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Cover

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Accomplishments

* What are the major goals of the project?

The impact of "Big Data" analysis on language science and technology is exemplified by tools like Siri and Google Translate. This technology relies on analysis of billions of words and sentences in English, but it is squarely outperformed by human children, who learn language using only modest amounts of data. Understanding how human learners make

such economical use of language input and translating these insights into “smarter” methods in language technology requires an interdisciplinary approach. Our NRT project combines team based research on the efficient use of language data (“Beyond Big Data”) with a strong emphasis on student leadership, science communication, outreach, public policy activities and preparation for diverse careers.

Major goals of the project include: (i) understanding efficient use of language data, with a focus on the informativity of data to human and machine learners; (ii) adopting team-based approaches to complex research problems spanning multiple fields; (iii) providing students with the experience and skills to be flexible communicators in writing and speaking; (iv) training students to become future leaders in interdisciplinary research.

The project’s training model is designed to train future leaders in the field of language science: researchers who are creative, adaptable, and skilled at working in teams to solve complex problems.

Building on lessons learned from our IGERT program, emphasis is placed on “enabling” activities-- activities that may at first seem like distractions, but in fact build communication skills and catalyze cross-disciplinary interactions, providing students with skills needed to become leaders in interdisciplinary and translational research. Specific activities fall into one or more of the following six categories: community activities, communication training, team-based research on flexible data use, career development, public policy experiences, and training that pushes students beyond their comfort zone. These activities are discussed in greater detail in the Major Activities section of this report.

We have been working in close conjunction with our NRT evaluator, Prof. KerryAnn O’Meara, to develop a comprehensive training and evaluation model. The model comprises a detailed program objectives statement, a logic model, and guidelines for measuring outcomes. Each of these components are included in the report. The program objectives statement is included in the Specific Objectives section. The logic model is included as a PDF attachment to the Accomplishments section. Finally, guidelines for measuring outcomes are included under the relevant subheading of the Major Activities section.

LANGUAGE SCIENCE CENTER

Our NRT program is housed in the Maryland Language Science Center (LSC), an interdisciplinary initiative with a mission to “advance an integrated science of language, through research and training that links fundamental science with applications in education, technology, and health.” Students and faculty from around 20 departments and programs are involved with the LSC, and the range of research is correspondingly broad.

The creation of the Language Science Center in 2013 was a direct consequence of efforts developed via our NSF IGERT program (2008-2015). It builds upon the interdisciplinary community that the IGERT program had already strengthened. The NRT program reinforces the activities of LSC in many ways.

Some major areas of interdisciplinary research include:

- Cognitive neuroscience of language development and processing
- Computational modeling of language, language processing, and language learning
- The role of language development/processing in literacy and school achievement
- Adult language learning and second-language processing
- Individual differences in language learning and processing
- Atypical language development and processing
- Language diversity and linguistic theory

A few representative projects directly supported by LSC staff:

- The LSC's Field Station in Guatemala is a multidisciplinary hub for research and training. It hosts independent researchers throughout the year. In an annual summer field school, students and faculty spend a month on intensive language classes and linguistic fieldwork in Mayan languages. We plan to expand activities to serve local community needs, and encompass new disciplines including public health, nutrition and education.
- The UMD Toggle Talk Project (led by LSC Associate Director Jan Edwards, funded by an IES Goal 3 grant) is a 5-year study investigating whether ToggleTalk®, a curriculum supplement on dialect shifting, improves reading scores of kindergarten and first grade children. 30 public elementary schools in Baltimore and DC are participating. The project involves 30-50 undergraduate and graduate students each year.
- Naomi Feldman (Linguistics) and Jan Edwards (HESP) are collaborating on an interdisciplinary project funded by an R21 grant from NIDCD. These faculty members met through the LSC and became interested in using computational modeling to predict which language interventions are most effective for helping children with developmental language disorders.

*** What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**

Major Activities:

RESEARCH

- i. Over the past year, students' interest in the relationship between dialect mismatch and school achievement has begun to crystallize into specific research agendas. "Dialect mismatch" is when a student's native dialect differs from the dialect used in school. It has been hypothesized that dialect mismatch makes it harder for students to process the language they hear in school, and that this processing burden causes delays in learning that accumulate over time, leading to poorer outcomes. However, there has been very little research to substantiate these specific links. Several trainees in the Hearing & Speech Sciences (HESP) department have begun to investigate how dialect mismatch affects sentence processing, with an eye to understanding the specific mechanisms underlying the downstream impact on literacy and school achievement.
- ii. Over the last few years growing numbers of students in the Linguistics department have begun to combine computational modeling with psycholinguistic research. This year, several current trainees and one incoming trainee in Hearing & Speech Sciences have started down the same path by taking the Computational Psycholinguistics course (which is designed for students with a background in either psycholinguistics or computational modeling, but not necessarily both).
- iii. This year's Winter Storm included a lot of time for research interest groups to meet. Research topics included "Reading as statistical learning", "Events and semantic architecture", "Utility of brain signals for language science", and "New approaches to neural measurement of auditory lexical processing." All the groups were organized by students, including 4 trainees. We adopted a more hands-off approach to these groups in 2019, and this helped to increase the groups' engagement, contributing to sustainability beyond Winter Storm. An example of a new collaboration that has emerged from this is one that spans computer science and cognitive neuroscience.

EDUCATION AND TRAINING

- i. This year the organization of Winter Storm was led by three faculty members (2 from Linguistics, 1 from Hearing & Speech Sciences) instead of a student committee. The past few Winter Storms have been dominated by structured sessions on topics related to professional development and research methods. This year's organizers aimed to shift the balance towards more unstructured time, allowing students to work

independently or in groups on topics closely aligned to their immediate interests. They solicited proposals from students and faculty for discussion groups as well as structured training sessions. In the end, the daily schedule included a 1-hour professional development session, 2 hours of writing time, a networking lunch, and 1.5 hours each for research discussion groups, policy discussion groups, and data analysis workshops. Rather than daily research talks by faculty, there was one invited speaker (Laura Wagner, OSU), who gave a research talk and led a session discussing outreach strategies.

ii. Many students are eager to supplement their formal coursework in statistics with peer-to-peer learning. Several trainees have taken the lead on creating these extracurricular opportunities.

- Adam Liter and Hanna Muller led a series of hands-on statistics sessions at Winter Storm, focusing on linear mixed effects modeling and Bayesian power analysis.
- Phoebe Gaston and Hanna Muller led a Winter Storm workshop on power analysis, effect sizes, and replicability. Later in the spring, they presented the same material in a weekly seminar series in the Hearing & Speech Sciences department.
- Phoebe Gaston led another Winter Storm workshop on pre-registering research studies.
- Following the Winter Storm sessions a group of 5 students (including 3 current and 1 incoming trainee) has continued to study and discuss linear mixed effects modeling.
- A group of 4-5 students (including 2 trainees) from the Hearing & Speech Sciences department have formed a reading group on growth curve modeling applied to eye-tracking analysis.

iii. Last year the student Professional Development Committee, led by trainee Allie Johnson, initiated a weekly writing accountability group for students; this year they have expanded to a second group. In Allie's words, "The primary goal of the writing group is to support each other. We work together to create specific, measurable, attainable, and realistic goals each week, and we hold each other accountable for achieving those goals. If someone is coming against obstacles in their writing, the group offers support, including ideas or solutions to help overcome barriers."

This year's Winter Storm featured 2 hours of writing time every morning, affectionately referred to as the "Cocoaloquium", for the cocoa made available for writers. The Cocoaloquium was so popular that students decided to continue with regularly-scheduled writing times each week at the Language Science Center. Many faculty also participated in the Cocoaloquium, contributing to the sense of shared student and faculty involvement.

EVALUATION

The NRT internal evaluation is guided by case study methods and seeks to answer two research questions: 1) To what extent has the NRT program achieved its seven stated goals? 2) Which elements of the program were most influential in accomplishing these goals? The evaluation draws primarily from qualitative data sources including interviews, focus groups, and ethnographic observations of NRT

program events. To date, the evaluation team has conducted focus groups with both students (3) and faculty (3), interviewed 18 trainees, conducted exit interviews with 9 graduating trainees, interviewed 6 key institutional informants (including faculty and administrators involved in graduate education), and observed approximately 50 hours of NRT programs and activities.

In addition, a survey was distributed in Fall 2017 and Fall 2018 to UMD trainees and students from three other universities (University of Connecticut, University of Wisconsin, and The Ohio State University). These institutions are all public flagship universities with some kind of cross-departmental coordination of language science activities, and so their inclusion as comparisons is valuable for understanding the value added by our program. Parts of the survey were also distributed to trainees in another NRT program at UMD (COMBINE, a program based primarily in physics and biology).

The evaluation team prepared and presented a comprehensive Year Four report of their findings to the PI and program staff in April 2019.

Specific Objectives:

Our research objectives have not changed since last year. We aim to create productive bridges between cognitive and computational research on language, to examine how human and machine learners can do more with less, and to create sustainable research teams that draw from multiple fields. The project falls under the NRT “data-enabled science” umbrella, but in our case this does not entail a focus on Big Data. Rather, the focus is on how to do more with less.

Our training objectives are also the same as last year. We aim to (i) enhance students’ ‘agency’ as interdisciplinary researchers, via their research skills, independence, collaborative skills, risk-taking and ability to move beyond the personal comfort zone, and ownership of program activities; (ii) change students’ professional networks, across disciplines, institutions, career stages, and career types; (iii) enhance students’ ability to connect specific research problems with their broader context (“zooming in” and “zooming out”); (iv) enhance student ability to communicate particular research problems and the contexts surrounding them to diverse academic and nonacademic audiences in writing, in speaking and in diverse contexts; and (v) enhance students’ ability to pursue careers within and outside of academia by helping them assess their own skills and values, understand the career options available, and make a plan to achieve their career goals.

Significant Results:

RESEARCH

i. Hanna Muller (Linguistics) has led a small team of students and research assistants who have been using “linguistic illusions” to understand how humans successfully and unsuccessfully extract meaning from sentences that they read and hear. Muller has revealed the triggers and the precise time course of semantic illusions, leading to rethinking of leading theories on how miscomprehension occurs. This led to an unexpected collaboration with a cybersecurity research project focused on how to protect information by creating fake alternatives that are hard to distinguish from the originals.

ii. The expansion of computational modeling approaches has continued across our community. In the course of a few years it has gone from unusual to normal among

linguistics students. It is now spreading to students in Hearing & Speech Sciences (HESP) labs. Many students are now enrolling in computational courses and integrating computational approaches with their human experimentation. As one example, Zoe Schlueter this year gave her Language Science Lunch Talk on a computational exploration of child difficulties in language understanding. The talk was distinctive not only because it was a new area for Zoe, but because there were many other students in the audience who were equipped to engage deeply with the research.

EDUCATION AND TRAINING

i. This year's Winter Storm attracted strong attendance, about 100 individuals in total across the days and sessions. We distributed a survey to the 99 people who registered, and received responses from 35. Overall, respondents were very positive about the sessions they had attended. In their comments, respondents said they appreciated the less structured sessions (writing time, research and policy discussion groups) because they were able to "get work done" while also interacting with more people. They highly value the opportunity to build relationships with people in other departments.

ii. Student-led training in statistics has led to a shift in how students plan their research projects. In the past it was more common for students to rely on intuition and precedent in planning the scope of their research. Now it is more common for students to carry out careful power analyses before starting their studies, both to gauge the amount of data needed to confidently draw a conclusion, and to identify strategies for safely terminating a study if a conclusion can be reached earlier. This is an unexpected way in which our program's focus on multi-scale data is bearing fruit.

iii. The student writing groups have been effective at helping their members develop better writing habits. One participant reported, "Being in the writing group has helped me develop a good writing routine. I rarely did any writing before the group, but now I have completed 2 grant proposals (awarded), 4 first-author and 2 co-author manuscripts (under review), and much more in preparation in one year. My group members did an excellent job supporting me to develop a good writing routine and move from thoughts to actions!" Another said, "The writing group has helped me keep on track for completing a large amount of writing projects that I would not be able to juggle otherwise. In the past year as part of the group, I've published two first author papers, submitted a bunch of abstracts, given a number of talks/posters, and submitted a few grants/fellowships."

The "Cocoaliquium" sessions at Winter storm were quite popular. About 20-40 students and faculty participated on any given day, with about 70 unique participants total. One visiting student summed up the community spirit created by the sessions: "I was impressed by how many different individuals from different departments and positions (professor, student, RA, etc) attended the Cocoaliquium, and even though everyone was working on their own, it felt like there was a real solidarity amongst the group and a strong sense of community; I cannot think of another time I have seen so many people convene to work together individually in the same space."

EVALUATION

The Year Four Report from our evaluation team includes findings for each of our five training objectives.

(i) Enhance doctoral student agency as interdisciplinary researchers

Trainees' survey responses indicate that they 1) have access to opportunities that develop their agency as interdisciplinary researchers; 2) have growing confidence in their abilities as interdisciplinary researchers, and 3) believe that they are making valuable contributions to their fields and departments. Nearly all trainees reported that they participated in activities that contribute to their interdisciplinary research skills such as research talks by faculty and students and meetings with collaborators and research teams. In interviews and focus groups, most trainees report that participating in the language science community influenced their research. Some pursued explicitly multidisciplinary research; others benefitted from discussions with students or faculty from other departments. Faculty report that some of the most influential practices are encouraging students to have multiple advisors, and giving trainees ownership of their training program. Although the formal research teams planned for the NRT program did not materialize in the form originally conceived, trainees report that their experiences with multidisciplinary groups were beneficial for learning how to create common ground amongst researchers with diverse perspectives.

(ii) Change the nature of student professional networks

In the survey, trainees are asked to list up to 12 individuals who they "talk about research with". 86% of trainees reported at least one member of their discussion network from outside their home discipline.

(iii) Enhance student understanding of particular research problems and the relationship between research problems and contexts, and (iv) enhance student ability to communicate about research problems and their contexts, and adjust their communication according to the audience, channel, and goals.

Trainees have access to many opportunities to address these goals. In both 2017 and 2018, UMD trainees reported greater access to relevant opportunities compared to students at comparable institutions (OSU, UConn, Wisconsin). In both years, students report high confidence in their ability to explain their research to peers, but somewhat lower confidence in their ability to connect their research with specific applications.

(v) Enhance student ability to choose and successfully pursue a career within and outside of academia

Survey results indicate that compared to students at comparable institutions, trainees at UMD have more opportunities to learn about academic and non-academic careers, more encouragement and advice to plan their careers, and more opportunities to develop leadership skills. They also have slightly greater confidence in their ability to identify, apply to, and interview for jobs.

Of the 10 trainees who have graduated (as of June 2019), 4 have pursued positions outside academia. Exit interviews suggest that the NRT program was especially helpful for some of those trainees pursuing nonacademic careers. On the other hand, some graduating trainees indicated that although they had gained some new skills that could have been marketable (e.g. in computational modeling or natural language

processing), they felt as though they had not achieved the level of competence they needed to get a position in a particular area.

Key outcomes or
Other achievements:

RESEARCH

i. A growing number of trainees from the Hearing and Speech Sciences (HESP) department are pursuing interdisciplinary research and training that promises to have a lasting impact on our research community. These students are taking advantage of the Linguistics department's strengths to learn state-of-the-art methods in psycholinguistics and computational modeling, which they can then apply to their questions about language processing in challenging circumstances (e.g. dialect mismatch, developmental delay, cochlear implants, second language learning). This has the effect of shifting expectations in both departments about the feasibility of applying lab skills to clinical and educational research. HESP students are now a much more visible presence in Linguistics department courses, and their perspective-informed by clinical experience and classroom-based research--changes the discussion.

The students working on dialect mismatch are also trying to build a bridge to researchers in the College of Education who study literacy development, reading proficiency, and school achievement. So far this connection has proved more difficult: researchers in Education have historically had little contact with the language science community (at our university and more generally). We hope that this work will be the foundation of more productive exchange in the future.

ii. This year's Winter Storm research groups benefited from more student leadership and a more flexible format and set of expectations, and this contributed to greater satisfaction among participants. 8 groups formed to read articles, work through specific problems, or to design new research projects. Themes ranged from analysis of brain signals to gender bias in academia to mental concepts of events, to statistical power analysis. In a number of cases the groups were successful in creating or accelerating new collaborative projects. In almost all cases the group leaders came away with the perception that their effort was worthwhile. This is highly valuable, as belief in the feasibility of collaborative research is an important prerequisite for attempting collaboration.

EDUCATION AND TRAINING

i. The policy experience component of the training program has been a challenge to implement: students find it intimidating, and faculty don't have the connections or resources to facilitate the process for students. Nevertheless, the students who have engaged with this part of the program have found it to be highly rewarding. There were two particularly successful cases this year.

Kasia Hitzcenko successfully advocated for a change in reviewing policy for the annual conference of the Cognitive Science Society: it is now double-blind, rather than single-blind. She reviewed the literature on the effectiveness of double-blind review for reducing bias, drafted a letter to the board, and solicited support from members of the community. She reports, "It is probably the singular thing I've been involved with that I'm most proud of since being in graduate school. The experience gave me a closer look at how these sorts of decisions are made, and made me realize that just because something is done a particular way does not at all mean that there is a good reason for it... One of my goals is to try to make whatever community

I am in a little bit better, and especially to reduce bias and unfair treatment, and having this experience will make me more likely to take active steps to do that when I see something that bothers me.”

Nick Huang did an internship with the non-profit DC Language Immersion Project, which aims to broaden access to dual language immersion programs in Washington DC public schools. He fulfilled the policy internship ‘requirement’ in summer 2018, but it went so well that he remained involved with the group through the academic year. His background in both linguistics and economics proved valuable for the group’s need to develop an assessment of the impact of immersion programs. But Huang also learned a great deal about the many different elements that go into turning well motivated ideas into policy. This practical experience served him well in applying for jobs during the final year of his PhD program.

*** What opportunities for training and professional development has the project provided?**

PROGRAM ELEMENTS

i. Applications.

Students apply to the NRT program after they are already enrolled at UMD and typically after they have already been active in a number of program activities. They submit a 5-page proposal detailing an integrated research and training plan, as well as various supporting documents. Early-stage students find this proposal somewhat intimidating, so we have added additional steps to the application process to provide more scaffolding. To scaffold the process, we ask applicants to submit a letter of intent and meet with the program coordinator before submitting their full proposal. By working with students directly as they write their proposals, we increase the chances that students’ plans fit their needs and interests, and reduce the need for extensive revisions later. This approach has been successful: students report that the meeting is helpful for thinking through their research and training plan, and makes the process less intimidating.

ii. Mentoring.

We strongly encourage students to seek out multiple mentors. Of the 25 current and former trainees, 13 have worked with more than one faculty advisor, some in different departments. The NRT program coordinator also provides mentorship that complements that of the faculty advisors. Once per year, trainees complete a report on their research and training activities over the past year, and write an IDP for the next year. Then they meet individually with the program coordinator to discuss how their previous and planned activities align with their long term goals. This process helps students zoom out from their day-to-day concerns and think about the broader picture.

iii. Career development.

Discussions about career plans have become routine in meetings with trainees: when they apply to become a Language Science Apprentice, when they are working on their research and training proposal to join the program, and in annual progress meetings. Students describe their career goals and identify skills to work on in their IDP, updated annually for the progress meeting. It is a notable step that this has shifted from a slightly taboo topic to a routine topic.

iv. Community events and leadership training.

As usual, students ably led a variety of community events and activities throughout the year, via the committees on Research Skills & Collaboration, Professional Development & Communication, Outreach, and Policy & Advocacy. On May 22, 2018, we held a half-day leadership workshop (led by the NRT coordinator) on managing people, managing projects, and team communication and accountability. It was attended by the incoming chairs of student committees, as well as students in other leadership roles.

v. Policy experience

Trainees are expected to complete a policy experience of their choosing. The goal of this part of the program is for trainees to connect science with societal issues, apply their research skills outside an academic context, and communicate with stakeholders with different backgrounds and expertise. Students tend to find the process of imagining and designing the policy experience to be intimidating, but they report afterwards that it was among the most interesting and rewarding parts of their graduate training.

COMMUNICATION

Trainees in our program have many opportunities to practice and improve their skills communicating to broad audiences.

- Speaking to a multidisciplinary audience: Each trainee presents at least one Language Science Lunch Talk (LSLT) per year, to an audience of students and faculty from different departments. To increase the training benefit of this experience, trainees are assigned to a peer group of 3-4 students at the beginning of the year, which meets to give feedback to each trainee the week before they present at LSLT.
- Outreach activities: Each trainee participates in at least one outreach activity each year. Students explain core principles and facts from language science through interactive demos, usually aimed at elementary, middle, and high school students and their families. In February 2019 we hosted students and faculty from universities around the country to lead a “Language Science for Everyone” booth at AAAS Family Science Days. Prior to the event, we held a workshop on communication strategies for outreach, and how to tackle common challenges.
- Policy experience: For the policy experience, trainees often produce presentations or written reports aimed at a non-academic audience.
- Writing (productivity): As detailed above, student leaders have launched writing support groups and write-on-site sessions that have been very effective at improving students’ writing productivity.

EVALUATION

Professional development topics are included in all program evaluation activities, including the survey, student interviews, and focus groups with students and faculty.

Survey results from this year and last year suggest that, compared to students at peer institutions, our trainees have more opportunities to learn about academic and non-academic career options, more encouragement and advice related to career planning, and more leadership opportunities. They also have more opportunities to learn about the impact of research on clinical practice or public policy, to learn and practice strategies for communicating with diverse audiences, and to actually communicate with non-academics.

Despite all these opportunities, trainees still report (in the survey and in interviews) lower confidence in their ability to communicate and otherwise contribute outside the university setting. They feel less able to communicate with non-academics, or to connect their own research to specific applications. Some graduating trainees expressed that although they had gained new marketable skills in a particular area, they did not feel sufficiently prepared to compete for a position in that area.

Our evaluation team also commented on the need to coordinate professional development activities offered within departments, across related departments (like through our NRT program), and by units serving the whole university (e.g. the Career Center and the Teaching and Learning Transformation Center):

“...In some ways, the NRT/LSC’s professional development opportunities intersect with what the Graduate School/Career Center offer to students on a campus level. The LSC started increasing graduate student professional development efforts before, and/or at the same time the Graduate School did, and it could be argued there is some duplication of effort (which is an issue across campus, not just for the LSC). ... The LSC has experienced some success in crossing departmental silos, whereas graduate student professional development at the campus level is still in its nascent stages in bringing together students from across units. One of the key factors in the LSC success in doing graduate student professional development across departments is faculty buy-in: students pay attention to professional development when their advisor recommends it.”

One way we have attempted to mitigate duplication of offerings is by disseminating a biweekly Professional Development Newsletter, enumerating the many training opportunities made available by the Career Center, the Teaching and Learning Transformation Center, the Graduate School Writing Center, the university library, and others.

*** How have the results been disseminated to communities of interest?**

(i) Websites. We have deliberately avoided creating an NRT-specific website, as we believe that it is hard to get broad buy-in to a short-term grant with an obscure acronym. As we did with our earlier IGERT program, we embed NRT materials as a section within the broader Language Science Center website. These materials are primarily aimed at prospective NRT students and their mentors.

We created websites for the NRT Teams' Meeting and Future STEM Leaders meeting in Maryland and Washington DC in May 2016. These sites now include materials from those meetings, making them a valuable resource on the activities of the first two NRT cohorts. These should, in principle, be of interest to prospective NRT applicants, an important and receptive audience.

(iii) Social media. LSC's Facebook following grew to over 800 people this year. Our posts reach 200-300 people on average, and some as many as a thousand. These are not huge numbers, but our activities have high visibility among language scientists, which increases the impact of our NRT program in our field(s). The primary goal of these posts is highlighting the culture of our interdisciplinary community to scientific peers.

(iv) Meetings with (inter)disciplinary groups. Our team's activities were highlighted in a special session at the January 2018 meeting of the Linguistic Society of America, as well as a symposium organized by Phillips for the 2017 National Humanities Conference in Boston. Phillips gave a presentation about the development of the UMD Language Science community to a multi-university group in Taipei in October 2018.

(v) Dissemination to other (prospective) NRT teams. Aspiring NRT teams at UMD and elsewhere regularly seek out Phillips for advice on developing interdisciplinary programs. We make all of our program's materials, including the proposal and reviews, available online. Our team has met with the PIs of the other NRT programs at UMD and the language science NRT program at UConn, as well as a handful of other NRT hopefuls at UMD and other universities. At the September 2018 NSF NRT meeting in Washington DC we again met a number of people who we had never met before who thanked us for the materials about our program that we had shared online.

(vi) Dissemination to other units at UMD. NRT program coordinator Dr. Shevaun Lewis took on a part-time appointment with the Neuroscience and Cognitive Science (NACS) program at UMD to work on PhD student career development. In this way the workshops, resources, and mentorship models developed for the NRT program were made available to a wider group of students. She has now been replaced with a full-time NACS staff member, but her work is folded into the job description for that position.

(vii) Dissemination of evaluation results. Our evaluation team is developing two or three academic papers out of the data collected from evaluation activities. The first of these was submitted to the annual conference of the Association for the Study of Higher Education (ASHE). It focused on the question of how students develop identities as interdisciplinary scientists. A second submission is in development on the theme of "creative collisions" in science.

*** What do you plan to do during the next reporting period to accomplish the goals?**

In this year's internal report on evaluation results (attached as a supporting document), our evaluation team made several recommendations for program improvements.

GRADUATE STUDENT OUTCOMES

There is evidence that the NRT program and the LSC more generally is making positive progress towards achieving the five student goals. We see the strongest evidence that the NRT program is exposing students to colleagues, knowledge,

and ideas in disciplines outside of their home units; changing student networks; and fostering students' interdisciplinary communication and collaboration skills.

On the other hand, we note a few areas on which program leaders might wish to focus. When we compared NRT student survey responses from Wave 1 to Wave 2, we observed a small but consistent downward trend. ... We recognize that (a) the sample of students changed from Wave 1 to Wave 2 and (b) due to the size of the sample, the results are not statistically significant. Yet, we wanted to note

these trends as an area program leader may wish to monitor. We also heard concerns by students and faculty about the level of workload and sustained involvement in the LSC and lack of clarity or confusion around required professional development activities.

Recommendations:

- Use a Language Science Lunch Talk as a forum to tackle the workload and participation problem as a community. At said meeting, provide opportunities for faculty and student input and present some alternatives that may reduce the perception and reality that student ownership and participation in LSC/NRT programs and activities are inherently in tension with workload concerns.
- More clearly articulate which professional development activities are being done locally, within the LSC/NRT, for specific reasons and which professional development activities might be handled by The Graduate School and/or academic departments.
- Re-think what activities and requirements are required versus not required and provide rationale to students and faculty about such considerations. Such requirements, policies, and procedures could be outlined in an NRT Student Handbook, which could be regularly revised by program leaders with student and faculty feedback in mind. Such guidelines may assist in providing clarity and transparency to students and faculty around participation in the NRT program.

GRADUATE EDUCATION REFORM

There is evidence that the NRT and LSC acts a nationally recognized model in language science and has been a catalytic and substantive support for other interdisciplinary programs on campus.

Recommendations:

- Much like meetings convened by the PIs of the NIH T-32 program, the LSC could convene an annual meeting with other UMD units interested in interdisciplinary graduate education and professional development as a mechanism for spreading ideas around campus. Many of these types of meetings are already happening informally between LSC program staff and other units, but formalizing meetings could be a way for all graduate units to share best practices. This event could be in partnership with the
- Graduate School and the other NRT programs on campus.
- Create a brief on NRT best practices that can be posted to the LSC website and shared with other language science graduate programs.
- Consider presenting at the Council of Graduate Schools, IDERN, or other graduate education conferences.

INSTITUTIONAL CHANGE

We see mixed evidence regarding the role of the NRT/LSC in fostering organizational change. On one hand, the LSC has facilitated professional relationships across UMD silos, provided new graduate training models adapted by other units,

and created new ways for faculty and students to work together. On the other hand, UMD and the LSC within it, still experience some of the same barriers in terms of:

- More traditional promotion and tenure system that rewards individual effort.
- Organization of faculty into departments and even centers that act as the major reward system.

Recommendation:

Identify one or two specific organizational changes (field-wide or institutional-wide) that the LSC/NRT leaders think would (a) most contribute interdisciplinary institutional change and (b) are likely to happen by the end of the grant in 2020. Examples of such organizational changes could be credit for team-taught courses, co-advising credits or policies, or practices governing PI-splits.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
2019 Internal Evaluation_FINAL.pdf	Internal evaluation, Fourth Year Report	Colin Phillips	06/12/2019
NRT-Logic_Model-2019progress.pdf	Logic model with notes on activities in this reporting period	Colin Phillips	06/12/2019
PDTable-2019.pdf	Table of professional development activities	Colin Phillips	06/12/2019
Trainee Table 2019 - revised.pdf	Table of trainees. Added more detail to the "Funding source" column.	Colin Phillips	06/28/2019

Products

Books

Book Chapters

Inventions

Journals or Juried Conference Papers

Allison Johnson and Patrick Reidy and Jan Edwards (2018). Quantifying robustness of the /t/-k/ contrast using a single, static feature. *The Journal of the Acoustical Society of America*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Allyson Ettinger, Ahmed Elgohary, Colin Phillips, Philip Resnik (2018). Assessing composition in sentence vector representations. *Proceedings of COLING 2018*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Jeffrey Lidz and Laurel Perkins (2018). The importance of input representations. *Linguistic Approaches to Bilingualism*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Kasia Hitczenko, Reiko Mazuka, Micha Elsner, Naomi Feldman (2018). How to use context to disambiguate overlapping categories: The test case of Japanese vowel length. *Proceedings of the 40th Annual Conference of the Cognitive Science Society*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Nick Huang and Chia-Hsuan Liao and Valentine Hacquard and Jeffrey Lidz (2018). Learning attitude verb meanings in a morphosyntactically-poor language via syntactic bootstrapping. *BUCLD 42: Proceedings of the 42nd annual Boston University Conference on Language Development*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Phoebe Gaston, Ellen Lau, Colin Phillips (2019). Syntactic category does not inhibit lexical competition. *Proceedings of the 11th International Conference on the Mental Lexicon 2018*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Shelby Lawson and Adam Fishbein and Nora Prior and Robert Dooling and Greg Ball (2018). Relative Saliency of Syllable Structure and Syllable Order in Zebra Finch Song. *Animal Cognition*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Licenses

Other Conference Presentations / Papers

Tyler Knowlton and Justin Halberda and Paul Pietroski and Jeffrey Lidz (2019). *A novel memory task reveals early understanding of quantifier meanings*. Society for Research in Child Development 2019. Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tyler Knowlton and Justin Halberda and Paul Pietroski and Jeffrey Lidz (2018). *Acquiring the universal quantifiers: every part together or each part on its own?*. Boston University Conference on Language Development 43. Boston, MA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tyler Knowlton (2018). *Are natural language quantifiers first- or second-order?*. McDonnell Network focused workshop on the development of set and quantifier representations. Johns Hopkins University, Baltimore, MD. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Zoe Ovans, Jared Novick, {Yi Ting} Huang (2018). *Better to be reliable than early: Cognitive-control effects on developmental parsing (conference poster)*. THE 43rd Annual Boston University Conference on Language Development. Boston, Massachusetts. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Julianne Garbarino and Einat Korman and Nan {Bernstein Ratner} (2018). *Complexity of written and spoken persuasive narratives of teens/young adults with and without autism*. American Speech-Language Hearing Association Annual Convention. Boston, MA, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Theodore Levin, Paulina Lyskawa, Rodrigo Ranero (2018). *Deriving optional agreement in Eastern Mayan*. FAMLi. Antigua, Guatemala. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

N. Basak Karatas and Nick Huang (2019). *Do we "need to" do unforced reanalysis during active gap filling?*. Psycholinguistics in Iceland – Parsing and Prediction (PIPP). Iceland. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jordan Hulse and Taylor Baron and Lea Marucci and Brittany Davis and Julianne Garbarino and Nan {Bernstein Ratner} (2018). *Eyes test predicts figurative language comprehension for high school/college students with & without autism*. American Speech-Language-Hearing Association Annual Convention. Boston, MA, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Phoebe Gaston and Ellen Lau and Colin Phillips (2019). *Facilitation vs. inhibition as mechanisms for syntactic constraints on word recognition*. 32nd annual CUNY Sentence Processing Conference. Boulder, CO, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

H. Muller and P. Gaston and B. Dickerson and A. Liter and K. Durvasula and M. Hirzel and K. Hitczenko and M. Kandel and P. Lyskawa and J. Nelligan and M. Papillon and L. Perkins (2019). *Gender bias in representation and publishing rates across subfields*. Annual Meeting of the Linguistic Society of America. New York, NY. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Hanna Muller and Phoebe Gaston and Bethany Dickerson and Karthik Durvasula and Mina Hirzel and Kasia Hitczenko and Margaret Kandel and Adam Liter and Paulina Lyskawa and Jacqueline Nelligan and Maxime Papillon and Laurel Perkins (2019). *Gender bias in representation and publishing rates across subfields*. 93rd Annual Meeting of the Linguistics Society of America. New York, New York. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Hanna Muller and Phoebe Gaston and Bethany Dickerson and Adam Liter and Karthik Durvasula and Mina Hirzel and Kasia Hitczenko and Margaret Kandel and Paulina Lyskawa and Jacqueline Nelligan and Maxime Papillon and Laurel Perkins (2018). *Gender bias in representation and publishing rates across subfield*. " Annual Meeting of the Linguistic Society of America. New York, NY. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tyler Knowlton and Laurel Perkins and Alexander Williams and Jeffrey Lidz (2018). *Getting a grip on infants' event representations: participant number in TAKE and PICK-UP*. XXI International Congress of Infant Studies Biennial Congress. Philadelphia, PA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tyler Knowlton and Laurel Perkins and Alexander Williams and Jeffrey Lidz (2018). *Getting a grip on infants' event representations: participant number in TAKE and PICK-UP*. The XXI Biennial International Congress of Infant Studies (ICIS). Philadelphia, Pennsylvania. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Phoebe Gaston and Ellen Lau and Colin Phillips (2019). *How syntactic context affects comprehension: facilitation vs. inhibition*. Linguistic Society of America 2019 Annual Meeting. New York, NY, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Kasia Hitczenko and Laurel Perkins (2019). *Introduction to Bayesian Modeling in Linguistics*. 2nd meeting of the Society for Computation in Linguistics (SCiL). New York, New York. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Pamela Dominguez and Julianne Garbarino and Nan {Bernstein Ratner} (2018). *Locational, syntactic, temporal, and phonological properties of atypical disfluencies produced by teens/young adults*. American Speech-Language-Hearing Association Annual Convention. Boston, MA, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Laurel Perkins and Tyler Knowlton and Alexander Williams and Jeffrey Lidz (2018). *Matching number vs. linking roles: Using 3- participant scene percepts to understand infants' bootstrapping*. 43rd Boston University Conference on Language Development (BUCLD 43). Boston, Massachusetts. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Laurel Perkins and Tyler Knowlton and Alexander Williams and Jeffrey Lidz (2018). *Matching number vs. linking roles: Using 3-participant scene percepts to understand infants' bootstrapping* . Boston University Conference on Language Development 43. Boston, MA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Theodore Levin, Paulina Lyskawa, Rodrigo Ranero (2018). *Microvariation in Eastern Mayan number agreement*.. CamCoS. Cambridge, England. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Kasia Hitczenko and Reiko Mazuka and Micha Elsner and Naomi Feldman (2018). *Normalization may be ineffective for phonetic category learning*. Boston University Conference on Language Development. Boston, MA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Kasia Hitczenko and Reiko Mazuka and Micha Elsner and Naomi Feldman (2019). *Normalization may be ineffective for phonetic category learning*. Society for Computation in Linguistics. New York, NY. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Hanna Muller and Iria {de Dios Flores} and Colin Phillips (2019). *Not (just) any licensors cause negative polarity illusions*. CUNY. University of Colorado Boulder. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Zoe Ovans, Kathleen Oppenheimer, {Yi Ting} Huang (2019). *Online parsing strategies are influenced by verb-specific and language-general biases (conference talk)*. CUNY 2019 32nd Annual CUNY Conference on Human Sentence Processing. Boulder, Colorado. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Theodore Levin, Paulina Lyskawa, Rodrigo Ranero (2019). *Optional agreement in Santiago Tz'utujil (Mayan) is syntactic*. DGfS. Bremen, Germany. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Adam Fishbein and Nora Prior and Greg Ball and Robert Dooling (2018). *Perception of Sequences and Syllables in Vocal Learning Birds*. Birdsong and Animal Communication Annual Meeting. Millbrook, NY. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Zoe Ovans, {Yi Ting} Huang, Jared Novick (2018). *Rely on what's reliable: Effects of cognitive-control engagement on children's sentence comprehension (conference poster)*. Psychonomic Society 59th annual meeting. New Orleans, Louisiana . Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tyler Knowlton and Paul Pietroski and Justin Halberda and Jeffrey Lidz (2019). *Representational format and universal quantifiers*. Linguistic Society of America Annual Meeting 2019. New York, NY. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Phoebe Gaston and Ellen Lau and Colin Phillips (2018). *Syntactic category facilitates rather than inhibits lexical competition*. 11th International Conference on the Mental Lexicon. Edmonton, Alberta, Canada. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tyler Knowlton and Paul Pietroski and Justin Halberda and Jeffrey Lidz (2019). *The mental representation of universal quantifiers: evidence from verification*. 32nd CUNY Conference on Human Sentence Processing. Boulder, CO . Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Adam Fishbein and Nora Prior and Shelby Lawson and Greg Ball and Robert Dooling (2018). *Variation in How Birds Listen to Their Songs*. Annual Conference of the Animal Behavior Society. Milwaukee. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Elaine Grolla and Adam Liter and Jeffrey Lidz (2019). *Why do you think why kids produce medial wh-phrases: Grammar or performance?*. Michigan State Undergraduate Linguistics Conference. East Lansing, MI. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Other Products

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites

Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Phillips, Colin	PD/PI	1

Name	Most Senior Project Role	Nearest Person Month Worked
Daume, Hal	Co PD/PI	0
DeKeyser, Robert	Co PD/PI	0
Idsardi, William	Co PD/PI	0
Newman, Rochelle	Co PD/PI	0
Boyd-Graber, Jordan	Faculty	0
Dooling, Robert	Faculty	0
Edwards, Jan	Faculty	0
Feldman, Naomi	Faculty	0
Gor, Kira	Faculty	0
Huang, Yi Ting	Faculty	0
Lasnik, Howard	Faculty	0
Lau, Ellen	Faculty	0
Lewis, Shevaun	Faculty	9
Lidz, Jeffrey	Faculty	0
Novick, Jared	Faculty	0
O'Meara, KerryAnn	Faculty	1
Polinsky, Maria	Faculty	0
Preminger, Omer	Faculty	0
Ratner, Nan	Faculty	0
Resnik, Philip	Faculty	0
Uriagereka, Juan	Faculty	0
Wang, Min	Faculty	0
Williams, Alexander	Faculty	0

Name	Most Senior Project Role	Nearest Person Month Worked
Wood, Tess	Faculty	1
Adler, Rachel	Graduate Student (research assistant)	0
Culpepper, Dawn	Graduate Student (research assistant)	3
Ehrenhofer, Lara	Graduate Student (research assistant)	0
Erskine, Michelle	Graduate Student (research assistant)	6
Ettinger, Allyson	Graduate Student (research assistant)	0
Fishbein, Adam	Graduate Student (research assistant)	6
Garbarino, Julianne	Graduate Student (research assistant)	6
Gaston, Phoebe	Graduate Student (research assistant)	6
Green, Jeffrey	Graduate Student (research assistant)	0
Hirzel, Mina	Graduate Student (research assistant)	6
Hitczenko, Kasia	Graduate Student (research assistant)	6
Huang, Nick	Graduate Student (research assistant)	6
Johnson, Allison	Graduate Student (research assistant)	6
Karatas, Nur Basak	Graduate Student (research assistant)	6
Knowlton, Tyler	Graduate Student (research assistant)	6
Li, Yixun Annie	Graduate Student (research assistant)	6
Liter, Adam	Graduate Student (research assistant)	6
Lyskawa, Paulina	Graduate Student (research assistant)	6
Maher, Zachary	Graduate Student (research assistant)	6
Malko, Anton	Graduate Student (research assistant)	5
Muller, Hanna	Graduate Student (research assistant)	6
Ovans, Zoe	Graduate Student (research assistant)	6

Name	Most Senior Project Role	Nearest Person Month Worked
Perkins, Laurel	Graduate Student (research assistant)	6
Rao, Sudha	Graduate Student (research assistant)	5
Shoemaker, Joanna	Graduate Student (research assistant)	6
Yang, Yu'an	Graduate Student (research assistant)	6
Eaves, Caitlin	Other	1

Full details of individuals who have worked on the project:

Colin Phillips

Email: colin@umd.edu

Most Senior Project Role: PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: PI, mentor

Funding Support: NRT, University

International Collaboration: Yes, Germany

International Travel: No

Hal Daume

Email: hal@umiacs.umd.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: Co-PI, Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Robert M DeKeyser

Email: rdk@umd.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: Co-PI, Mentor

Funding Support: University

International Collaboration: No

International Travel: No

William J Idsardi

Email: idsardi@umd.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: Co-PI, Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Rochelle Newman

Email: rnewman1@umd.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: Co-PI, Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Jordan Boyd-Graber

Email: ying@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Robert Dooling

Email: rdooling@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Jan Edwards

Email: edwards@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Naomi Feldman

Email: nhf@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor, key faculty in cognition-computation bridge

Funding Support: University

International Collaboration: No

International Travel: No

Kira Gor

Email: kiragor@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Yi Ting Huang

Email: ythuang1@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor, key psycholinguistics faculty, co-organizer of Winter Storm 2019

Funding Support: University

International Collaboration: Yes, Germany

International Travel: No

Howard Lasnik

Email: lasnik@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Ellen Lau

Email: ellenlau@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor, key cognitive neuroscience faculty, co-organizer of Winter Storm 2019

Funding Support: University

International Collaboration: No

International Travel: No

Shevaun Lewis

Email: shevaun@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 9

Contribution to the Project: NRT program coordinator

Funding Support: NRT, University

International Collaboration: No

International Travel: No

Jeffrey Lidz

Email: jlidz@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor, key language learning faculty, faculty advisor for outreach

Funding Support: University

International Collaboration: Yes, Germany

International Travel: No

Jared Novick

Email: jnovick1@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

KerryAnn O'Meara

Email: komeara@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Lead evaluator

Funding Support: NRT

International Collaboration: No

International Travel: No

Maria Polinsky

Email: polinsky@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor, key language diversity faculty

Funding Support: University

International Collaboration: Yes, Guatemala

International Travel: No

Omer Preminger

Email: omerp@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: Yes, Guatemala

International Travel: No

Nan Ratner

Email: nratner@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Philip Resnik

Email: resnik@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Juan Uriagereka

Email: juan@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Min Wang

Email: minwang@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor

Funding Support: University

International Collaboration: No

International Travel: No

Alexander Williams

Email: alxndrw@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mentor, co-organizer of Winter Storm 2019

Funding Support: University

International Collaboration: No

International Travel: No

Tess Wood

Email: ewood1@umd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Helped organize and manage NRT-related events, including Language Science Day and Winter Storm

Funding Support: University

International Collaboration: Yes, Guatemala

International Travel: No

Rachel Adler

Email: radler1@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 0

Contribution to the Project: Trainee (graduated summer 2018)

Funding Support: University

International Collaboration: No

International Travel: No

Dawn Culpepper

Email: dkculpep@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 3

Contribution to the Project: research assistant for program evaluation

Funding Support: NRT

International Collaboration: No

International Travel: No

Lara Ehrenhofer

Email: ehrenhof@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 0

Contribution to the Project: Trainee (graduated summer 2018)

Funding Support: University

International Collaboration: Yes, Germany

International Travel: No

Michelle Erskine

Email: merskine@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee, chair of Winter Storm organizing committee

Funding Support: NRT

International Collaboration: No

International Travel: No

Allyson Ettinger

Email: aetting@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 0

Contribution to the Project: Trainee (graduated summer 2018)

Funding Support: NSF GRF

International Collaboration: No

International Travel: No

Adam Fishbein

Email: afishbei@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Julianne Garbarino

Email: jgarbari@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Phoebe Gaston

Email: pgaston@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee, co-chair of Research Skills & Collaboration committee

Funding Support: University

International Collaboration: No

International Travel: No

Jeffrey Green

Email: jgreen88@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 0

Contribution to the Project: Trainee (graduated summer 2018)

Funding Support: University

International Collaboration: No

International Travel: No

Mina Hirzel

Email: mhirzel@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Kasia Hitczenko

Email: khit@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: Yes, Japan

International Travel: No

Nick Huang

Email: znhuang@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Allison Johnson

Email: ajohns51@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee, chair of Professional Development committee, leader of student writing group

Funding Support: University

International Collaboration: No

International Travel: No

Nur Basak Karatas

Email: nkaratas@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: Yes, Turkey

International Travel: Yes, Turkey - 0 years, 2 months, 19 days

Tyler Knowlton

Email: tknowlt@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee, chair of Outreach committee

Funding Support: University

International Collaboration: No

International Travel: No

Yixun Annie Li

Email: yixunli@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: Yes, China

International Travel: Yes, China - 0 years, 0 months, 11 days; United Kingdom - 0 years, 0 months, 20 days

Adam Liter

Email: liter@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Paulina Lyskawa

Email: lyskawa@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: Yes, Guatemala

International Travel: Yes, Guatemala - 0 years, 1 months, 0 days

Zachary Maher

Email: zach@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Anton Malko

Email: amalko@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 5

Contribution to the Project: Trainee (graduated December 2018)

Funding Support: University

International Collaboration: Yes, Russian Federation

International Travel: No

Hanna Muller

Email: hmuller@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Zoe Ovans

Email: zovans@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee, co-chair of Research Skills & Collaboration committee

Funding Support: NSF GRF

International Collaboration: No

International Travel: No

Laurel Perkins

Email: perkinsl@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: No

Sudha Rao

Email: raosudha@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 5

Contribution to the Project: Trainee (graduated December 2018)

Funding Support: University

International Collaboration: No

International Travel: No

Joanna Shoemaker

Email: joshoe@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: NRT

International Collaboration: No

International Travel: No

Yu'an Yang

Email: yuanyang@umd.edu

Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 6

Contribution to the Project: Trainee

Funding Support: University

International Collaboration: No

International Travel: Yes, China - 0 years, 1 months, 11 days

Caitlin Eaves

Email: ceaves@umd.edu

Most Senior Project Role: Other

Nearest Person Month Worked: 1

Contribution to the Project: LSC Business Manager

Funding Support: University

International Collaboration: No

International Travel: No

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
American Association for the Advancement of Science	Other Nonprofits	Washington, DC
American Council on the Teaching of Foreign Languages	Other Nonprofits	Alexandria, VA
Paul Public Charter School	School or School Systems	Washington DC
Planet Word Museum	Other Nonprofits	Washington DC
Prince George's County Schools	School or School Systems	Maryland
US Dept of Defense	Other Organizations (foreign or domestic)	Washington DC
Wuqu Kawoq Maya Health Alliance	Other Nonprofits	Boston, MA & Guatemala
DC Language Immersion Project	Other Nonprofits	Washington, DC
Expert Systems	Industrial or Commercial Firms	Rockville, MD
Helmholtz Association	Other Nonprofits	Germany
Linguistic Society of America	Other Nonprofits	Washington DC
Montgomery-Blair High School	School or School Systems	Silver Spring, MD

Name	Type of Partner Organization	Location
North American Computational Linguistics Olympiad	Other Nonprofits	Pittsburgh, PA
Northwood High School	School or School Systems	Silver Spring, MD
Paint Branch High School	School or School Systems	Burtonsville, MD

Full details of organizations that have been involved as partners:

American Association for the Advancement of Science

Organization Type: Other Nonprofits
Organization Location: Washington, DC

Partner's Contribution to the Project:
 Other: Staff expertise, outreach support

More Detail on Partner and Contribution: Erin Heath (Associate Director for Govt Relations) participated in our science policy forum, and the Future STEM Leaders meeting. AAAS hosted Family Science Days, where our team was a key contributor to the Language Science for Everyone exhibit.

American Council on the Teaching of Foreign Languages

Organization Type: Other Nonprofits
Organization Location: Alexandria, VA

Partner's Contribution to the Project:
 Other: Host for student policy internship

More Detail on Partner and Contribution: Hosted Jeff Green for a policy internship in summer 2017

DC Language Immersion Project

Organization Type: Other Nonprofits
Organization Location: Washington, DC

Partner's Contribution to the Project:
 Other: Host for trainee policy internship

More Detail on Partner and Contribution: Hosted trainee Nick Huang for policy internship in summer 2018.

Expert Systems

Organization Type: Industrial or Commercial Firms
Organization Location: Rockville, MD

Partner's Contribution to the Project:
 Other: Career development support

More Detail on Partner and Contribution: Dr Scott Fults participated in Winter Storm careers forum

Helmholtz Association

Organization Type: Other Nonprofits

Organization Location: Germany

Partner's Contribution to the Project:

Other: Host for trainee policy internship

More Detail on Partner and Contribution: Hosted Lara Ehrenhofer for a policy internship in summer 2017

Linguistic Society of America

Organization Type: Other Nonprofits

Organization Location: Washington DC

Partner's Contribution to the Project:

Other: Science policy partner

More Detail on Partner and Contribution: Collaborate on science policy and public engagement, consultant to Future STEM Leaders meeting

Montgomery-Blair High School

Organization Type: School or School Systems

Organization Location: Silver Spring, MD

Partner's Contribution to the Project:

Other: Outreach partner

More Detail on Partner and Contribution: Bilateral visits for language science outreach

North American Computational Linguistics Olympiad

Organization Type: Other Nonprofits

Organization Location: Pittsburgh, PA

Partner's Contribution to the Project:

Other: Outreach partner

More Detail on Partner and Contribution: NACLO is the umbrella organization for a language-focused olympiad. We served as a host site, and also contributed logistical support to the organization.

Northwood High School

Organization Type: School or School Systems

Organization Location: Silver Spring, MD

Partner's Contribution to the Project:

Other: Outreach partner

More Detail on Partner and Contribution: Bilateral visits for language science outreach

Paint Branch High School

Organization Type: School or School Systems

Organization Location: Burtonsville, MD

Partner's Contribution to the Project:

Other: Outreach partner

More Detail on Partner and Contribution: Bilateral visits for language science outreach

Paul Public Charter School

Organization Type: School or School Systems

Organization Location: Washington DC

Partner's Contribution to the Project:

Other: Outreach Partner

More Detail on Partner and Contribution: Bilateral visits for language science outreach

Planet Word Museum

Organization Type: Other Nonprofits

Organization Location: Washington DC

Partner's Contribution to the Project:

Other: Joint planning of museum activities

More Detail on Partner and Contribution: Planet Word is the first major US museum dedicated to language. It is due to open in 2019 in downtown Washington DC.

Prince George's County Schools

Organization Type: School or School Systems

Organization Location: Maryland

Partner's Contribution to the Project:

Other: Science Fair sponsor

More Detail on Partner and Contribution: Sponsored ATLAS STEM fair

US Dept of Defense

Organization Type: Other Organizations (foreign or domestic)

Organization Location: Washington DC

Partner's Contribution to the Project:

Other: Science policy panel

More Detail on Partner and Contribution: Erin Fitzgerald participated in Winter Storm science policy panel

Wuqu Kawoq Maya Health Alliance

Organization Type: Other Nonprofits

Organization Location: Boston, MA & Guatemala

Partner's Contribution to the Project:

Collaborative Research

Personnel Exchanges

More Detail on Partner and Contribution: Partner on our field station in Sololá, Guatemala, connecting minority languages to health.

What other collaborators or contacts have been involved?

Nothing to report

Impacts

What is the impact on the development of the principal discipline(s) of the project?

It is difficult to draw a clear line between the grassroots community that hosted an IGERT program (2008-2015), the university-wide center that grew out of that program (2013-) and the NRT program that the center now hosts (2015-2020). They are part of a continuous effort, which has had interdisciplinary graduate training at its heart. These efforts have had clear impacts on the development of language science as an integrated field.

Nationally, the success of Maryland's language science group and its graduates has drawn attention, especially in the field of linguistics. Departments have diversified their hiring, and graduate curricula are starting to evolve to reflect this, and the pace of change is accelerating. Phillips frequently serves as a consultant on graduate program reform, and new programs and initiatives are being formed at other institutions that are modeled on what our team has done.

Nationally, the success of our outreach programs contributed to the creation of the multi-institution Language Science for Everyone network, which is expanding disciplinary interest in public engagement. This network has coordinated activities that serve thousands of children and families, and it has created an online resource guide for language science outreach.

What is the impact on other disciplines?

Our training practices and results influence programs in other disciplines at UMD, to a greater degree now that we are more integrated into university-level graduate training initiatives. Nevertheless, these impacts remain limited, as student training models are so strongly influenced by disciplinary peers.

Our training model has some impact on other disciplines via other NRT programs. By making all of our materials publicly available, including our proposal and reviews, our practices are readily visible to teams that are preparing NRT proposals. That is probably the time at which teams are the most receptive to outside suggestions, as they are the most motivated. Also, we were able to influence other disciplines via our hosting of the 2016 NRT Teams meeting at UMD. Both our organization of the meeting and the thematic focus reflect our findings about best practices in graduate training.

What is the impact on the development of human resources?

GRADUATE STUDENTS BENEFITED

There were 20 trainees enrolled in our NRT program during this reporting period. 7 of these have received NRT stipends already (1 during this reporting period), and 4 will receive the stipend during the next reporting period.

We serve a much broader group of graduate students through our various events and courses. For example, over 50 graduate students participated in Winter Storm in January 2019, and about 70 graduate students attended Language Science Day in September 2018.

TRAINEE ACHIEVEMENTS/OUTCOME

- i. Kasia Hitzcenko and Laurel Perkins (both Linguistics) are both completing their PhDs in 2019 and going on to excellent postdoc positions that will build on their training that bridges cognitive development and computational modeling. Hitzcenko's PhD research made breakthroughs in understanding how human infants can identify the speech sound categories of the language around them based on naturalistic speech. (Previous research relied on less naturalistic, lab-generated recordings.) She is going to a postdoc at Northwestern in linguistics, where she will also teach a course that bridges linguistics and computer science. Perkins' PhD research combined modeling with infant experimentation to understand how early learners figure out the word order patterns of their language. She is going to a postdoc in Paris where she will continue to combine experimentation and modeling.
- ii. Annie Li (College of Education) has benefited greatly from her involvement with the NRT program, particularly because she is based in a very small research group in a department that focuses mostly on applied research. She is investigating implicit learning mechanisms involved in the process of learning to read in a second language. She is carrying out large-scale collaborative studies on school children in China learning to read in English, as well as studies with adults in the U.S. Her involvement with the NRT program is helping her develop the psycholinguistic aspects of the research. During Winter Storm, she led a discussion group on "Reading as Statistical Learning," which drew participants from Hearing & Speech Sciences as well as Education. She has been an enthusiastic participant in the student writing groups, and has had an extraordinarily productive year: she successfully applied for a grant from the Spencer Foundation, submitted 4 journal articles as the first author, and has several more in preparation.
- iii. Adam Fishbein (Neuroscience & Cognitive Science) has been pursuing a research program at the intersection of comparative cognition, neuroscience, and theoretical linguistics. He is interested in potentially shared cognitive mechanisms underlying pattern learning in songbirds and language in humans. He began with a series of behavioral studies on the processing of patterns in birdsong by zebra finches and budgerigars. Interestingly, the birds are often insensitive to alterations in the sequence of song "syllables", which are quite noticeable to humans. However, his recent behavioral and electrophysiological work has demonstrated that the birds are extremely sensitive to the temporal fine structure of the auditory signal--differences that are often imperceptible to humans. The research leads to no easy conclusions about the evolution of language. But Adam has persisted in drawing on linguistics as well as psychology/neuroscience to inform his research. He is co-advised by faculty in Psychology and Linguistics, and has TA'ed an undergraduate seminar in Linguistics on "biophysics of language."

BROADENING PARTICIPATION

In our current group of 19 NRT students, 14 are women, 5 are international, and one is African American. The demographics of our trainee group are similar to those of our participating units (although women are perhaps overrepresented).

- i. Women are underrepresented in computer science in general, but they are not a minority in our computational group. It certainly helps that we can offer strong mentorship from successful female faculty, but male faculty also help through their words and deeds. For example, co-PI Hal Daumé published a series of blog articles celebrating the work of female computer scientists and how they influenced his research. The linguistics-CS bridge contributes, as a number of female

students from linguistics have joined the computational linguistics research group. And the fact of having strong female students doing computational research becomes a self-fulfilling prophecy, as it helps to attract more female students.

ii. In our community there is now a greater emphasis on and respect for research with direct applications for underserved populations in the US (ToggleTalk, Language Poverty) and internationally (Guatemala). Also, in the current political climate more students are trying to connect their work with social justice issues. These have led to a subtle but noticeable shift in attitudes toward applied research in general, and have contributed to our ability to recruit a more diverse student population.

iii. We continue to make contact with minority students in local high schools through our outreach activities. We do not expect this to lead to direct impact on the diversity of our graduate program, but it is nevertheless valuable to engage with large numbers of minority students and to contribute to interest in college and science careers.

What is the impact on physical resources that form infrastructure?

In January 2017 the Language Science Center relocated to new space in the fully renovated HJ Patterson Building, in the center of the U of Maryland campus. The 4500 sq. ft. facility had been in development for 2 years, and it would not have been possible without the success of our graduate training efforts and our internationalization plans. This facility, with ample space for large and small events and group activities, has become a hub for language science community activities at UMD, including the NRT program. We have hosted large events like Winter Storm and the workshop on Language and Poverty, as well as the regularly scheduled meetings like the weekly Language Science Lunch Talks, cross-listed courses, lab meetings, reading groups, and committee meetings. Some students utilize the space regularly to meet with collaborators or as a quiet space for writing. It is also an ideal place for meetings with external partners, such as our quarterly briefings with government agencies, or our partners at the in-development Planet Word museum in downtown Washington DC.

What is the impact on institutional resources that form infrastructure?

Our graduate training efforts have had a major impact on institutional resources that create infrastructure. They have led to new hires across multiple departments, at the junior and senior levels. (During this reporting period, they played a significant role in the retention of a critical faculty member in linguistics and computer science.) They have led to staff who provide high level support for interdisciplinary research. And they have fostered diverse new partnerships, locally, nationally, and globally.

In focus groups for program evaluation, faculty attribute significant benefits and progress to the NRT program and related efforts by the Language Science Center. The NRT program has facilitated opportunities for language science faculty to become familiar with each other and identify potential areas for collaboration. Faculty have, for example, co-taught courses with faculty from other departments, and have frequent opportunities to present their research to a multi-disciplinary community. In some departments, the NRT program and Language Science Center have helped shift expectations about faculty service roles and the value of interdisciplinary research. However, the progress has been uneven across departments, and some faculty still perceive institutional constraints on their time that undermine their ability to participate in Language Science Center activities.

This year our evaluation team also conducted interviews with six institutional informants—key UMD administrators, graduate school staff, and faculty involved in the NRT program. They believe that the Language Science Center (LSC) and its NRT program (and IGERT before that) have strategically capitalized on pre-existing inclinations towards interdisciplinary research in the language science community. The LSC and NRT/IGERT have strengthened pre-existing connections, increased the visibility of units doing interdisciplinary work, and have provided central administrative support that facilitates collaborations that may not have happened otherwise. The university administrators also noted the impact of the language science programs on developing other successful interdisciplinary programs at UMD. However, they note that at the university level, any movement towards interdisciplinary research has been driven by funding, rather than responsive to actual change in institutional culture. There is still a lack of centralized, institutional support for interdisciplinary graduate training. There is a real concern that once grants like the NRT come to an end, the university will fail to provide more permanent funding, and the LSC (and other similar centers on campus) will lose their ability to provide quality programs.

What is the impact on information resources that form infrastructure?

The primary information resources from our program are the materials that we publicly share about our training efforts and our outreach programs, and the Langscape online portal that aggregates expertise on the world's 6000 languages (langscape.umd.edu).

What is the impact on technology transfer?

Nothing to report.

What is the impact on society beyond science and technology?

We approach language from a science and technology perspective, but language is important for many different aspects of society. Our trainees are engaged in various ways in connecting the science of language to broader societal concerns. They do this via K-12 and public outreach programs, via more targeted efforts to contribute to literacy and other educational efforts, and via research that has direct societal implications. For example, some of our trainees are involved in research on dialect mismatch training in the schools, testing ways to help African American K-1 children navigate the different varieties of language that they need to succeed in different spheres of life.

Changes/Problems

Changes in approach and reason for change

Nothing to report.

Actual or Anticipated problems or delays and actions or plans to resolve them

In the past year we have become aware of a number of challenges involving how students and their mentors understand program objectives and implementation. This has led to dissatisfaction among at least one group of students, and this has affected overall engagement levels from those students. We are taking multiple steps to address these challenges, mostly involving better communication with different participants.

- i. Student agency. Students' control over their own training has always been a core value for our NRT program, and for our IGERT before that. This applies to individual student plans, as well as to the way that the training program overall is run. We see much greater engagement when students feel ownership of the program. With a program that has been around in some form for over 10 years, and institutional structures that have been built around the training program (the Maryland Language Science Center), we have made efforts to keep student leadership and innovation strong. However, this may have backfired in some cases. We feel that we are encouraging students to think differently and not simply do things in the way that they have been done by their predecessors. We sometimes feel that we are guiding students to navigate around approaches that have been unsuccessful in the past. But this is sometimes perceived as directive on our part, depriving students of the very agency that we are hoping to encourage.
- ii. Disciplinary cultures. Different scientific fields have different norms for how people interact, how people give feedback, and how they frame criticism. They also have different bodies of shared knowledge, unsurprisingly. Also, candid scientific feedback often depends on a foundation of trust, if it is to be understood as constructive rather than as a personal attack. We have encountered some challenges relating to how students and faculty from different disciplinary groups engage in an interdisciplinary setting. This has been most visible in our Language Science Lunch Talks, a staple of our program's weekly calendar, where students explain their work to audiences of 30-50 students and faculty. But it is not exclusive to that setting. Members of one group may feel that they are engaging with the presenter in a restrained and respectful manner, while another group may perceive the exact same interaction as aggressive. Some faculty feel that certain claims from a student from another field simply cannot go unchallenged, or that their own students are compromising their work when they try to make it accessible to students from other fields.
- iii. Program evaluation. Students' concerns about other aspects of the program have spilled over into the evaluation process. In focusing on systematically addressing a predefined set of evaluation goals, there is less opportunity for students to convey general and miscellaneous concerns. This can lead them to feel, probably correctly, that program evaluation efforts are not focusing on the issues that they are most concerned about right now. And therefore that they are not being listened to, or even that their views are being mis-represented.

We are taking these issues very seriously. We do not think that there are fundamental differences in shared values or objectives. But it is clear that some misunderstandings have arisen, and in some cases they have been made worse because they were not addressed early enough. Key steps are:

a. We are taking specific steps, together with our evaluation team, to help students understand what the research-grade evaluation is and is not trying to do. And we are also working to create additional channels, independent of the evaluation team, to allow students to give feedback on any topics that might concern them.

b. Navigating different disciplinary styles and values requires multiple steps. We will more explicitly highlight the fact that these differences exist, and encourage students to discuss how to navigate this. It may be helpful that our students are already very aware of cross-language and cross-cultural differences, so they should have the tools needed to apply this understanding to their own day-to-day interactions. At the same time, we must continue to work to build the trust across groups and the awareness of what knowledge is and is not shared among them, in order for the interactions to work more effectively.

c. For addressing concerns about student agency, we need to have open discussions with students about what is and is not expected of them, and what are the benefits of activities that they may be apprehensive about participating in. We need to have more shared discussions with students' mentors, so that it is possible to align recommendations, and so that faculty do not feel that program leaders are at odds with them. We need to have more discussions with students in a group setting, so that there is broader awareness of shared values. We have had many discussions with students on an individual basis, assuming that this is good for addressing individual needs. But this has led to some messages either not spreading far enough, or being misinterpreted.

Our evaluation report comments on some concerns about support from campus administration for interdisciplinary research and training -- some of these concerns voiced by the leaders themselves. We do not regard this as a unique feature of our institution, more a consequence of the way that resources are governed by traditional academic units (departments, colleges). Also, in some ways we have received quite remarkable levels of support for our efforts. While we have limited ability to change ingrained structures, we are doing what we can to support other interdisciplinary initiatives on campus, secure support for our own program after the NRT grant ends, and inform administration about the barriers to interdisciplinary work.

a. We continue to advise groups that are interested in building interdisciplinary programs or initiatives similar to ours.

b. We volunteered to be among the first centers to undergo a new review process, and are currently in the midst of a self study. Our report highlights the challenges facing broad interdisciplinary efforts like ours, despite their positive impact on research and graduate training.

c. Phillips gives a talk every year to ~1,500 new grad students from across the university, highlighting interdisciplinary opportunities.

d. LSC staff are involved in various other programs, centers, and committees, and we make efforts to highlight measures that can help interdisciplinary initiatives succeed. Phillips is an Associate Director of the Neuroscience and Cognitive Science program, was involved in the creation of the Brain & Behavior Initiative, and has been on various research committees on a college and campus level.

e. We are working on written pieces for a broad audience that will highlight lessons learned.

f. Our biggest goal is to ensure that what we have created continues to be sustainable and scalable, and we are doing multiple things to this end, including meetings with stakeholders, adjusting our priorities, and refocusing our communications.

Changes that have a significant impact on expenditures

Nothing to report.

Significant changes in use or care of human subjects

Nothing to report.

Significant changes in use or care of vertebrate animals

Nothing to report.

Significant changes in use or care of biohazards

Nothing to report.