EDUCATION **Bachelor of Science in Communication Disorders,** May 2021
Texas State University - San Marcos, Texas

Minor: Psychology
Overall GPA: 4.0
Relevant Coursework:

- Introduction to Communication Disorders, Anatomy and Physiology, Medical Terminology, Adulthood and Aging, Lifespan Development

Research:

- Texas State University of College of Health Profession Research Forum- Spring 2018
  - Literature Review: "Theory of Mind in Bilingualism and Children with Autism."
- Departmental Advanced Independent Study (Fall 2019)
  - HIPAA Compliancy in Telepractice Platforms for Speech and Hearing Therapy

HONORS Dean's List**:** 4 Semesters
Terry Foundation Scholarship Recipient: 2017-Present
Honors College Member: 2017- Present

EXPERIENCE

Camp Counselor *May 2018 - July 2019*
Waco Family YMCA, Waco, Texas

- Acted as a leader, role model and moral compass to campers 4-12
- Built positive working relationships with campers, parents, and camp counselors
- Led excursions and trips out of campsite with responsibility for 15 camper's wellbeing

Asset Inventory Specialist *June 2017 – Aug. 2017*
Waco I.S.D. Accounting Department, Waco, Texas

- Collected physical and electronic inventory of technology distributed throughout multiple school campuses
- Collected departmental documents for appropriate distribution and electronic filing

Summer Intern *June 2015 – Aug. 2017*
ARC of McLennan County, Waco, Texas

- Assisted children with autism, cerebral palsy, and various communication disorders
- Assisted children create art projects for a city-wide exhibition
- Created fine and gross motor skill art activities

ACTIVITIES

- Department of Communication Disorders Junior Cohort Representative
- Communication Disorders Undergraduate Research Pool, 2018-Present
- Terry Foundation Student Organization Member 2017- Present
- Alpha Lambda Delta Honor Society Member, 2017- Present
- National Student Speech Language Hearing Association Member, 2017-Present

Recognizing Emotions: How Accurate is an App Designed for People with ASD?

The complex diversity in human communication and language is one of the defining characteristics of our species. In a community, we are often called to use different modes of communication to express our wants, needs, and feelings, but that skill alone does not engender positive social experiences. In many ways, the ability to act in response to other's emotions is essential for being a part of a community. This social dimension requires the use of context clues, like non-verbal cues, to perceive the emotions and desires of others in conjunction with oral communication. Around the age of four, children begin to understand abstract concepts: feelings, influence, perceptions, and emotions. However, these skills are more difficult for children with Autism Spectrum Disorder (ASD) to acquire.

Theory of mind is the ability to attribute the mental states of oneself and others (McGregor, 2008). This concept is crucial in social interaction, language development, and reading comprehension skills. Semantically, we use various word choice styles to describe mental states like 'believe', 'think', and 'assume.' Syntactically, complex and compound sentences are used to show opposing viewpoints and perspectives in sentences like, "Shaun is happy he won the race, but Sue is sad that she lost." Pragmatically, implicatures, figurative language, and social contexts are created within literature and to develop character-perception and feeling (McGregor, 2008).

All concepts within theory of mind are affected in children with ASD to some degree. Children with ASD are more likely to find difficulty in identifying emotional expressions and purposeful eye gazes in response to communication, as well as difficulties inferencing in text and predicting in conversation (Westby, n.d). Theory of mind scales shows that both meta and external awareness of diverse desires and beliefs, knowledge access, false belief, and hidden emotions constitute a strong theory of mind (Westra &Carruthers, 2017).

Abnormal gaze processing in individuals with ASD can be seen in both childhood and adulthood. Not only do children with ASD tend to detect direct gaze slower than control groups, but they also "spend less time looking at inner features of the face (Golarai, et. Al, 2006)." These factors present strong implications about individuals with ASD and their ability to develop face processing and emotion recognition. In an average conversation, identifying facial expressions is a large part of social communication and can be considered one of the core deficits those with ASD may experience (Loth, et. Al, 2018).

In collaboration with my thesis supervisor, Dr. X, Dr. Y and Dr. Z from the Ingram School of Engineering have developed a prototype application that can recognize seven universal emotions through machine learning. The goal for this application is to utilize it as an intervention tool for those with ASD to strengthen pragmatic skills.

For my undergraduate thesis as part of the requirement for the Honors College, my current research study aims to answer the following questions:

1. Do people with and without ASD agree with the app's categorization of facial expressions into seven basic emotions: happy, sad, angry, scared, neutral, disgusted, and surprised?
2. Is there any statistically significant difference in the results between neurotypically developing individuals and individuals with ASD in emotional expression recognition, and if so, what are these differences?

I will recruit 13 participants with ASD and 13 participants without ASD will be part of the larger study by Dr. X Dr. Y, and Dr. Z. A database of pictures of people with different facial expressions will be created. The pictures will be stored on the dedicated device, the iPad. Each picture will be labeled as one of the seven universal emotions.
Participants will answer the question: Do you agree with the emotion identified by the app? Each participant will choose one of the following 3 responses: yes, no, or I don't know. The iPad will record the responses of individual participants. I will then compare the differences between the groups with and without ASD using a t-test. I hypothesize that the group without ASD will have more agreement than the group with ASD when the emotion is identified correctly by the app and disagree with the emotion when it is identified incorrectly by the app. I also hypothesize that the group with ASD will have more "I don't know" responses.

References

Atance, C. M., Bernstein, D. M., & Meltzoff, A. N. (2010). Thinking about false belief: It's not just what children say, but how long it takes them to say it. *Cognition, 116*(2), 297-301. https://www.kpu.ca/sites/default/files/downloads/Thinking_about_false_belief18814.pdf

Golarai, G., Grill-Spector, K., & Reiss, A. L. (2006). Autism and the development of face processing. *Clinical neuroscience research*, *6*(3-4), 145-160.

Mcgregor, Karla (2008). *Theory of Mind: Evaluation and Clinical Applications* [PDF File]. https://www.asha.org/Events/convention/handouts/2008/1747_Walker_Elizabeth/

Miller, C. A. (2006). Developmental relationships between language and theory of mind. *American Journal of Speech-language Pathology*, *15*(2), 142-154. Retrieved Janurary 31, 2018, from http://psu.edu/dept/cls/pubs/pubs/miller_06_offprint.pdf

Loth, E., Garrido, L., Ahmad, J., Watson, E., Duff, A., & Duchaine, B. (2018). Facial expression recognition as a candidate marker for autism spectrum disorder: how frequent and severe are deficits? *Molecular Autism*, *9*(1), from https://molecularautism.biomedcentral.com/articles/10.1186/s13229-018-0187-7

Westby, Carol (n.d). *Theory of Mind: Understanding of self and others* [PDF File]. file:///C:/Users/a_s911/Downloads/1013%20Theory%20of%20Mind%20Developing%20Understanding%20of%20Self%20and%20Others%20(1).pdf

Westby, C., & Robinson, L. (n.d.). *Social Communication and Pragmatic Language: A Developmental Perspective from Infancy through Adolescence* [PDF File] https://wmich.edu/sites/default/files/attachments/u98/2017/other-resources-sm.pdf

Westra, E., & Carruthers, P. (2017). Pragmatic development explains the theory-of-mind scale. *Cognition, 158*, 165-176. Retrieved Janurary 31, 2018, from http://sciencedirect.com/science/article/pii/s001002771630261x

Project Timeline

Fall 2019:

Stage One: Material Development

I will recruit 26 student participants who are willing to take photographs and recording of the seven universal emotions.

Stage Two: Participant Recruitment

I will then recruit 13 individuals with ASD and 13 individuals without ASD to participate in the study. During this time, I will collect case history for each participant.

Spring 2020:

Stage One: Data Collection

I will conduct a questionnaire with each participant. They will be tasked with interacting with an application and saying if they agree, disagree, or are unsure about the accuracy of the application's assessment of the facial expressions in a variety of photographs.

Stage Two: Analyze Data

After all participants have completed the questionnaire, I will analyze the data and determine if there are any statistically significant differences between the individuals with ASD and the control group. More analysis will be conducted to see if there was a significant difference between individual emotions.

Stage Three: Write Undergraduate Honor's Thesis

Stage Four: Present at Texas State University's Undergraduate Research Conference (URC)

Summer 2020:

Stage One: Submitting Results to a National Conference

During this time, I will apply to present at the American Speech and Hearing Association Annual Conference.

Stage Two: Submit Manuscript to Peer Review Journal

Description	Details	Quantity	Unit Cost
iPad Mini 4	Dedicated device that will house prototype application and record data results collected during the study	1	$480.00
Student Participant Compensation	In the form of a gift card ($10 each)	26	$260.00
Participant Compensation	In the form of a gift card ($10 each)	26	$260.00
Total Requested			$1000.00

The $1000 total is requested. $480 is requested to purchase the required tablet to download the prototype application and serve as a dedicated device for storing digital materials and study results. $260 is requested to compensate those who provide pictures and recorded expressions for the facial expression database, as we except this task to take about 1 hour for each person to complete. We will have 26 different people who will allow themselves to be photographed expressing different emotions. Having several different people is important for evaluating the accuracy of the app because the long-term goal is to have the app usable with a variety of people in a variety of environments. $260 is requested to compensate both the individuals with ASD group and the control group who participate in the study assessment. There will be 13 people with ASD and 13 people without ASD.