



PURM

Perspectives on Undergraduate
Research & Mentoring

Reciprocal Empowerment to Re-humanize Language Sciences: The First Two Cycles of the NSF-REU Intersection of Linguistics, Language and Culture

Isabelle Barrière, Ph.D., Saint Elizabeth University and City University of New York
(Isabelle.barriere@gmail.com)

Jonathan Nissenbaum, Ph.D., Brooklyn College and City University of New York
Margareth Lafontant, Ph.D., M.S.Ed., Developmental Systems Inc., New York City College of
Technology, City University of New York

Introduction

Linguistics and speech-language-hearing-communication sciences differ from other disciplines that have the same object of study at their core — language and communication — in that they are scientific. Involving undergraduate students in language science research is challenging. Most students discover these fields while in college. In many institutions, linguistics programs are included in departments that reflect different disciplines. With respect to speech-language-hearing-communication sciences, many institutions only offer minors at the undergraduate level to fulfill speech-language-pathology master degree requirements, and most do not have doctoral programs. Research opportunities are limited, since most departments are focused on training their masters clinicians rather than producing researchers. This characteristic partly explains the general shortage of doctors that has loomed over the field of Speech-Language-Hearing and Communication Sciences since its inception in the United States (ASHA, 2002, 2008, HEC-Council of Academic Programs in Communication Sciences and Disorders and American & ASHA, 2011-2012). Additionally, conducting language science research requires discipline-specific and transferable Information Technology Communication (ITC) skills, which can only be gained in the context of specialized research laboratories and under the guidance of faculty mentors with relevant expertise.

As in other fields of higher education, the voices of students from minoritized populations have remained under-represented in language sciences. Black, Hispanic/Latinx, and American Indian students make up less than 10% of graduates in linguistics graduate programs and less than 30% in master's and doctoral psychology programs (NSF, 2019). These groups constitute less than 16% of students in speech-language pathology master programs and research doctorates in speech-language-hearing-communication-sciences (Hansen, 2024) and 10% of students in audiology clinical doctorates (CSD, 2015). These facts have several detrimental consequences: a) language science fields do not adequately reflect a cross-section of the populations they serve, both in their graduate programs and among researchers in linguistics and speech-language-communication-hearing sciences; b) while theories aim to make scientific claims that generalize across populations, the bulk of research is still conducted on mainstream varieties of English and other majority languages.

Reciprocal Empowerment: A New Mentoring Approach

The NSF-REU ILLC program integrated elements of recent approaches to diversifying language sciences, in particular, student funds of knowledge (Marquez Kiyama & Rios-Aguilar, 2018), Cultural

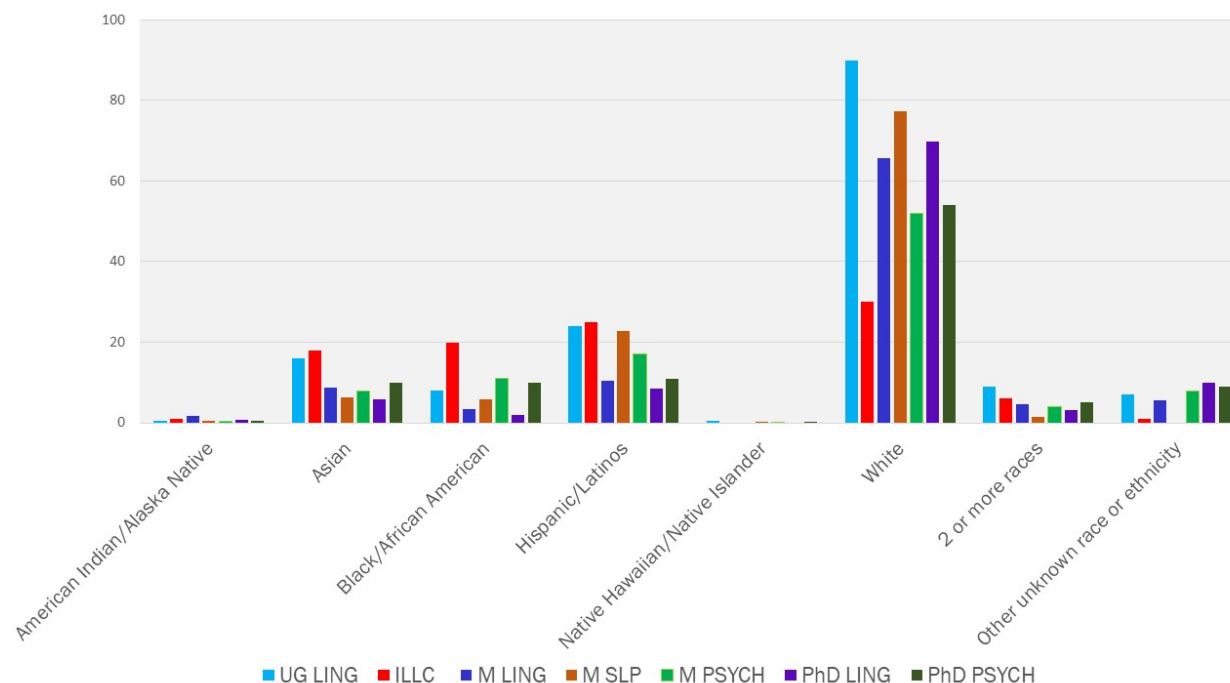
Competence and Humility (Gregory, 2020) and the application of Critical Race Theory to Linguistics (e.g. Hudley, et al., 2020). It also developed and implemented its own mentoring approach: Reciprocal Empowerment. According to this approach, the exchange of knowledge and skills between the program students/mentees and faculty members/mentors goes in both directions. Mentors contribute to the training of their mentees by enabling them to turn a research idea into an actual research project while mentees enable their mentors to expand and deepen the scope of their research by contributing their own background knowledge and skills, especially those gained in the home environment, to the development and conduct of a research project. The specificity of the NSF-REU ILLC lies in its focus on under-studied languages and minoritized populations. The sixty-three students who participated in the ILLC programs conducted projects on 21 different languages, including minoritized, endangered and under-studied languages. In most cases the selection of the language of investigation was the home language of the students. Similarly, students whose research project involved the participation of clinical populations often had a personal link with them, either because they were themselves members of this population and/or had a close relative who were. Both the feedback questionnaires and the students' testimonies about the program reveal that this aspect of the program positively contributed to their professional and personal development:

"I enjoy having this research experience while being an undergraduate student at CUNY Brooklyn College. Not many students have the opportunity to deepen their academic knowledge about their native language. This program has brought me into a stage where I could publicly and proudly introduce my mother tongue without awkwardness, and I had never considered researching it. I thank the Program for granting me this opportunity to deepen my academic knowledge of Cantonese [...] What the NSF-REU Site also provided for me is not success and accomplishments as an individual researcher, it's also about the teamwork experience, and the unique relationship with our research partner(s) and mentor. These are people that we probably would not have a chance to talk to after class. I think that has been unforgettable for me and it certainly increases my confidence in public speaking skills."

The program met its objectives of recruiting a very diverse population. Figure 1 shows the proportions of students belonging to different ethnic groups of the ILLC program, which recruited much higher proportions of Black and Hispanic students compared to those in related disciplines across US institutions. This success in the recruitment process is most probably due to a combination of factors, including the affiliations of the ILLC program directors, coordinators, evaluator and faculty mentors with institutions that serve diverse students in New York.

Ensuring that faculty mentors also experienced the positive impact on their own research required a) selecting the mentors based on their mentoring track records and their desire to diversify the field; b) matching the mentors and mentees based on the mentees coursework and interest and areas of expertise of the mentors and c) enabling the faculty mentors to focus on guiding their mentees in the formulation of a research topic and their completion of a research project. These aspects of the program and their evaluations are described in the next sections.

Figure 1. Percentage of students in different ethnic groups (self-reported data) in ILLC program (in red) compared to undergraduate and graduate programs in Linguistics (different shades of blue and purple), Speech-Language-Hearing-Communication Sciences (in brown) and Psychology (different shades of green) across the US*



* Data come from various sources for Undergraduate Linguistics (in light blue, UG LING) degrees (LSA, 2020), ILLC program (in red, NSF-REU Intersection of Linguistics, Language & Culture, NSF Reports 2018-2024), Masters in Linguistics (M LING in dark blue, LSA, 2020), masters in Speech Language Pathology (in brown, Hansen, 2024), Masters in Psychology (in light green M PSYCH, APA, 2023), Doctoral programs in Linguistics (in dark purple, PhD LING, LSA, 2020) and Psychology (in dark green, PhD PSYCH, 2023).

A Multi-Mentor Program That Reflects Different Subfields

The program involved various mentors, in addition to the two program directors. Although the faculty mentors did not receive specific training, they were selected based on their track records with mentoring students and their commitment to diversify the field. Each cohort of ILLC fellows included eight to fourteen students (selected among 50 to 80 applicants). The application form asked very detailed questions about the (potentially) relevant courses the applicant had completed and their areas of interest. This topic was also discussed at length with the directors and the program coordinator during the interviews.

In the week following the interviews, the program directors and coordinator held a long meeting during which they selected the applicants and matched each of them with their mentor. They sent the mentors all the application material of their potential mentee to ensure that they approved the match. The mentees were then emailed their contract letter informing them of the name and institution of their mentor. Faculty mentors contacted their mentee about a week before the beginning of the fall semester to arrange either weekly or fortnightly meetings with them.

Most mentors elected to work with one mentee per cohort, which enabled them to have the time to build a collaborative relationship. At the beginning of the program, mentors and mentees were informed of the program timetable, including specific deadlines with respect to the projects, and reminders were regularly sent. Presentations on the project proposal were scheduled at the beginning of the spring semester and on the completed projects at the annual program conference in June.

In addition to conducting their research projects, the fellows participated in workshops the week before the fall semester, during the academic year (fall and spring semester) and during the week that preceded the program conference in June. These workshops consisted of, and complemented, additional support for the mentees that facilitated the completion and dissemination of their projects. They were developed and run by the PI and program coordinators.

The Implementation of the Six Program Modules

(A) Establishment of a Community of Scholars Through Active Participation in a Professional Research Seminar, Regular Contribution to the Program Blog, and Becoming a Wikipedian

The objective of having fellows attend a research seminar was for students to familiarize themselves with the theories, styles of argumentation and sources of empirical evidence used in language sciences.

An obstacle to undergraduate students' contribution to oral group discussions after academic presentations results from their inhibition, shyness and concern that they possess too little knowledge to bring a valuable contribution to the discussion. To overcome this obstacle, ILIC fellows participated in discussions on a blog specifically set up for them. Use of a blog was selected over other types of interactions for different logistic, programmatic and pedagogical reasons. Many higher education institutions in NY are still largely commuter colleges attended by students who tend to have family and/or professional responsibilities that they juggle with their studies. Use of a blog accessible at individually convenient times optimized participation in discussions. The fellows found that blogging enabled them to enhance their ITC skills and fostered the establishment of a scholar community with their program peers. The surveys indicated that the requirement to regularly post — on the seminars they had attended, in response to articles published in the media on a broad range of language-related topics regularly placed on the program website, and on different aspects of their project — allowed students to broaden and deepen their knowledge of the field.

Another way students were motivated to become emerging experts in their topics and in the research methods they used was through training to become Wikipedians. During workshops facilitated by the non-for-profit AfroCrowd — devoted to increasing diversity among Wikipedia entries, editors and authors — students edited a Wikipedia entry on a topic related to their projects, in the language of their choice. Based on the feedback, these workshops also met their objectives of empowering them in disseminating knowledge they had gained in the program.

(B) Anti-harassment and Research Ethics Training

In the week before the fall semester, all students participated in an anti-harassment workshop that was based on a course specifically developed for undergraduate programs (Hubenthal et al., 2021). The workshop involved many discussions of Title IX topics.

Much of the research investigating speech-language-hearing-communication sciences involves participation of human subjects. All students completed the CITI (CITI, 2020) online courses for undergraduate students in social and behavioral sciences at the beginning of the fall semester. The fellows also participated in two workshops run by the PI on how to write an Institutional Review

Board application. Depending on the nature of their project, they either submitted an amendment to an existing IRB application of their mentor or prepared and submitted a full one, under the guidance of their mentor and with the assistance of the ILLC program coordinator. An additional workshop focused on working with speakers of different minoritized languages and diverse clinical populations, on naming, and on the need to respect individual language users' terminology.

The feedback on these workshops, which were delivered early in the program year, indicate that they set a positive tone for the program, and that they established the program as a safe space for students, including minoritized students.

(C) Mentored Research

This component consisted of an original research project in a field of speech-language-hearing-communication sciences under the guidance of a mentor specialist in one of these respective fields. The transferable and discipline-specific STEM skills that the program fostered in each student partly depended on the parameters of each specific project, and included a combination of skills: conducting a literature review, formulating a research question, eliciting judgments from study participants, selecting appropriate tasks and tests, transcribing audio/video-recordings, conducting qualitative and quantitative data analyses of the data, using digital tools to collect and analyze data, producing visual representations of linguistic representations and cognitive models and of results of data analyses. Mentor areas of research, their expertise in specific language groups and the methodologies they use are presented in Table 1.

Table 1. *Areas of specialty of the faculty mentors*

Analyses	Languages	Subfields	Methods
Sounds	Signed Languages (e.g. ASL and BSL)	Articulatory and brain bases of communication	Speech samples, corpora analyses
Words	African languages (e.g. Twi)	Speech-language representations and processing	Experimental paradigms: eye tracking, preferential looking paradigms
Word and sentence structure	Asian languages (Bengali, Cantonese, Japanese)	Monolingual, bilingual, bidialectal development	Qualtrics survey
Semantics	Germanic languages other than English (Flemish, Yiddish)	Language and cultural attitudes	Use of audiology and Acoustic equipment
Pragmatics and Language use	Romance languages (French, Spanish) English and French-based creoles (e.g. Haitian, Jamaican)	Atypical development, hearing impairments, acquired disorders.	Brain-imaging, ultrasound systems to investigate speech production

Case Studies

Three short case studies are briefly presented below to illustrate various subfields, the intellectual merits of the projects and the impact of the program on the fellows' educational journeys.

Case 1: Modified sine wave speech (MSWS) and tone perception and identification in Cantonese
Fellow became familiarized with the literature on tone discrimination in Cantonese (her native language) and MSWS methodology; investigated tone discrimination in Cantonese Native Speaker

with MSWS; developed stimuli for MSWS experiments; wrote and submitted IRB application; recruited participants; collected data; presented experimental design at local student conference; processed and analyzed the data using Praat, Matlab and Excel.

Intellectual merit: First study on the discrimination of lexical tone using a methodology that isolates voice fundamental frequency from other acoustic cues; results reveal that listeners are able to form perceptual judgments of tone using a 'missing fundamental.'

Dissemination: Presentations at (i) 59th Annual NYS Speech Language Hearing Association, (ii) Minnesota Undergraduate Linguistics Symposium, (iii) American Speech & Hearing Association, 2019, Orlando, (iv) 50th Annual Meeting of the North East Linguistic Society, MIT (v) Linguistic Society of America 2020.

Case 2: Acquisition of subject-verb agreement (SVA) in Hebrew-L1 and Russian-L1 & English bilingual children

Fellow became familiar with the literature on bilingual development and the acquisition of SVA, including by faculty mentor on acquisition of SVA in English, French and Spanish; investigated acquisition of SVA in Russian and Hebrew (her two home languages); learned experimental comprehension paradigm based on Psychopy software formerly used for other languages, and developed the stimuli for Hebrew and Russian; delivered presentation on experimental design at student conference; recruited participants and collected data; processed data using Psychopy and Excel.

Intellectual merit: First study on comprehension of SVA by Hebrew and Russian-speaking bilinguals; results provide strong evidence for positive transfer for children exposed at least half of the time to the Language Other Than English.

Dissemination: Conference presentations at (i) American Speech Language Association (2018) Selected for 'PROGENY-Emergent Scholar award, (ii) 59th Annual NYS Annual Speech-Language-Hearing Association (2019); Council for Undergraduate Research-NSF annual conference, 2018; (iii) Symposium on Typical and Atypical Language Development, Architecture and Mechanisms of Language Processing, Moscow, 2019.

Educational and professional journey: successfully entered and completed Masters in Speech Language Pathology; currently working as an SLP serving bilingual Russian-speaking children.

Case 3: The Influence of bilingualism and hearing loss on cognitive decline in older adults

Fellow became familiar with literature on age-related hearing loss and associated cognitive decline and debates on bilingualism and cognitive advantage; investigated whether bilingualism slows down or prevents cognitive decline in those with age-related hearing loss; learned to use audiological tests to measure hearing loss in older adults and to select and interpret questionnaires adapted to older bilingual adults; and to assess different aspects of cognitive functions; wrote and submitted an IRB application; recruited and learned to work with older Spanish-English bilinguals; delivered presentations on study design; analyzed and interpreted the data.

Intellectual merit: First study and findings on whether regular use of two languages impact cognition in individuals with age-related hearing issues.

Dissemination: Conference presentation at American Speech Language Association (2019).

Educational and professional journey: Fellow decided to become a researcher in cognitive science instead of a medical doctor, attributing the decision to the ILLC program; she entered Tufts University Cognitive Science doctoral program for which she received funding; she has now obtained her doctorate and works as a researcher in Social and Behavioral Sciences for MITRE.

The end-of-program survey that all fellows completed included detailed questions about the knowledge and STEM-based skills they felt they had gained through the completion of their project. All responded they had gained general and discipline-specific research skills. The mentors survey also indicated that they felt that the projects conducted by the fellows under their guidance had expanded the scope of their research, including by enabling them to investigate languages and/or cultures and/or clinical populations they had not investigated before, in a way that positively contributed to their research agenda.

(D) Research Dissemination

ILLC fellows participated in a workshop, during the winter break, to learn general principles of writing and submitting conference abstracts and how to prepare and deliver successful and memorable oral and poster presentations. In addition to their project at the NSF-REU ILLC conference, they presented their work at a student conference in the spring semester. A subset of the NSF-REU ILLC fellows presented at the annual CUR-NSF conferences and at the Emerging Researchers National Conference in STEM during the year after they ended the program. Fellows also presented their work at professional conferences in the US and abroad, including the annual conferences of the Linguistics Society of America and the Annual Speech Language Hearing Association, among others. The program budget included financial support for the travel and per diem of the fellows. For the few conferences abroad, fellows succeeded in applying for additional funds from their institutions or from the conferences themselves. Across the two cycles, the fellows presented more than a hundred papers at student and professional conferences, with above 95% acceptance rate of their peer-reviewed abstracts. This number speaks to the fellows' and mentor's commitment to the ILLC projects and to the quality of projects that emerged from this collaboration.

When students presented at the CUR-NSF and the Emerging Researchers National Conference in STEM, the co-PIs accompanied the students to Washington, D.C. All students who participated in these conferences reported that it was the first time they had traveled to Washington, D.C. and a memorable empowering experience.

(E) Participation in Workshops to Prepare a Graduate School Application Portfolio

Each cohort of NSF-REU ILLC fellows participated in a workshop delivered by PIs and program coordinator that focused on graduate school applications. The workshop grew as the result of the feedback of the first program cohort. It included a general introduction to Graduate School applications by the PIs and the program coordinator and presentations by invited guests on masters and doctoral programs in audiology, linguistics, psychology and speech-language- hearing-communication sciences. The workshops were held in the fall semester and received positive feedback. In the last three years of the program, they have been held online and are open to all students interested. Between 80 and 100 students participate every year in addition to the NSF-REU ILLC fellows and the workshops have received very positive evaluations.

(F) Organization of the NSF-REU ILLC Conference

ILLC fellows developed teamwork and organizational skills and the appreciation of the societal impact of their work by professionals in different fields and fellow students, including those who do not participate in the program. The format and the rules and regulations to be followed at the conference were chosen following discussions with each cohort. The fellows were guided by the program coordinator and the directors in their preparation of their oral presentations on their

research projects. The fellows also received training and conducted reviews of the abstracts that had been submitted by students outside the program to present posters on their research. The feedback from faculty, graduate and undergraduate students who participated in the conference was positive, and the quality of the ILLC fellows' projects was systematically praised. The final year conference was recognized for Continuing Education Credits by ASHA, under the topic of diversity, which boosted participation by Speech Language Pathologists. Three presentations were also attended by high school students participating in a summer educational enhancement program; they asked many questions after the presentations and positively commented on how the presentations had enabled them to discover sub-fields of languages sciences.

Achievements and Limitations

The program was evaluated in three different ways. After each workshop, students completed brief surveys. During the middle of the program cycle as well as immediately after the end of the program cycle, both ILLC fellows and faculty mentors completed detailed surveys. Finally, the students had a focus group meeting with the evaluator — a trained Bilingual Educator and Developmental Psychologist as well as a seasoned evaluator — the week after the program conference. The evaluator provided a summary of the points discussed with the students, including the suggestions for improvements. On the whole, the feedback for the program has been excellent. Examples of testimonies are presented below:

“As a minority in a field that is predominately white, this program was a great experience for building a sense of belonging to the academic research community at large. Overall, I have definitely been able to improve my research skills, and build my confidence in being an emerging scholar. From this program, I have solidified my aspirations to complete my masters in SLP and then pursue a PhD.”

“The ILLC program marked a before-and-after in my academic journey. [...] Not only that, I also feel more empowered and confident in transitioning into graduate school; the hands-on experience of working in a laboratory will certainly ease the transition into graduate studies. The program also allowed me to further explore aspects of my mother tongue in ways that I had not considered before.”

At the end of the ILLC program:

“This program is exceptional, and my experience has been unforgettable. Unfortunately, exclusion becomes the norm when you are part of a marginalized community. However, seeing myself and others represented in spaces where we are the linguistic/cultural minority was incredible. Everyone deserves to feel that sense of belonging. I am delighted to say that inclusion and respect were at the forefront of all my interactions throughout this process. I entered this program nervous and unsure of the concluding outcome. I've left this program hopeful and assured that my voice and contributing research are impactful to this field. Now, I'm recommending it to peers and am eternally grateful to my mentor and everyone who supported me along the way.”

After the program ended, as a recipient of Ponce Bank scholarship:

[...]. My academic journey began with challenges, as I initially dropped out of high school. However, recognizing the importance of education, I earned my GED and enrolled in college with renewed determination. In 2022, I graduated from LaGuardia Community College with an associate degree in education. I dual major in communication sciences and disorders and psychology [...], along with double minoring in neuroscience and philosophy. During my

academic career I have maintained a 4.0 GPA and have been on the dean's list every semester. However my achievements extend beyond the classroom. I participated in a yearlong research program through the [NSF-REU ILLC]. This was transformative and deepened my understanding of how language and culture shape our interactions, which was reflected in my research of underrepresented languages [...].

Authors' emphasis

These testimonials reflect the objectives of the program of empowering students through conducting research projects on their own languages and cultures. Fellows often recognize that the program has positively contributed to their admission in competitive masters and doctoral programs and to their success in graduate school. The program has also had a long-lasting impact in that it has driven them to continue to work on minoritized languages.

The results of the survey have revealed that the *Reciprocal Empowerment* approach on the basis of which mentees were carefully matched with mentors also positively impacted the research agenda of the faculty mentors.

A benefit of the NSF-REU ILLC program is that it enabled students to receive substantial stipends while enhancing their education. Among the few fellows who did not complete the program, the obstacles included health issues and/or (more often) financial issues. Participation in the program requires a 6-to-8 hour commitment per week for two semesters, which is challenging given that fellows must combine it with their studies. At the end of the (post-COVID) last cycle, it became clear that a higher proportion of the students we recruited faced hardship that could negatively impact their education in general, including their participation in the ILLC program. With the termination of the award, the ILLC program cannot be successfully run.

It is interesting to note that the NSF-REU ILLC program was launched in 2017, five years before NSF issued a special call to Stimulate Diversification in the Language Sciences (LangDiv). The NSF-REU ILLC spent two cycles of funding enabling this diversification for emergent researchers through a comprehensive program that created a space for both students and faculty to thrive for '*Diversity and Excellence*' (Stewart & Valian, 2018). By simultaneously publishing this call in 2023 addressed to potential Principal Investigators – that is current faculty mentors – and terminating the last NSF-REU ILLC award, the assumption seems to be that current faculty mentors by themselves will manage this formidable task, against formidable odds, and against all best practices – *Critical Race Theory, Cultural Competence and Humility, Student Funds of Knowledge, and Reciprocal Empowerment*.

Acknowledgments

The first two cycles of the NSF-ILLC program 2017- 2024 were supported by Awards # 2041294 (NSF and American Rescue Plan Act of 2021; Public Law 117-2); # 2050922 (NSF and co-funded by US Department of Defense Air Force Office of Scientific Research (AFOSR) ASSURE program); #1659607 (NSF). We thank the faculty mentors for their commitment to the program including Drs. Miriam Baigorri, Hia Datta, Daniel Kaufman, Nelson Moses, Gemma Moya-Gales, Simanique Moody, Marisa Nagano, Erin Reilly, Valerie Shafer, Martha Tyrone, Katrien Vermeire and Gina Youmans; and Sherry Antoine, from AfroCROWD for the fantastic Wikipedia workshops; all the speakers, faculty and discussants at ILLC conferences; and speakers at ILLC graduate application workshops; the program coordinators- Drs. Syelle Graves and Cass Lowry. The first author would also like to thank her former research laboratory manager Dr. Katsiaryna Aharodnik for her assistance in effectively mentoring students in the ILLC program and Yeled V'Yalda Early Childhood Center for providing an exceptional research context for language acquisition projects. The views expressed in this article are those of

the authors and do not necessarily reflect those of the colleagues involved in the NSF-REU ILLC program and/or of the institutions to which they are affiliated.

References

- APA (2010). Race/ethnicity of doctorate recipients in psychology for the past 10 years. *APA Center for Workforce Studies*, January Issue. <http://www.apa.org/workforce/publications/10-race/index.aspx>
- ASHA (2002). *Crisis in the discipline: A plan for reshaping our future*. <http://www.asha.org/uploadedFiles/academic/reports/CrisisInTheDiscipline.pdf>
- ASHA (2003). *Minority student recruitment and retention: preface*. www.asha.org/practice/multicultural/recruit/03initiative.html
- ASHA (2008). *Report of the 2008 joint ad hoc committee on PhD shortages in communication sciences and disorders*. <http://www.asha.org/uploadedFiles/academic/reports/2008PhDAdHocComFullReport.pdf>
- Barrière, I. (2018). NSF Annual Report for Grant Award SMA # 1659607.
- Barrière, I. (2019). NSF Annual Report for Grant Award SMA # 1659607.
- Barrière, I. (2020). NSF Annual Report for Grant Award SMA # 2025637.
- Collaborative Institutional Training Initiative at the University of Miami (CITI Program). (2020). Human Subjects Research (HSR) Series. Available online at <https://about.citiprogram.org/en/homepage/>
- CSD Education Survey. (2015). <https://www.asha.org/uploadedFiles/Trend-Report-AYs-2008-2009-through-2013-2014.pdf>
- Foronda, C., Baptiste, D.L., Reinholdt, M.M. & Ousman, K. (2016). Cultural humility: a concept analysis. *Journal of Transcultural Nursing*, 27 (3), 210-217.
- Gregory, K. (2020). *Moving from cultural competence to cultural humility*. Presented at National Black Association for Speech-Language & Hearing, Series Speak Up and Speak Out Part 4 (online).
- Hansen, J. (2024). *Preparing Students in Speech-Language Pathology Through a Diversity, Equity, and Inclusion Lens* [Master's thesis, Minnesota State University, Mankato]. Cornerstone: A Collection of Scholarly and Creative Works for Minnesota State University, Mankato. <https://cornerstone.lib.mnsu.edu/etds/1417/>
- HEC-Council of Academic Programs in Communication Sciences and Disorders and American Speech-Language-Hearing Association (2011-2012). *HES CSD education survey*. Retrieved from <http://www.asha.org/uploadedFiles/2011-2012-CSD-Education-Survey-National-Aggregate-Data%20Report.pdf>
- Hudley, A.H.C. & Flores, N. (2022) Social justice in applied linguistics: Not a conclusion, but a way forward. *Annual Review of Applied Linguistics*, 42, 144-154.

Hudley, A. H. C., Mallinson, C., & Bucholtz, M. (2020). Toward racial justice in linguistics: Interdisciplinary insights into theorizing race in the discipline and diversifying the profession. *Language*, 96(4), e200-e235.

Hubenthal, M. Ladie, D. Snow, M. & Reed, W. (2021) Interactive anti-harassment/discrimination curriculum for undergraduate research opportunities, field camps/campaigns, and other educational experiences in the earth sciences.
https://www.iris.edu/hq/inclass/lesson/antiharassment_discrimination_and_nonfraternization_curriculum

LSA (2020) The State of Linguistics in Higher Education, 8th edition. <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://files.eric.ed.gov/fulltext/ED611867.pdf>

Marquez Kiyama, J. & Rios-Aguilar, C. (2018). *Funds of knowledge in higher education: honoring students' cultural experiences and resources as strengths*. New York, NY: Routledge.

National Science Foundation (NSF). (2013). *Women, minorities and persons with disabilities in science and engineering*. Arlington, VA: NSF 13-304. Retrieved on 08/07/2013: <http://www.nsf.gov/statistics/wmpd/2013/start.cfm>

NSF (2019). *Women, minorities and persons with disabilities in science and engineering*. Retrieved on 07/31/2019 from <https://nces.nsf.gov/pubs/nsf19304/>

Stewart, A.J. & Valian, V. (2018). *An inclusive academy: achieving diversity and excellence*. Cambridge, Mass MIT Press.