabulary while the other worked on the same vocabulary words with the graduate researcher in direct teaching sessions. Both subjects completed pretest and posttest measures using the Peabody Picture Vocabulary Test (PPVT-4), the Expressive Vocabulary Test (EVT-2), and the Nonliteral Language subtest of the Comprehensive Assessment of Spoken Language (CASL). Results comparing pretest with posttest scores demonstrated that neither direct instruction or independent study was more successful with increasing English-language competency, nor was either approach more successful with increasing English-language competency than no intervention when compared to a control group. From this study, we can conclude that studying arbitrary vocabulary words does not generally contribute toward English-language competency.

## Paper Presentation Group 13

### Food for Thought

Presenter: Kacie Bartlett

Author: Kacie Bartlett

Research Advisor: Ms. Nicole Bougie

The purpose of this study is to determine the impact of low glycemic foods and drinks versus high glycemic foods and drinks on a child's short-term memory. The Glycemic Index is a rating scale used to determine the impact food or drinks have on the body's blood glucose levels. The Glycemic Index can be rated as high, medium, or low based on the scores they receive. Low Glycemic is considered as score of 55 or lower (e.g. fruits), medium is considered as scores between 56 and 69 (e.g. oat bran & raisins) and high glycemic is considered as a score of 70 or higher (white rice & fruit drinks). Higher scores on the Glycemic Index cause glucose levels to spike rapidly. This study will compare high glycemic foods and drinks and low glycemic foods and drinks and determine which is most optimal for a student's performance during activities that require short-term memory. This study is important because memory can be linked to a child's school performance and can provide valuable information to teachers, school administrators, speech therapists, and parents. This study consisted of two sessions, one week apart and included 30 participants who attended Gateway Christian School in Roswell, New Mexico; participants grade levels ranged from 4th to 6th grade. On the first day of the study, half of the students consumed high glycemic foods/drinks and the other half consumed low glycemic foods/drinks. Thirty minutes after consumption the students were administered three short-term memory tasks. One week later the same procedure was implemented but the students who first consumed high glycemic foods were given low glycemic foods and students who first received low glycemic foods were given high glycemic foods. The memory tasks were scored and a repeated measures t-test was used to determine if there was significant difference between high glycemic foods and drinks and low glycemic foods and drinks on the participant's memory.

### IEP What? Parental Knowledge & Understanding of IEP Processes

Presenter: Liliana Borunda

Author: Liliana Borunda

Research Advisor: Ms. Nicole Bougie

Parents are increasingly being exposed to special education due to an increase of students receiving individualized education plan (IEP) services under the federal law, Individual with Disabilities Education Act (IDEA, 2004). Data from the United States Department of Education states that during the 2013-2014 school year, approximately 6.5 million (12.9%) of students in public schools received special education services under IDEA. These students come from backgrounds that include parents with different educational levels, ages, and socioeconomic status. This study aimed to understand parents' knowledge of IEP processes and how they relate to speech therapy services. The study also explored overall understanding of the IEP procedures. A survey collected demographic information with a total of 10 questions about the IEP and its association to speech therapy. There were five questions over IEP processes that included procedural safeguards and parental rights. The five speech therapy services questions on the survey included eligibility criteria and service delivery. Participants were 18 and older and had a child currently receiving special education in the public schools. The number of surveys completed totaled 102 with a completion rate of 69%. A Pearson's  $r$  assessed the relationship between the five questions of IEP procedures and the five questions of the IEP as it relates to speech therapy services. Knowledge of IEP procedures and speech therapy services were moderately positively correlated,  $r(100) = +.45$ ,  $p < .05$ , two tails. It appears that the more parents knew about the IEP procedure, the more they knew about speech therapy services. Parents in Group A had five or more years of experience with an IEP and those in Group B had 1-4 years of experience. A t-test for independent measures was used to compare overall survey results between the groups and revealed no significant difference,  $t(100) = .68$ ,  $p = .49$ .

### **The Effects of Watching Between the Lions on Phonological Awareness**

Presenter: Alejandra Del Hierro

Author: Alejandra Del Hierro

Research Advisor: Ms. Nicole Bougie

There are many educational television shows that help children learn skills that will benefit them in their academic life. The objective of this study is to demonstrate how the series "Between the Lions" (BTL) promotes phonologic awareness to potentially help children ages 5-8 increase their literacy skills. Four participants were assessed using The Phonological Awareness Test (PAT-2) to establish baseline of the participant's phonological awareness skills. The participants were then exposed to 30 episodes of BTL in the span of 30 weekdays. During this time parents were asked to fill out a weekly survey to rate the participant's attention to the show. Overall attention was rated as 75% "attentive,

no re-direction needed” and 25% as “attentive, but had to redirect once or twice to pay attention to the show” during the 5-week study period. After the participants were exposed to the show, the PAT-2 was re-administered to determine any gain scores. The scores obtained were compared using a paired t-test, to see if there was statistical significance, and where the significance lies. The results demonstrated that watching *Between the Lions* does have a positive effect on phonological awareness skills, as all the participants demonstrated improvement after watching the show. A repeated-paired measure t-test, was also used to measure improvements in the subtests scores. The subtest included six important phonological awareness skills; rhyming, segmentation, isolation, deletion, substitution and blending. Only two subtest demonstrated significant difference, Rhyming pre-test scores (M=66.75, SD=5.19) and post-test scores (M=87.00, SD=8.41);  $t(3)=3.50$ ,  $p<.05$ , and Substitution pre-test scores (M=85.00, SD=6.38) and post-test scores (M=102.00, SD=8.41);  $t(3)=2.13$ ,  $p<.05$ . These results suggest that BTL had the most impact on these two phonological awareness skills. These results are promising, as they suggest that print presented through television can have a positive change in early literacy skills. Teachers, parents, and therapist can use BTL as a tool to help the struggling reader with their early literacy skills.

### **Sit Up to Speak Up!**

Presenter: Sarah Eilert

Author: Sarah Eilert

Research Advisor: Dr. Suzanne Swift

Speech-language pathologists have historically considered traditional articulation therapy to be the best method to correct articulation disorders; however, research studies have documented the success of gross motor flexion exercises to facilitate /r/ phoneme production in elementary-age participants who are delayed in their acquisition of the /r/ phoneme (Swift & Havens, 2013; Swift & Plummer, 2011). Yet, no previous study has investigated if gross motor flexion exercises will facilitate correct /r/ production in a young preschool-age participant who is unable to produce the /r/, but is not “delayed” in the acquisition of the /r/ phoneme (i.e., the child does not yet produce the /r/ phoneme but is young enough that this is not an age appropriate expectation). This research study purposed to answer the following research questions: Will gross motor flexion exercises establish /r/ production in a three-year-old participant who is not developmentally ready to produce /r/, and do these findings complement previous research for /r/ flexion exercises?

In a single subject experimental withdrawal research design, a three-year-old participant completed gross-motor movement exercises (e.g., sit-ups

and crunches) to facilitate fine-motor movements in the tongue necessary to produce /r/. The study lasted a total of nine weeks with six weeks of treatment and three weeks for baseline, withdrawal, and observation. Results indicated that gross-motor flexion exercises were not successful in stimulating consistent /r/ production in the three-year-old participant, yet the participant demonstrated some success producing the /r/ phoneme with the /gr/ and /kr/ blends when her gross-motor flexion movements were coordinated with her /r/ vocalizations. These findings suggest that /gr/ and /kr/ are excellent phonemes to begin /r/ therapy, and also that no amount of stimulation will “speed up” the development of a physiologically immature motor system. Overall, the study’s results indicate that gross motor flexion therapy is not effective for participants who are not developmentally primed to complete elevated retroflexed phonemes, and participation in therapy does not give preschool children a head start in their phoneme production. Future research should seek to establish the youngest age where gross motor flexion exercises are effective and additional gross motor flexion movements which can stimulate the development of other speech sounds. These findings provide valuable implications for future research and speech articulation therapy.

### **Reading “Blooms” with SQ4R**

Presenter: Shelby Halcomb

Author: Shelby Halcomb

Research Advisor: Dr. Suzanne Swift

The practice of assigning various reading materials is very common in school settings across all grade level. Reading comprehension plays a crucial role in a person’s life experiences and academic/professional successes. Students who cannot comprehend what they read are at risk for failure and are typically identified for remedial instruction and/or intervention. The purpose of this study was to examine the effectiveness of one such intervention in facilitating increased reading success.

This study investigated the effectiveness of the SQ4R reading comprehension technique coupled with Bloom’s Taxonomy questions on improving the reading comprehension of three elementary school-aged children. Three subjects aged 10-12 identified by their parents as struggling with reading comprehension completed this quantitative single subject experimental A-B-A study. Subjects were pre-tested with both standardized and criterion-referenced assessments, received intervention four times a week for five weeks, and then post-tested with the same measures used for pre-test. During the treatment phase, each child was provided with a reading passage at the beginning of

each session and then asked to develop six questions about the passage using the Bloom's Taxonomy hierarchy as a session pre-test. The researcher and participant then reviewed the same reading passage and re-read it while implementing the SQ4R program. At the end of the session, the child then answered the same six questions created at the beginning to measure their progress from the session.

Results of this study were analyzed with descriptive statistics by using percentage of correct response (PCR) and standard deviation comparisons. Additionally, results were analyzed with inferential statistics using gain scores, t-tests, and a one-way ANOVA for repeated measures. Statistical analysis revealed significant improvement in reading comprehension across all subjects and significant improvement in oral reading accuracy for one subject. While each subject in this study made significant improvement in reading comprehension, future research with larger sample sizes would be beneficial to determine the generalization of results to other children of similar backgrounds as well as other populations.

## **Background Babble**

Presenter: Kaitlyn Johnson

Author: Kaitlyn Johnson

Research Advisor: Ms. Nicole Bougie

The purpose of this study was to explore the abilities of males and females in environments with and without the presence of background noise. More specifically, the study focused on reading comprehension abilities of the participants in the different environments and exploring if gender differences are present. Using a quantitative and one shot-quasi experimental paradigm, this study analyzed the reading comprehension abilities between male and females in an environment containing background noise and in an environment with an absence of background noise. The reading passages used were two 8th grade nonfiction passages. The background noise that was used in this study was a recording of someone reading the same passages the participants read in the foreign language of Persian. Descriptive and inferential statistical methods were used to compute data. For each gender group, change score, mean, median, and mode were computer. An ANOVA was conducted for each gender group to identify if differences in scores were present. An ANOVA based on each genders change scores was used to identify if differences between genders were present. Statistical findings indicate there is no significant difference between the performance of males versus females when comparing their change scores on the reading comprehension tasks performed in the two different environments.

It was also concluded there is no significant difference within each gender when comparing their scores in each conditions. Confounding variables present in this study include the time of day the tasks were completed, the ages and education levels of the participants, natural memory abilities of participants, and unknown hearing impairments. The importance of these findings are relevant to professionals who may need to make accommodations had there been significant difference among the genders. More research still needs to be conducted in the area of gender differences performance in environments which contain background noise.

### **Impact of Support Groups on Stroke Survivors' Quality of Life**

Presenter: Nicole Leahy

Author: Nicole Leahy

Research Advisor: Ms. Nicole Bougie

Award Winner

This study was designed to evaluate the impact of participation or nonparticipation in a stroke support group on an individual's quality of life, and to determine what factors influence participation or nonparticipation in a support group following a stroke. The study employed a mixed methods design combining quantitative data gathered from a survey with qualitative data gathered from participant interviews. Quality of life, a multidimensional concept accounting for both subjective and objective evaluations of multiple facets of life, was measured in five domains: social participation, memory, emotion, mobility, and communication. Participants completed an adapted version of the Stroke Impact Scale (SIS) survey and participated in a semi-structured interview to gather additional insight into their perceptions of recovery variables. Interviews were transcribed and coded to develop themes and categories, and survey data was analyzed to determine the correlation between participation and nonparticipation in a support group with overall quality of life scores. Results indicated that participation in a support group positively impacted quality of life as measured by the SIS, but scores were only 3% higher for support group participants. However, strong positive correlations existed between quality of life and communication ( $r = 0.912$ ) and social engagement ( $r = 0.815$ ). Data from qualitative interviews was in concurrence with survey data, and suggested that support group participants cited availability, awareness, and similarity of recovery goals as their primary motivation for participating in a support group. Nonparticipants cited group composition, lack of availability, and other health conditions as factors that influenced their decision not to participate. Additionally, incidental findings from the interviews suggest that future research be conducted on mental

health support following discharge from acute care, awareness of variability in recovery, and awareness about communication disorders. Results indicated that participation in a support group positively impacted overall quality of life scores, but not as significantly as anticipated.

## **Differences in Perceptions of Stuttering Between Individuals Who Do and Do Not Stutter**

Presenter: Mary Lento

Author: Mary Lento

Research Advisor: Dr. Suzanne Swift

The purpose of this study was to determine the differences in perceptions of people who stutter (PWS) and people who do not stutter (PWOS) when listening to a stuttered speech sample. A quantitative Likert scale survey design was used to gather information from each group regarding their perceptions of three speech samples (mild stuttering, moderate stuttering, and severe stuttering). Non-identical speech sample monologues were obtained from the University College London Archive of Stuttered Speech (UCLASS), each being a general description of school subjects, hobbies, etc. Respondents were instructed to listen to the speech sample and then agree or disagree (using a 5-point Likert scale) to a series of statements about the stuttered speech. Respondents were also asked to rate the severity of each speech sample on a ten-point rating scale.

A two-factor ANOVA was used to identify any significant differences between PWS and PWOS groups on each question. Results revealed significant differences in their judgements of “distractibility” and in their overall severity ratings, with interaction effects also positively noted. This indicates that perceptual ratings of stuttering may be influenced by the fluency of the listener (vs. the fluency of the speaker), especially when the listener identifies themselves as a PWS.

Future research should seek to clarify why PWS find stuttering less distracting, and if they view other PWS with more empathy than the general population. Future research should also include using videotaped samples (vs. audio only) to determine if perceptual ratings are impacted by this feedback, as well as to identify any differences in listener perceptions of stuttered speakers when secondary characteristics are involved.

## Paper Presentation Group 14

### TRANScending Voice: A Survey of Perception

Presenter: Alana Dickinson

Author: Alana Dickinson

Research Advisor: Dr. Linda Weems

Transgender voice and communication therapy is becoming more recognized and practiced in the field of speech language pathology, creating the need for increased evidence regarding efficacy since it is currently lacking. The majority of current studies in this area focus primarily on a single vocal characteristic: pitch. These studies indicate that transgender people who have vocal characteristic disconnect from their physical appearance can have a lowered quality of life. Some studies have indicated that other factors play a role, yet there is little research on listeners' perceptions of transgender people based on their speech. Using cisgender and transgender speech samples to determine personality perceptions, this study aims to add definition to the disconnect and add additional research to transgender voice and communication therapy. The intention of this study is to determine if transgender people are perceived more similar to their birth gender or their identified gender. A survey containing speech samples from cisgender and transgender men and women was conducted in order to answer that question. The speech samples were rated on 12 different personality characteristics. ANOVAs run on each characteristic showed significant difference on eleven out of the twelve characteristics. A Tukey's honest significant difference test was run on the eleven characteristics that showed significant difference to determine where the difference lies. The results showed that the transfemale group was judged to be most similar to the transmale group. The results also showed that the transmale group was judged to be most similar to the transfemale group. Transwomen were found to have the most significant difference most from their birth gender. Transmen, however, had equal significant difference from both their biological and their birth gender. These results indicate that there is a need for transgender voice and communication therapy for transmen. Transmen are generally not included in research in this area because hormone therapy deepens their voice. This study shows that further research should be conducted on the benefits of transgender voice and communication therapy for transmen. Further study can be done by incorporating video with the voice samples to see how seeing the person changes perception. Pitch could also be incorporated into future study to determine if pitch plays a role in the perception of transgender speakers.

## **Student Outcomes and Attitudes in the New Online Classroom**

Presenter: Wafa Haddad

Author: Wafa Haddad

Research Advisor: Dr. Linda Weems

This research investigates how computer-mediated communication impacts instructional quality, student performance, and students' classroom experience in a simultaneous video-based classroom. This study used a quasi-experimental design in which Communicative Disorders graduate students attended an hour-long lecture at Eastern New Mexico University. The control group in this study consisted of 25 female graduate students attending the lecture in-person in a traditional classroom setting. The experimental group consisted 41 female graduate students attending the same lecture via a simultaneous video-based classroom. Participants were compared according to their performance on a multiple choice and free response exam based on the content of this lecture. Participants also completed a survey about their experience of the lecture; trends in perceptions of online and in-person participants were also compared. The results of this study showed that students who attended the lecture in-person performed better academically on the content based quiz following the lecture. In-person traditional classroom participants (control group) also gave more positive ratings in the perception categories "lecturer's fairness" and "lecturer's helpfulness." No significant difference was found in other perception categories ("lecturer's expertise", "lecturer's approachability", and "overall value of the lecture.")

## **Combating the Reading Crisis**

Presenter: George McKamy

Author: George McKamy

Research Advisor: Dr. Adrienne Bratcher

**ABSTRACT:** Purpose: The purpose of this research paper was to discuss how using the two strategies impacted reading comprehension. In addition, the researcher wanted to add to the existing body of research on this topic. Reading comprehension is crucial for fourth grade students who are no longer "learning to read," but rather "reading to learn." The literature review indicated that two strategies, previewing vocabulary and questions before reading increased reading comprehension. These two strategies have never been included in a research study together. Method: A convenience sampling was used to obtain the sixty subjects where fifteen subjects were randomly assigned into a no preview group,

preview of vocabulary terms group, preview of comprehension questions group, and preview of both preview of comprehension questions and vocabulary terms group. The researcher typed out a reading passage from the book *Charlie and the Chocolate Factory* by Roald Dahl. Comprehension and vocabulary terms were developed from the typed passage. A post-test control group design was used. A one-way analysis of variance (ANOVA), F-ratio was calculated to determine if there was a significant difference. Results: The results indicated that there was a significant difference between the previewing vocabulary group and the no previewing group, and between previewing the vocabulary and comprehension questions group and the no previewing group. The results can only be generalized to the fourth-grade subjects in this study. Implications from the research indicated speech-language pathologists can use previewing vocabulary to target vocabulary instruction. The results also indicated that the general education teachers can also use this strategy to teach vocabulary as part of the literacy instruction as well as other content areas. There were four confounding variables which the researcher could control for which were reading grade level, reading comprehension, previous exposure to the text in the academic setting, and gender. Further research studies are warranted in this area with fourth grade students that include larger sample size, multiple schools, multiple school districts, learning style, and gender.

### **Does One Size Fit All? Examining Reading Comprehension Among Text Genres**

Presenter: Megan Padron

Author: Megan Padron

Research Advisor: Dr. Adrienne Bratcher

Award Winner

This study aimed to investigate the effects of text genre on subjects' reading comprehension. The underlying mechanisms for comprehension differences across the two different genres, narrative and expository, were explored. Children are widely exposed to these two styles of text throughout their education, and many students who are language impaired have poor reading comprehension. Students are required to meet Common Core Standards, and difficulty with comprehension of different text structures will affect their ability to do this. This study examined the differences that occur in students' reading comprehension in order to enable improved teaching and learning strategies for teachers, speech-language pathologists, and students. Thirty eighth-grade students from a Midwestern school district read separate passages of both expository and narrative prose, and their comprehension in regards to specific and general information about the texts were measured through a local comprehension

assessment. Inferential data was collected and analyzed using a t-test for independent measures to determine statistical significance regarding subjects' comprehension levels of the passages. Descriptive data, using raw scores and percentage of correct response, was used to determine and describe themes that occurred in subjects' comprehension among common reading macrostructures. Results indicated a significant difference in subjects' comprehension of the two genres. Additionally, the macrostructures of inferencing, cause-effect, and summarizing were identified with more precision in the narrative passage, while subjects were more successful at identifying the main idea in the expository passage. This study concluded that text structure does have an effect on readers' comprehension, with narrative structures facilitating higher comprehension than expository structures. These findings could be useful for speech-language pathologists and educators in order to tailor reading comprehension instruction to the specific text structure in order to facilitate improved understanding, especially with those students who have language delays.

## **The Power of Breath**

Presenter: Melissa Scheller

Author: Melissa Scheller

Research Advisor: Dr. Linda Weems

This study investigated the effects of a four week expiratory muscle strength training (EMST) on a subject's vocal quality with multiple sclerosis. The subject was a 52 year old female with multiple sclerosis that had persisting concerns with her vocal quality (i.e harshness, breathiness, tremor, overall vocal instability). The investigator was interested in analyzing the vocal performance of this subject before and after EMST treatment. EMST (expiratory muscle strength training) is a device used to strengthen expiratory muscles, which are crucial for a strong cough, swallow, and vocal quality. This study was conducted using the EMST 150. The EMST 150 is a spring loaded device used for elicitation of expiratory muscle strength training. It is easily calibrated to the user's ability and is very user friendly. The user simply holds the device to the mouth and blows with maximum force until the valve inside the device opens and allows air to flow freely through. The valve inside the device was calibrated to only open once the air pressure inside the device is great enough to allow the valve to open and air to flow through. Treatment took place according to the "power of five"; a commonly used frequency of EMST treatment method. This method has the subject use the device for five repetitions for five sets of breaths. Specific voice parameters (fundamental frequency, jitter, shimmer, harmonics to noise ratio: HNR) were analyzed using the PRAAT program by way of sustained vowel

production (i.e /ah/). These parameters were analyzed before and after treatment was administered. The posttest results were then compared to the results obtained during the baseline. The subject's maximum phonation times were taken before and after treatment. The subject's results were analyzed for an increase in maximum phonation time average. The PRAAT parameters are measures of vocal quality and maximum phonation averages are used to measure glottic efficiency. The subject's fundamental frequency and HNR results were not statistically significant; however, the subject's maximum phonation time average, jitter and shimmer results were statistically significant when baseline and posttest results were compared using a t-test for repeated measures.

### **Differing Perspectives in Shaping Echolalia into Intentional Communication**

Presenter: Katherine Smith Harris

Author: Katherine Smith Harris

Research Advisor: Dr. Adrienne Bratcher

Individuals with Autism Spectrum Disorder frequently exhibit echolalia, an immediate or delayed repeated speech that is rooted in outside verbal sources. The individuals are often provided services by Speech Language Pathologists with a linguistic training framework, and Board Certified Behavior Analyst with a behavioral developmental framework. Both professionals are trained to treat the disorder, but often use different methods of providing services. The goal of the study was to find a treatment method that both professionals could utilize to shape echolalia into appropriate expressive communication for the individual with ASD. A mixed method qualitative study with open-ended interviews and a comparison of the frequencies of particular semantic responses was analyzed with descriptive statistics and non-parametric inferential statistics. The participants were Speech-Language Pathologist (SLP), Board Certified Behavior Analyst (BCBA), and dual certified Speech-Language Pathologist-Board Certified Behavior Analyst (SLP-BCBA). The interviews were transcribed with the content analyzed to determine the frequencies of particular semantic responses. The responses were put into categories. Each category was put into a nominal code, and the total number of responses in each category was used in descriptive and inferential statistical analysis. The results were put into a Chi-Square. The Chi-Square showed a significant difference in treatment method and the generalization for each clinician group. After reviewing the results, each discipline chose a different treatment, for varying reasons, though not every treatment method reached generalization in practice. The method, Pivotal Response Training (PRT), that was generalized the most was the one chosen by the dual certified Speech-Language Pathologist-Board Certified Behavior Analyst.

The SLP-BCB stated that they had previously used PRT with young children age 3 to 8 to decrease echolalia, and generalized the results of the treatment method. There needs to be a greater collaboration and terms need to be defined between the two disciplines.

## **The Effects of Font Type on Reading Fluency**

Presenter: Ana Stotlemeyer

Author: Ana Stotlemeyer

Research Advisor: Dr. Adrienne Bratcher

Dyslexie font was created by Christian Boer to help children and adults with dyslexia. This font was designed based on the assumption of the magnocellular or visuo-spatial theory of dyslexia. The font has longer stems and wider bases which are believed to help prevent reversing and rotating letters during reading. Children who do not meet age appropriate reading fluency scores may be struggling with reading comprehension and academic reading. It is believed that Dyslexie font can improve reading fluency scores, but previous research on Dyslexie font is mostly survey research. No norm scores for correct words per minute with Dyslexie font are available. Thirty-five students were selected from school districts in Denver, CO to participate in a quantitative, quasi-experimental study about font type and reading fluency. These participants were enrolled in 1st and 2nd grades and were chosen because of their status as emerging readers. The purpose of this study was to determine if Dyslexie font improves reading fluency and reading speed in emerging readers. The participants were baselined using the Informal Reading Inventory (IRI) by Burns and Roe and then tested using grade-normed reading passages for the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) standardized test. Participants were not randomly assigned to a control and experimental group, but were all given the same independent variables. DIBELS passages were presented in random order in Times New Roman, Dyslexie, and Courier fonts. Reading fluency scores were determined by the amount of time it took to complete each passage and the number of words in error in each passage. Descriptive statistics revealed that 1st grade students had greater reading fluency scores with Courier font and 2nd grade students had greater reading fluency scores with Dyslexie font. Inferential statistics with multiple 2x3 ANOVAs revealed that there was no significant difference between reading fluency scores and font type. Changing font type is not a solution for reading difficulties, but this study reveals that using new fonts will not be detrimental to the reader.

## Problems in Practice

Presenter: Shannon Swingle

Author: Shannon Swingle

Research Advisor: Dr. Adrienne Bratcher

This study examines whether massed or distributed practice has an effect on the retention of Spanish vocabulary in adults. Distributed practice has been previously found to result in better short-term and long-term retention. Subjects have previously believed massed practice to be most effective in prior studies. Four middle-aged adult subjects were asked to participate in the study. Using an experimental alternating-treatment design, the participants were pretested on 280 Spanish vocabulary words. The participants were randomly assigned to begin the experiment on a practice strategy group of either massed or distributed practice. The participants practiced 35 new Spanish vocabulary words each week. The massed practice group practiced for one hour for one day a week at the participant's own pace given all 35 words. The distributed practice group practiced for twelve minutes each day for five days at the participant's own pace given all 35 words. Immediately after all material had been practiced for the week, participants took a posttest to measure short-term retention. The participants alternated practice strategies each week. After eight weeks of practice, the participants stopped and were not to practice the vocabulary. One month later, the participants were asked via verbal survey which practice strategy they believed worked best for their retention of the vocabulary. Additionally, the participants took a posttest to measure their long-term retention of the Spanish vocabulary. Results revealed that there was no difference between massed and distributed practice in terms of short-term or long-term retention. Therefore, neither practice type proved most effective in this experiment. All participants believed that distributed practice was the best practice strategy for their retention of the Spanish vocabulary, however their performance on the long term retention post-test did not coincide with everyone's beliefs. The results from this study are useful for the decisions of adults when trying to retain novel information in order to have a job, improve efficiency, advance performance, and communicate with others. The results may also have clinical relevance to a patient in speech therapy who might benefit from massed practice, which allows for a more focused therapy session and more opportunities to practice. Lastly, the results support a therapist or patient who cannot travel to therapy for more than one time a week due to long distance or financial restriction.

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