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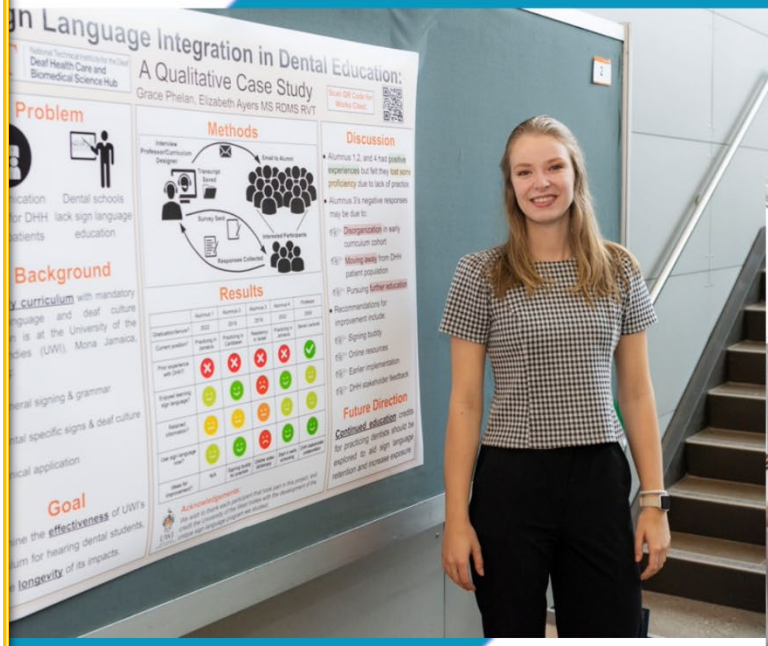
Rosica Hall
April 25, 2025
10am - 12pm



NTID STUDENT RESEARCH FAIR

RIT | National Technical Institute for the Deaf

2025 NTID Student Research Fair

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Abstracts

Rosica Hall - 1st Floor

1	**Assessment of Tubular Microfiltration as a Digestate Treatment Method** *Yangdu Sherpa* *Advisor: Diana Rodriguez-Alberto*

Through anaerobic digestion, microorganisms break down organic waste, like food waste and manure, to produce a fuel known as biogas. A byproduct of this process is an effluent called digestate, a nutrient-rich material which currently only serves a purpose as a fertilizer. Managing digestate can become a problem when large amounts of it is produced leading to over use in soils which can impact the environment, in the form of greenhouse gas emissions and water pollution. The purpose of this research is to test the potential of micro tubular filtration as a treatment for digestate. We expect this type of treatment to help reduce the suspended solids in the effluent while maintaining its nutrient content, which opens other potential uses like nutrient adsorption, microalgae cultivation and hydroponics farming. For the microfiltration test, we collected several digestate samples from two different digesters located in NY state, both processing dairy manure along with food waste. After the filtration process, we obtained mainly two products: permeate, the liquid with most solids removed; and concentrate, the starting material with now concentrated solids content. To assess the efficiency of the filtration process we analyzed the total solids and measured the concentration of nitrogen and phosphorus of each product. This research is expected to demonstrate the potential use of microtubular filtration as a digestate treatment alternative to provide new outlets for its use, therefore helping to mitigate its impact on environmental resources.

2	**How Did a Planet Get So Close to a White Dwarf?** *Elizabeth Adamson* *Advisor: Jason Nordhaus*

A white dwarf forms when a star like our Sun exhausts core-hydrogen burning and the stellar radius expands to approximately where the Earth orbits. This sudden increase in the physical size of the star means nearby orbiting planets will be engulfed/destroyed and that planets in close orbits around white dwarfs should be rare. Recent observations of WD 1856+537, show a planet orbiting a white dwarf every 1.4 days. Using the n-body code REBOUND, we explore whether WD 1856+537 could be the result of orbital dynamics in a triple system. In triples, inclination of the orbit of a second star could pump the eccentricity of the inner binary to high values, thereby pushing the planet closer to the white dwarf. Tides raised on the planet would then circularize the orbit. This work shows how orbital dynamics of planetary systems around evolved stars can constrain their evolutionary histories.

3	**Modeling Thermal Testing in Environmental Chambers** *Elizabeth Adamson* *Advisor: Marriner Merrill*

Thermal testing in environmental chambers is a standard way to evaluate product lifecycle. When these chambers are used for thermal ramp testing, the temperature consistency throughout the chamber changes based on chamber airflow characteristics, part location and shape, and the thermal conductivity of the parts. We developed a simulation using a finite difference model implemented with matrix methods in MATLAB. Our model includes convection boundary conditions incorporating thermal ramp profiles and tracks how sample internal temperatures respond over time. The results reveal how chamber conditions affect temperature, offering insights into worst-case thermal exposures and supporting the design of more effective thermal tests.

4	**Assessment of Deaf American Sign Language-English Bilinguals' Cognitive Abilities** *Chehally Soto* *Advisors: Peter Hauser, Jessica Contreras*

The assessment of cognitive abilities in deaf individuals using standard neuropsychological tools presents significant challenges, as these tools often fail to account for the unique linguistic and cultural aspects of the deaf community. This research aims to address this gap by developing and evaluating bilingual American Sign Language (ASL) and English neuropsychological assessment tools designed for use with deaf adults, particularly in the context of dementia diagnosis. The current study focuses on assessing the psychometric properties of these bilingual tools by testing the cognitive and language abilities of deaf college students. The study employs a battery of tests, including both ASL and English versions, to measure a range of cognitive functions such as memory, attention, and executive function. The findings from this study will contribute valuable insights into how linguistic background and language modality (ASL versus spoken/written English) may influence the presentation of cognitive aging and dementia. By refining diagnostic tools to account for these variables, the study aims to improve early identification and intervention for cognitive disorders in the deaf community, ultimately leading to better treatment outcomes. Additionally, the research has broader implications for enhancing the inclusivity and accuracy of neuropsychological assessments for diverse linguistic groups, particularly those who are often overlooked or misdiagnosed due to language barriers. This poster presentation will discuss recruitment challenges, testing methodologies, and the broader implications of using bilingual tools in clinical settings.

5	**Developing a Spectroscopic Technique for Assessing Glass Bird Strikes** *Cha'Risa Reins* *Advisors: Susan Smith Pagano, Todd Pagano*

Bird strikes on windows have become an issue at RIT, as more glass buildings are being built in contrast to traditional brick buildings at RIT. Birds can hit windows because they are transparent (and they often do not realize that the barrier is present). Strikes often result in mortality or injury to the birds. In an effort to reduce strikes, different types of glass, or amendments (stickers, patterns, etching, etc.), are being developed. These remedies often emit in the UV spectral range—given that birds see well in the UV range and humans are less likely to see them (or have their view blocked by them). We developed a procedure, based on transmission and reflectance spectroscopy, to attempt to assess these window materials. The fiber optic-based method proved successful in quantifying the amendments made to the glass. While transmission data, theoretically, reveals the most pertinent information, incident light was not always able to transverse the glass pane. In these situations, reflectance (subsequently converted to transmission) was superior in assessing the amendments (especially in the all-important UV region). Future work will involve testing more types of amendments and observing how birds respond to them. The goal is that the method will help to develop materials to reduce bird strikes.

6	**Evaluating Automated External Defibrillators for Deaf and Hard-of-Hearing Individuals at RIT/NTID** *Menna Nicola* *Advisors: Wendy Dannels, Elizabeth Ayers, Tiffany Panko*

Automated External Defibrillators (AEDs) are medical devices used to deliver an electric shock to restore a normal heartbeat during sudden cardiac arrest. RIT has emergency response stations equipped with Philips HeartStart devices in most buildings. The campus has over 1,000 deaf and hard-of-hearing (DHH) students, staff, and faculty. However, the HeartStart devices provide voice prompts with minimal visual information or icons, making it difficult for DHH individuals to follow the instructions during a cardiac emergency. The purpose of this research project is to identify accessible AEDs for DHH individuals at RIT. The Deaf Hub team conducted a literature review on AEDs and assessment of existing models. Thirty-two AED manuals were analyzed using 15 keywords such as "deaf," "visual," and "audio" to compare the devices and identify accessible models. The three most accessible AEDs identified are Avive Connect AED, Defibtech Lifeline VIEW AED, and ZOLL AED 3. These devices provide clear visual information, including screens, text, and voice prompts—assistive

technologies that are accessible for DHH individuals at RIT. As a result of this study, the three recommended AEDs were shared with RIT/NTID staff. RIT is in the process of replacing existing Philips HeartStart with ZOLL AED 3 in three buildings with the largest percentage of DHH individuals studying and working. The remaining buildings on campus will be upgraded once the Philips HeartStart devices reach their expiration date. DHH individuals will be able to respond effectively in a cardiac emergency with the most appropriate AEDs on campus.

7	**Evaluating and Comparing the Usability Between the RxASL Prototype and the Apple Health App for Deaf and Hard-of-Hearing Individuals** *Menna Nicola* *Advisors: Mariam Paracha, Walter Bubie, Wendy Dannels, Aaron Parker*

Deaf and hard-of-hearing (DHH) individuals often face challenges communicating with hearing pharmacists due to language barriers and limited health literacy. This can lead to incorrect medication use, a higher risk of drug interaction issues, and an overall unease with the prescription. While many DHH individuals seek health information online, they prefer visual aids over text descriptions for better understanding. The RxASL prototype is based on Apple's Health application design with more deaf-friendly delivery methods such as ASL, ASL with a transcript, or ASL with captions. The RxASL prototype currently provides medication information for Metformin and Atorvastatin. The purpose of this study is to gather usability feedback, assess medication engagement, and explore potential challenges with this prototype. The Newest Vital Sign, created by Pfizer to identify patients at risk for low health literacy, was used in this study to divide participants into two groups: limited health literacy and adequate health literacy. Sixteen participants were asked to evaluate and rate their user experience with the RxASL prototype and Apple Health app. The study was counterbalanced, and each in-person test session was recorded. Preliminary results reveal both groups found the RxASL prototype beneficial. This study verifies that embedded video medication information may aid DHH individuals to take their medications properly. In the future, we will either develop our own health app or medication tracking app or start a conversation with Apple Health to improve the accessibility of their Apple Health app.

8	**Spatial Attention and the Nature of Nonverbal Number Representation** *Elise Adams, Anna Nack* *Advisor: Clifton Langdon*

Assigning a number word to a set of objects permits humans to precisely represent the numerical value of a set. However, outside of using symbolic systems, numerical values of objects can still be represented. Small and large sets are represented differently non-symbolically, but emerging evidence points to a distinction between the contexts in which small sets of objects are represented as distinct items using parallel individua on, and in other contexts, small sets of objects are represented as an approximate numerical value. If the parallel individua on system is expected to track only small quantities and the approximate number system (ANS) expected to track only large quantities, why does the context in which small quantities are perceived manipulate the involvement of these systems? The answer appears to lie in identifying the role spatial attention plays. Specifically, whether the spatial attention of a visual scene necessitates a broader spread of attention, which the objects are then automatically encoded as an ensemble representation that contains the average properties of the objects in the set. Whether subitizing is a pre-attention process or an attentional process has attracted considerable debate. Testing the hypothesis that subitizing is an attentional process can be carried out by testing deaf individuals with greater allocation of attention to periphery to see if they show a shift from the parallel individuation system to the approximate number system (ANS) differently than hearing individuals. This shift would be indicated by a change in EEG waveform (ERP) from the early evoked N1 to the later evoked P2p. By comparing enumeration under high attentional load in between deaf and hearing individuals we apply a novel lens to a debate that holds high impact for our understanding of the intersection between visual-spatial attention and numerical cognition.

9	**Class Research Project: Exposure to Cosmic Radiation on Chimpanzee's Survival** *Levi Klock, Bryan Ortiz, Yang Sherpa, Cha'Risa Reins* *Advisors: Phu Duong, Sara Blick-Nitko, David Templeton*
In this class project, students studied the literature related to exposure to cosmic radiation on chimpanzee's survival.	
10	**Class Research Project: 12q14.1 Deletion Syndrome** *Hannah Dunn, Ana Dodi, Kallie Ruggieri, Kenasis Brown* *Advisors: Phu Duong, Sara Blick-Nitko, David Templeton*
In this class project, students studied the literature related to 12q14.1 Deletion Syndrome.	
11	**Class Research Project: COVID-19 ELISA Testing** *Viktoria Finnstrom, Joanne Finitsas, Richard Hernandez, Tao Yi Dallmann* *Advisors: Phu Duong, Sara Blick-Nitko, David Templeton*
In this class project, students studied the literature related to COVID-19 ELISA testing.	
12	**Measuring Resveratrol in Grape Pomace Using Reflectance Spectroscopy** *Wendy Frink* *Advisors: Todd Pagano, Pepsi Holmquist*
Grape pulp, also known as grape pomace, after wine-making, can be utilized as fertilizer, animal feed, and even piquette (“second wine”), among other uses. It is also possible to extract nutrients from grape pomace and use them as supplements for health benefits. Found in high amounts in red grapes, one such nutrient, resveratrol, has shown cardioprotective effects as an antioxidant, anti-carcinogenic, and anti-inflammatory agent. Here, we characterized resveratrol in grape pomace. Resveratrol was identified with reflectance spectroscopy. The developed method, which uses fiber optic-based instrumentation, could be used to rapidly assess resveratrol in grape pomace. This could help supply managers make decisions about the end-use of the pomace. It could be beneficial to extract resveratrol from grape pomace and use it as supplements instead of disposing the pomace as food waste. However, a challenge could remain in the potential efficient upscaling of the resveratrol.	
Rosica Hall – 2nd Floor	
13	**Comparing Seed Germination in Soil and Soil Enhanced With Electric Tabletop Composting Machine Outputs** *Brianna Finnegan, Dov Nathanson, Jordan Johnson* *Advisors: Callie Babbitt, Kaitlin Stack Whitney*
More people are interested in adopting environmentally-friendly practices, including finding ways to reduce and manage food waste without sending it to landfills. One potential innovative solution for managing food waste is indoor, electric tabletop composting machines. While traditionally composting has been outdoors in piles or bins, electric tabletop composting machines are a potentially convenient way to recycle food waste inside. The machines operate by grinding up food waste, heating it, and breaking it down. The process is different from traditional composting, in which food waste is decomposed by living microorganisms. We were curious about whether the output from these machines is functionally the same as compost. To explore this, our team conducted a study to examine if the outputs from electric tabletop composting machines can be used as a fertilizer to help plants grow. Beginning in January 2025, we collected food waste from a household compost dropoff site. We removed plastic contaminants, non-food waste, and fibrous food	

scraps that the machine couldn't handle. Then we processed the food waste in a Lomi-brand electric composting machine. To observe how seeds germinate and plants grow in the output, we set up 3 different treatments: soil only, a mix of 90% soil with 10% composting machine output, and a mix of 80% soil with 20% machine output. We planted two different plants commonly grown in home gardens: tomatoes and radishes. Each day, our team would observe the plants, checking the seed germination. We also recorded how many had sprouted, how many had set true leaves, how much each plant had grown and if there were any significant changes. Plants were grown with 12 hours daily of full spectrum light. We added ~12 oz. of water daily to the bottom of the trays and misted the surface as needed.

So far, we have found that plants grown in soil-only treatment had the highest number of seeds germinated and the fastest rate of growth compared to both of the treatments with the Lomi product added. The tomatoes growing the slowest have been the ones planted in the soil mixed with 20% composting machine output. While our experiment is still ongoing, we anticipate that our findings will be useful for understanding if and how the output from electric tabletop composting machines can be used in similar ways to traditional composting.

14	**Deaf and Hearing Adults' Visual Processing Speed** *Sari Schuman* *Advisors: Peter Hauser, Jessica Contreras*

There is a common belief that deaf children are not as aware of environmental factors as hearing people are due to not being able to hear what is happening. This concern is seen in many pamphlets and brochures for assistive hearing devices, such as from John Hopkins Medicine. Conversely, some people believe that when there is a lack of one sense, other senses become more advanced in order to compensate. We want to further investigate these notions by measuring and comparing the visual abilities of deaf, hearing, and hard-of-hearing people. These subjects (n=30) will be RIT students 18 years of age or older who have good vision. Data will be gathered through the use of Qualtrics and the Sway Medical App. Sway is often used for athletes to measure concussions. Due to this, it has the means to measure visual reaction time, impulse control, and inspection time. These areas will give us insight into the visual acuity of people with various hearing levels. The study aims to evaluate the relationship between hearing level and visual acuity.

15	**The Certificate in Educational Interpreting: Interpreter Perspectives on Online Professional Development** *Elena Desai* *Advisors: Lisa Prinzi, Kim Kurz*

This research project examines educational interpreters' perspectives on online professional development designed specifically for them. The Rochester Institute of Technology's National Technical Institute for the Deaf (RIT/NTID) launched the Certificate in Educational Interpreting (CEI) in the fall of 2021. This specialized professional development program is for interpreters working in K-12 and postsecondary educational settings. This three-year study includes findings from approximately 38 interpreters who participated in CEI taken from pre- and post-survey data and focus group interviews. The findings confirm the need for support and continued specialized training for educational interpreters. Also, the confusion about interpreter roles and responsibilities persists, charging interpreters with explaining their roles and educating classroom participants. Additionally, CEI led to a shift in interpreters' perceptions toward collaboration with the educational team and as a way of further professional development. This research calls attention to interpreters' communication and collaboration (or lack thereof) with school administration. The findings suggest that CEI participation led to increased networking and professional support. Finally, this research highlights the need for more training for educational interpreters regarding feedback practices. In so doing, it reveals how interpreters experience fear and anxiety regarding the feedback process. Still, interpreters felt more confident participating in feedback conversations and developing assessment practices at the end of CEI. This study will include considerations and recommendations for educational interpreters and the interpreter education community. Overall, the research project emphasizes the importance of continued specialized training to support deaf students.

16	**Frequency of Pointing in Deaf/Hard-of-Hearing vs Hearing Preschool Classrooms** *Carrisa Hallock, Savannah Tellander* *Advisors: Allison Fitch, Rain Bosworth*

Directing attention using pointing is a key component of language acquisition during the critical period (prior to age 5) because it connects words to their real-world referents (Morgenstern et al., 2010; Kalagher & Yu, 2000). For Deaf/Hard-of-Hearing signers, pointing includes more complexity due to its linguistic function in ASL. In addition to directing attention, signers use pointing as a referent, the way that pronouns function in English. As a result, Deaf adults have been observed to point more frequently than hearing adults (Leary et al., 2022). Deaf parents also tend to use points frequently (Fieldsteel et al., 2020). However, little is known about the development of pointing in Deaf children. They may, like adults, use pointing more frequently than hearing peers. Alternatively, they may still be developing referential use of pointing. The goal of this study is to start identifying the developmental trajectory of pointing by uncovering if preschoolers in deaf classrooms use pointing more frequently than in hearing classrooms. To do this, participants were recorded in their natural classroom setting for an hour for each of three days. Pointing frequencies of four children in each classroom were coded by trained research assistants. Analyses are ongoing and will be completed at the time of the poster presentation.

17	**Large-Scale Outflows in Active Galactic Nuclei (Narrow Line Region)** *Jayden Butler* *Advisor: Andrew Robinson*

Understanding the evolution of galaxies requires studying the role of Active Galactic Nuclei (AGNs). This research investigates how AGN-driven outflows transfer energy to the interstellar medium (ISM) and whether this transfer can be traced through the Narrow Line Region (NLR). Specifically, we aim to study the kinematics of the wind and core components of the [O III] emission lines, which trace the ionized gas outflows in the NLR. Using the Python QSO fitting code (PyQSOFit) [Guo, H., Shen, Y., Wang, S. 2018], we fit the [O III] λ4959, λ5007, and Hβ emission lines (along with others) in the Sloan Digital Sky Survey (SDSS) spectra, selected from the quasar dataset [Liu et al., 2019], in order to measure spectral properties such as full width at half maximum (FWHM), flux, velocity shift, and amplitude. By fitting and isolating the wind and core components of the [O III] lines, we aim to trace the presence of blue wings and investigate their correlation with other AGN properties, such as BLR dynamics, X-ray luminosity, velocity shift, and the AGN's Eddington ratio. To ensure robust spectral fitting, we apply a signal-to-noise (S/N) threshold to both the Hβ and [O III] emission lines, selecting a subset of spectra with sufficient data quality for reliable measurements. Our next step is to perform a statistical analysis to assess whether these spectral properties exhibit significant correlations with BLR dynamics, X-ray luminosity, and the AGN's Eddington ratio, providing insight into the role of AGN outflows in feedback processes.

18	**A Critical Analysis of US Government Climate Disaster Preparedness Communication Strategies: A Focus on Accessibility** *Abigail Block* *Advisor: Kaitlin Stack Whitney*

As climate change worsens, natural disasters are becoming more frequent and severe. To maintain the well being of any humans who live in the paths of these disasters, governments have the responsibility to help people prepare. Emergency and disaster preparedness professionals within the government have the complex task of making and sharing effective communication for everyone who may live in the paths of destruction, including people with Intellectual and Developmental Disabilities (IDDs). Because of the diversity of this population, the ideal for accessible communications is a multimodal approach. The objective of my research was to determine if US state and federal governments are designing and sharing accessible communication, and to make recommendations for ensuring future disaster preparedness communications are accessible to people with IDDs. To do this, I conducted an in-depth content analysis of current publicly available, climate-related preparedness communications from all United States government disaster agencies (n=509).

The documents I reviewed included guidebooks, brochures, and videos. To analyze these communications, I searched for documents with 5 or more of the 21 plain language guidelines and/or with actionable images. My findings explore the current state of accessible climate disaster preparedness communications. With more awareness and understanding of the importance of accessibility, emergency and disaster professionals can better adapt their work towards maintaining the health and safety of more people, resulting in decreased stress on response teams and increases in lives saved.

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Transcription Factor Myb Expression and Functions in Bone Marrow Megakaryocytes

Morgan Singleton
Advisors: Craig Morrell, Michael Malloy, Sara True

Myb proto-oncogene is a transcription factor that contributes to regulation of hematopoiesis, including megakaryocyte maturation. Megakaryocytes (Mks) are present in both the bone marrow (BM) and the lung, with BM Mks producing the majority of circulating platelets, while lung Mks have an immune phenotype/function. However, inflammatory stimulation can induce BM Mks to have an immune phenotype. Previously conducted scRNA sequencing by our lab showed that BM Mks express Myb while lung Mks did not. This was validated using qRT-PCR of flow sorted BM and lung Mks, and in a mouse model of chronic malaria, we showed that Myb is expressed only in BM Mks, that declined with infection. I therefore investigated the role of Myb in Mk immune differentiation.

BM from Mk specific Myb Knock Out (PF4cre-Mybflx/flx) mice was collected and underwent magnetic cell separation to enrich for Mks. The cells were then seeded in cell culture and treated with IFNγ. Using a flow cytometer, results showed that the PF4-Myb KO cells when treated with IFNγ had an increased expression of immune markers ICAM and MHCII. In an in vivo experiment, PF4-Myb KO mice where given an intraperitoneal injection of IFNγ (.04mg/kg) over the course of 3 days. BM was collected and stained with fluorescent antibodies, ICAM, MHC II, CD41, and Lineage markers before evaluation using flow cytometry. There was an elevated expression of ICAM and MHC II in control PF4-Myb KO mouse Mks compared to WT mouse Mks and mice treated with IFNγ had similar Mk immune molecule expression. Using a Myb-GFP reporter mouse we also confirmed that BM but not lung Mks expressed Myb and that the number of GFP+ Mks declines in the BM with malaria infection and IFNγ treatment.

These data demonstrate that Mks that lack Myb have increased immune differentiation in vivo and that Myb is dynamically regulated in BM Mks. The similar immune differentiation of WT and Myb KO in vitro indicates there may be BM factors that regulate Myb expression. Therefore, Myb may dynamically regulate Mk immune differentiation in the BM.

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Preliminary Insights Into Fingerspelling and Number Comprehension Retest Performance

Isabella McGuire
Advisors: Peter Hauser, Jessica Contreras, Jason Listman

American Sign Language (ASL) is a signed language that utilizes fingerspelling for articulating specific words and number sequences. This project aims to understand how time limitations and presentation techniques affect second language ASL learners' ability to comprehend fingerspelling and numbers through a test-retest approach. This will be achieved by examining how repeated exposure and slower presentation speeds impact participants' performance. These findings will contribute to the discussion on appropriate presentation of ASL stimuli in assessment instruments and provide insights into the cognitive processes involved in processing fingerspelling. The results will have implications for students with disabilities who might require untimed tests or repeated viewing of stimuli on formal ASL comprehension tests. If the results demonstrate that no time limits and repeating videos does not affect comprehension then current tests should remove such restrictions.

21	**Exploring the Reproductive Health Experiences in the Deaf and Hard-of-Hearing Community** *Emma Kane* *Advisors: Jenna Stewardson, Tiffany Panko*

Access to reproductive health information is minimal for deaf individuals with uteruses due to the significant language barriers (e.g., in-person interpreters versus virtual interpreters, access to language in home environments, and so on). Limited access to reproductive health information can result in negative experiences in their reproductive health care. The language barriers can increase the risks of negative health outcomes, as existing literature has shown that preterm birth, low weight births, and pregnancy complications are prevalent for Deaf and hard-of-hearing people with a uterus. We launched a nationwide survey to capture a wide lens of reproductive health experiences compared between deaf and hearing peers. In addition to the nationwide survey, we also conducted semi-structured interviews with deaf individuals with reproductive health experiences to gain understanding of how they engage in health communication for their reproductive health needs. Ten interviews were conducted via Zoom by the research team. The interviews were broken into four parts: 1) abortion experiences, 2) family planning definition, 3) abortion knowledge, and 4) knowledge of reproductive health information sources. We asked participants questions to learn more about their experiences with receiving reproductive health care, finding resources to make informed decisions, and communication between them and their healthcare providers. Our thematic analysis shows the following themes: low healthcare provider level of trust, not complete informed consent, and mistrust of interpreters. The findings will help us to better understand how DHH people with a uterus can access reproductive health care, family planning options, and pregnancy termination.

22	**The Laughter Connection: Humor's Role in DHH Couple Dynamics** *Cathleen Jolly* *Advisors: Elizabeth Ayers, Stephen Aldersley*

This research project explores the significance of humor in fostering healthy relationships, specifically among DHH (Deaf and Hard of Hearing) couples. Building on a prior study of 10 DHH participants in long-term relationships (over 10 years), this project now includes data from an additional 10 DHH participants in short-term relationships (under 10 years), with the full sample consisting of 20 DHH couples. Using a mixed methods approach, the study aims to compare and contrast how humor operates in both long- and short-term relationships to enhance communication, conflict resolution, emotional bonding, and overall well-being. It addresses several key research gaps, including limited understanding of humor’s impact within DHH relationships, misconceptions about its relevance, individual differences in humor appreciation, cultural influences on humor interpretation, challenges in expressing and receiving humor in signed communication, and the sustainability of humor’s role over time. Findings will contribute to a deeper understanding of how humor shapes relationship dynamics within the DHH community.

23	**Representation of Disability and Deafness in Animal and Humans Across College Biology Textbooks** *Julia Resciniti* *Advisor: Kaitlin Stack Whitney*

Students often learn about bodies through biology textbooks and coursework. We were interested in understanding how ideas about disability and ableism show up in early undergraduate biology education. To explore this further, we conducted a survey and content analysis of ten introductory biology textbooks currently used on our campus in the 2024-2025 academic year. Specifically, we used James L. Cherney's concept of rhetorical dimensions of ableism to situate these narratives within a larger societal context of disability.

In our ongoing research, so far we've found a recurring trend that disability was treated as a human issue and was largely absent from biology books about nonhumans. In discussion of nonhuman species, disability was only discussed as it can harm or infect humans. Conversely, human biology textbooks highlighted specific

medical conditions and disabilities to illustrate complex biological concepts and discussed cures or body modifications at length.

We also specifically looked at how deafness was presented in the texts. In our findings thus far, deafness was presented as a human issue and typically as the unfortunate result of disease. These books present a view of a human body that has a “normal,” default state of being and variation is used to further illustrate how many structures must work together to maintain that state. Where nonhumans, especially plants and microorganisms, can be endlessly modified without ethical concerns, these books are incredibly concerned with the science, and sometimes ethics, of returning the body to an imagined nondisabled, healthy original condition. To this end, we also see claims about society that include normative assumptions about the use of language, often omitting or minimizing the role of sign language across human cultures.

We explore these ideas in an attempt to grapple with disability’s role in science education. Our findings in progress are in line with recent research from Branch et al., which found ableist rhetoric commonly used in framing "fitness" in evolutionary biology literature and advocates for more inclusive approaches to teaching and discussing traits and evolution. Ideas about “normal” bodies shape how disability is viewed in all species. Deficit views not only cause harm to humans but can limit scientific education and prevent educators from having full, nuanced discussions of disability, especially within an ecological framework.

24	**Parents Empower Parent: Preliminary Findings on Barriers & Resources** *Gigi Zheng* *Advisors: Jessica Contreras, Julie Mitchiner, Mike McKee, Peter Hauser*

This study investigates the unique challenges faced by deaf and hard-of-hearing parents who use American Sign Language (ASL), a marginalized group that often encounters significant obstacles in accessing essential resources for education, healthcare, and legal support. Research indicates that these parents frequently experience discrimination and oppression, which not only contributes to a lack of social support but also heightens issues such as interpersonal violence, marital discord, and legal disputes. The inaccessibility of legal and service systems further exacerbates these challenges, leaving many parents to struggle without adequate assistance. Additionally, gaps in literacy and health literacy can adversely affect their children's health, development, and educational progress. Service providers in health, education, and legal sectors are often ill-equipped to offer the necessary support, which increases the risk of negative parenting outcomes. To address these issues, we involved 20 deaf and hard-of-hearing parents in our study, recruiting participants through flyers and utilizing a pre-screening form to assess eligibility prior to conducting interviews. Our preliminary findings reveal various barriers faced by deaf parents during pregnancy and while raising their children, with experiences varying based on education level, available support, and community resources. We are committed to identifying and developing effective resources tailored to assist these parents in navigating their challenges. Ultimately, our goal is to enhance the tools and support systems available to help this population successfully raise their children and create targeted solutions that address their specific needs while combating discrimination and promoting equity.

Thank you for your support!

Special thanks to the 2025 NTID Student Research Fair organizing committee: Todd Pagano, Hope Williams, Brooke Williams, Laurie Furibondo, Cea Dorn, and Jorge Samper.

About the Fair: This event is dedicated exclusively to NTID-supported students' research. Students were invited to present a poster or give a demonstration to showcase their research projects conducted with other students and their faculty mentors. Two workshops were offered to assist the students in the abstract writing and poster design processes. In a third session, students practiced presenting their posters. We plan to offer this event annually to celebrate the many accomplishments of our student researchers.

For more information about NTID Student Research Resources, go to www.ntid.rit.edu/student-researchers.