

# Maryland Language Science Center Self Study 2019

September 17, 2019



Language  
at Maryland

## Self Study Committee

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# Executive Summary

The Maryland Language Science Center (LSC) was created with the aim of making the University of Maryland a world leader in the science of human language. It is an experiment in how to connect broad research and education efforts that span much of the university.

LSC was launched in 2013, building on a successful grassroots community that had formed around graduate training. In institutionalizing this community LSC took on a more ambitious mission, to support research, education, and partnerships that advance the fundamental science of language, and applications in education, technology, and health. LSC serves around 300 UMD researchers in 17 units that range from elementary education to electrical engineering. LSC's scope of activities makes it quite unusual as an interdisciplinary center, and almost unique as an approach to language science.

LSC was launched with many specific plans, together with significant commitments from the Provost, VPR, and many colleges and departments. The plans have been substantially realized: the planned faculty leadership hires brought outstanding talent to multiple areas, and came very close to a 100% success rate in recruiting. The planned dedicated space for LSC came only after a few years, but the results exceeded expectations. Many aspects of research, education, or broader engagement that we thought of as exceptional a few years ago are now regarded as normal. LSC has helped to attract new talent to UMD in many fields, at all levels, and it has helped to raise the profile of some departments.

LSC's [research](#) role includes many different types of activity. In some cases LSC takes the lead in coordinating complex initiatives that are beyond the scope of an individual investigator. This has been extremely successful for interdisciplinary projects involving a relatively small number of investigators, such as the Guatemala Field Station or the UMD Toggle Talk Project. It has thus far been less successful for ambitious many-investigator funding proposals for projects worth tens of millions of dollars. In some cases LSC contributes to projects in specific ways, ranging from pre-award support to hosting research testing to organizing or hosting events and courses that develop new collaborations. In other cases LSC has no immediate role in a project, the project depends on the faculty and student talent that is attracted to UMD by the outstanding environment for language science. Therefore, the research impact of the language science initiative is seen in diverse ways that are not easily captured in a simple number of dollars or publications.

Two research areas that have seen significant development in recent years are (i) the intersection of **language and computation**, including computational modeling of human cognitive and neural processes, and (ii) the intersection of fundamental and applied research on **language and health**. These areas have seen robust growth in activity and talent. Research on language diversity at UMD is also significantly stronger than it was 6 years ago, thanks to new talent. Research in education and second language acquisition has followed a more uneven

trajectory, due to arrivals and departures of key personnel and the shifting fortunes of the Center for Advanced Study of Language.

LSC's role in [graduate and undergraduate education](#) is one of its core strengths. LSC does not currently offer degree programs, though this is a possibility for future consideration at the undergraduate level. LSC aims to attract outstanding talent to existing graduate and undergraduate degree programs, and prepares them to be leaders in diverse careers. It takes the aim of innovating in education very seriously, and it has experimented with many new approaches. A key focus of LSC's approach is to support student agency, allowing students to take ownership of their training, individually and collectively.

At the [graduate level](#) LSC was the first group in the country, in any field of science or engineering, to win training grants through both NSF's IGERT and NRT programs. Thanks to \$6M in NSF support from 2008-2021, approximately 100 PhD students from 10 departments will have been trained. Two additional awards based in the College of Education (PRoPELL and Project RISE) built in part on LSC's experience in securing training grants. Language science graduates are being placed in strong positions and they play a key role in expanding the reach of our training model. A key challenge for the coming years is to not lose momentum after NSF support concludes.

At the [undergraduate level](#) the PULSAR degree notation program has been very successful on a small scale, enriching the experience of a select group of outstanding students. LSC now faces a key choice on whether and how to build upon this small-scale success to develop new programming that can make UMD the talent magnet for undergraduate language scientists that it already is at the graduate and faculty levels. Possibilities include a living-learning program, interdisciplinary degrees in high-demand areas such as language and computation, or a focused individualized studies program.

LSC's [partnerships](#) encompass many different activities that enable the community to do things that it could not do alone. Managing partnerships is a natural role for LSC, because it provides a single contact point representing a broad range of expertise, rather than a messy web of connections between a shifting cast of individuals and departments. These partnerships range from academia to NGOs, and are on a scale that ranges from local to national to global. LSC has partnered with local school districts on education research. It has partnered with international NGOs on projects that link language with health and other humanitarian needs. It has worked to raise the public understanding of language science, in collaboration with local public schools and the new Planet Word museum in Washington DC, due to open at the end of 2019. LSC has supported various efforts to work with US Government agencies, especially on projects relating to language diversity, such as the Langscape online portal. LSC also worked with the Office of International Affairs and academic partners around the world to develop plans for a global language science initiative (GRAIL) that would serve as a model for aligning internationalization goals of institutions, researchers, and students, and would be a key contributor to UMD's role in the Universitas 21 global alliance.

At best LSC's partnerships have made it possible to pursue creative projects that would have been unimaginable before LSC was created, benefiting from the scale of the community and the high level staff support. At other times it has been challenging to get the partnership projects to reach a sustainable level, due to shifting priorities in the partner organizations and due to LSC being pulled in too many directions.

### **Organization, Infrastructure, Sustainability.**

LSC's **oversight model** has proven to be mostly effective. LSC reports to the deans of ARHU and BSOS, who act on behalf of a larger group of deans plus the VPR and Provost. LSC works closely with both colleges, who have combined their expertise to support LSC. This approach makes it clear that LSC is a multi-college initiative without creating an unworkable oversight structure. However, decisions that have required coordination among the larger group of deans and VPs have sometimes proven challenging. In some instances this has led to misunderstandings that have caused significant lapses in operating support.

LSC was created with a clear vision but **no clear mandate**. It serves many functions for the broad language science community, and in many regards it has assumed the role of leading and representing that community. But it has no formal role. This creates various challenges in terms of representing the community, community ownership, and tracking of contributions. This has been particularly acute in the area of **university-government** relations involving LSC and the UARC formerly known as the Center for Advanced Study of Language (CASL, now ARLIS). Much could be gained from a formal clarification of LSC's role.

The **(shared) governance** model for LSC has a mix of strengths and weaknesses. It builds on unusually strong foundations for a broad initiative, but as the size and scope of the initiative has grown some elements have not scaled easily.

LSC grew from an intellectually vibrant grassroots community, with Colin Phillips as the most prominent cheerleader among a larger group of faculty supporter, drawing energy from an unusually engaged group of student leaders. We have tried to retain this as the community was institutionalized to form LSC. At best, LSC thrives because intellectual leaders in multiple fields and at multiple levels (faculty and students) enthusiastically share LSC's goals and values. As the reach and mission of LSC has expanded there has been erosion in this sense of shared purpose in some quarters, and this has created some challenges. These growing pains have probably been worse than they need to be due to the lack of a formal role for LSC.

The role of **LSC Director** Colin Phillips is both a strength and a weakness. Phillips brings a combination of scientific success, a broad vision for language science, and energy, plus deep institutional knowledge and diverse connections. But too much has depended on him, leading to bottlenecks, which in turn create further centralization and sometimes frustration. The campus-wide language science initiative should not be built around one individual and there

need to be ways to effectively share and rotate leadership. Broadening leadership has been a central goal since before the creation of LSC, but progress has been slower than hoped. In the absence of a clear mandate, much of LSC's work has depended on broad institutional knowledge and community connections. Individuals who have that experience tend to get tapped for other leadership roles. And for newer recruits it is difficult to get up to speed.

Engaged **student leadership** was the key to the success of the NSF IGERT training grant (2008-2015) that laid the groundwork for LSC. Following the institutionalization of LSC, it has proven difficult to sustain that leadership, despite many outstanding contributions by students. Finding the right level of ownership and responsibility within the larger and more opaque organization (LSC) is not easy. A heightened emphasis on diverse career pathways and professional skills development, consistent with broader trends in graduate education, has been met with a mix of enthusiasm and apprehension.

There is broad agreement that LSC could benefit from an **advisory structure** involving a mix of academic and non-academic experts and supporters. This would bring regular review and opportunities for the community to take stock of progress, accomplishments, and challenges. It could also open doors for new connections and funding opportunities. Some outstanding advocates, academic and non-academic, have been identified and reached out to. But as long as other priorities were more pressing, it has been difficult for this process to gain traction.

LSC's dedicated **space** in HJ Patterson Hall is excellent, and it is a significant contributor to the goals of the language science initiative. Much time in Years 1-4 was dedicated to finding, designing and building the space. In that time LSC occupied makeshift space in the basement of Taliaferro Hall. The delay slowed momentum, but the end result has exceeded expectations. The space is central, flexible, and inviting. It is extensively used by diverse groups for planned and impromptu events and meetings, in addition to hosting staff, visitors, and limited research. It is a clear focal point for the community.

LSC's **funding model** has revealed strengths and weaknesses. The aim is for LSC to support a sustainable university-wide initiative in many more ways than just managing grants and contracts. This includes LSC's role in the university's educational mission. LSC does this in a setting where most financial resources are tied to departments and self-contained research centers, including faculty salaries, tuition revenue, and most grant activity. This makes it difficult to account for LSC's activity and contributions.

As detailed in the [financial overview](#), LSC's core operations (\$300k/year) provide a foundation for a much larger body of research and education activity. LSC manages \$2 million of activity annually, including over \$1 million in grant funding. It has directly contributed to the generation of additional grant funding in at least 10 other units that does not flow through LSC accounts (e.g. by recruiting/retaining faculty, facilitating collaborations, supporting grant applications, etc.). The overall scope of language science research at UMD exceeds \$20M annually.

At its best, LSC works to the benefit of many different parts of the university, which in return jointly contribute to funding LSC. This occurs in a non-transactional fashion, allowing LSC to focus on multiple types of impact on many different groups. The fruits of these efforts often flow to departments and colleges and are invisible in LSC's balance sheet, but LSC's supporters understand and value LSC's contributions. But in many cases the model works less well. LSC's contributions may be invisible, leading to a perception of ineffectiveness. Or LSC faces pressure to prioritize revenue potential at the expense of academic impact, contributing to erosion of trust within the community -- LSC is perceived as a "sell out". Or LSC spends much of its time working to try to keep its core operations afloat rather than focusing on achieving its mission.

Hard-budgeted salaries for a number of tenure-track faculty flow in part through LSC. This arrangement was created to ensure that the cross-appointments would be truly shared across units, and so that departments could not easily repurpose the positions for other needs (making the cross-appointments 'sticky'). This model works well, though these resources have not yet been sufficiently leveraged to benefit LSC's operations.

LSC's core operations have been supported primarily through soft-funded positions. Two full-time positions and a 25% director position were supported by colleges, VPR and Provost in Years 1-3 and 5. An additional full-time position has been supported by the NSF training grants, which end in 2021. Campus funds were not received in Year 4 due to a misunderstanding of LSC's accounts, although a partial reimbursement was received later, and they were not received in Year 6 while this review process has been underway. These uncertainties have significantly undermined morale. Phillips has been serving as director without a contract since August 2018, and this also led to loss of support for a position that supports his research group.

LSC is at a critical juncture. In terms of faculty and students, LSC has never been stronger. LSC has a critical mass of highly engaged faculty across many different departments, and a broadening group of highly engaged students. However, uncertainty over funding and the lack of a clear mandate have taken a toll on the leadership, key personnel, and on the community. The NSF training grant that has sustained the key graduate training activities will end in 2021 after 13 years, and it is not renewable. LSC does not currently have the stability that would be needed to enlist a strong successor to Phillips as director. Now is the time to establish long-term plans to secure the future of LSC, including solidifying its mandate, so that the gains of the past 15 years are not lost.

### **Need for External Review**

The committee found the self-study process to be highly informative. It brought into focus both the accomplishments of the past 6 years and the challenges that the language science community faces. The committee concluded that an external review of LSC should be an important next step. Only such a process will provide the focus and the perspective to chart a sustainable future trajectory in language science for the University of Maryland.





UNIVERSITY OF MARYLAND'S 10TH ANNUAL

# LANGUAGE SCIENCE DAY 2019

Friday, September 20

12 PM to 5 PM

Maryland Language Science Center

2130 H.J. Patterson Hall



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# Introduction

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The Maryland Language Science Center (LSC) was established in 2013 as the latest phase in a process that started 15-20 years ago, with the goal of making the University of Maryland a world leader in the scientific study of language. This self-study is a report on progress towards that goal.

LSC is also an **experiment** in building a broad interdisciplinary research community. The many fields that share an interest in human language are diverse in their aims and scientific cultures. They span much of the university, from elementary education to electrical engineering. There is no straightforward recipe for how to build such a broad community. In many respects the LSC effort also amounts to creating a new field: 'language science' is a new term, and the notion that an institution is "strong in language", rather than in individual sub-areas, is unusual.

LSC's strategy, which includes a strong focus on interdisciplinary student training and external partnerships, reflects our **hypotheses** about the ingredients that are needed for success: a simple, inclusive vision; integration of education and research; shared ownership; shared values; and responding to local context. This report describes the hypotheses, and offers an assessment of the progress made towards implementing them and testing their effectiveness.

Beyond the field of language science this university, together with many other universities nationally and internationally, has a strong interest in interdisciplinary research that cuts across traditional boundaries, and in new, flexible educational approaches. UMD also has an interest in engaged scholars and scientists who are active in the surrounding community and working to address societal challenges. LSC is an unusually well-developed example of an attempt to do all of these things. As such, it can serve as a valuable model, as UMD and other institutions attempt similarly broad interdisciplinary efforts.

LSC's path has combined long-range intentional planning over the past 15+ years with opportunistic development, responding to threats and opportunities as they arise. Therefore, it is timely to examine which aspects of the organization make sense and which are ripe for reconsideration.

## Current membership

LSC serves language scientists throughout the University of Maryland, including tenure-track and professional track faculty (clinical faculty, research scientists, lecturers), undergraduate and graduate students. 'Language scientists' are anybody who works on human language in a systematic fashion, including fundamental science, applied science, and engineering.



Language scientists can be found at the University of Maryland in around **17 different academic units** in at least 5 colleges (ARHU, BSOS, CMNS, EDUC, iSchool)). There is no formal mechanism for units to affiliate with LSC. An academic unit is treated as part of the LSC community simply by virtue of having faculty or students who participate in the community. LSC “penetration” varies by department, with some departments maintaining more active involvement (or involvement by a larger proportion of its members) than others. LSC’s relationship with different units is described in [Organizational Relationships](#) below.

The LSC reaches about **130 UMD faculty** (TTK and PTK) through communications and events. A current list is included as an appendix. ‘Membership’ in LSC is a flexible notion. There is a formal mechanism for faculty to hold 0% appointments in LSC; currently about 90 faculty do so. But LSC currently makes no practical distinction between faculty who have gone through this process and faculty who have not. There are currently 9 faculty who hold more than a 0% appointment in LSC (ranging from 25% to 100%). All are part of the leadership team of the LSC or the Guatemala Field Station. Many more faculty with 0% appointments actively contribute to LSC, as described in the section on [faculty leadership](#).

The LSC reaches around **170-200 students** through communications and events. About 40 graduate students are officially affiliated with LSC by having joined the [Language Science Fellows](#) program. About 20 undergraduate students are currently participating in [PULSAR](#). These affiliations are certainly meaningful, as they come with commitments from LSC and from the student. But almost all events are open to all students, and all are encouraged to identify as part of the language science community. The majority of students who participate in LSC activities or [student leadership](#) do so without the promise of financial support from the LSC.



*Students from Linguistics, Education, Computer Science, HESP at Winter Storm 2018*

# Mission

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**LSC's mission statement is:**

“Advancing an integrated science of language, through research and training that links fundamental science with applications in education, technology, and health.”

This mission statement has several key elements:

**Advancing an Integrated science:** The aim is to provide a focal point for UMD's expertise in language science, which reaches across the university, from Education to Engineering. The breadth is almost unique among language initiatives worldwide. And by “advancing the science” LSC aims to help create a new integrated science of language, rather than simply contributing to a pre-existing field. There is widespread skepticism that this is feasible or even worthwhile.

**Research and training:** LSC is deliberately not only a research unit. Integration of research and education is a core part of LSC's philosophy. This differs from centers that have a primary focus on research.

**Fundamental science and applications:** Fundamental science can be linked with applications in multiple ways. This includes application-driven research into technological, clinical, or educational tools. It includes applications of language science research in (broad) public engagement and more targeted public policy efforts.

## Goals

LSC pursues the following specific goals in service of its mission.

- **Research**
  - Environment: Foster a vibrant, diverse, multidisciplinary research community at UMD, including talented individuals as well as strong departments and programs.
  - Specific projects: Lead or support large-scale research initiatives addressing complex scientific questions and societal needs in communication, education, health, technology, and security.
- **Education**: Provide innovative interdisciplinary education at the graduate and undergraduate level, preparing students to be leaders in diverse careers.
- **Partnerships**: Establish local, national, and international partnerships and infrastructure to enhance research and training.
- **Dissemination**:
  - Language Science: Inform the general public and policymakers about language, language science and the scientific process.

- Interdisciplinary: Identify and share sustainable models for interdisciplinary research and education to benefit the broader scientific and academic communities.

LSC's goals align well with the **broader goals of the University of Maryland**.

There are many benefits to being an international leader in an area of scholarship, especially a broad one. Language science is an area where this is conceivable for UMD, because of the early mover advantage.

UMD professes a commitment to "fearless ideas". (This is a slogan that has been central in the university's marketing for many years.) This presumably means a commitment to taking risks on things that are not yet sure bets. This is exactly the strategy that guided the creation of a language science initiative. It is not a field that is on everybody's list of priorities or sure bets, but it is one where UMD could be highly successful.

UMD wants to be seen as an innovator in education and career preparation. The UMD language science community has an excellent record of innovation in graduate education, and it is working to extend its success to undergraduate education.

UMD takes seriously its land grant mission and aims to have engaged scholars who are making a difference beyond the university, locally, nationally, and globally. Developing and supporting engaged scholars is one of LSC's core values.

UMD wants to support broad, cross-cutting scholarship that is not confined by traditional academic boundaries. LSC aims to be a model of how to do this.

UMD wants to be globally visible and engaged. In fact, UMD probably has an easier path to global prominence than it does to national prominence. On a global scale, there are fewer preconceptions to overcome (about the institution's history, wealth, or prestige), and the university's Washington DC location and opportunities are a greater benefit. LSC has worked with UMD's Office of International Affairs to develop new ideas for global collaboration.

## Benefits

There are many benefits if LSC is successful. Some involve specific projects and objectives, while others involve the high-level benefits of creating and spreading a sustainable culture.

If LSC is successful in pursuing its mission, then *language science* will be broadly seen as a coherent area of study, the University of Maryland will be seen as one of the best places to do it, and outstanding students, researchers, practitioners, and partners will want to be involved with it. Also, others will want to emulate what we have done.

These may sound like vague, lofty benefits, but they have shaped LSC's activities. They translate into many more specific actions and benefits.

A first benefit is about creating an **identity**, for individuals and as a community. This is hard to define, but it is extremely powerful if it can be achieved. People's identities define their values, how they set their priorities, and what they want to be associated with. If individuals identify as language scientists and feel invested in the language science community, then this creates a foundation that makes it so much easier to achieve LSC's other goals.

An identity has to be backed up by substance. Individuals need a clear sense of why they identify as language scientists and they need to feel that they belong, and that they are also valued contributors. This means that we need to find many different concrete ways for a diverse group of individuals to benefit and contribute.

A second benefit is about **visibility**, internal to the University of Maryland, in academia more broadly, and in broader society, and about **results**. Language science is standardly splintered into many different fields or subfields, e.g., linguists, speech scientists, and sub-groups of education researchers and computer scientists. This serves to divide language experts, and it creates barriers to broader impact. For example, one could easily survey UMD's academic profile and be entirely unaware that it has outstanding strength in language, because it is spread across a few small units and corners of many larger units.

If language science is seen as a coherent field, then it should be immediately apparent that it is far-reaching and important, and that UMD has a lot to offer. In order to be seen as a coherent field it is important to show that there are problems and solutions that cut across traditional disciplinary divides.

A third benefit is about the **talent magnet** that a successful initiative can create, attracting (and retaining) students and researchers at all levels, and attracting partners that we can work with to address important societal problems.

UMD is not alone in pursuing an initiative in language science. Related efforts can be found at a number of other prominent institutions worldwide. But UMD has 'stuck its neck out' further than most, and has a genuine early-mover advantage. This gives it an opportunity to really be prominent on a world stage in this area.

We can also point to more specific benefits associated with our four broad goals (in education, research, and partnerships/engagement)

- **Education**

- For [undergraduate students](#) LSC provides programming that allows them to design an exceptional learning experience (classes, research, and engagement) that they could not get in an individual department major. The PULSAR program is the main

example of this to date, but there are multiple avenues for building upon this in the future, as discussed further below.

- For [graduate students](#) LSC offers enriched programming that goes well beyond what is offered in traditional departmental PhD programs. Students are prepared to be leaders in different career pathways. LSC's programs have a proven track record, so our goal is "simply" to maintain the innovation and student ownership that have been responsible for the program's greatest successes.
- [Research](#)
  - LSC supports in various ways integrative workshops and (semester-length) courses that develop new sub-groups of researchers.
  - LSC supports complex research efforts in multiple ways, through pre- and post-award support, convening groups of experts, supporting students who explore new connections.
  - The Infant and Child Studies Consortium is managed by LSC. It supports a large part of the UMD research on child development through coordinated outreach and recruitment. This gives individual researchers access to a broader pool of participants than they could on their own.
  - LSC manages the [Guatemala Field Station](#) that provides infrastructure for education, fundamental and applied research, and social justice efforts surrounding indigenous languages and communities in Central America.
  - LSC's physical space serves many different research activities. One large DARPA-funded project is carried out primarily at LSC. Many departmental and cross-departmental groups meet at LSC. It is a popular place for planned and impromptu meetings. It hosts many different kinds of events.
- [Partnerships](#)
  - LSC's work with other academic institutions increases the reach of our efforts and enables UMD students and researchers to do things that they could not do otherwise. The Global Research Alliance in Language (GRAIL) developed by LSC and OIA represents a creative approach to achieving this benefit.
  - LSC's work with organizations with expertise beyond language increases its reach, and the ability to address broad societal problems. Examples include work with health experts (in Guatemala, in Maryland clinics for traumatic brain injury) and work with geographical information systems (GIS) experts.
  - LSC's work with non-academic organizations allows it to reach the public and policy makers. Examples include work with the Baltimore and DC public schools on literacy challenges affecting minority students, and work with the soon-to-open Planet Word museum in downtown Washington DC.

Beyond language science, there are substantial benefits if LSC is successful. LSC is an experiment in how to create a broad, integrative research and education initiative. If the experiment works, then it provides a useful model for UMD and other institutions that have an interest in ambitious cross-cutting efforts.



## History and motivations

A grass-roots cross-department effort in language had been underway for many years before the idea of LSC arose. This effort led to UMD's first ever NSF interdisciplinary training grant (IGERT, 2008-2015), which began to build structure and community, and also planted the notion of *Language Science*. LSC was built upon these efforts to address growing needs and significant opportunities.

**Fertile ground (1980-1998):** UMD has long had islands of strength in different language science areas (e.g., linguistics, natural language processing, literacy). There have long been positive relations between most of the groups. The Department of Linguistics (LING) pursued a non-standard model, relative to its peers, from its beginnings in the 1980s. The Department of Hearing and Speech Sciences (HESP) has a long tradition of combining clinical and fundamental cognitive science research. There is a long history of collaboration between Computer Science and Linguistics.

**Grassroots (1997-2005):** A series of new hires in LING and HESP in this period led to grassroots efforts to build an interdisciplinary research community, with a center of gravity around cognitive and neuroscientific approaches to language. In the case of LING the faculty hires and space enhancements were part of a concerted effort to make UMD a different kind of linguistics department, with strong support from ARHU and the Provosts of that period.

In the same period LING undertook radical reforms to its graduate curriculum, including eliminating specific course requirements. This made it easier for LING graduate students to pursue non-traditional linguistics research from the outset, and helped LING to recruit a new cadre of students that raised the profile of the department. 10-15 years later, those students are now emerging leaders in their field.

Further expansion in 2005 broadened the UMD language research base. The creation of the Center for Advanced Study of Language (CASL) led to a sharp increase in the number of UMD language researchers. The creation of the Second Language Acquisition PhD program within the newly formed School of Languages, Literatures and Cultures (SLLC) created a bridge between language science and language education that had not existed previously. New faculty with language expertise were recruited to various departments, attracted in part by UMD's growing reputation as a hub for language research.

**IGERT (2006-2013):** In 2006-7 a cross-department team succeeded in winning UMD's first ever NSF interdisciplinary training grant ("IGERT", 2008-2015, \$3M). This award led to substantial strengthening of the interdisciplinary research community, especially among those with a strong interest in graduate training. Many students began working across fields. We quickly learned that grassroots leadership by students was highly effective in building a strong interdisciplinary community, and made this a focus of the program. The program launched signature events

such as Winter Storm and Language Science Day, and it developed outreach efforts to local schools. The IGERT program trained around 50 PhDs from 10 departments. Around half of the students did not receive funding from the NSF award, indicating the strength of interest in the program.

The IGERT award period saw the start of a deliberate effort to build a community identity that extended beyond the NSF training grant. This is when the community started to identify as “Language Science”. The same period saw a new generation of faculty hires with interdisciplinary interests (in HESP, LING, CS, and Human Development (HDQM)). For this new group of faculty, language science was just the way things had always been.

**Threats and opportunities:** As the community grew and more individuals and units got involved, it became increasingly difficult to continue as an amateur effort. The staff member supporting the NSF-IGERT grant (50% from grant, 25% from LING) doubled as support for the language science effort, but this was not sustainable, especially as the prospects for renewing NSF training grants are extremely low. Also, faculty leadership was too narrow. Phillips took on unofficial leadership roles, but he was acutely aware that his own expertise and capacity were too narrow to connect different areas of language science. There was a need for additional faculty leaders who could help to forge different kinds of connections.

VPR Pat O’Shea was the first, to our knowledge, to push the idea of institutionalizing the grassroots effort in language science. O’Shea, now President of University College Cork in Ireland, saw this as a strong opportunity for UMD for many reasons: it is an area that UMD was already very good at; it is not an area that other institutions were already pursuing aggressively -- UMD had an opportunity to get ahead -- and there was already informal leadership in place.

Language science does not rank high on standard lists of institutional priorities (biotechnology, climate change, artificial intelligence, ...), but language deserves to feature in those lists. As we wrote in our 2015 NSF training grant proposal:

“The biggest societal change of the past two decades is the internet and electronic communication, where progress depends on technology that works with human language. The biggest economic upheavals in recent years involve globalization of markets for products, services, and employees. The biggest security change, laid bare by repeated conflicts since 2001, involves the disruptive potential of threats from small groups, that can emerge at a moment’s notice, using a language about which almost nothing is known (there are hundreds of such languages in Africa and South Asia). And some of the biggest recent changes in US education involve technology and the increasing diversity of students. Millions of Americans struggle to contribute effectively to society due to language barriers, caused by poverty, clinical conditions, or simply being adult learners. All these areas demand flexible expertise in human language, in adults, children, and machines; and communication between them.”

Since 2015 these needs have only grown, with further international destabilization and growing threats relating to climate change, human displacement, and disinformation campaigns.

**Getting started (2011-2013):** LSC was created in roughly two phases. The first phase lasted a couple of years, and generated a lot of paper and discussion, but few concrete results. The second phase lasted just a few weeks, and put in place many of the key elements that have been developed over the past 6 years.

In 2011-2013 there were protracted efforts to bring together the different pieces that would be needed to create a university-wide initiative in language science. No college or internal funding mechanism could do this alone, so multiple threads were pursued in parallel. O'Shea convened meetings with deans of key colleges, but it proved difficult to get all deans ready to jump at the same time. Understandably, different deans had different priorities. A cluster hire proposal (2012) was deemed highly competitive, but it faced unexpected challenges. A proposal for the VPR's Tier 3 Major Research Initiative mechanism went through multiple versions, but it was unclear what might turn it into a reality.

The pace shifted rapidly in summer 2013 when Phillips (and subsequently Jeff Lidz) were recruited to a position at a prominent university, with the expectation of leading a new language sciences initiative there. This created urgency and motivation that had not existed previously. It was then possible to move rather quickly, since so much planning had already been done. The Provost played a very active role, and a multi-pronged plan was settled in the space of a few weeks.

- **Institutionalization:** Creation of Maryland Language Science Center as a new unit. Overseen by the Provost and VPR, but with regular oversight handled jointly by the deans of ARHU and BSOS.
- **Infrastructure:** Tier 3 Major Research Initiative, 3 years, funded at double the usual level (\$300k/year instead of \$150k/year). Funding split between Provost, VPR, and deans of 4 colleges. Soft funds mostly used to support center staff.
- **Faculty leadership:** commitments to four senior cross-cutting hires, each creating a bridge between different areas of language science, and contributing to leadership of the university-wide initiative. Provost contributed around 50% of (hard budget) funds, which were to flow to LSC rather than to home departments, as a model for how to make hires to the language science initiative "sticky", i.e., unable to be repurposed by departments.
- **Government bridge:** one faculty hire was specifically intended to help cement the connection between government-focused research at CASL and the rest of the language science community. This was to be achieved via a joint appointment for Dr. Jared Novick in HESP (BSOS) and CASL. Novick was, at the time, the most active faculty member in creating that bridge.
- **Space:** promise of future dedicated space for the center, though the location was to be determined at a later date. Interim space while a long-term home was found, location also unclear at that time.

- Phillips was to be appointed as LSC's initial **director**, for an initial 5-year term. He would retain his existing 9-month appointment in LING, adding the LSC role as a 25% soft-funded position.

## Outcomes

The key elements of the 2013 plan have largely been implemented.

**Institutionalization:** LSC was established as a formal unit within ARHU that functions as a unit within both ARHU and BSOS. Key staff were recruited and a great deal of effort has been devoted to equip LSC to support innovative education programs, complex research projects, and diverse partnerships.

**Infrastructure:** Tier 3 funding was provided for Years 1-3, as planned. Creating a sustainable funding model beyond that time has proven difficult. [Center finances](#) are discussed in more detail below.

**Faculty leadership:** The plans to recruit cross-appointed faculty to help lead the language science initiative have been almost entirely completed. Two senior appointments were completed exactly as planned. Maria Polinsky (joint with LING) and Jan Edwards (joint with HESP) have gone on to lead important initiatives for LSC. The planned senior appointment in computation was converted to contributions to two mid-level appointments, both of which have been successful on many fronts. The final planned senior appointment, involving a bridge between the School of Languages and the College of Education, narrowly failed after a multi-year effort, for reasons that had nothing to do with LSC/UMD. This opportunity is as critical as ever. The strategy of having funds for these appointments flow through LSC has proven to be a successful strategy, though additional steps may be needed. The background to faculty appointments is described below.

**Government bridge:** The efforts to more closely connect government-funded centers to the rest of UMD language science have taken up much of LSC's time and energy, with mixed results. The shifting fortunes of CASL and its relation to its sponsors and to UMD, eventually leading to major layoffs and the formal dissolution of CASL, greatly impacted LSC. As planned, Jared Novick was initially hired to a joint position between CASL and HESP, creating the hoped-for bridge. But this role was soon dismantled, beyond LSC's control. LSC worked to partner with CASL in multiple ways, and to support CASL and its relation to government sponsors. This led to some valuable outcomes, such as the highly visible Langscape project. But it also presented many challenges. LSC's relation to government research is in urgent need of clarification, as discussed further below.

**Space:** For its first 3.5 years LSC occupied limited temporary space in the basement of Taliaferro Hall, which permanent space was identified, designed, and built. From early 2017

LSC has occupied outstanding custom-designed space in HJ Patterson Hall in the center of campus. This space has been hugely beneficial to the language science community.

**Director:** Phillips completed his 5-year term as LSC Director, and he has continued to serve in this capacity through Years 6-7, though now without a contract. The position was established as a 25% soft-funded appointment. It has proven to be much more than a 25% commitment, though funds for the 25% were received in only years 1-3 and 5. Phillips has served in many capacities for LSC. This has been both a strength and a limitation. Phillips' energy and expertise have helped to develop many promising initiatives and to attract talent and partners. But he has been pulled in too many directions and has become a key bottleneck.

## Faculty Recruitment and Leadership

The creation of LSC was accompanied by a plan to provide broader faculty leadership for the language science initiative. Although Phillips had been nominally leading grassroots efforts in language science, it was clear to him that his capacity and his reach were limited, and that the initiative would depend on bringing in leaders with diverse expertise and connections.

Senior hires present many challenges and they can take a long time. Sometimes they need to be carried out in sequence. Therefore, LSC's faculty hiring efforts have been spread over a number of years. Relative to other "cluster hire" efforts LSC has been unusually successful, thanks to UMD's strength in language science and to relationships developed over many years.

1. **Maria Polinsky.** Professor, Linguistics/LSC (50% LSC). Expertise in linguistics, language diversity, heritage languages. Polinsky was recruited from Harvard University in the 2013-2014 academic year through a target of opportunity hire, and she moved to UMD in 2015. A key attraction for Polinsky in coming to UMD was the ability to develop a field station initiative. Together with LSC staff she has led the creation of UMD's Guatemala Field Station, serving research and education with indigenous Mayan communities in Guatemala. She has laid groundwork for additional efforts in the Republic of Georgia. She has contributed to significant advances in student recruitment in linguistics.
2. **Jan Edwards.** Professor, HESP/LSC (50% LSC). Expertise in language development, clinical populations, dialect diversity. Edwards was recruited from the University of Wisconsin, one of the top programs in its field, through an open rank HESP/LSC search in the 2014-2015 academic year, and she moved to UMD in 2016. An attraction for Edwards in coming to UMD was the ability to link her research on language issues facing minority populations to educational interventions. To that end, Edwards leads the UMD Toggle Talk project, supported by a \$3M IES grant, and is conducting a randomized control study in Baltimore City schools. Edwards has also secured an NIH grant for innovative joint computational-clinical research with Naomi Feldman (LING/UMIACS). She has been a major contributor to the dramatic change in graduate student recruitment in HESP.



3. **Jared Novick.** Associate Professor, HESP (0% LSC). Expertise in psychology of language and cognition. Novick was previously 100% in CASL, but was active in supporting language science graduate students. As part of the plans for the language science initiative his position was converted to a 50-50 split between CASL and HESP, with the goal of formalizing a bridge between CASL and traditional departments. This arrangement was short-lived, and Novick soon moved to a 100% position in HESP, as CASL was reducing its staff, and Novick valued independence. Novick has contributed to the strengthening of the HESP graduate program, and he was awarded tenure in 2019.
4. **Omer Preminger.** Associate Professor, LING (28% LSC). Expertise in syntax, morphology, language diversity. Preminger was hired in a search for an Assistant Professor in syntax in 2013-2014. Creating this position supported the concurrent target of opportunity search that brought Polinsky to UMD. Preminger has been involved in the planning and implementation of the Guatemala Field Station.
5. **Marine Carpuat/Hal Daumé,** Assistant/Associate Professors, CS/UMIACS/LSC (Daumé is 25% LSC). In consultation with computational faculty it was concluded that more could be gained from two junior appointments than one senior leadership hire in computation and language. In 2014 CMNS was interested in recruiting Marine Carpuat, and there was interest in using LSC funds for that purpose. Since Carpuat would be starting an entry-level faculty position in CS and needed space to develop her own research profile rather than take on an LSC leadership role, LSC arranged for its funds to go to Daumé, who was already tenured, freeing up salary to be shifted to Carpuat. Carpuat has been successful, including winning an NSF CAREER award, and has been engaged in the language science community. Daumé currently splits his time between UMD and Microsoft Research.
6. **Jordan Boyd-Graber.** Associate Professor, CS/iSchool/UMIACS/LSC (25% LSC). Boyd-Graber was an iSchool faculty member when LSC launched, but was then recruited away to the University of Colorado. He was later brought back to UMD in a new arrangement that placed his primary appointment in CS, with LSC contributing 25% salary. Boyd-Graber has been very active, was recently tenured, and also won an NSF CAREER award.
7. **Incomplete Senior Appointment.** SLLC/COE/LSC (50% LSC). The final senior leadership hire was a target of opportunity hire that would link the School of Languages with the College of Education. The targeted recruit had been cultivated over a number of years and was also more amenable to moving once LSC had recruited Polinsky and Edwards. By 2017-2018, with help from ARHU and TLTC, we also found a position that was ideal for the recruit's spouse. The process was on the point of successful completion when it was derailed by unexpected (and major) personal constraints on the part of the recruit. This sent the process back to the drawing board. With various departures in TTK and PTK positions in second language acquisition, this position is as valuable as ever.

# Research

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A central component of LSC's mission is to support research in language science at UMD.

UMD is home to many prominent language science researchers spread across multiple departments. In that respect UMD is not unique: other universities might boast a similar number of researchers in language science fields. What makes us special is that UMD language scientists are less siloed: they are part of a vibrant, diverse, multi-disciplinary research community.

**The Language Science Center multiplies the potential of this grass-roots research community by providing some central coordination and support.** Importantly, we do not plan research projects and assign people to them, as might happen in some labs or self-contained research centers. Rather:

- We bring together researchers with diverse backgrounds and expertise.
- We help departments recruit and retain the most talented faculty and students (including through strategic interdisciplinary hires).
- We enable and support multi-departmental research initiatives led by faculty as well as interdisciplinary research projects led by students.
- We lead and support large-scale research initiatives.

In the following, we describe these roles in more detail ([Strategy/activities](#)), quantify the [people and resources](#) required, evaluate the [outcomes](#) of our efforts, and discuss [challenges](#) and areas for improvement.

## Summary

LSC has helped in many ways to support innovative smaller projects, ranging from the scale of co-supervised PhD dissertation projects to faculty collaborations involving a few researchers.

LSC has been successful in supporting research infrastructure that benefits many different groups. The Infant and Child Studies Consortium is a good example of this.

Larger research efforts that involve many investigators and/or partners, or large-scale funding from diverse sources, have had more uneven success to date. LSC has pursued a number of different large-scale ideas, with proposals, infrastructure development, or other ground work. This has also generated many excellent ideas. It is clear that UMD has advantages that make it unusually well prepared to undertake large-scale projects in language science. It has been able to react quickly to unexpected major RFPs. It has also been able to undertake sustained development efforts. But it has proven difficult so far to translate these into sustainable funding streams.

Some significant research growth areas have been language and computation, language and health, and language diversity.

Some important areas that have struggled more include language and education, which has been affected by the departure of key personnel, and second language acquisition, which has been affected by retirements and the demise of CASL. These areas remain important to LSC's mission.

## Strategy

### Bringing people together

You can't collaborate with someone you've never met, or whose discipline is utterly foreign to you. That's why one of LSC's most important roles is to simply create regular opportunities for researchers from different departments to be in the same room, exchanging ideas. These interactions allow researchers to learn about other fields and recognize points of intersecting interest. But more importantly, over time such interactions build trusting relationships between researchers--the foundation of any collaboration. Thus, even activities that aren't strictly research-focused are important to building an effective research community.

The LSC organizes or supports many activities and events that bring together students and faculty from different departments. Examples include:

- **Weekly Language Science Lunch Talks**, providing students and faculty with the opportunity to present their in-progress work to a supportive, interdisciplinary audience
- **Language Science Day** – a yearly event that brings together up to 200 students and faculty to exchange ideas, showcase new or ongoing projects, find out about research and training opportunities, and spark potential collaborations.
- **Winter Storm** – a 2 week January workshop, where students and faculty collaborate on research, training, and professional development
- **Cross-taught interdisciplinary seminars**
- **Co-advising** of students in the Language Science Fellows program
- **Reading groups** led by faculty or students
- **Outreach** opportunities in the local community
- Student-led **workshops** and **writing groups**



LSC maintains an events calendar and sends a weekly Events Digest to keep the community up to date on any and all activities related to language science on campus--not only those organized by the LSC, but also those taking place within departments.

LSC's physical space is a key resource for bringing faculty and students together to build research connections and supporting a variety of research activities. The value and use of LSC's dedicated space in H.J. Patterson is covered in more detail in [Center Operations: Space](#).

## Recruiting talented faculty and students

To produce great research, you need great researchers. LSC works to help departments become stronger by recruiting and retaining top faculty and graduate students. LSC has played a central role in several high-profile faculty hires in Linguistics, HESP, CS, and the iSchool, including strategic cross-appointed hires that were planned as part of the formation of LSC. LSC leadership regularly meet with prospective faculty members and students, and provide space for graduate recruitment events.

## Supporting interdisciplinary and cross-departmental research initiatives

LSC's ongoing activities provide researchers with regular opportunities to connect, learn from each other's expertise, discuss research questions of shared interest, and build trust. However, LSC also plays a role in deliberately supporting researchers to develop proposals and projects.

LSC facilitates proposal and project development by connecting faculty with relevant expertise, and providing administrative support. LSC can offer an important resource in the form of administrative expertise for interdisciplinary research. Caitlin Eaves, LSC's Assistant Director for Finance and Administration has experience working across departments and colleges, collaborative relationships with multiple units, and the ability to flexibly support different kinds of research needs effectively (setting up MOUs, child accounts, working with external partners, etc.) For example, Naomi Feldman (LING/UMIACS) and Jan Edwards' (HESP) grant, 'Optimizing input for typical and atypical language learners', is led by faculty who are connected through the LSC and their interdisciplinary grant relies on LSC administrative support.

## Coordinated research initiatives

Beyond facilitation, LSC can also serve more of a "matchmaking" role, bringing together appropriate people to respond to a specific opportunity. The ability to do this depends both on broad understanding of the expertise of researchers in the language science community and on the trust that has been built within that community. At the largest scale, the LSC has the capacity to lead the development of major funding proposals that would engage and benefit a large number of people within the community (e.g. the NSF-NRT grant, as well as submissions for campus-internal competitions including MacArthur 100&Change, NSF-PIRE and NSF-STC. Beyond the success of specific funding applications, these processes encourage big-picture

discussions and engagement among a diverse group of faculty who might otherwise be less likely to collaborate.

## People and resources

Research activities involve all parts of the language science community, from LSC staff, faculty leaders and other affiliated faculty, graduate students, and undergraduates.

LSC's core management team organizes and contributes to research-related events and activities. LSC's assistant directors also play key roles in facilitating and advising graduate and undergraduate research projects, and providing administrative support for grants and contracts.

Graduate students play a key role in maintaining a strong interdisciplinary research community, because of the flexibility that enables them to explore new connections and research pathways, and the clear benefits to their education of interacting with multiple research communities and mentors. Graduate student research projects can build connections between faculty members. Graduate students, as well as individual faculty members, also take on a leadership role in organizing research-related activities, such as co-taught seminars and reading groups).

LSC's physical space is a key resource for bringing faculty and students together to build research connections and supporting a variety of research activities. The value and use of our dedicated space in H.J. Patterson is covered in more detail in [Center Operations: Space](#).

LSC currently almost no funds for supporting research development, unless it can be justified under the NSF-NRT training grant, which ends March 2021. For example, LSC does not have seed money for faculty research or funds to support workshops or conferences.

The choice to not focus on seed funding aligned with guidance from VPR to use Tier 3 funding for core staff support. This contrasts with the focus on seed funding under the current Brain and Behavior Initiative. LSC agreed with this approach, because seed funding would likely touch very few and have low visibility in a rather broad community, and because the economics of the fields that fall under LSC are so varied. The closest counterpart of seed funding has been LSC's support for different cross-taught seminars, which have proven to be successful incubators of new partnerships.

## Infant and Child Studies

The Infant and Child Studies (ICS) Consortium is an essential piece of research infrastructure for UMD research on child development. ICS pre-dates LSC, but its administrative move to LSC in 2013 has allowed it to mature and become significantly more sustainable.

Whereas some research areas depend on large pieces of shared equipment, a core need for child development research is a steady supply of willing families whose children can participate in studies. Labs often need to recruit children that meet quite specific criteria (e.g., 20 months of

age, monolingual household, no older siblings). This creates substantial burdens for developmental labs, and a recruiting infrastructure is a central feature of most developmental research groups.

The ICS consortium aims to remove barriers to developmental research by pooling funding and personnel for recruiting across many different research groups. ICS maintains a database of thousands of willing participants aged from birth to teenage. ICS coordinates recruiting families to join that database via hospitals, fairs, markets, and other places where families can be found. Then when individual lab groups are ready to conduct a study, they can make targeted calls to families that are already in the database, with suitable background information and history of participation. (Some children from the ICS database may participate in studies in different labs 10 years apart.) ICS also pools funding from different researchers to pay for recruiting staff and materials. This sharing model allows labs to weather the inevitable rise and fall in grant funds. They contribute more in good years, and they are covered by the consortium in leaner years.

ICS represents a creative solution to a widespread problem. It grew out of the same collaborative spirit that led to the growth of the UMD language science community. And it works well to be housed as part of LSC. Faculty and their lab groups provide funding, they set priorities for recruiting, they recruit the recruiters, and they set policies on how different groups contribute to the effort. LSC provides a department-independent home for the consortium; it provides expertise in managing funds from across many departments and colleges, and advice on setting sustainable group policies; and it provides physical space for the ICS coordinator, typically a 50% - 75% position for a post-bac research assistant. At one point LSC co-funded the ICS coordinator position, paying for 25% of the position for help with LSC communications. The ICS coordinator is formally supervised by LSC Assistant Director Caitlin Eaves, and the coordinator supervises a fluctuating crew of hourly recruiting assistants. Rochelle Newman and Jeff Lidz act as faculty leads for ICS and in effect they are co-supervisors for the ICS coordinator.

ICS currently serves 15 researchers/labs in 6 departments. Around 1,500 children are recruited each year for the database that currently has over 7,000 active child participant profiles. More than 1,700 participants have come in for studies in the last year alone.

Managing ICS is not cost free for LSC, but it delivers substantial benefits to the community for a limited investment. It took a significant investment of time to create some of the financial structures that now support ICS, and it takes ongoing supervision and payroll coordination on the part of Caitlin Eaves. But is no longer a major time sink, and ICS pays for itself in terms of all other costs. LSC is in a better position to host ICS than other departments would be.



PI / Faculty	Lab	Department
Jeff Lidz	Project on Children's Language Learning	Linguistics
Samira Anderson	Hearing Brain Lab	Hearing and Speech
Lucas Butler Richard Prather	Cognition and Development Lab	Human Development and Quantitative Methodology
Angel Dunbar	N/A	African American Studies Department
Rochelle Newman	Language Development and Perception Lab	Hearing and Speech
Yi Ting Huang	Language and Cognition Lab	Hearing and Speech
Tracy Riggins	Neurocognitive Development Lab	Psychology
Nathan Fox	Child Development Lab	Human Development and Quantitative Methodology
Jonathan Beier	Lab for Early Social Cognition	Psychology
Elizabeth Redcay	Developmental Social Cognitive Neuroscience Lab	Psychology
Geetha Ramani	Early Childhood Interaction Lab	Human Development and Quantitative Methodology
Nan Ratner	Language Fluency Lab	Hearing and Speech
Naomi Feldman	Computational Linguistics & Information Processing Lab	UMIACS / Linguistics
Jan Edwards	Learning to Talk Lab	Hearing and Speech

## Successes, challenges, and opportunities

### Broad participation

LSC has been quite successful in bringing together people from different units, who otherwise would not have much opportunity to meet.

Language Science Day is designed to be as broad as possible, including faculty and students at all levels from many fields/units. Every year it draws 150+ faculty and students from nearly every relevant unit.

Other events and activities serve a smaller, more dedicated group on a regular basis. Some activities, such as Language Science Lunch Talks, tend to be dominated by students and faculty from Linguistics and HESP, but they also include participants from 6-7 other units in some weeks. It is inevitable that Linguistics and HESP contribute a large proportion of the language science community, since those departments are dedicated to language science. The dominance of those two perspectives can be challenging for language scientists from other fields, such as education or computer science.

On the other hand, other events, such as co-taught seminars, have higher representation from different audiences. Co-taught seminars that bridge computer science and linguistics have seen strong participation from CS students. Aside from the largest events, different activities draw different participants, unsurprisingly.

## Recruitment and retention

Many faculty and students report that the LSC was a major factor in their decision to attend UMD. It is difficult to assess what these numbers would have been without LSC involvement, but there have been several faculty retentions that (according to the faculty members themselves) would not have been successful were it not for the LSC.

Faculty who have come to or stayed at UMD in part because of the existence of LSC (or the grassroots effort that preceded it), include the following:

- Linguistics: Naomi Feldman, Jeff Lidz, Colin Phillips, Maria Polinsky, Omer Preminger
- HESP: Jan Edwards, Yi Ting Huang, Jared Novick
- Computer Science: Jordan Boyd-Graber, Marine Carpuat, Hal Daumé, Rachel Rudinger
- Psychology: Bob Slevc
- TLPL: Jeff MacSwan
- Philosophy: Paolo Santorio, Fabrizio Cariani

In recruiting and retaining faculty UMD successfully competed against such institutions as Harvard, Yale, Cambridge, MIT, Wisconsin (#2 in HESP), and USC (very strong in AI).

There were also a few unsuccessful campaigns to recruit or retain faculty. In Education, Meredith Rowe moved to Harvard and Rebecca Silverman to Stanford, after previously fending off advances from Vanderbilt, a top program in that field. Paul Pietroski (Linguistics/Philosophy) moved to Rutgers, ranked #1 in philosophy, though he maintains close ties to UMD. One of LSC's senior leadership hires was unsuccessful, due to unexpected personal constraints.

Language science departments have succeeded in recruiting highly talented students, in part because of the interdisciplinary community and training opportunities supported by the LSC. In the last 6 years (2013-2019), 12 language science students held **UMD Flagship Fellowships**, out of 70 received across the entire university during that time. During the same period, 5 were

awarded the **NSF Graduate Research Fellowship**. LSC Assistant Director Shevaun Lewis has guided a number of successful NSF GRF applications.

The evaluation team for the NRT-funded Language Science Fellows program ([see below](#)) investigated the role of the LSC in recruiting students. Based on interviews with students and faculty, they concluded that the LSC “plays a critical role in attracting students who have an inclination towards interdisciplinary language science research. In particular, students who attended Language Science Lunch Talks or other LSC events as prospective students noted that they were attracted to the sense of community they observed.” For example, one student explained (in an anonymous survey for the NRT program):

*I certainly know that the Language Science Center was a real interest to me even when I was applying. It was something that I didn't hear anyone anywhere else talk about, that this sort of interdisciplinary community that existed. Pretty much as soon as I showed up, I knew that I wanted to get involved with different events and different things around campus because that was the sort of approach that really appealed to me. The fact that people actually talked to each other across departments and collaborated on different projects. That there was actually this sort of collaboration rather than competition in getting things done. I knew as soon as I set foot onto campus, I would be expected to do that ... it's just been a part of what makes Maryland special.*

The evaluation team also found that some faculty believe that the LSC has increased their ability to recruit high caliber students to UMD: “Students are often deciding between UMD and other top programs and the LSC is often seen as the critical factor in bringing them to UMD.”

The experience of Jan Edwards (who came to UMD from UW-Madison in 2016) is illustrative. The HESP graduate program at UW-Madison is ranked 3<sup>rd</sup> in the country and the one at UMD is ranked 20<sup>th</sup>. Nevertheless, Edwards has been *more* successful at recruiting PhD students at UMD than at UW-Madison, and students have explicitly mentioned that the LSC played a significant role in their decision to attend UMD.

## Interdisciplinary grants

The LSC has been successful in promoting and supporting the development of small- to medium-scale collaborative research projects. A number of interdisciplinary grants would not have occurred without LSC support. A list is included as Appendix F; here we highlight four grants administered by LSC.

The **UMD Toggle Talk Project** [[website](#)] is a \$3.3 million Goal 3 grant funded by the Institute of Education Sciences (IES) at the Department of Education. This is the first Goal 3 grant from IES to any unit at UMD and it was funded on the first submission (which occurs for only 10% of IES proposals). The principal investigator on this grant is Jan Edwards, an Associate Director of the

LSC; her co-investigators are faculty in the College of Education. The proposal was first drafted even before Edwards arrived at UMD thanks to connections with COE faculty that LSC facilitated.

A smaller-scale (\$275,000 in direct costs over two years) interdisciplinary grant is an **R21 from NIDCD, Optimizing Input for Language Interventions**, with Naomi Feldman (Linguistics, expertise in computational modeling) as PI and Jan Edwards (HESP, expertise in language development and disorders) as co-investigator. These faculty members met through the LSC and took a leap of faith to work together on a proposal that encompassed their disparate research areas: using computational modeling to predict which language interventions are most effective for helping children with developmental language disorders. This grant was scored at the 4<sup>th</sup> percentile and funded on the first submission, which is extremely rare for NIDCD proposals, especially for new investigators such as Feldman.

The NSF-funded grant, **Documentation of Mayan Languages in Contact**, is another award funded through the LSC. PI Maria Polinsky (Linguistics) is an Associate Director of LSC. This grant supports work at the **Guatemala Field Station** [\[website\]](#) where researchers at all levels from UMD and other universities are trained in language documentation and linguistic analysis of indigenous Mayan languages ([see below](#)). LSC is also revising a larger NSF-REU Site proposal for the Field Station, to be resubmitted in August 2019. This grant would provide a mentored field research experience for undergraduates from diverse backgrounds (including from community colleges as well as HBCUs), examining the relationship between language and community vitality.

LSC is limited in its ability to support faculty in developing interdisciplinary research projects. Although it provides many opportunities for faculty to meet and learn about intersecting interests, it cannot provide those faculty with additional time or resources to develop them. With more financial resources to invest in promising projects early on, LSC could potentially access significantly more grant funding. For example, LSC could provide seed money for pilot projects, or a teaching load reduction for one semester to develop major research proposals. One area where LSC has been able to play a more active ‘incubator’ role is in student-initiated projects, thanks to the resources in LSC’s NSF training grants. However, this source is at risk of ending.

## Large-scale research initiatives, Internal Competitions

The LSC has led the development of preproposals for large-scale projects involving many investigators and sometimes worth tens of millions of dollars. Most have not been selected to move forward. These include:

- In Summer 2014 LSC submitted a proposal to NSF’s first **NRT** training grant competition. LSC’s internal pre-proposal was not chosen in the UMD-internal competition, despite the fact that LSC had won UMD’s only ever NSF IGERT training grant and that project had been highly successful. LSC was allowed to submit only when another team withdrew,

leaving LSC just two weeks to put together a large and complex proposal. The submission was among the 3% of successful proposals in that competition.

- In Summer 2016 LSC submitted an invited preproposal for an internal UMD competition for the **MacArthur Foundation 100 & Change** funding mechanism (see Appendix G, p. 79). This proposal focused on improving young children's access to rich linguistic interactions that are readily scalable across languages and cultures using mobile technology. LSC was told that the proposal was ranked #2 in the UMD internal competition, with only one team allowed to submit. (The 100 & Change competition was announced again in 2019, but changed guidelines made it unsuitable for a research center.)
- In Fall 2016 LSC submitted a preproposal to the NSF for its **PIRE** grant program (\$4M), NSF's flagship international program. This proposal focused on reducing global differences and disparities in language learning, use, and technology. LSC assembled an impressive worldwide team of partners, including strong ties to UMD's Universitas 21 partner institutions. The preproposal was selected as the winner in the UMD competition, but it did not proceed to the final round of the NSF competition. Since these competitions come once in 4 years and institutions are allowed only one submission, a second chance is unlikely.
- In Spring 2019 LSC submitted a preproposal (see Appendix G, p. 84) for an internal UMD competition for the **NSF Science & Technology Center** mechanism (\$50M over 10 years). LSC is arguably as well prepared as any other social science focused unit in the country to mount an STC-scale effort. The proposal was not selected to move forward by UMD, and requests for feedback on the proposal were not answered.

These proposals have typically been fast, opportunistic responses to unexpected RFPs. Despite the short lead times involved in the UMD-internal competitions, typically just a couple of weeks, we have been quite successful in bringing together diverse teams on short notice, leading to proposals that have been generally well received, even if they have not been selected to move forward.

All of these very broad proposals have been shepherded by LSC Director Phillips. They have benefited from his knowledge of diverse interests in the community and his ability to creatively combine them. But this is a fragile and unsustainable strategy.

A more deliberate, forward-looking approach could lead to stronger proposals, led by a more diverse group of faculty. But this is often not straightforward. In the absence of specific funding opportunities it can be difficult to secure the buy-in seen when an urgent RFP is on the table.

More proactive development is more feasible when RFPs are predictable, such as programs like NSF's Smart & Connected Communities. In some cases LSC has developed projects proactively, expecting funding to be available, but those opportunities have turned out to be elusive. The Langscape project is a good example of this, as discussed elsewhere in this report.

For multi-site initiatives (e.g. NSF PIRE or Smart & Connected Health), it would be helpful to host meetings of researchers and other partners from outside UMD. For example, prior to writing a SSHRC Canada Research Partnership Grant, the Language Sciences Initiative at the University of British Columbia brought together researchers from across Canada for a 3-day workshop on “Envisioning a Language Science of Literacy”. (Notably, the only two researchers from the US that were invited were from LSC – Colin Phillips and Jan Edwards.)

Internal competitions have proven to be a significant hurdle. These competitions are inevitable when a funding agency limits the number of submissions from an institution. But clearly such processes have limitations. A case in point is our NSF NRT training grant preproposal. LSC had a strong track record and a strong proposal (as shown by the fact that we won an award). Yet we were not chosen in the internal competition, and were told by the VPR’s office that they were concerned our proposal did not match NSF’s priorities. If it had not been for the accident of another team withdrawing, this would have prevented our leading success in graduate education, which also helped lead to two further successful NRT awards at UMD.

## Emerging strength: Language and computation

A long-standing goal has been to create close connections between computer science and human language research. We have made great strides in this area in the past 6 years, and this has also helped to bring outstanding women computer scientists to Maryland.

The University of Maryland has long had strengths in computational research on language, extending at least to the 1990s. The university’s strengths in linguistics and psycholinguistics extend roughly as far. There has always been good will and overlapping interests between the different groups. Most institutions cannot count on this foundation. But it proved harder to create deep research connections, and the modern revolution towards statistical methods and machine learning made these links harder to build.

When we submitted our first NSF training grant in 2006-2007, we identified the human-computation bridge as a key priority, including plans for a targeted hire if we secured the training grant. We hoped to create bridges among multiple fields. In 2019 the change that this brought about is clear to see.

A new generation of younger computational faculty has been highly successful. The young faculty member hired when we secured the first NSF training grant was Naomi Feldman (LING). We recently were able to retain her at UMD, despite a strong offer from a top institution. Jordan Boyd-Graber (CS, iSchool) and Marine Carpuat (CS) both won NSF CAREER Awards. Hal Daumé has become a leader in multiple areas of natural language processing (NLP) and machine learning. Senior faculty such as Philip Resnik (LING) and Doug Oard (iSchool) have thrived in new areas. New hire Rachel Rudinger (CS, from JHU) is a rising star in her field.



There has been a cultural change around computation. It is now standard among LING graduate students to incorporate computational approaches, and we see the beginning of it becoming normal among HESP students.

Multiple dissertations involve co-supervision involving computational and cognitive faculty. A prime example is Allyson Ettinger (LING, supervisors Phillips & Resnik). She chose UMD over other outstanding graduate programs. She entered with training in linguistics and cognitive neuroscience and once here she developed expertise in computer science. She won an NSF GRF award and carried out research that bridges computer science and cognitive neuroscience. She was offered not one but two faculty positions at the U of Chicago: a tenure-track position in Linguistics, and a research faculty position at the Toyota Technical Institute. Numerous other completed or in-progress dissertations involve co-supervisions between experts in computation and cognition.

A notable success of these efforts has been the representation of women in computational research on language. Like other computational research areas this field is typically male dominated. But at UMD there is roughly equal representation of women and men. This has helped in recruiting and retaining outstanding female talent.

Various activities have supported this culture shift, including gateway courses, multi-lab research groups, and co-taught seminars.

A striking recent example illustrates the reach of UMD. In New York City at the 2019 meeting of the Society for Computation in Linguistics, the theme of the plenary symposium was “What should linguists know about Natural Language Processing and Machine Learning?” Three of the four invited panelists were UMD graduates: Noah Smith (BA, LING & CS) is now Professor at the U of Washington and Director of the Paul Allen funded AI2 Institute in Seattle. Chris Dyer (PhD, LING) is a CMU faculty member and established leader in NLP, currently based at Google Deep Mind in London. Allyson Ettinger (PhD, LING) is a new faculty member at the U of Chicago.

There are many opportunities for building on existing successes.

1. Much can be gained by building upon what we already have, leading to a stronger and broader culture that **connects humans and computation**.
2. There are opportunities to create exciting **undergraduate offerings** at the intersection of language and computation. This could attract talent, funding, and employers.
3. There is much potential for **government and corporate funded research** at the intersection of language, cognition, and computation. The challenge is to make it possible to do so in a way that is interesting for all parties.

## Emerging strength: Language and health (and the growth of HESP)

The Department of Hearing & Speech Sciences is well on its way to becoming UMD's next Top 10 department. This is a significant achievement that few units at UMD could hope to match.

The department's profile has risen sharply, despite being small compared to its peers. It has done so by adopting an outward-looking perspective that sets it apart from the competition.

The faculty has seen both important new talent, and renewed success from established faculty. Newer faculty include Jan Edwards (senior hire, joint with LSC), Jared Novick (tenured 2019; hired to be campus-CASL bridge as part of the creation of LSC), and Yi Ting Huang (tenured 2019, drawn to UMD by broader language community), plus other excellent new faculty. Existing faculty such as Nan Bernstein Ratner, Rochelle Newman, and Sandra Gordon-Salant have seen new success in their research, including substantial recent funding from NIH.

The HESP PhD program is dramatically different now than it was 6 years ago. Nationally, the market for Masters graduates is so strong that many programs struggle to recruit PhD students. UMD now has a sizable contingent of research-focused PhD students in HESP (n=20, with 4 incoming) where it used to have just one or two. Students are attracted to UMD by the breadth of opportunities and specifically by the presence of the LSC. Jan Edwards commented that she moved from a higher ranked department (UW-Madison, #3) to UMD, but now is able to recruit stronger PhD students than ever before. HESP recruits now regularly win UMD Flagship Fellowships and NSF GRFs, and the department has competed successfully against top programs such as the joint Harvard-MIT PhD program (twice).

Student and faculty research has reached broad visibility beyond the academic literature. Research on African American dialects and education involving Edwards was featured in *The Atlantic*. Newman's research on dogs' perception of speech (led by PhD student Amritha Mallkarjun) was featured in *National Geographic*. Huang's research on what Qur'an memorizers implicitly learn about Arabic was featured in the popular online magazine *Mental Floss*.

Graduates are now hired to sought-after faculty positions. Giovanna Morini is an Assistant Professor at the University of Delaware and Chris Heffner is an Assistant Professor at the University of Buffalo. Both students benefited significantly from cross-department co-supervision or engagement and from international research partnerships.

The department's research involves diverse collaborations with other units, including research collaborations with COE, the Institute for Systems Research (ISR/CMNS), and ARLIS (Applied Research Laboratory for Intelligence and Security), co-supervision with Linguistics, Psychology, and COE, and a new Cochlear Implant Center of Excellence joint with the UM Baltimore School of Medicine. An initiative serving high school and college students with autism is one of many that has an important community engagement component.

Departmental rankings in this field are strongly driven by professional programs. The criteria might not capture well the areas in which UMD has excelled in recent years. But there is no question that the Department of Hearing & Speech Sciences is now a force to be reckoned with, punching well above its (small) weight.

LSC cannot take all of the credit for the rise of HESP. But there is much overlap between HESP and LSC, and the rise of HESP is grounded in the same spirit that fueled the rise of Linguistics a decade or more earlier, by carving out a distinctive and more outward-looking approach.



*The Infant and Child Studies Consortium, managed by LSC, supports 15 labs in 6 departments, bringing 1700 families per year to participate in research at UMD*

# Education

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One of LSC's major goals is **to provide innovative interdisciplinary education preparing students to be leaders in diverse careers**. Education at the graduate and undergraduate level has been a foundational strength of the LSC. LSC's programs are widely recognized for their innovation--especially in promoting student agency. At the graduate level they have had remarkable success in attracting talented students and federal support.

At the graduate level, LSC is the home of the **Language Science Fellows** program, currently funded by the NSF NRT grant "Flexibility in Language Processes and Technology: Human- and Global-Scale" ([described below](#)). **LSC faces a serious risk of losing momentum at the end of this grant, with no alternative funding sources currently available to sustain the program.** Without a strong graduate program, it is unclear that LSC can continue at all.

At the undergraduate level LSC is the home of the **PULSAR** program ([described below](#)). This program has provided valuable experiences for a small number of outstanding students. **LSC is now at a critical decision point to determine the future direction of its programming for undergraduates.** There are some promising options, with equally promising faculty buy-in, but the specific choice is uncertain. Options include expansion of PULSAR, developing targeted programs in areas such as Language and Computation, creating a Living-Learning Community, or developing a language science program in the vein of Individual Studies and LSC's graduate programs.

Beyond the core graduate and undergraduate programs, there are a number of other interesting possibilities that LSC could pursue in the future. For example, LSC could develop a year-long post-baccalaureate research program for underrepresented populations, or educational programs at all levels on language policy. However, with current staff and resources, opportunities of this kind would take essential time and funding away from core programs that advance LSC's mission.

## Graduate Education: Language Science Fellows

LSC's primary educational initiative for graduate students is the **Language Science Fellows (LSF) program** ([link](#)). This program is available to all currently enrolled PhD students in language science, regardless of citizenship, current funding status, advisor, or home PhD program. Applicants to the program propose an individualized training and research plan, combining the requirements of their PhD program with opportunities outside their home department. Activities commonly include:

- **Courses** in other departments, or co-taught by faculty from other departments;

- Regular participation in **cross-departmental language science events**, such as Language Science Lunch Talks, Winter Storm, Language Science Day, and others;
- Some form of **interdisciplinary research experience**, such as a lab rotation, collaborations with students or faculty from other departments, or joining a multidisciplinary research team;
- Courses, workshops, and mentoring related to career development, communication, and other **professional skills**;
- Participation in **outreach** to non-scientists, such as high schoolers or policy makers;
- **Internships** in non-academic environments (e.g. industry or policy);
- **Leadership** in student committees responsible for organizing community activities and events.

Because of the NRT grant and matching funds from ARHU and BSOS, Language Science Fellows are eligible to receive **funding** to support research-related expenses, including travel funding for both conference presentations and data collection. Some Fellows are eligible for a year of full stipend from the NRT grant.

Importantly, many of the resources created for LSF are also available to a broader range of students who are not formally affiliated with the program. For example, LSC provides a wide range of **professional development workshops** and **outreach activities** that are open to everyone.

LSC's educational initiatives for graduate students are designed to provide valuable supplements to the experiences they have in their home PhD departments. LSC's goal is not to eventually build a formal language science degree or certificate program. Doing so would undermine core aspects of LSC's strategy. Rather, LSC continues to seek ways to collaborate with and complement traditional departmental programs.



## Strategy

### Innovation in graduate education

LSC's program for PhD students was built on two NSF training grants--an IGERT (2008-2015, \$3M) and an NRT (2015-2021, \$3M)--which were designed to promote innovation in graduate education. Innovation and evaluation have been part of the approach from the beginning. Because the LSC does not have the constraints of a traditional PhD program, it is possible to try



new things, evaluate our success, and adjust accordingly. LSC faculty are engaged in national conversations about best practices in interdisciplinary training and career development for PhD students. The LSC is internationally recognized among language scientists (particularly linguists) as a leader in interdisciplinary training and research.

### Interdisciplinary research and communication

A primary goal of both the IGERT and NRT programs has been to **train students to be interdisciplinary researchers**. Traditional PhD training is highly specialized: students pursue extremely narrow research while surrounded by a small and homogenous community of experts with similar training. This type of training makes it challenging for researchers to take a broader perspective--to understand what matters, why, and to whom. By contrast, interdisciplinary research and collaboration requires researchers to “zoom in” and “zoom out”: to understand specific problems, their broader context, and the relationship between them. Thinking and communicating clearly about these different levels is an essential step in connecting methods and findings from different fields.

It is sometimes possible to provide students with opportunities to witness that kind of thinking and communication in action--for example, in interdisciplinary seminars co-taught by faculty from different departments. In most cases, however, students must learn to do it by leaving their “comfort zone” to interact directly with researchers who have very different background knowledge and assumptions. Students are strongly encouraged to take courses outside their home department, to experience a semester-long immersion in an unfamiliar perspective. An advanced lab rotation (which was required during the IGERT program) can help to turn that experience into research projects. In some of the most successful cases, lab rotations lead to a co-advising relationship with faculty from multiple departments, where the student is able to act as an intermediary between two very different perspectives.

We have found that **communication skills** are critical to successful interdisciplinary collaboration. Researchers must be able to explain their work in ways that people from other disciplines can understand, and listen and respond to feedback from different perspectives. These skills are difficult to learn, especially since traditional academic culture often pushes in the opposite direction, toward insider jargon and dismissal of ideas from different theoretical frameworks. But they are essential for all scientists, regardless of their chosen career. Despite the trope of the bumbling, incomprehensible professor, the most successful scientists are those who can communicate effectively--whether it's with collaborators, students, deans, funders, managers, clients, or policymakers.

Students in our program have many opportunities to practice communicating with diverse audiences. They present their work to researchers from different disciplines at Language Science Day and Language Science Lunch Talks, and initiate cross-disciplinary collaborations at Winter Storm. They participate in outreach to K-12 students--an extreme exercise of accessible communication. Importantly, they also have plenty of opportunities to collaborate



with students from other departments on projects with lower stakes than research--for example, organizing an event or workshop. These kinds of interactions build trust, which is essential for more high-stakes communication like a Language Science Lunch Talk.

## LANGUAGE SCIENCE LUNCH TALKS

**Thursday, April 25th** at 12:30 PM  
in the Language Science Center  
(H.J. Patterson Room 2130).

**Shenika Hankerson (TLPL)** on *African American Language Explained: (Almost) Everything You Need to Know About Its History, Structure, and Evolution.*



### Student ownership and leadership

Our goal is to train students to be not just scholars, but **leaders** in their chosen careers. This sets us apart from traditional PhD programs, where independent scholarship is often not just the primary but the only focus.

Some degree of leadership is necessary to pursue interdisciplinary research at any scale. It requires breaking down barriers, leading a diverse team, and sometimes working outside traditional academic reward structures--forgoing conventional paths to success.

Furthermore, nearly all PhDs take on leadership roles after graduation,

regardless of their chosen career path. University faculty lead research teams, manage a lab, participate in the administration of their department, and are increasingly expected to take an entrepreneurial approach to funding. In government and private industry, PhDs are looked up to as experts in their fields. They manage diverse teams and communicate about their work to a range of stakeholders.

The first step toward leadership is **individual agency**. From the beginning, we give students full control over their research and training plan. Rather than having a set of core requirements, we work with students individually to help them identify their own training, research, and career goals, and make a plan to reach them. Communication and leadership skills are important for any career path, so we encourage students to find ways to develop them throughout their training.

We give students ownership not only of their individual training, but also the program as a whole. Students organize many program activities, from professional development and methods workshops to outreach at local career fairs. They are also deeply involved in the evaluation of the program. We have found that students who are not just "consumers" but active "contributors" are more invested in and satisfied with the program. The program benefits from both the contributions themselves and the students' increased commitment to it. The students

also benefit from the practical experience in team leadership, project management, and broad communication, which in some cases increases their self confidence and prepares them for leadership roles in their future career.

### Career development

Many organizations involved in PhD education are concerned about a “crisis” in career opportunities for PhDs. In many fields, the number of PhD graduates is increasing, while the number of tenure-track faculty jobs remains quite small. NSF and NIH have responded by including “preparation for diverse careers” as a key component of their training grants—including our NRT.

What does it mean to **prepare students for diverse careers**? Industry employers report that PhD hires often lack professional skills, especially in communication. Students report that they have little knowledge of career options outside academia, and their advisors often feel either unable or unwilling to help. Many graduate programs attempt to respond to these problems by offering workshops that expose students to “alternative” career options and train professional skills necessary for non-academic careers.

We have gone much farther than that. “Career development” cannot be hastily accomplished through a handful of workshops in the fourth or fifth year of a PhD. Every aspect of our mentorship of students in the program is driven by this core philosophy: **the end goal of a PhD is not the dissertation, but a transition to a satisfying career that builds on the skills and values of scholarship.**

When students begin to draft their research and training plans, we encourage them to consider their **long-term goals** from the beginning. We help them assess their own interests, skills, and values, explore careers that might be a good fit, and adjust their plans to gain relevant skills and experience. When students struggle to prioritize a diverse range of projects and responsibilities, we help them consider their long-term goals as well as their academic progress to determine how to allocate their time. (They do so in writing once per year, by updating their Individual Development Plan.) While we do provide occasional workshops on non-academic career options, we put more emphasis on increasing students’ agency in career exploration through networking and informational interviews.

### Engaging faculty across departments

Graduate training is a valuable rallying point for the UMD language science community. Before LSC existed, the NSF IGERT-funded training program brought students and faculty together for cross-disciplinary communication and collaboration. The Language Science Fellows program continues to engage faculty from multiple departments through regular events, co-teaching, and co-advising.

## Student and faculty participation (2013-2019)

From Fall 2008 through Spring 2019, a total of 96 graduate students have participated in a formal language science program. (A full list is included as Appendix D.) These students have come from eleven different PhD programs across five colleges (ARHU, BSOS, COE, CMNS, and iSchool). The chart below details the 59 students who have been involved in the past 6 years, since the LSC was officially founded.

### Student participation in LSC graduate training programs, Fall 2013 - Spring 2019.

College	Department/ program	LSC Program				TOTAL
		Apprentice*	IGERT**	LSF (non-NRT)	NRT	
<b>ARHU</b>	LING	4	5	1	14	24
	PHIL		2			2
	SLA	1	2	1	2	6
	<b>Total ARHU</b>	5	9	2	16	32
<b>BSOS</b>	HESP***	5	1		3	9
	NACS***	1	1		4	6
	PSYC		1			1
	<b>Total BSOS</b>	6	3		7	16
<b>CMNS</b>	CS	1			2	3
	ECE			1		1
	<b>Total CMNS</b>	1		1	2	4
<b>COE</b>	CHSE	1				1
	HDQM	1	1	1	1	4
	<b>Total COE</b>	2	1	1	1	5
<b>iSchool</b>	<b>Total iSchool</b>		1	1		2
<b>Grand Total</b>		<b>14*</b>	<b>14**</b>	<b>5</b>	<b>25</b>	<b>59</b>

\*This includes only those apprentices who had not joined a program as of spring 2019. (I.e., students are not double-counted.)

\*\*This does not include all IGERT students--37 others graduated or left UMD before Fall 2013.

\*\*\*Four of the six NACS students are/were based in HESP.

During this period, a total of 37 faculty have participated in the programs as students' advisors or as hosts of lab rotations. Many more have contributed in other ways by, for example, giving talks or leading workshops during Winter Storm.

## People and resources

LSC's graduate education initiatives are mostly funded by the NRT grant (2015-2020, \$3M), along with supplementary funds of \$40,000 per year awarded by ARHU and BSOS intended for expenses not allowed on the NRT grant (e.g. stipends for international students, supplies for outreach activities, and food for research and training activities).

### Annual budget

	<b>NRT grant (direct costs)</b>	<b>Supplementary funds</b>	<b>LSC operational funding</b>
LSC faculty (Shevaun Lewis - 75%, Colin Phillips - 1 month)	\$83,500*	-	-
Evaluation team	\$29,000*	-	-
LSC Staff (Caitlin Eaves, ~15%)	-	-	\$11,860*
Student support (stipends, research fellowships, tuition, fees, health)	\$226,000	\$20,000	-
Student travel	\$30,000	\$3,000	-
Student research	\$25,000	\$2,000	-
Activities and events	\$2,000	\$15,000	-
<b>TOTAL</b>	<b>\$395,500</b>	<b>\$40,000</b>	<b>\$11,860</b>

\*These budgeted salaries do not include fringe benefits.

LSC's graduate education initiatives are managed by one of our Assistant Directors, Shevaun Lewis, who is 75% funded by the NRT grant. The attention of a PTK faculty member housed in LSC is essential to the continued success of the program. The **program manager** ensures that program activities continue to be prioritized in a growing multi-department community, without becoming localized within a single department. She also provides individual mentorship to students, complementing that of their primary advisor(s)--particularly in professional and career development. Centralized leadership also greatly facilitates the volunteer contributions of many students and faculty. Lewis has deep knowledge of LSC's graduate programs. She came to UMD in 2008 and was one of the student leaders who was responsible for the success of the IGERT program. She is deeply committed to innovation in graduate training, and she has a strong understanding of different areas of language science. She is the third program manager that for LSC's graduate training programs, and she has transformed the position.

Colin Phillips, as **LSC Director** as well as PI of the NRT grant, continues to play a significant role in the strategic development of the program. He is also the main disseminator of the

training model, through talks, workshops, and participation on external advisory boards for departments at other universities. Prior to the creation of LSC Phillips had a broader role in the graduate training efforts. But the demands of the LSC Director role have made it difficult for him to maintain as involved in the graduate efforts that were his original passion. This has been a loss for the graduate program.

The **evaluation team** includes Prof. KerryAnn O'Meara (1 summer month funded by the NRT grant) and a graduate assistant, currently Dawn Culpepper (25% funded by the NRT grant). They help design the evaluation strategy; conduct surveys, interviews, and focus groups; and they analyze and summarize the results as formative feedback for internal use, as well as publications for broader dissemination. Their role as expert researchers on graduate education is valuable for the program: it ensures that there is ongoing attention to what the program is doing well and what areas need improvement. And it connects the LSC team's ideas to the broader graduate education literature.

Phillips compares the roles to elite sports coaches and kinesiologists. The LSC team is like the elite coaches. They have extensive experience of training highly successful students, and they have practical knowledge of what works, learned through trial and error. O'Meara's team is like the kinesiologists. Their understanding is more grounded in systematic research. They can bring new ideas, and they can gather evidence to test whether LSC's ideas are effective.

A good example of this productive partnership is a submitted paper by O'Meara and Culpepper on how students develop an "interdisciplinary identity". They were inspired to look at this theme by a literature on how researchers develop a "disciplinary identity", and how this shapes their values and actions. Interdisciplinary identities are different in a number of ways. Phillips and Lewis realized that forming interdisciplinary identities is what the LSC programs had been trying to do all along, though they had never recognized it in such clear terms.

LSC's **Assistant Director of Finance and Administration**, Caitlin Eaves, spends 15-20% of her time on the graduate program. She manages travel, purchasing and contracts, executes student stipends and faculty/staff appointments, and she oversees human subject funds. She also manages post-award processes, financial reporting, and provides administrative support for events and activities related to the graduate program.

The program also relies on significant **volunteer contributions** from participating students and faculty. The LSC Graduate Committee includes 6 faculty members from various departments (Linguistics, HESP, CS, SLA, CHSE) who assist with application review and occasionally give input on program decisions. Students are self-organized into committees (Research, Professional Development, Outreach, Policy) that lead many of the program's visible activities, from one-off workshops to major events like Language Science Day and Winter Storm.

## Outcomes

The graduate program outcomes are unusually well documented, as a result of the evaluation process, regular NSF reports, and the relatively long history of the program, relative to other LSC activities. In an effort to provide transparency, all non-confidential program reports are shared publicly on LSC's website [\[link\]](#).

### Interdisciplinary research

The IGERT and NRT programs have been effective in encouraging students to pursue interdisciplinary research that crosses departmental boundaries. While student projects may be small in scale, they often have long-term impact by creating lasting connections between students and faculty from different departments. Talented graduate students make excellent “scientific ambassadors”.

Over the last 10 years there has been noticeable growth of interdisciplinary research in a few key areas in the UMD language science community. Methods or research connections that used to seem inaccessible or tenuous have become commonplace. These changes can be directly traced to projects and courses that came about through the IGERT and NRT programs.

One key accomplishment is the wider adoption of computational approaches in cognitive and linguistic research at UMD (as discussed [above](#) in the Research section). To support the IGERT award, the university committed to create a new faculty position in computational modeling of language processes if the proposal was successful. Naomi Feldman was hired to this position in 2011. She created a new foundational course in computational modeling for students from a cognitive background. This stimulated many small projects that grew into larger collaborative efforts. Feldman also helped create a new sub-community around a weekly research group meeting that she formed together with young CS faculty (“Prob Mod”). These efforts led to more students (including, notably, many women) incorporating computational methods in their research. In 2019, the effect of the culture change is striking: among Linguistics students, cutting-edge computational methods are no longer intimidating, but standard practice. Students in HESP are now headed in a similar direction. They are starting to routinely take Feldman’s course and incorporate computational modeling in their work. The culture shift already seen in LING may be underway in HESP.

The culture change around computation illustrates how key strategic commitments may bring impacts that take 10-15 years to take hold. The need for a computational psycholinguistics position was identified as a priority in the 2006 Linguistics self study, and this led to its inclusion in a support letter from then ARHU Dean Harris when the NSF IGERT training grant was submitted. Given the low success rate of IGERT proposals this promise had a low probability of being called upon. The award was confirmed in 2008, a search was conducted in 2009-10, and Feldman joined the faculty in January 2011. Now, in 2019, deep changes are evident in LING, and related changes are starting to occur in HESP.



A second key development involves research on how language learners' individual experience contributes to their learning outcomes. Most research in the cognitive science of language learning focuses on describing the course of language development for “average” children, with less attention to how the specific experience of an individual learner influences their progress. (And the “average” children are often anything but average, given the tendency to recruit children from middle class, highly educated families.) Meanwhile, researchers in education have documented the dramatic consequences of impoverished language experience in children from disadvantaged groups, but this research has relied on rather coarse-grained measures of language outcomes, such as vocabulary size. Two cross-department seminars (one under the IGERT program, one more recently under the NRT program) have brought together these different research perspectives, attracting interest and generating new research activity among students in Linguistics, HESP, and HDQM. Students have pursued numerous projects on how the development of language knowledge and processing mechanisms are affected by individual context, including socioeconomic status and home dialect.

#### Student placement (2011-2018)

As of Spring 2019, 50 students who participated in IGERT or LSF/NRT had graduated with a PhD. (The first of these graduated in 2011.)

Placement of PhD Graduates	
<b>Academia</b>	<b>32</b>
<i>Postdoc</i>	9
<i>Non-tenure-track</i>	9
<i>Tenure(-track)</i>	14
<b>Government</b>	<b>3</b>
<b>Healthcare</b>	<b>1</b>
<b>Industry</b>	<b>9</b>
<b>Unknown</b>	<b>6</b>
<b>Total</b>	<b>50</b>

32 of these students (64%) currently hold positions at universities, including 14 in tenured or tenure-track faculty positions. Language science graduates now in faculty positions are notable for their leadership in interdisciplinary research and community building at their new homes.

For example, as a student in the IGERT program, Alexis Wellwood (LING, PhD '14) launched an ambitious interdisciplinary research program, and she was instrumental in creating a vibrant cross-departmental research community at the intersection of linguistics, philosophy, and cognitive science. She was a leader of “PHLING”, a reading and discussion group involving

students and faculty from Philosophy and Linguistics, and she organized several interdisciplinary workshops and conferences. After graduating she became an Assistant Professor in Linguistics at Northwestern University, with additional affiliations in the Philosophy Department and the Cognitive Science Program. In 2017 she was recruited to the University of Southern California, as Assistant Professor in Philosophy, with additional affiliations in the Linguistics Department and the Cognitive Science Program. She directs the USC Meaning Lab, she mentors graduate and undergraduate students in multiple disciplines, and she is regarded as an emerging leader in her field.

Rachel Adler (NACS/HESP, PhD '18) is a recent example of a student who benefited from LSC workshops and mentorship about pursuing non-academic careers. With support from the NRT grant, she completed a 200-hour online course in data science to develop technical skills and expand her professional network. After graduating, she secured a position as a Data Scientist at the Financial Industry Regulatory Authority, and has since moved on to a position at Bloomberg.

There are many other examples of PhD graduates who are pursuing successful careers -- in academia, industry, policy, or government -- that have benefited in clear ways from the broad and intentional training that LSC promotes. A full list of alumni and their current employment can be found in Appendix D.

### Training grants

The LSC has been very successful in obtaining federal funding for graduate training. Phillips led a team that was the first at UMD to win an NSF training grant (IGERT, 2008-2015), after around 40 attempts by some of UMD's strongest research groups. In 2015 LSC was allowed to apply for NSF's new NRT training grant only after another team withdrew. The entire proposal was put together on short notice and it was again successful. Until recently LSC was the only team in any STEM field to win both of these awards. (To our knowledge, only two other groups have succeeded to date. One of them is a language science group at the University of Connecticut that benefitted from consulting with LSC before submitting their IGERT and NRT proposals.)

A team of faculty in the Department of Counseling, Higher Education and Special Education (CHSE) adopted some insights from the IGERT and NRT programs when designing **Project ProPELL**, which is funded by a 5 year, \$1.25 million Leadership Preparation grant from the US Department of Education's Office of Special Education Programs (OSEP). ProPELL, or *Preparing Practice-based researchers with Expertise in Language and Literacy*, addresses an urgent need for new faculty with expertise in learning disabilities, language and literacy. (Although ProPELL was originally intended as a track of the Language Science Fellows program, differences in academic culture have made it more difficult to integrate ProPELL students into the broader student community than originally hoped.)

LSC contributed expertise and substantial staff effort to the development of **Project RISE** (Research Institute for Scholars in Education [[website](#)]), a training grant funded by the Institute

of Education Sciences. Phillips is a member of the project's advisory board, and LSC-affiliated faculty and students continue to be involved as mentors and instructors. ([See additional details below](#), under interdisciplinary opportunities for undergraduates.)

### Dissemination of training model

Given the significant investment from NSF and the university in LSC's programs for language science graduate students, it is important to disseminate the training model so that other groups at UMD and other universities can benefit from the insights gained over time. LSC does this in a number of different ways, and has devoted substantial time and effort to this, as detailed in [the section below on \*Sharing sustainable models\*](#).

After a decade of dissemination by Phillips and others, **UMD is internationally recognized among language scientists (particularly linguists) as a leader in interdisciplinary training and research**. Groups at several other universities are making efforts to follow our example.

Here at UMD, however, the success of the interdisciplinary research community and training programs in language science is largely invisible to other units. There are a few accessible avenues for increasing our impact at UMD. First, the LSC could work with the other two NRT programs on campus ([COMBINE](#) in Physics/Biology and [Global STEWARDS](#) in Public Health) to exchange and disseminate best practices, and build awareness in more units about innovation in graduate education. Second, the LSC could work more closely with faculty in the Graduate School (e.g. Linda Macri, Director of Academic and Professional Development, and Susan Martin, Program Director for Doctoral & Postdoctoral Career & Professional Development), who are working to provide professional and career development resources for graduate students across campus. The Graduate School has focused on making resources available for individual students, rather than departments. The LSC could potentially provide a testing ground of sorts for programming aimed to transform professional and career development practices within units.

Thanks in significant measure to efforts by the language science community, UMD has gone from being chronically unsuccessful with NSF training grants to (we think) becoming one of the most successful institutions in the country. LSC provided key support to UMD's other successful NSF training grant teams (and many other teams over the years). This is a resource that UMD could make better use of.

### Challenges with student ownership

LSC currently faces some challenges relating to student leadership and trust. It is critical that these be understood and addressed, or they threaten to undermine not only the graduate training program, but one of the foundations of the language science initiative.

A number of specific concerns have been raised by students and by faculty, relating to service expectations, processing of payments for travel and human subjects, the style of interaction at

student talks, and contributions by students from different departments. Some students report that they feel that the LSC is not interested in the kind of research that they do, particularly that the LSC might be unsupportive of work that is “not interdisciplinary enough”. Some students perceive that the LSC is too directive over individual projects or broader community activities. Students have expressed concerns about the program assessment process for the NRT program, objecting that it is biased and/or invasive.

A number of faculty share these concerns.

This has led some students to be more guarded or disengaged with LSC. This is particularly the case for some in the Linguistics Department. That has led to further resentment among other constituencies, especially HESP students and faculty, who perceive that LING students are not contributing as much as they are’. Irrespective of whether this perception is accurate, it stands in marked contrast to much of the past 10-15 years, when the concern has typically been that LING students have been too central and too dominant.

In this climate, possibly also fueled by broader societal tensions, tensions have arisen over issues of diversity and inclusion.

We can address specifics, but that carries a risk of appearing defensive. Our broader diagnosis of the issues is that some community members are unsure that LSC’s values align with their own values, and hence whether LSC staff are acting in their interest.

- To some degree the perception is accurate. The language science community previously was roughly the same as the community of language scientists focused on PhD training, with linguistics the dominant group, and the primary driver of community culture. This is no longer true. LSC is larger, it has a broader mission, and the academic culture is more diverse. Students are no longer in charge.
- For graduate students LSC is sometimes regarded as synonymous with the Language Science Fellows program or the NSF NRT grant. This can lead to dissonance in situations where LSC pursues priorities that fall outside the mission of the training grant. For example, some activities at Language Science Day have been poorly received when they are driven by the broader needs of the language science initiative rather than the specific needs of graduate students.
- There are mixed feelings among students and faculty around the role of professional development in PhD training, around the objective of a PhD degree, and the value placed on different career pathways. Some enthusiastically support the broader perspective on careers and training that NSF wants. Others are more skeptical. This adds to the sense of some community members that LSC does not reflect their values.
- Some aspects of developing and sustaining the NSF NRT program have undermined the shared ownership that was so important to the success of the earlier NSF IGERT program. University constraints led the proposal to be developed under extreme time pressure, reducing time for consultation. NSF expectations created pressure to promise

things that went well beyond what we had done previously. And after the award arrived pressures to do the 'next big thing' to keep LSC alive diverted attention from sufficiently attending to student and faculty input in the direction of the training grant.

- LSF program leaders (Phillips, Lewis) deliberately kept themselves at a distance from meetings with students about program evaluation, with the aim of allowing students to give more candid feedback. This may have backfired, as some students feel that they are not being heard or their concerns are not being accurately represented.
- Ideally community members should feel co-ownership of LSC and the language science community. But when they regard LSC as equivalent to the management team, this reflects more of an "us" vs. "them" mindset.

For an initiative with the scope of language science, it is probably impossible for everything that LSC does to align with all individuals' priorities. But it is clear that many individuals do not feel that they are being heard, and that **more needs to be done to support the shared ownership that LSC leaders and staff are firmly committed to**. Periodic meetings of the type conducted by the IGERT advisory board (2010-2014) could be very useful as a way to bring the community together and allow many voices to be heard. Town hall meetings, and more joint meetings between members of a student's mentoring team could all help to address the concerns. Some of these meetings have begun to happen. It is essential that this process continues, as the trust among members of the grassroots community is the foundation of the language science initiative.

## Future directions: LSF without NRT

The NRT grant is set to end in 2020; a no-cost extension will continue through March 2021. After that, LSC graduate training programs will need a new source of funds. Having been awarded both an IGERT and an NRT grant, LSC has exhausted the institutional predoctoral training grants offered by NSF. NSF has clearly conveyed that a third training grant will not be forthcoming.

NIH T32 training grants [\[link\]](#) are attractive in many ways, and they are more sustainable than NSF training grants. LSC applied unsuccessfully for an NIH T32 in 2016, and could try again in the future. But they are no substitute for what the NSF training grants have achieved since 2008. The NSF awards are more inclusive, they are more focused on innovation in graduate training, and they are compatible with supporting an intellectual community. In contrast, the NIH awards are focused on narrower research areas, and they focus on a relatively traditional training pipeline in which NIH-funded PIs develop future NIH-funded PIs. (In fact, NIH training grants are only available when there exists a critical mass of faculty who are already funded by the *same institute* of the NIH. While a number of LSC faculty currently have NIH funding, this funding comes from a variety of institutes. Thus, the LSC is not yet even eligible for graduate training grants from NIH.) NIH support is attractive, but it cannot sustain the core of the language science community. The second serious limitation has to do specifically with NIH funding - not only is such funding limited to health-related concerns, but it is also less focused

on innovation in graduate training. One goal for the upcoming three years is to develop a plan for how to better set the stage for applying for such funding, as well as to look more deeply into other opportunities for graduate training initiatives (such as foundation-based funding, described above).

By 2021, UMD will have received 13 years of federal support for developing an approach to interdisciplinary graduate education in language science. Several options present themselves at the conclusion of this period. One would be to settle on a version of the program that should persist long term, and secure long-term funding for it. Another is to pursue a “constant revolution” strategy in which UMD attempts to keep innovating in graduate education, staying a step ahead of the competition. This would still need funding. Whichever path is chosen, the plans should address several questions:

- What are the features of the program that are most beneficial to individual students’ development as researchers, communicators, and leaders?
- What are the features of the program that are most beneficial for the interdisciplinary language science community as a whole?
- What resources are required to support essential program features?
- How do financial resources incentivize or facilitate participation for students from different units?

The answers to these different questions point toward different directions for the graduate program. For example, if the program focuses only on benefits for individual students, it may lose features that are essential for maintaining and invigorating the language science research community. Or if financial resources are dedicated exclusively to interdisciplinary research projects, the LSC may miss out on opportunities to draw more participation from departments that are currently less well integrated in the community.

### Benefiting individual students

Some benefits to students are tied to the **financial resources** from the training grants. All Language Science Fellows are eligible for generous funding for research and travel. This is especially helpful for novel, interdisciplinary projects that cannot be funded through an advisor’s grant. It is also essential for students from departments with limited resources, who otherwise would not be able to attend conferences regularly. Language Science Fellows typically present at 1-2 conferences per year. Some students have also benefited from funding for professional development opportunities, such as internships, workshops, or online courses. Most departments have no funds available for these kinds of experiences.

Some students have also received 1-2 years of stipend support from the IGERT or NRT grants. The impact of the stipend is different for students in different departments. Students in Linguistics are always guaranteed 5 years of funding, so the IGERT/NRT stipend is just a temporary but welcome pay raise. For students in departments with more limited resources



(particularly SLA and HDQM), who often have burdensome teaching responsibilities or outside jobs, the stipend has a huge impact on their ability to pursue independent research.

An indirect benefit of the financial resources is that they draw explicit commitment and cooperation from advisors. Some advisors might be reluctant to encourage their students to pursue interdisciplinary research: it's riskier, and it can take time away from work on the advisor's core research projects. However, the funding for research, travel, and possibly stipend makes up for that risk, especially for faculty in departments with limited resources. Once the advisor has committed to the goals and values of the Language Science Fellows program, the student has more freedom to pursue their own research and professional priorities.

Many benefits to students are made possible by financial resources from the training grants, but are available to a much broader group of students. The LSC hosts a range of activities year-round designed to **enhance research and professional skills**, and offers opportunities to **connect with students and faculty in different research areas**. These include flagship events like Language Science Day, Winter Storm, and Language Science Lunch Talks, as well as a range of smaller activities, often organized by students: workshops on professional and communication skills, writing groups, advocacy groups, research discussion groups, etc. Compared to most departments, the LSC takes a much broader view of potential career paths for PhDs, and provides **up-to-date career development resources and mentorship**. The opportunity to take on leadership roles at the LSC is an important benefit in itself. Unlike in many departments, at the LSC students have the ability to set the agenda and create the research and training experiences they want to have.

Some benefits to students are not associated with specific training grants, but rather are the result of **long-term culture change** promoted by the LSC and its programs for graduate students. For example, seminars team-taught by faculty from multiple departments have significant impact on both individual students and the community as a whole: long-term, in-depth discussion across disciplinary boundaries can fundamentally change people's perspectives on research questions, and launch **sustainable interdisciplinary collaborations**. Another practice that positively impacts students is having **multiple advisors**, sometimes from different departments. It's almost always beneficial to have more than one faculty member responsible for a student's success. While there can be tensions and disagreements, those can lead to discussions that are productive not only for the student but also the faculty.

Finally, it is arguable--though difficult to prove--that students gain some additional benefit from **long-term commitment to the program**. In their application to LSF, students lay out an integrated research and training plan for the 3-4 years remaining in their PhD. They consider not only what they need to graduate, but what they need to do to prepare for a career after graduation. For most 1st- and 2nd-year PhD students, this is a unique opportunity to think seriously about their long-term goals. This broader context for graduate training stays with them, and as a result **they pursue a broader range of experiences** than typical PhD students: novel research collaborations, courses in other departments, leadership roles, public-facing outreach,

etc. These experiences are enormously helpful in preparing them to be leaders in their future careers, whether in academia or outside of it. Without a formal commitment to the program, students would be less likely to pursue such experiences. It's not enough to make resources and opportunities available to students: they also need context to understand their potential value.

### Benefiting the community

A major benefit of having formal, generously funded graduate training programs has been that they ensure that a core group of students maintains **long-term engagement with the broader language science community**. This engagement enables multidisciplinary and cutting-edge research: unlike faculty, students have the time and flexibility to invest in risky new collaborations and methodologies. Student engagement also sets the general tone of the community. Students show up week after week, and organize many community activities and events. For example, our outreach activities are organized almost entirely by students.

Without a funded program, it is likely that fewer students would have the time or motivation to contribute to the community in this way, which would be a significant loss. With funding for a set of core activities and events (Language Science Lunch Talks, Language Science Day, and Winter Storm), we could at least bring people together regularly. But without the commitment and energy from a highly engaged group, these activities could lose much of their impact. We have found that bottom-up, grass-roots leadership is much more effective than our efforts to lead from the top.

The downside to relying on graduate students to energize the community is that it places significant responsibility on a relatively small number of students, which can at times seem burdensome. It would be beneficial to have more faculty take on this role on a more consistent basis, but we have yet to find a way to motivate such engagement.

A poster for the 'Winter Storm' event. The title 'WINTER STORM' is in large, dark blue, blocky letters with white snow and icicles hanging from the top. The background is light blue with white snowflakes. Below the title, text describes the event as an annual two-week series of seminars and workshops for the language science community at UMD, which is free and open to all language scientists. It lists the dates (January 15th to 17th and January 22nd to 24th, 2019) and the location (Language Science Center, 2130 H.J. Patterson). A registration deadline of January 4th is mentioned. A list of highlights includes an invited talk by Laura Wagner (OSU), daily writing time, research and policy discussion groups, methods workshops, and professional development. At the bottom, a website for more information is provided, and the Language Science Center at Maryland logo is in the bottom right corner.

**WINTER STORM**

Winter Storm is an annual two-week series of seminars and workshops, organized by and for the language science community at UMD. It is **FREE** and open to all language scientists!

**January 15th to 17th and January 22th to 24th, 2019**

**Language Science Center (2130 H.J. Patterson)**

**Please register by January 4th!**

This year's highlights:

- Invited talk by Laura Wagner (OSU)
- Daily writing time
- Research discussion groups
- Policy discussion groups
- Methods workshops
- Professional development

For more information, please visit [languagescience.umd.edu/ws2019](http://languagescience.umd.edu/ws2019)

 Language Science Center at Maryland

## Options for the future

There are several different approaches we could take to preserve the most impactful components of the Language Science Fellows program after the end of the NRT grant. Each option has benefits and costs (financial and otherwise), but they are not mutually exclusive.

One option is to make a similar range of research and training **resources available “a la carte”**. Rather than focusing our resources on a small group of students who commit to a specific program, the resources would be available to everyone (in the case of workshops, events, and other activities--much as they are now), or on a competitive basis (in the case of financial assistance). The resources could include the following:

- Workshops and series organized by LSC staff and made available on a regular basis (\$2,000)
- LSC events (e.g. Language Science Day, Language Science Lunch Talks) to promote cross-departmental interaction and research collaboration (\$15,000)
- Research and travel funding for students awarded on a competitive basis (\$40,000)
- Summer research fellowships awarded on a competitive basis (\$15,000)
- Activities organized by students and faculty (\$2,000)
- Annual research event - conference or extended workshop (\$10,000)

Including a program manager (Shevaun Lewis, 50% - \$42,000) and administrative support (Caitlin Eaves, 10% - \$8,000), the annual budget would be approximately \$134,000. The advantage of this approach is breadth and flexibility. We would be able to serve a broad range of students, with the flexibility to prioritize different groups or research areas in different years.

This approach has downsides for both individual students and the community. With resources for research and professional development available independently, students would lose the opportunity to consider their training more holistically, and understand the value of different experiences for their long term goals. The community would also lose the core group of committed students who bring grassroots energy to the language science community.

A second option is **a shorter version of the Language Science Fellows program**, designed to promote interdisciplinary research and community leadership. Students would propose an interdisciplinary research project with mentorship from their primary advisor and a second mentor from another department. The fellowship would include one summer research fellowship (\$5,000), and up to \$3,000 for research or travel expenses associated with the project over the subsequent 2 years. If we accepted about 7 students per year, the overall spending on student research and travel would be similar to the “a la carte” model. However, it would have the additional benefit of securing a more extended commitment from a core group of students. We would be able to specify expectations for leadership and service, encouraging the grassroots leadership we have found so valuable.

Although a **language science certificate program** might seem to be a natural option for the long term, it would actually be a very sharp turn from our approach thus far. None of our graduate programs have ever had an extensive list of course requirements; the current iteration of the Language Science Fellows program has no specific course requirements, though all students take on additional coursework. Students are encouraged to seek “out of the box” experiences, but that can mean very different things for different students. No single set of courses would suit the needs of, say, a student in Linguistics seeking to use computational methods to model neural processes in speech recognition, and a student in Education seeking to incorporate the literature on children’s sentence processing into work on literacy development. We also believe that while some courses can be very influential, other kinds of experiences are also important—lab rotations, reading groups, internships, etc.

While a “language science” certificate is unlikely to be useful, we could consider one or more certificate programs in specific opportunity areas that seem ripe for growth, and are not already well served by the NACS certificate program. Two possible focus areas are **Language and Computation** (with courses from Linguistics, Computer Science, and applied math or quantitative methodology) and **Language Development and School Achievement** (with courses from Linguistics, HESP, and COE). These more focused programs could potentially create a more integrated community of students and faculty around those research areas. We could also create courses to serve the professional development needs of those groups.

An additional limitation of certificate programs is that some PhD programs make it difficult for students to participate. Some programs (e.g. Computer Science) have such extensive course requirements that students cannot easily fit in additional credits. Other programs (e.g. Second Language Acquisition) do not provide tuition remission for non-required courses, so students cannot afford them. Depending on the target audience, a certificate program might need financial resources to support some students.

## Undergraduate Education

The LSC aims for undergraduate students to benefit from UMD’s exceptional strength in language science, and LSC’s experience as innovators in student training. We achieve this by training a diverse group of undergraduates in ways of thinking that go beyond the breadth of a single field, and research skills that allow them to contribute to language science research at a higher level.

Undergraduate education contributes to the LSC’s overall mission. The engagement and participation of undergraduates expands and strengthens the UMD language science community, and directly benefits the faculty and graduate students they collaborate with. A diverse undergraduate program also strengthens the pipeline of future language scientists, which benefits the field.

So far, the LSC's primary undergraduate training opportunity has been through **PULSAR**, the Program for Undergraduate Language Science Ambassadors in Research [[website](#)]. This program was established at the end of LSC's first year of operation, due to strong interest from students and faculty. PULSAR has always been intended to be only one part of LSC's broader undergraduate education strategy. This broader strategy is currently still under development and likely directions are outlined below.

## PULSAR

PULSAR [[website](#)] applies to undergraduate education the philosophy of student agency and ownership that has been so successful in UMD's language science graduate programs. It takes highly motivated early-stage undergraduates and puts them in a cross-disciplinary group of peers where they learn to become self-directed researchers and engaged scientists.

PULSAR is a 4-semester program that leads to a transcript notation and includes **12 credits of language-science coursework** beyond that required for the student's primary major. PULSAR students also take a **1-credit seminar** each semester during which they learn about, and meet researchers engaged in, a variety of research topics in language science. They also participate in research skills and

professional/career development **workshops** (e.g. resume writing, applying to graduate school). Students receive individual **mentorship** towards finding an appropriate **research assistantship position or internship**, in which they participate for a minimum of two semesters.

Students may apply to PULSAR in any semester. A committee made up of faculty and students evaluates each applicant for their fit for the program. PULSAR is supported not only by LSC staff (particularly Dr. Tess Wood), but also by two graduate student fellows who lead the weekly seminar and meet individually with PULSAR members.

### Program environment

PULSAR is deliberately designed to create a supportive environment for students in the middle of their college careers and to provide individual mentoring and support with networking and professional development, in addition to exposure to the broad field of language science.

### Rebecca Higgins

Third semester PULSAR student majoring in Hearing and Speech Sciences



- \* Member of Hearing and Speech Departmental Honors
- \* Undergraduate research assistant in Dr. Jan Edwards' Learning to Talk Lab
- \* Toggle Talk Project Assessor
- \* Dream job is to become a speech pathologist with a focus on aural rehabilitation
- \* For fun, she loves athletic competition, such as running marathons and playing soccer.





Several key characteristics of the program:

1. **Small size** (<20 students per semester) allows for a clear sense of community among members, as well as for individualized mentoring and tailored opportunities for learning and pursuing specific interests.
2. Most students enter the program as **Sophomores or Juniors**, although some students begin as early as their second semester of Freshman year. Targeting students in the middle of their college studies is a deliberate choice: students have had some time to adjust to college and develop their interests, but are not necessarily already heading down a clearly defined career path. These are students who have time to commit to the program, are still developing and refining their interests, and can benefit from the individual mentoring and guidance of the PULSAR program. They are also students who have some time remaining at the university, which means they can benefit from research opportunities and networking, and will contribute to the undergraduate research culture and to the language science community through their engagement.
3. **Low-pressure, structured networking opportunities** with faculty and graduate students (mainly through the weekly seminar but also through attendance at other language science events) help PULSAR students feel like part of a research community and develop their awareness of contributions they can make to research, as well as possible research opportunities and future career paths.
4. **Leveling the “expert/novice divide”** (and explicitly acknowledging that in an interdisciplinary group, everyone is a novice in some areas) creates a culture in which students are willing to take risks and try new things.
5. **Building relationships with graduate student mentors (‘Fellows’)** benefits both undergraduate and graduate students. Graduate Fellows share their experience, while learning to guide and support undergraduates towards their research and academic goals.

### Student participation

To date, a total of 45 students have participated in the PULSAR program. The PULSAR program has included students from a variety of different majors, and many students complete a double major or minor, reflecting the breadth of their interests.

Majors represented have included:

Linguistics, Hearing and Speech, Computer Science, Government and Politics, Mathematics, Physics, Education, Psychology, General Biology, Physiology and Neurobiology, Spanish, Russian, German, Persian, Arabic. Linguistics and






The PULSAR program has been particularly successful in attracting female students in the field of computer science (a field where women are particularly underrepresented). Of 9 computer science students participating in PULSAR, 7 have been female. PULSAR as a whole has been majority female (approximately 75%; however, this figure goes down to 63% if HESP majors - who are overwhelmingly female - are excluded).

Of the 23 students who have completed the PULSAR program to date, 18 have also graduated from UMD (1 left the university, and 4 are still enrolled, having completed the program before graduating). Of those 18, 7 (39%) are currently in graduate school in a variety of fields (education, linguistics, communication sciences and disorders) and at least 4 more (22%) are in the process of applying to graduate school while currently working, i.e. 61% of graduates are currently enrolled in or applying to graduate school.

English language and TESOL teaching (public school and community college), software engineering and NLP, health data analysis, and education program management.



**Language**  
at Maryland


# ASK A LANGUAGE SCIENTIST


Undergraduates are invited to join Drs.  
**Jeff Lidz** and **Tess Wood** for coffee and  
conversation about language science,  
getting involved in research, post-graduate  
options, and more. Drop in with specific  
questions or join us for a while to chat!

**Friday October 5, 2018**

**11 AM to 12 PM**

**H.J. Patterson Hall**  
**Room 2123**





It is common for students to remain engaged in PULSAR activities after formally completing the program. For example, students working on their own research projects often return to the seminar as guest speakers once their project or thesis is complete to present their findings to current students. The following comment from a recent PULSAR graduate is representative of the kind of feedback we receive after students complete the program:

*“PULSAR not only taught me about research, but also inspired me to think about its implications for clinical practice, outreach and policy. Thank you for the incredible opportunities to learn these broader lessons.”*

PULSAR has also been beneficial for faculty and graduate students who have participated.

For faculty who present at the weekly PULSAR seminar or who mentor PULSAR students in research it is an overwhelmingly positive experience. They get to spend time with engaged, well prepared students, and when those students join their labs they help to raise the bar for other lab members. PULSAR provides a simple way for faculty to contribute to LSC, and they come away feeling good about undergraduate students.

For graduate students who have been involved as “PULSAR Fellows” -- two students each semester that receives a stipend supplement to help lead the weekly seminar and mentor students -- it has provided valuable experience that is generally much more rewarding than a typical TA assignment.

## People and resources

Resources committed to PULSAR are primarily in the form of LSC staff/faculty time and funding for graduate student fellowships. LSC Assistant Director Tess Wood spends approximately 10% of her time directing and managing PULSAR (including recruitment, program administration, scheduling, mentoring, etc.). LSC’s Assistant Director for Administration and Finance, Caitlin Eaves, spends a small amount (~1-2%) of her time administering PULSAR graduate student fellowships and event costs, as well as supervising hourly work on LSC communications, which benefits PULSAR.

In addition, PULSAR provides \$1500 in fellowship funds to two graduate student Fellows per semester (\$6,000 total annual cost).

## Undergraduate Activities Beyond PULSAR

### Classes

Overlapping with and in addition to PULSAR, faculty have already developed several new **undergraduate classes** designed to reach a wider student audience (e.g. i-series, general education classes) and/or to target a group of students interested in language from multiple disciplinary perspectives. For example, language science faculty have developed widely accessible courses in topics such as: Heritage Languages (LING262, Dr. Maria Polinsky), and

comparing media claims with current findings in brain and behavior research (HESP214, an i-series course, Dr. Jared Novick). There are also new undergraduate courses which connect language and computation (e.g. MLSC410 Computational Approaches in Language Science, cross-listed in LING and CS) and which introduce undergraduates to field research methods which will enable them to participate in Mayan language research in Guatemala (e.g. Linguistic Field Methods).

### Internships and Practical Experience

In addition to helping PULSAR students find research assistantships and internships, several LSC initiatives directly provide such opportunities for students.

- **ToggleTalk** [[website](#)] hires and trains approximately 20 undergraduates per semester, who acquire hands-on experience in educational assessment, working with children in the Baltimore City Public Schools.
- Our **Guatemala Field Station** [[website](#)] enables undergraduates to participate in Mayan language research, whether through research assistantships with faculty and graduate students in Linguistics or through participation in our annual Summer Field School.
- The **Infant and Child Studies Consortium** [[website](#)] provides multiple long-standing opportunities for lab-based research assistantships.
- **Project RISE** [[website](#)], in the College of Education, admits 12 undergraduate fellows (50% from Bowie State and 50% from UMD) and provides research training and experience, with the goal of increasing the numbers of PhD students of color and first generation college students in fields such as Education, Cognitive Psychology, Educational Psychology, Human Development, Speech Language Pathology, Special Education, Linguistics, or Audiology. LSC provided faculty and staff assistance in the grant application process; language science faculty and graduate students also teach in the intensive summer course on language and literacy and are mentoring RISE fellows.

### Future directions for undergraduate programs

In the context of LSC's mission and goals, PULSAR addresses several important priorities. In particular, PULSAR:

- **Expands** and **enriches** undergraduate educational opportunities in language science, drawing more talented students into language science fields
- Builds a more **diverse** research community by enabling more students to contribute to and benefit from research and practical experience;
- Increases capacity of language science research projects and strengthens on-campus and off-campus **partnerships** by connecting well-prepared and well-supported students to ongoing research projects;
- Increases faculty and graduate student **engagement** and **satisfaction** in preparing undergraduates for language science career paths.

To date, 45 students have participated in the PULSAR program. This is a substantial number of students who have been provided with opportunities well beyond the typical undergraduate experience. But it is a relatively small proportion of the undergraduate student body as a whole. The PULSAR model sits in contrast to other interdisciplinary or research-focused programs for undergraduates such as FIRE and the Living Learning Communities at UMD, which target Freshmen and introduce them to research. PULSAR is a smaller, more focused and individualized program, which we regard as complementary to these other earlier, broader programs. However, building more opportunities for students to engage in language science (particularly earlier in college) could increase LSC's impacts in undergraduate education in a valuable direction and contribute significantly to diversity efforts in language science.

LSC has been investigating options for developing additional interdisciplinary undergraduate opportunities that would build upon the individualized, mentoring-intensive PULSAR program. Possibilities under discussion include:

- **Hybrid major: combined major in Computational and Language Science in collaboration with CS:** This is a combination of fields and expertise in high demand for the workforce, and an area of strong interest among students. (e.g., CS participation in PULSAR has grown quickly in recent years and CS majors constitute the largest group of students who inquire about PULSAR.) The Computer Science department is extremely interested in the development of programs that combine CS with other related fields, and many students with language interests would benefit from gaining a background in computer science.
- **Living Learning Community in Language, Technology, and Society.** These communities co-house early stage students and expose them to thematic programming independent of their major. They contribute to UMD's undergraduate recruitment efforts, and sometimes are designated for specific segments of students, e.g., honors (upper quartile), College Park Scholars (second quartile). There is demand for more LLCs that serve (interdisciplinary) science and engineering. An LLC would serve a larger and more diverse group of students than PULSAR can. There are established models for their funding, but it is unclear who would pay.
- **Expansion of PULSAR or Individualized Studies Program.** PULSAR has worked well at small scale, because of the individualized support that students receive. It shares features with the Individual Studies Program (IVSP) which serves a small number of students from throughout UMD in self-designed majors. PULSAR could be expanded to a minor or major program, serving more students in a similar fashion to IVSP. However, scaling PULSAR would require changes to allow the program to continue to provide the community and intensive support that make the current program attractive.
- We have considered developing a track for the Provost's **FIRE (First-Year Innovation and Research Experience)** initiative. This program serves large numbers of beginning students, and it is largely independent of the students' majors. There is less enthusiasm for this approach, as it would be a more independent program, less integrated with our

interdisciplinary faculty and student community. (LSC faculty submitted a couple of proposals for FIRE tracks around 2014-2015, but neither were accepted.)

We have also considered a couple of options for different types of undergraduate programming that would serve other constituencies.

- **High school/pre-undergraduate summer classes in language science:** This option would focus on reaching high school students interested in earning college credit and learning about language science. This option has the most potential to increase diversity in the pipeline in language science, by offering language science credits and experience to students who might otherwise be unaware of the field. But it does not serve our core constituency of UMD undergraduates.
- **Summer research program for advanced undergraduates or immediate post-baccalaureate students:** This would be an entrepreneurial program geared towards students from UMD and other institutions who plan to apply to graduate school but have had limited research opportunities. We would only undertake an entrepreneurial program of this kind if it would benefit rather than undermine LSC's core mission.

LSC has held initial meetings to discuss options such as these, and we look forward to a broader discussion of pros and cons.



*Ellen Lau (LING) and Bob Slevc (PSYC), Winter Storm 2017*



# Partnerships

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One of the Language Science Center's goals is to **establish local, national and international partnerships to enhance research and training**. This is a natural role for LSC: it has the infrastructure to support partnerships that would be difficult for an individual to maintain on their own. Moreover, the reach and continuity of the center can make partnerships more sustainable than connections established through an individual researcher or smaller program.

Why are partnerships so important? Pursuing an integrated language science in which fundamental science is directly connected to applications in technology, education and health requires partnerships with organizations that specialize in those domains. Partnerships with external organizations, including other academic institutions in the US and internationally, can provide collaboration and expertise, student training and research opportunities, as well as paths to broader outreach and public engagement.

Over the course of the last six years, we have cultivated partnerships in many of these areas, most of which have grown from a particular specific project or connection but have been strengthened and institutionalized within the framework of the LSC. They reflect in particular:

- The strong community connectedness of our [Field Station in Guatemala](#), and a commitment to building local capacity and supporting local organizations
- Development of [Langscape](#) as a highly visible portal for information about the world's 7000 languages, working with experts in language documentation, learning, and mapping, with prospective users in humanitarian organizations, government, and K-12.
- The worldwide reach of the [Global Research Alliance in Language](#) (GRAIL), together with OIA, the Universitas21 alliance, and leading universities from 6 continents.
- The broad public reach of [Planet Word](#), a museum in downtown Washington DC whose vision LSC helped to shape.
- LSC's focus on outreach, education and public-facing science, both nationally and locally ([described below in the section on public engagement](#));
- A commitment to research, outreach, and community service that touches a diverse population in K-12 schools (e.g. partnerships with Baltimore City Public Schools, Hyattsville Education Advisory Committee, local high schools).

At best LSC's partnerships have made it possible to pursue creative projects that would have been unimaginable before LSC was created, benefiting from the scale of the community and the high level staff support. At other times it has been challenging to get the partnership projects to reach a sustainable level, due to shifting priorities in the partner organizations and due to LSC being pulled in too many directions.



## Field Stations

A major initiative of the LSC has been to develop **community-based research field stations** in strategic locations around the world that provide opportunities for innovative research and training that is not possible in the US.

These field stations are envisioned to be centralized resources that coordinate scientific research and training by providing (i) research infrastructure, (ii) access to specific social or other (e.g. ecological, economic) systems that are not immediately available otherwise, (iii) training for students at the graduate and undergraduate level, and (iv) access to local communities with the goal of obtaining data from them as well as training local specialists and working on issues relevant to the local community context (e.g. language revitalization; public health; human migration; economic change and development).

Efforts to date have concentrated on Mayan communities in the highlands of Guatemala, with some exploratory development in the Republic of Georgia. A great deal of infrastructure has been created, a number of programs delivered, and many lessons learned. LSC now much better understands what it takes to be financially sustainable (it's feasible, if not easy), what is the potential impact for students and researchers (it's substantial), and what it takes to make a difference in multiple fields beyond language science (that will take a sustained effort).

### Field Station in Guatemala

The **Guatemala Field Station** [\[website\]](#) was founded in 2015. Primary activities have included four summer schools (and one winter school), which combine immersion classes in a local Mayan language with supervised mentored research. These have attracted students and faculty from around the world. In addition, the Field Station hosts independent researchers throughout the year from institutions worldwide (to date: Japan, Germany, Singapore, England, Russia, and Hungary, as well as the US).

Director	Dr. Maria Polinsky
Executive Director (in Guatemala)	Dr. Pedro Mateo Pedro
Associate Director	Dr. Omer Preminger
Assistant Director (Research/Prog. Mgmt)	Dr. Tess Wood
Assistant Director (Admin/Finance)	Caitlin Eaves
Local Coordinator	Ana Victoria López Sipac

A hallmark of the Guatemala Field Station and one of its greatest strengths is its extensive connections to the **local community**. Visiting researchers and students stay with local host families, participate in the activities of local indigenous groups such as a women's cooperative, and observe and assist with the work of local NGOs. (Two essential partners have been the [Wuqu' Kawoq Maya Health Alliance](#) and the [Asociación Renacimiento NGO](#)) The Field Station Executive Director, has extensive connections and is highly respected in Mayan communities in

the area, and this has been invaluable for facilitating research and building local trust in the Field Station and UMD. The Director, Executive Director and researchers at the field station also provide training for native speaker linguists (around 50 speakers of Mayan languages to date).

# UNIVERSITY OF MARYLAND GUATEMALA FIELD STATION SUMMER PROGRAMS

ACCEPTING APPLICATIONS THROUGH  
MARCH 11, 2019



## MAYAN LANGUAGE AND COMMUNITY DEVELOPMENT EXPERIENCE

**Dates:** June 22 - July 14, 2019

**Location:** Patzún, Guatemala

**Language:** Kaqchikel

**Program Fee:** \$2,350

UMD's Kaqchikel summer field school in Patzún, Guatemala offers students the opportunity to study the Mayan language Kaqchikel and to work on an internship or project in the areas of language technology, public health, education, or business administration. The three-week program includes a homestay with a local family and weekend field trips (e.g. volcano hike, Antigua, or Iximche archeological site).



## MAYAN LANGUAGE SCHOOL AND FIELD RESEARCH PROGRAM

**Dates:** July 6 - August 4, 2019

**Location:** Nahualá, Guatemala

**Language:** K'iche'

**Program Fee:** \$2,700

Our 4th annual language and field research summer school will focus on the Mayan language K'iche' and be located in Nahualá, in the Lake Atitlán area. The trip has two main components: two weeks of intensive language classes and two weeks devoted to research with support from our experienced research faculty. This four week program also includes a homestay with a family and local weekend trips.



Application available at [go.umd.edu/fieldstation](http://go.umd.edu/fieldstation)

✉ [lsc@umd.edu](mailto:lsc@umd.edu)

f Maryland Language Science Center

📷 @UMD\_LSC



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## Future development

To date, most work of the Field Station has been in linguistics and related to Kaqchikel, K'iche', Chuj, Akateko, Mam, and Tz'utujil. The goals going forward include:

- Expanding the range of **research and community connections** to new language communities;
- Continuing to expand the **participation of undergraduates** in the Field School (In 2017, there were three undergraduates in the summer school; in 2018, that number was five; and as noted below, we are applying for an NSF REU Site grant to dramatically expand our undergraduate education activities.);
- Expanding awareness of **research potential** for students and faculty in various fields of inquiry all year round, encouraging research in areas such as economics, nutrition, health care, sustainable agriculture, human rights, and others.

Language continues to be the core of all these activities: In order to work with indigenous groups, understand their needs, and gain their trust, it is essential that field station participants speak their language and know their culture. We expect that the more diversified activities of the Field Station will make it more attractive to a larger cohort of undergraduates.

## Challenges/Threats to the Field Station

First, **sustainable funding** is vital in order to maintain and expand educational and research programs. Fees for summer schools and independent researcher costs cover all of the participant's basic needs (accommodation, classes, research support) as well as faculty/staff travel and expenses for program support. However, they cover only a small portion of the salary of Executive Director, Dr. Pedro Mateo Pedro (25% FTE), who leads day-to-day research and administrative activities of the Field Station on the ground throughout the year. No funds are available for associated LSC staff and administrative costs for the time required from Caitlin Eaves and Tess Wood.. Since most of our participants at this point are graduate students, many from international institutions, and many self-funded, we do not anticipate that raising participant fees would provide a simple solution, since it would likely deter many potential participants. Mateo Pedro's salary has been paid via Dr. Polinsky's start-up funds since 2015; these funds are no longer available as of FY20. Our ability to retain Mateo Pedro, with his extensive local connections, research expertise, and understanding of academic systems in both the US and Guatemala, is key. As the Field Station becomes more visible as well, Mateo Pedro becomes more desirable as a hire for a number of institutions, and we need to ensure that his position within the Field Station is secure in the longer term.

Second, while the potential value of the field station to researchers in multiple fields (including global public health, agricultural and development economics, maternal and child healthcare) seems evident, we have had limited success in attracting **students and faculty from diverse disciplines** (beyond language science). This is in part due to LSC's currently limited

connections and lack of reputation in these areas, as well as our limited ability to envision the most interesting research directions in areas we are unfamiliar with, and therefore one challenge is identifying *who* to reach.

Sustainable funding will require several different components. An immediate goal is to re-submit a proposal for an NSF-REU Site, which will fund a much larger undergraduate program focused on the intersections of language with community development and health. As part of our preparation for this application, we have several undergraduates at the Field Station in Summer 2019 who are taking Kaqchikel language classes and working on projects with local community organizations: Renacimiento (education non-profit), Aj Su'um women's cooperative, and the Digital Humanities for Mayan Languages project. This program is jointly being led by Dr. Pedro Mateo Pedro and Jill Janofsky (a UMD staff member in Agriculture and Resource Economics who coordinates the undergraduate Global Poverty minor).

A successful REU proposal will help us to cover part of Mateo Pedro's salary, as well as some of the UMD administrative costs required to maintain the field station, and will simultaneously contribute to our outreach to faculty in different research areas. We already have an interdisciplinary group of UMD faculty interested in working with REU students on projects in Guatemala, including in Economics and Agriculture and Resource Economics. We have also discussed potential collaborations with faculty in the School of Public Health.

An NSF-REU award will therefore partially improve both funding and outreach challenges. However, it will not pay for the LSC full-time staff's time spent on administration of the field station, and our outreach to different fields beyond UMD.

In the realm of outreach, Maria Polinsky has been presenting on the Field Station in her various invited talks in the USA and internationally. Her paper on the Field Station appeared in the journal "Language" in June 2019. We have been successful in recruiting student applicants for the Summer Schools from a variety of institutions in the US, Canada, Europe, and Japan - but so far all within the general area of language science. We aim to build on our REU-centered interdisciplinary connections at UMD to reach faculty and students more broadly in fields such as economics, agriculture and public health.

Finally, conducting research and education programs across international boundaries, and particularly in rural Guatemala, poses a number of challenges in administration and in building trust with local partners. The most significant problem has been **financial**: it is difficult to promptly send money for necessary program costs, reimbursements, and to pay community members for hosting visitors, working as language teachers, linguistic consultants, etc. Since many of these people depend on income from their work for the Field Station and Guatemala is primarily a cash economy, the need for payment to be timely is critical. Not surprisingly, the university and State of Maryland's processes are not designed with this kind of scenario in mind, and as a result we have faced several delayed payments which have threatened good will and trust with our partners in Guatemala (both NGOs and individuals). We have taken several steps



to mitigate this problem, including using cash advance mechanisms to pay for program expenses without lengthy waits for reimbursement and working with local partners to make local payments. However, transferring money to partners in Guatemala promptly is still complex, and we continue to look for ways to address this problem.

## Langscape

**Langscape** is a worldwide language mapping and language information project, which has been developed for public access by the Language Science Center in collaboration with CASL, building on and adapting work initially supported by the US Government.

At the center of the project is a web portal [<http://langscape.umd.edu/>] which connects information and resources about all 7000 languages of the world, primarily via a map interface. The map is so visually compelling that it is tempting to think of Langscape and the map as the same thing. But the map is the gateway that leads to a wealth of additional resources.

This online platform has already proven highly valuable for outreach and public visibility. Additionally, an important aim has always been to develop its value for research applications in language science, i.e., research on language itself, and for other fields, e.g., research on how language connects with other behavioral and social phenomena, geographical information, and technology. Also, Langscape has many potential applications in domains such as humanitarian relief and global education.

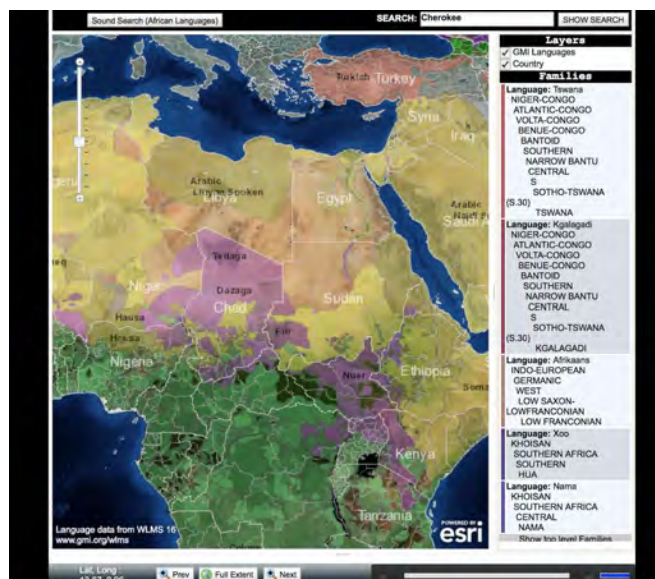
## History/Origins

Langscape did not originate at LSC and it was not part of the center's early plans. The former VPR, Pat O'Shea, asked Phillips in late 2013 to take on this new project. At the time it was not possible to even see what the project was, because it was on classified servers, and it was described in only vague terms. Phillips did not feel that LSC had much choice in whether to take on the project.

The project had started as a well-intentioned effort inside US intelligence agencies which have an interest in a broad understanding of what languages are spoken where, including minority languages that hold little interest for Big Tech. The project struggled as an internal effort, because intelligence agencies rarely engage with the general public or with a broad community of academics that might provide resources. CASL did some work on developing specific resources, such as word lists for a few hundred languages, but it faced a similar limitation. The decision was made to take an entirely different strategy, basically giving the technology away and creating a publicly available resource, which could reach a very broad audience and could generate much greater interest in contributing new language resources and developing new applications.

The goals for the project were framed in very general terms, so it was left to LSC to develop plans from the ground up. In early 2014 the project's main software engineer, Paul England began working with LSC Assistant Director, Tess Wood.

Paul England's work continued to be funded through CASL, initially through US Government contracts and later by short-term support from the VPR. The USG continued to maintain an internal/secure version of the project, which depended on the work of CASL researchers. This is how one of LSC's largest undertakings, which was supported by external contracts, is invisible in LSC's balance sheet, and LSC never saw a single dollar in DRIF returns from the project.



At the point when it was “rehomed” to LSC, the project was not ready for public consumption. The geographical interface at the time depended on a proprietary dataset (polygon data of locations for most of the world’s 7,000 languages). The missionary organization that owned the dataset was concerned that it be protected from unauthorized download or use, since the dataset is very valuable. This required several months of work. This was followed by several months of re-design of the database and interfaces in order to make the project accessible to a much wider audience. By the time of the initial public

release in September 2014, the project, now named “Langscape”, was dramatically different than what LSC had inherited.

The initial public release led to rapid public engagement and strong interest. For example, a positive story about Langscape on MentalFloss in early 2015 brought more than 3,000 visitors in a single day (12,000 in a month) and almost crashed the CASL servers, as well as leading to publicity around the world and in multiple different languages. Langscape was subsequently moved to Amazon servers, which are more robustly scalable.

The next year after the site became public (through the end of 2015), work on Langscape was largely devoted to obtaining, cleaning and integrating several large datasets, i.e. focusing on data covering several thousand languages, to begin to populate the portal with more information. The goal of these efforts was to create a “proof of concept” that would help secure funding for further development from the US Government, as well as potentially NSF, foundations and other sponsors. Throughout this period (and since), Tess Wood’s time was supported from the LSC’s core operational funding, meaning that she devoted time to Langscape instead of to other center activities, and Paul England’s funding was highly



constrained. Paul continued to work for CASL, but with small amounts of his time devoted to “dual use” developments that served both the public project and its USG twin.

The understanding of LSC leadership at the time was that Langscape had a number of strengths that made it a good strategic investment of time.

(a) It provided high value in public visibility for language science, particularly language diversity. With its powerful visualization, it could convey in a few seconds what we might struggle to convey in an hour in words. It also provided broad exposure to LSC and UMD.

(b) It had significant potential for future research and educational applications. There is much interest in fundamental science and applications on broad language diversity, but a scarcity of resources to support such efforts.

(c) It contributed to an important collaborative relationship with CASL and the US Government, and thus served both the language science community and UMD’s interest in close USG ties. It was conveyed clearly to LSC that success was important, as this was the first case of tech transfer from CASL’s sponsor to UMD.

(d) It would likely be fundable by the USG and other organizations, enabling LSC to develop valuable research and educational uses that align with LSC’s mission, and creating strong revenue streams.

LSC was in a unique position to take on a project like Langscape, due to the UMD interdisciplinary community, due to LSC’s ability to host infrastructure projects, and due to the US and worldwide academic connections LSC had developed and was focused on supporting.

Expectations (c) and (d) have not yet been borne out. The situation of CASL (and LSC’s relationship to it) has changed, and while various government agencies have repeatedly expressed interest in the Langscape project, funding through different channels has been sought but not been forthcoming. These two factors have a strong impact on the current and likely future direction of the project.

Some examples of the funding sources that have been pursued are: multiple IC agencies (Phillips made a number of presentations at the National Geospatial Intelligence Agency and at UMD; Phillips and Wood submitted an NGA white paper). Phillips & Wood submitted a proposal to an NSF research infrastructure program. The program officer was enthusiastic about the project’s broad applications, but the review panel was less enthusiastic. Phillips and Wood began to collaborate on an exciting proposal to USAID led by a contractor, but the contractor was reluctantly forced to drop LSC as a partner due to small/minority business contracting requirements. Wood led development of foundation proposals, in particular joint with Translators

without Borders, with support from UMD's Ted Knight. This effort was stalled by delays in securing a letter from a high profile partner such as the World Health Organization.

After 2 years of gradual development (2016-2017) with very limited time and funds available to the project, a major change came in January 2018 when, after several months of discussion and negotiation, we lost the ability to license the map layer that provided the key visual gateway to Langscape's resources. This map layer, which covers the whole world, was the intellectual property of a missionary organization that LSC (and CASL) had built a good trust with. That organization closed and sold the IP to SIL International, another missionary organization that has a long history in language documentation. SIL saw Langscape as posing a risk to its business model and so it increased the license price by approximately 600%, well beyond our means. This effectively removed a key element of Langscape, and it meant that the world's most comprehensive language mapping data would be available only behind a paywall. (This change caused consternation among many language experts who had provided their geographical knowledge in the expectation that they were contributing to an open resource.)

Since early 2018 efforts have been devoted to creating a temporary means of displaying some language and geographical data, while developing plans for the future.

## Current status of Langscape



The loss of the dataset behind Langscape's primary visual gateway posed major challenges. At the same time it was partly liberating, as it created an impetus to create new and better open source resources, in collaboration with academic and non-academic audiences. However, this depends on finding a way to capitalize on the opportunities.

Langscape currently displays a dot map of languages based on openly available data ([glottolog.org](http://glottolog.org)), as well as a nation-by-nation map layer of major and official languages, which we created from publicly available information. These are useful "intermediate" datasets that keep the site alive, but they are far from the detailed language and geographical information that we would need and that the world wants. In addition to the applications we previously envisioned, we have heard from linguists, humanitarian organizations, and others, that there are significant needs for a freely usable worldwide language location dataset for both research and humanitarian applications.

Across much of the world the question “What language is spoken here?” has a complex answer. Different speakers use different languages in different settings, and language groups overlap and are frequently on the move. The proprietary worldwide map layer that was the entry point to Langscape from 2014-2017 was visually attractive with its neatly bounded polygons. But it was a gross oversimplification, and it provided the answer to the question “What language should we translate the Bible into here?” That is not the question that most researchers, aid workers or others aim to answer.

While the missionary mapping data was relatively cheaply available, it created a kind of barrier to developing the kinds of mapping resources that the world needs.

**The long-term solution:** Combine data from multiple sources, including carefully-designed crowd-sourcing, which gathers detailed information about language-use around the world, as well as online data-mining and published research on language use.

This is a challenging, multi-year project - but given the right resources, it is achievable through engagement with “citizen scientists” as well as academics, other language experts and stakeholders.

LSC has done a good amount of planning and feasibility testing for a project of this kind. The effort has been led by Tess Wood, in close consultation with Dr Michelle Morrison, one of the CASL leaders on the Langscape project. Morrison is funded primarily by ARLIS contracts, but her position now is based at LSC.

## Collaborations and Outreach

- We have been partnering with **Translators Without Borders** (TWB [[website](#)]), an NGO that provides language services and language information to serve humanitarian needs, to develop an understanding of humanitarian needs for language mapping and to identify potential funding mechanisms, pilot projects, and data collection methods for accomplishing this. Langscape was part of a proposal TWB submitted last year to a Humanitarian Grand Challenges initiative being funded by USAID, DFID (UK), and Canada, and we have been seeking other joint funding opportunities. A copy of this proposal is included as an appendix.
- A team from LSC, CASL, and UMD’s Center for Geospatial Information Science collaborated to develop ideas for a **“Language Observatory” platform** connected to Langscape - integrating data from multiple different sources and developing geospatial tools to support a wider range of applications of the data. This team put together white papers for potential government funding but was unsuccessful in obtaining funding.
- A group of Carnegie Mellon Human-Computer Interaction students worked with Tess Wood in Spring 2018 to develop **prototypes of a crowd-sourcing interface and**

**methodology**, and their work has since been extended and revised by volunteer research assistants at UMD.

- In Spring 2019, a team of UMD iSchool graduate students (in the Masters of Information Management program) developed a **pilot model for online data mining** in both digitally under-represented and data-rich/highly represented areas of the world.
- **Amazon's AI for Social Good** team has expressed strong interest in Langscape and our collaboration with Translators Without Borders, and is willing to offer resources in the form of AI/Machine Learning tools and Amazon Web Services.

## Challenges

Langscape is currently at a precarious crossroads. Multiple government agencies, academics, NGOs, have expressed interest in the project, as both collaborators and potential future users of the project. We have established relationships with CGIS and the iSchool, where there is highly relevant expertise and interest. We have an excellent and extremely qualified developer who has been working on the project long-term and wants to continue, and we have talented students (undergraduate and graduate) who are keen to contribute to and learn from the project. We also have the potential for donated services from Amazon. However, development has slowed to a crawl, since we have no funding for personnel. (We currently pay Paul England hourly from LSC's funds for a few hours per month of consulting and maintenance work.)

There are several reasons we think it has been so challenging to secure funding:

- Although the project creates infrastructure to support research in multiple fields, the work required is generally not considered research. This closes off several potential funding channels (e.g. NSF).
- While many different organizations, analysts and researchers see the value of Langscape for their work, it is never the #1 priority for any organization. The breadth of applications means that everyone hopes that someone else will pay for it.
- Foundations and corporate sponsors are interested, but are generally reluctant to pay for personnel. Money for a highly competent and specialized software developer is an essential prerequisite to the more "fundable" components of the project, such as crowd-sourcing and piloting humanitarian applications.

The Langscape project has been somewhat of an odyssey for LSC. It was placed in our laps by the VPR. LSC invested substantial time and creativity to develop a compelling proof of concept for a project that would embody LSC's mission to connect detailed language expertise to major societal challenges. It remains the case that, if successful, Langscape would be by far the most visible output from UMD language science. But the project often struggled to navigate the politics of USG relations, CASL, and external organizations. LSC led significant sponsored research activity, but because of how contracts flow, this work left almost no trace in the accounts that are often used as measures of "research activity". And from the perspective of LSC's core constituency of language scientists in traditional academic departments, it has distracted from LSC's ability to tend to their interests.

## International Partnerships: GRAIL

The Global Research Alliance in Language (GRAIL) is an initiative that LSC developed in collaboration with UMD's Office of International Affairs, in the context of UMD's participation in the Universitas 21 global alliance. (The original proposal is included in Appendix G, p. 55.) The aim was to advance many LSC and UMD goals by aligning internationalization efforts at the level of students, faculty, and institutions.

LSC Director Phillips worked closely with OIA Director Ross Lewin to develop plans and an impressive worldwide group of partners. But the initiative struggled when faced with shifting institutional priorities and funding opportunities. The vision that guided GRAIL remains clear and attractive, but the future trajectory is uncertain.

### Vision and Rationale - Internationalization

There is much talk nowadays about internationalization of science and higher education, and it is meant sincerely. But it is difficult to turn talk into action, because of efforts at multiple levels that are typically disconnected.

University leaders shake hands and sign MOUs. Faculty seek out collaborations with partners who have exactly the expertise they need, regardless of institution. Students seek international experiences that they expect to be rewarding and memorable, often looking beyond just the academics. These interests generally do not align. Faculty don't want to be told who to play with. Students often take part in dedicated international programs that give them limited contact with the local student population.

The rationale for GRAIL was to align internationalization efforts at these three levels: institutions, researchers, students. And to do so around a theme that is ideally suited for a large scale international network. Language science is a broad area that is "globally necessary, and necessarily global". Importantly, language science is an area where every institution, no matter how rich or poor, has something valuable to contribute, because everywhere has interesting linguistic resources.

The U21 network consists of 27 member institutions from around the world. The network can be thought of as similar to airline alliances: Star Alliance or Sky Team for universities. They make it easier for students and researchers to move and work across institutions. And by being a larger group, they offer literally hundreds more bilateral opportunities than a typical bilateral arrangement could.

By sheer good luck, U21 also happens to include a number of world class groups of language scientists. This makes it much more plausible for faculty to find colleagues who they would be eager to work with.

Student mobility can be a powerful (and cost-effective) catalyst for research partnerships, if students serve as ambassadors between research groups in different institutions, in the same way that they have proven to be excellent ambassadors for creating connections across departments within one university. By acting as a research ambassador, students can also have a richer international experience, because they have a role with a purpose and an authentic host in the international destination.

## Actions and Partners

The [27 members of U21](#) include many universities that have strong language science groups, in addition to UMD.

- University of British Columbia (Canada). One of the few institutions that is pursuing an integrative language science initiative similar to UMD.
- University of Edinburgh (UK). The broadest and strongest language research community in the UK, arguably in Europe.
- University of Melbourne (Australia). Key member of a large Center of Excellence in language science funded by the Australian government.
- Lund University (Sweden). Strongest and most integrated language research group in Sweden.
- University of Connecticut (USA). Already a close partner with UMD. Their IGERT and NRT training grants in language science are strongly influenced by ours.
- UC Davis (USA). Strong interdisciplinary language community, interested in pursuing greater institutionalization, like at UMD.
- Waseda University (Japan). Language group led by a long-standing UMD partner who is quietly assembling Japan's strongest language science group.
- Hong Kong University (Hong Kong). One of the strongest language groups in the Chinese speaking world.
- University of Amsterdam (Netherlands). Multiple large language groups in one of the Netherlands' top universities.
- University of Zürich (Switzerland). Growing language group, eager partner.
- University of Auckland (New Zealand). Largest language group in New Zealand. Already collaborating with UMD.

Over 2014-2016 Phillips held many **meetings with faculty** from individual institutions, to generate interest in the GRAIL network. He held in-person meetings in Lund, Connecticut, Vancouver, Seoul, Hong Kong, and Edinburgh. And he had online meetings with Australia (3 different universities), New Zealand, and Nottingham (UK). Ohio State was also an enthusiastic partner at the time, but the institution subsequently withdrew from U21. McGill was the one prominent institution that proved to be lukewarm at both the faculty and institutional level. McGill later withdrew from U21.



In Spring 2016 Phillips organized a **GRAIL planning workshop** at the University of Edinburgh, joint with Antonella Sorace (a leading researcher at Edinburgh) and Ewa Wiberg (Vice Rektor at Lund, then Executive Director of U21). Representatives of most U21 institutions took part, generating a good amount of interest at the faculty level.

At the institutional level, multiple **presentations and meetings to university leaders** were made, either at U21's annual meetings of presidents/vice chancellors, or at meetings of graduate deans and VPRs. Most of these were led by Ross Lewin and/or Joe Scholten of UMD's Office of International Affairs, or by VPR Pat O'Shea. One was led by Phillips. This generated a good amount of high level interest from university leaders in multiple countries.

**White papers** were prepared for U21 leadership, seeking funding to launch the initiative, through contributions from member institutions.

In 2016 Phillips and the LSC team put together a proposal to **NSF's PIRE program** (Partnerships in International Education and Research, \$4M), NSF's signature program for international research. This proposal included representatives from many U21 institutions plus a "dream team" of further international partners in language science, from top research groups in developed countries, including Berlin, Paris, Moscow, Tel Aviv, and Tübingen, together with research sites in developing countries such as Guatemala and the Republic of Georgia. The proposal was selected by UMD in the internal Limited Submissions process, but it did not advance to the final round of the NSF competition. Feedback was not received.

## Challenges

The international plans showed much promise. Not only as an opportunity to increase the reach of language science, but also as a model for institutionalization efforts that align students, researchers, and institutions, and an opportunity for UMD to be a visible innovator in internationalization. But the efforts stalled. Why did this happen? Mostly due to shifting priorities at multiple levels.

- Within U21 there were shifting priorities over the mission of the organization. Some institutions were keen to expand U21's role in research, while others (especially Australians) were mostly interested in student mobility. Meanwhile, the Executive Director of U21 was replaced. Somebody with a keen interest in language was replaced by a leader from an institution with one of the weakest language groups in U21. This made it difficult to get support from U21.
- At UMD there were also shifting priorities. The VPR who had been supporting the effort joint with OIA moved away from UMD. With LSC's Tier 3 support finished, it was apparent that LSC would receive less credit for an initiative like GRAIL that had high potential impact but low prospects of generating large amounts of revenue. Also, there was uncertainty over UMD's continued commitment to U21 membership.

- At the ground level in the language science community, there was a need to create momentum for student exchanges, joint courses, research meetings, etc., and to include a wider range of faculty and institutions in the process. This was likely to be a gradual effort that could not attain big results quickly.

## Other International Efforts

Separate from the U21/GRAIL effort, LSC worked to develop promising bilateral partnerships that aligned with UMD's institutional goals. For example, in 2014 Phillips organized, with support from Omer Preminger, a joint workshop with linguists at **Tel Aviv University**, as part of an initiative started by VPR/OIA. 4 faculty and 3 graduate students traveled to Tel Aviv for what turned out to be a creative and engaging workshop. Instead of the usual talks plus Q&A format, the group followed a riskier format that was much more open, with experts from different areas (non-publicly) live-blogging the workshop discussions.

The aim of the joint workshop was that it should lead to joint proposals. The one specific case of this was a proposal to the US-Israel Binational Science Foundation, by Phillips and Aya Meltzer-Asscher of TAU. This proposal came frustratingly close to receiving funding. A 2015 submission received very high reviews from all but one reviewer. The same happened to a revised proposal in 2016. Further submissions are not allowed.

Additionally, Phillips was recruited to pursue efforts to develop research partnerships with Chinese institutions. NSF's international office was keen to develop international workshops as a means to build ties and potential funding streams from China. This also fit with UMD interest in developing increased activity in China. At the encouragement of NSF, Phillips developed a plan for a language science workshop. Ultimately the plans crumbled due to politics, surrounding the involvement of Hong Kong, and the interest in minority languages of China.

## Planet Word

Planet Word is a language museum that is scheduled to open in Franklin Square in downtown Washington DC in early 2020. It will be the first major museum related to language in the US. It occupies a historically important building adjacent to the Washington Post. It is designed to the highest standards -- the designers of the 9/11 Museum in New York City are designing exhibits for Planet Word. The leader of the museum is Ann Friedman, an educator and philanthropist who has devoted her considerable resources to engaging a strong team for Planet Word.

LSC played an important role in the development of Planet Word. It also has the potential to benefit in many ways from a partnership with the museum.

LSC director Phillips was referred to Ann Friedman early in the development of plans for the museum. As Friedman herself has reported, discussions with Phillips and learning about UMD's view of language science helped to shape her vision for the museum. Phillips also helped to

recruit a number of members of the PW advisory board. Friedman has also agreed to be a member of an advisory board for LSC.

PW will create greater visibility for language in Washington DC, by virtue of being a high quality museum in a prominent location with a very strong set of backers and endorsements. PW will also have event space that could be useful for holding events in DC.

With leadership from LSC Associate Director Jan Edwards we have explored the possibility of conducting research at PW. This is inspired by a very successful lab-in-a-museum initiative led by language scientists at The Ohio State University in the Center of Science and Industry (COSI)

in Columbus, OH, one of the leading science museums in the US. Previously there were plans to have a dedicated lab space at PW, but those plans had to be dropped due to constraints on the building renovation from the DC Historic Preservation Commission. However, we still hope that there will be opportunities for pop-up research stations at the museum.

UMD has invested in other partnerships with DC museums. This is a promising strategy for raising the profile of the university in the DC area. A major partnership with the Corcoran Museum was developed, although it was ultimately unsuccessful. A partnership with The Phillips Collection has been beneficial for UMD's profile in fine arts. Planet Word has the potential to be even more successful, especially in light of UMD's involvement in the development of the museum.

The Post's View • Opinion

## The District should welcome a museum about language with open arms – and ears



Built in 1869, the Franklin School in downtown Washington is set to house the Planet Word museum, which backers hope will open in 2019. (Joe Davidson/Courtesy DC Preservation League)

By Editorial Board

## Dissemination

Broad dissemination within and beyond UMD is an important part of LSC's mission. Language is important to human society in so many ways, but it is generally overlooked in lists of scientific priorities. The science of language tends to be divided into disconnected silos, diluting its visibility as well as its impact.

One of LSC's key goals is to ***inform the general public and policymakers about language, language science and the scientific process***. Over the long term, public engagement raises the profile of language science, which in turn leads to more research and funding opportunities, and a more diverse pipeline of future language scientists.

A second important dissemination goal is to ***identify and share effective, sustainable models for interdisciplinary research and education to benefit the broader scientific and academic communities***. We are invested in the success of language science more broadly, which will require successful interdisciplinary initiatives at universities around the world. We also want our success to raise the profile of the University of Maryland as a leader in interdisciplinary scholarship.

## Public Engagement

Although language science is highly relevant to key national interests (in areas such as education, social justice, electronic communication, globalization, and national security), public awareness is extremely low. Most people do not realize that language can be studied scientifically, let alone the potential value of doing so. **Improving public understanding is essential for securing public support, which in turn enables long-term investment in language science research and education.** Reaching a diverse public audience also potentially inspires a diverse range of young people to pursue careers in language science, or other sciences. Language science can serve as an excellent vehicle for raising interest in science, because it is highly engaging and presents relatively low barriers to participation.

For scientists, engaging the public requires not only advanced communication skills, but also an understanding of how scientific research connects to societal needs. In different disciplines, that connection takes very different forms. Research in Hearing & Speech Sciences can inform clinical practice that directly helps people. Systems developed in Computer Science and Engineering can be used in a range of applications that most people are familiar with, from machine translation to cybersecurity. Research in Linguistics can address deep questions about how human minds work, and the foundations of social interaction and culture.

Scientists at all levels--from first-year PhD students to tenured faculty--benefit from taking the time to engage the public. They learn to step back and take a broad view of their field, and communicate their perspective to people who don't share their specialized disciplinary training. Those skills are particularly useful for collaborative interdisciplinary research.

## Strategy/Activities

### Engaging children and families in the local community

In 2007, the Linguistics department began a **partnership with the Psychology AP program at Northwood High School**, a majority-minority public school. Jeff Lidz (LING) gave a lecture at Northwood on the relation between language and psychology. Then the psychology classes took a field trip to UMD. To get a taste of the college experience, the students attended a lecture presented by a faculty member. Then, to get an idea of who scientists are and how they do their work, students were divided into small groups, each attending two breakout sessions on different topics in language science. These sessions were organized and led by graduate students, and held in various lab spaces in the linguistics department. They presented about active areas of research and experimental methods and technologies, while also trying to teach students about the nature of hypothesis testing in linguistics and the cognitive sciences.

This partnership with Northwood High School formed the foundation of a **robust language science outreach program** spanning multiple departments. For the past 12 years it has been sustained and expanded primarily by a student committee formed during the IGERT program. Annual student-led outreach activities now include:

- Hosting about 200 students per year from Northwood High School and Paint Branch High School
- Mentoring a student Linguistics Club at Montgomery Blair High School
- Hosting early rounds of the North American Computational Linguistics Olympiad (NACLO)
- Tabling at local STEM career fairs
- Hosting research internships for high school students
- A language science and neuroscience tent at Maryland Day

We also help lead **Language Science for Everyone** [[website](#)], a consortium of faculty and students from four universities (UMD, The Ohio State University, University of Arizona, University of Massachusetts) who collaborate for large scale outreach events, often with support from the Linguistics Society of America. UMD students and faculty have helped staff a Language Science for Everyone table at **AAAS Family Science Days** [[website](#)] every year since 2014, and at the **USA Science and Engineering Festival** (USASEF) in 2018.

Students have developed a range of interactive demos to engage people of different ages and teach them about a variety of different topics in language science.



## Engaging policy-makers

In the past 2-3 years, students and faculty have developed increasing interest in **engaging policy-makers about issues related to language and science**. Part of this development was planned: the NRT program includes a requirement that students participate in a “policy experience” (e.g. interning with an advocacy organization or writing a white paper). But most of the increased enthusiasm is most likely due to changes in the national political environment. Researchers are strongly motivated to defend the role of science in public policy, and use science to address social justice issues.

In 2017, student organizers dedicated the last day of Winter Storm (January 20, 2017) to a “**Language Science Day of Action**” [[website](#)]. The day featured a panel of faculty talking about issues related to linguistic diversity in education, as well as workshops on crafting pitches for policy makers and writing “shareable” content suitable for social media. A month later, three faculty and eight students attended **Language**

**Advocacy Day on Capitol Hill**, and

met with staffers from both parties in the House and Senate science committees. A month after that, the LSC hosted a workshop on “**Language and Poverty: Home, School, and Society**,” highlighting language science research at UMD that connects to social and educational issues.

Building on the momentum generated by these three events, we encouraged the formation of a **new student committee focused on policy and advocacy**. The committee has been working to understand potential roles for academic researchers in policy-related advocacy. They have launched several task forces to tackle specific topics, and designed events and workshops to engage a broader group of language scientists at UMD.

## People and Resources

Most of our outreach efforts are made possible by students’ volunteer contributions and very modest financial resources for materials. Our participation in AAAS Family Science Days and USASEF has been coordinated by Assistant Director Shevaun Lewis and funded by a \$48,000 supplement to the NRT grant for 2018-2020.

**3<sup>RD</sup> ANNUAL**  
**Social Justice Day**  
**4.11.19**

**Language in Pursuit of Social Justice (2130 H.J. Patterson Hall)**

**9 A.M. | TALKS BY:**  
John Baugh  
(Washington University)  
on Language and  
Fair Housing  
  
Susan Ehrlich  
(York University)  
on Language and Gender  
  
Aylin Caliskan  
(George Washington University)  
on Language and AI

**11 A.M. | DISCUSSION**

**12:30 P.M. | LUNCH**

UNIVERSITY OF MARYLAND  
Language at Maryland



In any given year, 30-40 students (mostly PhD students) are involved in organizing or leading public engagement activities. Only a handful of faculty have participated.

## Outcomes

It is difficult to evaluate the impact of our efforts on the target audience. Although we reach hundreds or thousands of people each year, in most cases we have no follow-up contact.

For the students who participate in public outreach activities, the benefits are clear. Because they are forced to explain their work outside the context of a previous literature and theoretical framework, they develop a clearer vision of **why their work is important and relevant**. With practice, they become more able to **explain complex topics in an accessible and interesting way**, and more confident in their ability to **engage with a diverse range of people**.

Conversations with high school students provide a low-stakes opportunity to learn from failure: some first attempts are disastrous, but lead to substantial improvements later. These communication skills serve them not only in conversations with non-scientists, but also teaching undergraduates, collaborating with researchers from other disciplines, and even writing proposals for federal grants. Many students also find it inspiring and rewarding to “give back” to the community in this way, and feel a renewed commitment to serve the public with their research and teaching.

## Challenges of Public Engagement

We consider student leadership to be a strength of our public outreach efforts, but it does bring some challenges. The Outreach Committee is often the busiest of the student committees: they take on a lot of logistical planning for all the activities they organize. Since the student organizers put so much effort into planning all the annual activities, they don't have the time or resources to invest in new audiences or approaches (e.g. writing, audio/video, or social media), or more training for would-be communicators (e.g. internal or external workshops). Furthermore, the burden of responsibility on a small number of students can lead to particular frustration when they have difficulty recruiting other students and faculty to participate in the events. Students in the Language Science Fellows program and faculty officially affiliated with the LSC are supposed to volunteer for at least one outreach event per year, but this requirement is not enforced. It is likely that few faculty are even aware of it.

The student efforts would benefit from more faculty involvement. For public outreach, many faculty could contribute a big picture perspective and skills from teaching experience. For policy and advocacy, however, few faculty have relevant knowledge or experience. It would perhaps be helpful to connect with faculty from other fields or university administration who have the relevant expertise.

The student efforts would also benefit from more diverse contributions. Outreach activities have historically been dominated by Linguistics students. Recently more HESP students have been

getting involved, which has injected a useful new perspective. Policy and advocacy activities have so far been dominated by HESP and Education students. Students in less applied disciplines have more difficulty imagining how to connect their work and expertise to societal needs.

## Sharing sustainable models

It is widely recognized that interdisciplinary research is important for progress on important scientific and societal goals. *Almost everyone* professes interest in broad research and education efforts. Some recognize that they're not easy. Very few offer replicable models for how to make it work. This could be because the models do not exist, or because they are poorly documented.

Therefore, if we have good evidence for what works (or what doesn't) it is important to share it. Ours is by no means the only attempt to institutionalize a broad language science effort, but it may be the most ambitious yet.

The ingredients of our success are interesting and complex: an established grassroots community, a strong record of graduate training, buy-in from key faculty and administrators, and the presence of unusual additional opportunities, such as through government-affiliated projects (CASL, NFLC, Flagships). It is not always easy to distill our experience into transferable lessons or general tools.

Our audience includes language scientists at other universities, and interdisciplinary teams in other fields at UMD and at other universities. We reach these groups in different ways.

We reach other language scientists largely through faculty networks and scientific associations and conferences. After a decade of dissemination efforts, **UMD is internationally recognized among language scientists (particularly linguists) as a leader in interdisciplinary training and research.** Numerous other groups have imitated "the Maryland model," accelerating the growth of interdisciplinary language science as a field.

We reach interdisciplinary teams in other fields mainly through the network created by NSF training grants (the IGERT and NRT programs). We have had a noticeable impact on that community, although we may be recognized by a narrower group of people.

Here at UMD, we have contributed to the growth of interdisciplinary graduate training programs, but our impact has been relatively small-scale and mostly invisible, compared to our impact outside UMD.

## Language science beyond UMD

We have been active in promoting language science beyond UMD for many years. The two primary vehicles for this have been Phillips, who is often asked to advise on language science efforts elsewhere, and our graduates, who take positions elsewhere and start to implement changes.

Phillips has had many meetings with other institutions that are interested in building upon our experiences. This happens via invited talks, advisory boards, visits to UMD, Skype meetings, and correspondence. University contacts include: University of Wisconsin (invited talks, 2017), University of British Columbia (bilateral visits), National Taiwan University (bilateral visits and presentations), University of Connecticut (bilateral visits), The Ohio State University (bilateral visits), the Leibniz Center for Linguistics, Berlin (= German federal research center), Hong Kong University (invited presentation), University of Iceland. Phillips is frequently asked to join external evaluation teams for departments that are interested in organizational change that mirrors what we have done at UMD.

Phillips has also promoted a broad orientation towards language science through **service to national organizations**. This includes the **Linguistic Society of America**, where he served on the executive committee, co-authored the strategic plan, and helped to lead many other projects aimed at broadening the reach of the field. This included a signature event at the 2018 LSA Annual Meeting that was aimed at highlighting initiatives like ours, and a highly successful event at the annual meetings that raises the profile of accessible communication about the results of the field ("Five minute linguist" competition). Phillips has also been active through his role on the steering committee of the language section of the **American Association for the Advancement of Science**, where he was elected for 2012-2016, and then (quite unusually) reelected for a second term from 2016-2020.

We pursued a number of initiatives together with other institutions with the aim of raising the profile of language science nationally or internationally.

- Language science initiative under the umbrella of the Universitas 21 consortium - **Global Research Alliance in Language (GRAIL)**. This initiative was a collaboration with UMD's Office of International Affairs, and worldwide colleagues. It represented a coordinated attempt to align internationalization efforts across (i) institutions, (ii) researchers, and (iii) students, using a theme that is broad and unavoidably international. It stalled in part due to institutional priorities at UMD -- the impact would come more in visibility and engagement than in dollars -- and shifting leadership and priorities at Universitas 21. [GRAIL is described elsewhere in this report](#).
- **NSF PIRE submission**. In 2016 we were UMD's entry to NSF's signature international competition, Partnerships in International Research and Education (PIRE). These are complex awards that include \$4M in support for the US partner, preferably paired with

awards from national funding bodies of the international partner institutions. We assembled a world-class consortium that included many Universitas 21 institutions plus other key international research groups, in places such as Paris, Berlin, Moscow, and Tokyo. We submitted it as US lead institution, joint with the University of Connecticut and The Ohio State University (both were Universitas 21 members at the time). The proposal was not selected as a finalist.

- UMD has been one of the lead partners in the informal **Language Science for Everyone** consortium that coordinates language science outreach efforts at various national science events, such as the AAAS Family Science Days and the USA Science and Engineering Festival. ([Details above under public engagement.](#))

Sharing of our materials via our website, together with occasional papers and blogging, have reached a broader audience. For example, Phillips' writing about the impact of "exploding" the traditional linguistics curriculum ([blog post](#), "Pro choice on the linguistics curriculum", May 2015) has been widely read and triggered a national conversation, which helped moves towards curricular changes at various institutions.

Our graduates have a sustained impact when they are hired to other institutions and take with them things that they experienced at UMD. **Our graduates are often hired for their broader skill set and their ability to help with institutional change.** We see changes being led in unexpected areas, including by graduates whose perspectives were shaped by their UMD experience more than we had realized.

- Graduates like Brian Dillon (UMass Linguistics), Akira Omaki (JHU Cognitive Science, then U of Washington Linguistics, died 2018), Giovanna Morini (Delaware Communication Sciences), or Lisa Pearl (UC Irvine Cognitive Science) were active across fields as students and have helped to lead changes in their new institutions. For example, Pearl is now head of a new PhD program in Language Science at UC Irvine, possibly the first of its kind.
- Terje Lohndal was not centrally involved in language science efforts during his PhD years at UMD, but since returning to Norway he has become a leading force in institutional change and in building cross-disciplinary initiatives in language, both at his



home institution (NTNU Trondheim, Norway's primary technical university), and elsewhere in the country.

- Alexis Wellwood was trained in linguistic semantics and was very active during her time at UMD in building connections with philosophy and cognitive science. After an initial tenure-track position at Northwestern University she was hired to USC's highly ranked philosophy department, where she is a highly innovative appointment for a philosophy program, due to her extensive laboratory experience.
- Allyson Ettinger was hired to two faculty positions at the University of Chicago, first a research faculty position at the Toyota Technical Institute, and then a tenure-track position in linguistics. She will maintain both affiliations and create a new bridge between these previously disconnected parts of the institution.

The cross-institution impact of our graduates has been most clearly felt in linguistics at this point, but we expect this to change as other UMD departments rise in prominence and produce more graduates. These impacts are deep but they take a long time. We are now seeing important impacts from individuals who entered UMD 10-15 years ago.

## Interdisciplinary initiatives in other fields

Our greatest direct influence on interdisciplinary programs beyond language science comes from our actions related to our NSF training grants, both in coordinating events and in broad sharing of materials.

We share all of our NSF IGERT and NRT grant materials -- proposals, reviews, evaluation reports, annual reports, etc. (We do not, of course, share confidential student information.) This transparency means that **we have one of the best repositories of information on successful NSF training grants** [\[link\]](#). This serves a hungry audience, as there are hundreds of teams each year who are looking for inspiration as they prepare their own submissions. We do not know how many groups have used this, but we are regularly approached at NSF meetings by individuals with no connection to language science or UMD who thank us for making the materials available and who tell us how they shaped their own programs.

**We organized the first annual meeting of NSF NRT programs** [\[website\]](#) in May 2016. This was the first time that the meeting was coordinated by an awardee institution rather than by NSF or a contractor. We held two days of meetings at UMD for faculty, students, and coordinators from around 20 NRT teams. It created a national community of NRT participants, and offered an essential opportunity for sharing program results. We were able to highlight some strategies that we have found to be especially valuable at UMD. This event was followed by the Future STEM Leaders conference [\[website\]](#), an event held downtown in the Ronald Reagan Building that brought together many different stakeholders with an interest in graduate education reform, including funding agencies, industry, government, and academia.

LSC invested substantial time in organizing these meetings, with the hope that they would be valuable for LSC, for UMD, and for graduate education generally. The outcomes were mixed.

We had learned a lot over the years from developing a very successful NSF-IGERT program, and we had also learned a lot from interaction with others in a similar situation. We had found NSF generally reluctant to identify and disseminate best practices, despite its major investments in its IGERT program. We wanted to foster closer connections between awardee teams in NSF's new NRT program. Feedback and actions after the events indicate that we were successful in this goal. Further meetings of NRT programs have been shaped by the approach that we took at that first meeting. Phillips is a member of the steering group for the 2019 NRT awardees meeting (organized by Northwestern University).

In addition, we hoped that the meetings would help to position LSC and UMD more visibly as an innovator in graduate education. And we hoped to connect the kind of small scale innovations fostered by NSF training grants with broader recommendations and policy changes affecting graduate education. It is less clear that we made a difference in that regard. We followed advice from UMD leaders to make the most of our location to gain visibility for UMD in national conversations happening in DC. The Provost and VPR were unable to attend the meeting due to scheduling conflicts. The deans of ARHU and BSOS did participate, and this led to Bonnie Thornton Dill being invited to participate in a National Academy of Sciences commission: *Branches from the Same Tree: Integration of Arts, Humanities, and STEMM in Higher Education* [[website](#)].

The evaluation team for the NRT project is developing two or three academic papers, which will reach the higher education research community. While that work will most likely not be directly consumed by innovators at other universities, it can provide the evidentiary basis for pieces written for a broader audience.

## Other initiatives at UMD

Our community has contributed to the growth of interdisciplinary graduate training at UMD.

When we won our first NSF training grant, in 2008, we were the first ever successful UMD team, after 40 attempts. Since that time we have consulted with many different UMD teams, from diverse fields. Phillips has given many presentations, and consulted with many different groups. For the past few years Phillips has been invited to give a presentation to an audience of around 1500 at the orientation for new graduate students.

Currently UMD has three active NSF NRT training grants. In addition to our language science award, UMD has one that spans physics and biology (COMBINE [[website](#)], PI: Michelle Girvan) and another that focuses on public health and sustainable water systems (UMD Global STEWARDS [[website](#)], PI: Amy Sapkota). Both of these teams consulted with us and built on our experiences. For example, UMD Global STEWARDS held a workshop during the winter



term called Winter Boost, modeled on LSC's Winter Storm, focusing on graduate student professional development. Both COMBINE and Global STEWARDS aim to replicate LSC's emphasis on student ownership.

Beyond the area of graduate training, where we have a long track record, we have consulted with a small number of groups, and we have occasionally advised on features of LSC's model that could be useful to other initiatives at UMD or at other institutions.

A common reaction when we meet with other groups, about developing a center or applying for a training grant or overhauling a curriculum, is that they are surprised to learn about the long arc of development for the language science community. For example, we started making key curricular changes 4-5 years before our first (unsuccessful) application for an NSF training grant, and then there were another 7 years of development before the language science community was institutionalized as LSC. These groups are typically looking to submit a proposal right away, so they have little opportunity for gradual, intentional development. It is unsurprising that they are most likely to pay attention to us when they face an imminent need or deadline. So perhaps the most effective way for UMD to promote the spread of good models is to create staged incentives for new initiatives to pursue.



*LSC Student Allyson Ettinger at the Future STEM Leaders meeting, Washington DC, May 2016. Ettinger is now Assistant Professor at the University of Chicago*

# Center Operations

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LSC's structure includes a small management team that accomplishes many of the core operations of the Center, with leadership contributions from members of the Executive Committee as well as a range of other faculty and students.

The Center's reach is relatively large, in terms of numbers of faculty and students involved in LSC activities, LSC education programs, and LSC-supported research. LSC's operations budget is relatively small compared to the overall budget of the Center. **A number of challenges currently facing LSC are directly related to the lack of stable financial support for these core operations.** LSC's survival depends on reducing the substantial time costs to core staff that this instability creates.

It is also a priority for the immediate future to broaden faculty leadership, so that decision-making and workload is less concentrated in the Director and so that the leadership structure is more transferable and sustainable.

## Management and leadership structure

LSC's core management team consists of the Director, Colin Phillips, two PTK faculty members (Assistant Directors Shevaun Lewis and Tess Wood) and one staff member (Assistant Director Caitlin Eaves). This group currently handles most of the ongoing management of LSC, but it works with LSC's three Associate Directors (Masha Polinsky, Jan Edwards, Rochelle Newman), as well as the larger Executive Committee (which includes Director, Associate and Assistant Directors, plus several other key faculty members involved in LSC's research, education and partnership initiatives). These personnel are indicated on the Organizational Chart in Appendix B.

LSC's current management team came together over the center's first 3 years. The Director and an administrator/business manager (initially Judy Gorski, later Caitlin Eaves) were in place from the start in 2013. Tess Wood joined as Assistant Director in Spring 2014, taking a hand in a wide range of center activities. One additional staff position was always present, with a focus on training grant activities, but the NSF NRT training grant made it possible to elevate this role to a PhD-level Assistant Director position. Shevaun Lewis joined LSC in 2016, taking on a much greater responsibility for graduate program activities and mentoring than her predecessors. For the past 3-4 years the full time team has stayed at the same size, but LSC faculty/leadership has continued to expand via hiring of additional TTK Associate Directors (Masha Polinsky, Jan Edwards) as well as other faculty leaders who have significant responsibilities towards the LSC (e.g. Jordan Boyd-Graber). This has shifted a substantial portion of staff time to supporting initiatives led by these faculty.

From the beginning LSC has been the institutionalization of a pre-existing grass roots academic community, which has relied since before the creation of LSC on the voluntary contributions of effort and creativity from many graduate students and faculty. This voluntary participation has been essential to LSC's ability to carry out many of the activities it supports (including Winter Storm and other training activities, Language Science Day, student talk series, seminars and research groups, outreach, etc.), as well as to the development of collaborative and interdisciplinary research and training opportunities. Maintaining and expanding this culture of participation and collaboration is an essential part of LSC's future aims.

## Management team

The LSC is managed by a small but highly skilled team covering a wide range of tasks. The team (Assistant Directors plus Director Phillips) works collaboratively on ongoing activities of the Center. The management model has both assigned areas of responsibility with shared teamwork on many big projects (e.g. Eaves/Wood on the Field Station).

**Director:** Colin Phillips is appointed 25% in LSC, though in practice his LSC role takes much more time than this, and the role came with no change in his responsibilities to LING. The scale of the Director role was hard to predict before LSC's creation, but it is by now clear that it is much more than a 25% role. Even with three Assistant Directors there are many functions for which Phillips is indispensable, due to the extensive connections and trust he has developed in different contexts, and his reputation and authority as a researcher and leader both at UMD, nationally, and internationally. Phillips is a significant asset for the LSC, but he also is a key point of fragility in the Center's leadership structure, as discussed further below.

**Assistant Directors:** Caitlin Eaves, Shevaun Lewis, and Tess Wood are all full-time employees in the LSC, working on different elements of LSC's activities and mission. Between them, they cover a wide range of roles and responsibilities, relying on diverse areas of expertise and experience: language science research and training (Wood, Lewis), education/program leadership (Wood, Lewis), program management (Eaves), research administration (Eaves), international program administration (Eaves). The following summarizes their approximate responsibilities and the proportion of effort each of these currently occupies:

- *Caitlin Eaves, Assistant Director for Administration and Finance (Staff)*  
Expertise in pre- and post-award grant management, budget development, strategic financial planning, event planning, and educational program development.
  - 40% LSC administration: Supplies, facilities/space, PHR, contracts/MOUs, purchasing and travel, accounting/finances (grants, state accounts, start-up, research), membership, communications, education programs.
  - 40% grant management
  - 15% other responsibilities: development, event planning, Field Station coordination, Infant & Child Studies Consortium financial management
  - 5% supervision of part-time & hourly staff (3)

- *Dr. Tess Wood, Assistant Director, Assistant Research Professor (PTK)*  
PhD in Linguistics, UC Berkeley; undergraduate teaching and research management experience in HESP 2007-2014. Language science expertise across diverse areas, from fieldwork/documentation to experimental and behavioral research on autism and child development, to management of digital infrastructure.
  - 15% undergraduate education programs (Director of PULSAR).
  - 30% research and research support: development of interdisciplinary projects, research and coordination for Landscape, Field Station.
  - 35% LSC management: fundraising, partnerships, developing research infrastructure, managing use of facilities/space, coordinating Executive Committee.
  - 20% events, activities, communications.
  
- *Dr. Shevaun Lewis, Assistant Director, Assistant Research Professor*  
PhD in Linguistics, University of Maryland; leadership role in IGERT program. Postdoc in Cognitive Science at Johns Hopkins. Language science expertise in psycholinguistics, language development, cognitive neuroscience.
  - 75% NRT-funded Language Science Fellows program: program development and administration, mentoring graduate student research and professional development, implementing training and professional development activities, evaluation and research on graduate education, applications and admissions, data management/analysis, reporting.
  - 15% LSC management: fundraising, partnerships, coordinating Executive Committee and student committees
  - 10% events, activities, communications.

## Faculty leadership

Faculty leadership includes faculty members with formal, ongoing responsibilities to the LSC, through membership in the LSC Executive Committee, and/or 25%+ appointments in the Center. It also includes faculty who are engaged in LSC's activities and mission in other ways, such as teaching interdisciplinary classes, advising language science students, or leading language science events and activities.

**The LSC Executive Committee (EC)** includes the Director, Associate Directors, and Assistant Directors as permanent members. The EC has had a stable group of additional faculty members for the last few years. The EC has developed a planned structure in which up to four additional faculty (TTK or PTK) may join the EC for renewable 2-year terms. In order to implement this plan, each year in the Spring the Director will solicit nominations from language science faculty (including self nominations) for new EC members.

Current EC members include:

Colin Phillips (Director) - Linguistics  
Caitlin Eaves (Assistant Director for Administration and Finance)  
Shevaun Lewis (Assistant Director)  
Tess Wood (Assistant Director)  
Rochelle Newman (Associate Director) - Hearing and Speech Sciences  
Jan Edwards (Associate Director) - Hearing and Speech Sciences  
Maria Polinsky (Associate Director) - Linguistics  
Hal Daumé III - Computer Science, UMIACS  
Ana Taboada Barber - Counseling, Higher Education, and Special Education  
Jeff Lidz - Linguistics  
Jordan Boyd Graber - iSchool, Computer Science, UMIACS

The Executive Committee (EC) is designed to play a central role in developing and implementing LSC's mission and goals. This includes:

- Developing, guiding and executing LSC's strategy in research, education, partnerships, and in fundraising.
- Advising on specific initiatives as they arise
- Advocating on behalf of LSC within and outside of UMD (e.g. to external partners).
- Encouraging, facilitating and inspiring participation in the language science community by other faculty and students
- Providing area-specific expertise to guide LSC's initiatives
- Forming the Advisory Board, the Academic Strategy Board, and the Language Science Council
- Approving special committees formed by the Director
- Approving Associate Director appointments made by the Director

While the Executive Committee members have a defined role and an extended commitment to the LSC, **the Center would not function without the involvement of many faculty members in more flexible and diverse roles.** The UMD language science community, which predated the establishment of LSC, has always depended on faculty engagement; an important goal of the LSC is to maintain, support, and further develop that engagement. Language science faculty make essential contributions in many areas, such as:

- Mentoring language science students, including both undergraduate researchers and graduate students (often jointly with faculty in other departments);
- Teaching and developing classes that bring together different perspectives and disciplines related to language;
- Organizing and guiding language science events and activities: workshops, working groups, reading groups, as well as contributing to major events like Language Science Day;

- Valuing and supporting interdisciplinary training for their students, and encouraging them to engage with other areas of language science;
- Discussing their research with other faculty and students in the UMD community;
- Initiating and leading collaborative research projects, reading groups, and similar research activities;
- Engaging in outreach, either through LSC-organized channels or through other activities related to their field (e.g. LSC high school outreach; Hyattsville Summer Reading Program; sensory friendly concerts for people on the Autism Spectrum; writing about language science research for a general audience).

## Student Leadership

Student leadership has been an important part of UMD language science since the IGERT grant. Though not all students take on leadership roles in the community, many activities could not be done without the active participation of students. Students take a great deal of responsibility for designing and managing training and outreach activities, as well as leading and participating in reading groups, research groups and collaborative projects.

Many forms of student contribution are not supervised or coordinated by LSC staff except in a supporting role (e.g. assistance reserving rooms, purchasing essential supplies, or advice on how to design an event that will appeal to a broad audience). For example, our student-led Outreach Committee organizes and runs multiple events each year (including a range of activities at Maryland Day), with the help of a faculty advisor, plus staff help with purchasing supplies and reserving space.

Challenges include balancing the benefits of student leadership (e.g. leadership experience, network-building, and having LSC activities that reflect student needs and priorities) with students' pre-existing commitments to their program, expected department service, etc. It is a consistent challenge to ensure that students can balance the commitment they make to LSC activities with the commitment they make to their home departments. It is important for students to be able to contribute to the community in ways that are beneficial to them and their professional development without overwhelming them with work.

LSC has recently instituted annual Student Leadership and Service awards to recognize students who take on significant responsibilities within the language science community. (Importantly, this does not mean that students' contributions must be to or through the Language Science Center - but rather that they are consonant with the LSC's mission and, ideally, affect a range of students and faculty across more than one field or department.)



## Management Needs

LSC's management team accomplishes a wide range of tasks with very few people. There is no redundancy: any new task, unforeseen challenge, or staff absence detracts from the core functions of the center. While university stakeholders and external funders are most interested in investing in exciting new initiatives, the LSC management team cannot develop those opportunities without sacrificing critical daily tasks.

LSC's Assistant Director for Administration and Finance Caitlin Eaves has valuable expertise for supporting interdisciplinary research projects, and the talent and experience to resolve many different kinds of complex problems. Her skills are in high demand from many LSC faculty and students--from preparing grant reports, to managing finances with developing countries, to navigating responses to personnel complaints. However, making the best use of her skills often puts a significant strain on her time for regular responsibilities, such as PHR, purchasing, travel reimbursement, and other ongoing LSC business needs. The tension between the different demands on Eaves' time has become a significant concern for LSC's climate and viability. When it is difficult to keep up with many small tasks this leads to erosion of trust, and community members become less likely to engage with LSC. **A shared staff person to cover less specialized tasks** would free up Eaves' time for grant management and other work which makes use of her expertise. A staff person jointly appointed with the Department of Linguistics would work well, but LSC currently has no funds to support an additional half-time appointment.

If LSC's direct role in government-focused projects increases, as has been discussed following the demise of CASL and creation of ARLIS ([see below](#)), then LSC will need expertise in business development for government projects. LSC's current staff and paid tenure-track faculty do not have the necessary background or expertise to effectively develop and maintain **government relations**. This role should be filled by a person who has a good understanding of language science in academia and language needs in government, most likely somebody with CASL experience. The person should also have security clearance. This matters not because LSC would be looking for contracts for classified research. That is not a goal. But access to RFPs and client meetings for non-classified research often requires access to a classified setting. This would likely not be a full-time role, but needs to be a formal part of at least one faculty member's responsibilities. Ideally, this role would encompass relationships in multiple government domains (defense, education, health, for example).

Communications (website, news, social media, brochures, etc.) has been an ongoing challenge. **It takes time to maintain a consistent flow of communications, and creating high-quality content requires an understanding of the research, interests, and community culture of LSC.** For the first 3-4 years of LSC's existence, the core staff and director were responsible for most communications, but as the Center's operations grow that has become less and less practical. For the last year, part-time hourly staff with expertise in design and communications

have been very helpful in maintaining consistent communications and producing professional quality materials. The LSC has shared these design services with several other language science departments and lab groups. However, without someone who has an ongoing investment in understanding the language science community, the Director and Assistant Directors must still provide significant input when it comes to sharing news and writing content about the scientific interests of the community. **LSC needs a full-time communications specialist with sufficient background in language science to communicate flexibly to internal and external audiences.** This role can include events and external relations with partners, sponsors, advisory group, etc. The role could also be shared with other related units.

## Concentration of leadership

The LSC aims to represent and support a large and diverse community, but it is currently led by a small number of people. Although a larger number of faculty and students contribute to LSC activities, there are currently few formal structures or processes in place to allow a broader group to participate in strategic planning or decision-making. This has led to two serious problems that threaten the future of the LSC:

- 1) Many essential tasks take too long or simply don't get done, because they depend on the institutional knowledge and personal reputation of the Director, Colin Phillips, who has only a 25% appointment in LSC and a full load of faculty responsibilities in Linguistics.
- 2) Many faculty and students are uncertain that the LSC represents their values or is working for their benefit, because they feel disconnected from its leadership. As a consequence, they are less likely to contribute the bottom-up initiative that the UMD language science community has thrived on in the past.

When the LSC was first established, one of the first priorities was to develop infrastructure and establish administrative systems as quickly as possible, in order to provide resources and support to the language science community. **From the beginning, a lot of work has been done by a small team** (initially Colin Phillips, Rochelle Newman, Tess Wood and then-Business Manager Judi Gorski; later joined by Shevaun Lewis and Caitlin Eaves). While this was a necessary stage of LSC's development, an unintended side-effect has been a concentration of expertise and institutional knowledge in a small number of people.

Expanding or changing leadership necessitates a training period to develop the relevant expertise in new leaders. In departments, this often happens organically over time through faculty meetings and full-faculty discussions, where all members of the unit gain some background knowledge about the issues facing the unit as a whole. Also, departments by their nature have a well-defined mandate and they change slowly. LSC is a different kind of entity. Even with a clear vision it is large, rapidly changing, and it depends on a complex web of connections. It serves an emerging field that spans many disciplinary cultures. Much of what occurs happens behind the scenes, or has to happen too quickly to fit with the typical

deliberative pace of faculty governance. The gap between the knowledge base of the Director and even very well informed faculty is much greater than the corresponding gap in a regular department or a less diverse center.

Because of its uncertain funding and awkward position in the university hierarchy, LSC's continued existence has depended on a Director with extensive institutional knowledge and relationships. Phillips' expertise and reputation was essential to the creation of the LSC, and has remained essential as the LSC attempts to satisfy the demands of stakeholders in five colleges and higher university administration. **Without stable funding or a certain future, there is no time or room for error that would allow other faculty take on more responsibilities** and gradually develop more institutional knowledge.

To make matters worse, many of those individuals who do have large amounts of institutional knowledge have already been tapped for other administrative roles. Rochelle Newman (Chair, HESP) and Bill Idsardi (Chair, LING) are primary examples of this. Essentially, institutional knowledge takes time to develop, and by the time individual faculty members have those skills, they have often already taken on competing administrative roles.

Rochelle Newman's role illustrates this challenge. When LSC was formed in 2013 she agreed to become the first Associate Director of LSC. She and Phillips had worked together on many aspects of the emerging language science community over the previous 10 years. They contribute different backgrounds, different styles, and different connections, but they worked well together. Newman had deep institutional knowledge, and could independently lead new LSC initiatives such as the creation of the PULSAR program for undergraduates. There were opportunities to provide partial salary support for Newman's role. But by 2014 Newman was tapped to become chair of HESP. She continues to be a strong supporter and key voice in LSC, but she had to scale back her day-to-day role with LSC.

The **Executive Committee** (EC) is intended to be a mechanism for broadening Center leadership. It includes several highly engaged, senior faculty members with a strong commitment to the Center. While there are some major LSC initiatives that these faculty members lead (e.g. Maria Polinsky is the director of the Field Station(s)), it has nevertheless become evident that institutional knowledge and institutional relationships are critical to advocating for, and making decisions about, the Center more generally. Incoming faculty leaders new to UMD do not have these connections, and therefore the Director continues to fill the role of the "face" of the LSC in most campus contexts. The members of the EC are willing to take on more of the leadership functions the LSC needs, but it has been difficult for them to do so without extensive involvement from the Director. Important questions for us to address include:

- (a) How can willing faculty leaders build the institutional knowledge and trust that enable them to work more effectively on behalf of LSC and take on leadership roles, e.g. in representing the Center?

- (b) What must be done to create a “succession plan”? What knowledge and experience and skills would be essential for an incoming Director, and how are these acquired? How does the role of the Director need to change (or be constrained) so that the current/founding Director becomes replaceable?
- (c) How can leading the LSC become a more distributed task that effectively engages multiple senior faculty at the same time, in order to make the roles of the Director, Associate Directors and Executive Committee more balanced?

## Plans to decentralize leadership

The self-study committee has identified two changes that may help “de-centralize” LSC leadership. These changes will take time to institute and to become effective; they are not quick fixes, but are changes along a pathway towards becoming a more self-sustaining unit.

**First, there needs to be more transparency around the activities of the EC, and the leadership of the LSC in general.** This likely necessitates some form of reporting to LSC members about EC activities; currently, LSC members hear about LSC successes/outcomes (new programs, etc.), but do not hear much about other activities of the leadership team. The EC needs to report more regularly to LSC members, whether through yearly faculty meetings or regular reports. It would also make sense for EC meetings to be at a more standardized, regular time, allowing faculty to plan their teaching schedules around these meetings if they are interested in joining the EC.

**Second, members of the Executive Committee and/or Associate Directors should be assigned particular portfolios,** potentially on a rotating basis. Some EC members already lead particular projects (e.g. Field Stations), or participate in the creation of new initiatives (e.g. discussions about future undergraduate programs). These assignments would be broader, and more closely tied to the core goals of the LSC. This will serve two purposes: (1) knowledge will be distributed across different people, so that not all decisions and issues go through the Director, but will instead be best handled by different individuals with different expertise; and (2) new individuals will have an opportunity to build broader LSC knowledge, serving as potential future leaders.

Some of the tasks of the LSC require daily attention (e.g. communications, graduate and undergraduate education programs), and thus need to be performed by full-time staff. Others are so integral to the nature of the LSC that they must be performed by the Director. However, some tasks are more modular, and could be performed by others. Below we list some responsibilities that we believe could be “carved off” and assigned to a particular individual. It is worth pointing out, however, that there is not necessarily an appropriate person available to take on those roles at the current time. Moreover, particularly for junior faculty members, there must be some mechanism by which the individual receives appropriate credit for these activities for tenure and merit considerations.

- Research: Development for large-scale grants and foundation funding.
- Governmental Relationships: Managing government relations and government-related grants and contracts.
- International Relationships: Developing international institutional partnerships for research and education.
- Policy and Advocacy: Developing working groups and communications on policy issues with relevance to language science; providing opportunities for LSC members to interface with policy-makers; advising student Policy Committee.
- Alumni relations: Maintaining communications with LSC alumni. (Relevant record-keeping should be assigned to an alumni relations specialist in one of the colleges to which we report, and we strongly recommend that the Deans of BSOS and ARHU consider whether one or the other would be willing to help in this regard.)
- Education Outreach: Leading K-12 community outreach initiatives; advising student Outreach Committee. (Jeff Lidz, LING, has long held this role informally; formalizing it and potentially expanding its responsibilities could be beneficial.)
- External Advisory Board: Organizing advisory board meetings and events; maintaining contact with advisory board members.

Finally, another issue related to (but separate from) de-centralization attempts has to do with plans for future directors. Currently, the Director of the LSC is a part-time position, roughly funded at 25% time, but on soft money. **The role of the Director, however, is more akin to the level of work of a department Chair, which is typically considered a 50% time appointment.** More critically, however, Chair positions are on hard money lines; individuals do not lose their base salary if they step down from being Chair (although they would drop from 12-months to 9-months), and the funds for a Chair are part of the primary budget. We believe this should likewise be the case for the LSC Director.

A structural weakness in the Director position may exacerbate the bottleneck. With the Director and core staff positions all soft funded, whereas other faculty leadership positions are hard funded, there are uneven incentives. The Director's position is subject to the same existential threat as the core staff positions. This creates greater urgency to do things that make continued core funding more likely.

## Restoring community ownership

LSC was founded to institutionalize a broad grassroots community. The intention was not to supplant bottom-up initiatives, but rather to maintain broad community ownership while adding some much-needed administrative support. Whether faculty members were part of the pre-LSC language science community or not, **the existence of a formal unit with full-time staff has left some faculty uncertain of their role:** how should they participate, how do their priorities fit with LSC's priorities, or why should they contribute as volunteers when other faculty are paid for their role? Many faculty and students are unsure that the LSC shares their values. We discussed [some related challenges with students above](#).

LSC has been successful in addressing this in a couple of specific cases, but it has yet to find a way to have a more democratic structure that feels open to community members to contribute.

A recent success was Winter Storm 2019, the two week January workshop for graduate students and faculty. After some feedback from students and (especially) faculty suggesting that it was time to rethink the format of the workshop, a small committee of faculty from HESP and LING offered to take on the leadership of the event, with very successful results. The planning process involved (1) the organizers sitting down with LSC staff to find out what were the basic requirements and resources for the event (e.g. funding from the NRT grant is important for the workshop, and therefore the workshop needs to be consistent with NRT priorities); and then (2) the organizers moving forward with planning, with check-ins with LSC staff (as needed) about the practicality of decisions they made.

It is important to find ways to build on this kind of experience to help to increase and diversify faculty engagement and faculty leadership roles.

## Communications

### Why it matters

Communications are an integral part of LSC's effort to build a community that is well connected, visible, and understood by many different audiences. This is especially important in light of LSC's "missionary" goals.

Communications are sometimes conceived of as marketing. But this is too narrow, and too one directional. The ideal is the level of trust and interest that holds among individuals who interact regularly and understand one another. The goal is to scale this up to much larger groups of people who have less opportunity to interact directly.

There is no real substitute for authentic person-to-person communications. A carefully planned communications strategy can build on effective human connections, but it is no substitute.

Therefore, LSC's communications goal should be to support relationships between many different individuals and groups, internal and external to the language science community and the University of Maryland. To think of them as "audiences" is too one directional. And "stakeholders" is too corporate.

The specific aims of LSC's communications include sharing the identity and values of the language science community; acknowledging the contributions and activities of many different people; informing about what is happening; helping people to feel connected even when they don't see each other on a daily basis; increasing the visibility of UMD language science and individual language scientists; helping to attract new talent to UMD; and listening and learning.



## Activities

LSC's communications efforts fall into many different categories.

Having a **simple identity** helps a lot. Universities are filled with acronyms and complex names that people struggle to understand. As one of many UMD units with "language" and "center" in the name, and no formal mandate, LSC can be hard to understand. By creating the simple identity "Language at Maryland", together with a clean logo that reflects LSC's mission, it has been possible to attain greater understanding of LSC's role and mission, and a greater sense of belonging.

The LSC **website** [languagescience.umd.edu](http://languagescience.umd.edu) was created in 2013-2014, the result of a close collaboration between LSC and the ARHU Communications team. The website was designed to help make LSC's aims, scope and activities easier to understand, and to serve internal and external audiences. The LSC and ARHU teams worked hard to achieve these goals, and tried to do so in a way that integrated well with college and university IT plans. The collaboration between experts in content, communications, design, and CMS worked well. The results have been mixed. The site design was forward looking in many ways. But it also was quickly left behind by changes in how people digest information, and by changed college and university IT plans. As a result the site is currently harder to use and harder to maintain/update, and often rather slow to load.

LSC has a **social media** presence on Facebook, Instagram, and Twitter. Facebook and, more recently, Instagram have been used to share messages locally and more broadly in a semi-strategic fashion. There is a plan, it is generally followed, but it is limited in scope. Twitter is an active forum for academic engagement, but LSC has not really found its niche there, as it is not well suited to simply recycling content used in other channels.

**Email** is old but effective. LSC maintains multiple mailing lists that serve different segments of the internal language science community, reaching a few hundred people. These are widely used for announcements, and occasionally used to share news.

LSC has produced many **graphics and print/electronic brochures** that highlight different parts of its activities. The quality of these materials dramatically increased once LSC hired designer Melissa Zamora as an hourly staff member. An example is included at the end of Appendix G. Zamora has also helped with design and graphics for research groups within the language science community.

LSC's growing collections of high quality **photography** [archived on [Flickr](#)] are valuable tools for communicating what the language science community does. This is increasingly important as people read less and scroll more. Small investments in hiring UMD photographers or in paying hourly staff member Melissa Zamora have been effective.

In Summer 2018 LSC made a professional **video** about its activities, intended for diverse audiences.

A **student blog**, *Language in Mind*, generated some strong content, but it has proven challenging to maintain initial enthusiasm.

Specific projects such as **Langscape** and LSC's **graduate training materials** have been especially successful in drawing attentive readers to learn about what LSC does. When it is working well, Langscape has the capacity to draw a far broader audience than would normally learn about LSC. LSC's unusually transparent sharing of proposals and reports from its NSF training grants has served a hungry audience of teams from diverse STEM fields that are looking to develop competitive NSF proposals.

LSC's in person meetings, including **Language Science Day** and **Winter Storm**, are important ways of spreading information and fostering human connections that can be supported by electronic communications at other times.

Aside from these specific activities, a host of one-on-one meetings and simply showing up at different events and meetings play an important role in building trust and awareness of the language science community.

## Reach

The LSC website sees around 400 unique visitors per day, and around 18,000 unique visitors per year.

The Langscape site currently sees around 300 unique visitors per day, but at times of peak usage, before key map data was taken away, it has seen many thousands of visitors per day.

LSC's email lists reach around 300 language scientists at UMD, with various sub-lists for specific groups, such as Language Science Fellows, graduate mentors, etc.

LSC has around 900 followers on Facebook, 350 Twitter followers, and 160 followers on Instagram.

## Assessment, Challenges

Effective communications play a much larger role than was expected at the creation of LSC. They are much more important for a diverse, physically separated community than when the language science community was smaller and more homogeneous.

LSC has done a lot, but it has probably not done enough to keep the different internal and external groups engaged. To some degree this is a matter of resources and priorities.

Communications are rarely as urgent as getting a grant proposal finished or coordinating an upcoming event. But it also reflects the need for deep knowledge of the community, who does what, what is valued, or how to talk about different areas. This creates a communications bottleneck, because much depends on the expertise of a few.

Having a simple, systematic plan for gathering content and for spreading it across multiple channels is extremely useful. LSC has been partly successful in doing this, but this has worked unevenly. Some content is hard to gather -- it depends on having effective ears to the ground throughout the community. And some content requires expert shaping. The comms strategy has worked best when the content and goals are simple and recurring, and do not depend heavily on expert time. The weekly comms cycle for the Language Science Lunch Talks is a good example of this.

Hiring Melissa Zamora and Ayesha Amsa as hourly assistants for comms has worked well for specific projects.

The video project was a good exercise and its content was well received. But it did not realize its potential, either because it was too long -- college-level communicators were worried that the 11-minute length was prohibitive-- or because the message was too diffuse.

In person communications have probably been too limited. Individual and group meetings, and periodic town halls and advisory group meetings really make a difference.

## Space

### Temporary Space 2013-2016

From 2013-2016, LSC was housed in around 1500 sq. ft. of temporary space on the basement floor of Taliaferro Hall, consisting of a large meeting room/classroom, two staff offices and two meeting rooms. LSC made extensive use of the space for classes, collaboration, meetings, and activities, including hosting the two week Winter Storm workshop with the help of additional lecture hall space. This space was useful, but for LSC's first 3.5 years there was no real focal point for the community.

During this period, much time and energy was devoted to finding and designing LSC's future home in HJ Patterson Hall.

### LSC main space in HJ Patterson Hall

In January 2017 the Language Science Center moved to new custom-designed space as part of the renovation of the HJ Patterson Building Wing 2. LSC has around 4,500 sq. ft. of space for research, events, and meetings, and office space for LSC staff, plus space and resources for

teaching and collaboration with partners around the world. Appendix G (p. 26) includes a list of all the events the space was used for during the 2018-2019 academic year.

#### *Hub (2130) and “Garage” (2124): large event space*

The large hub area is used a central meeting and collaboration space, and is often in use by several small groups at a time. When the garage door separating the hub from 2124 is open, this space is ideal for larger events (up to 100 people). This space is used for:

- Hosting Language Science Day, weekly Language Science Lunch Talks, Winter Storm (for LSC)
- Conferences (often organized by community members from affiliated departments, e.g. a linguistics conference, *Workshop on the Structure and Constituency of the Languages of America*, Spring 2019)
- Professional workshops (e.g. HESP faculty have hosted professional training events serving an external clinical audience as well as UMD students and faculty)
- Hosting events for non language science groups, e.g., Black Faculty reception

#### *Testing rooms*

LSC has three research ‘testing’ rooms: interior rooms with blackout curtains which are ideal for housing experimental research as well as small meetings. Currently 1-2 of these are in use for ARLIS researchers working on a DARPA-sponsored project, with the third available for reservations. These rooms are also popular for impromptu research meetings.

#### *Classrooms (HJP 2124 & 2123)*

LSC regularly hosts classes (including PULSAR seminars, but also co-taught interdisciplinary seminars, professional development seminars), lab meetings (e.g. Jan Edwards’ Learning to Talk Lab), and reading groups (e.g. the LING/CS/iSchool Probabilistic Modeling group). During the summer, HJP 2123 is used for classes as part of intensive Arabic and Persian Summer Institutes. LSC regularly loans space to other programs in the building on an ad hoc basis, and in turn they reciprocate when LSC needs additional space for events.

#### *Benefits of the LSC space*

The size and design of the space has been of huge benefit for community purposes.

- LSC faculty and students are far more likely to stop by, hang out, and get involved in conversations in the current space than previously.
- The availability of the space for large events has helped strengthen connections, including with faculty and students who were previously more peripherally involved with LSC. For example, HESP has hosted several public (entrepreneurial) training workshops for clinicians. This is a win for everyone: it provides a great facility and an excellent public facing location; it brings LSC faculty and staff into contact with faculty leaders from

different units more often; and it builds awareness of LSC among a broader academic and clinical audience.

- ARLIS researchers teaching on campus can use temporary office space for office hours or research and writing; while so far this amounts to a small number of people spending time at LSC, this has certainly strengthened LSC's connections with some of the ARLIS (and former CASL) research and researchers.
- The central location of the space on campus means interdisciplinary research groups often choose it as a convenient meeting place.
- Proximity to Language Flagship programs, Education Abroad and the Office of International Affairs encourages collaboration.

A particular benefit of the LSC space is its multipurpose and flexible nature.

Individual "ownership" of spaces is minimized so that (aside from offices for core staff who are present at LSC full time) most spaces can be reserved and are easily configurable for different purposes. For example, a small conference room labeled "Director's Conference Room," - initially conceived of as the Director's office but deliberately designed for small meetings - is heavily used for meetings of student groups, small research groups, meetings with visiting speakers, etc. as well as LSC committee meetings.

In addition to making language scientists feel welcome and encouraged to meet and work in the LSC on a regular basis, when LSC offers space for non-language science events the centrality, flexibility, size and character of the Center's physical space helps to convey to others the reach of the LSC and the university's commitment to language science.

The availability of additional, attractive event, class and meeting space within HJ Patterson and the collegial relationships among units in the building are a significant added bonus.



## Challenges/potential changes

The size, appeal and flexibility of the space is of enormous benefit to LSC in building community, hosting events and convening faculty and students in various configurations, in activities that serve the center's goals. However, managing the space and the activities within it poses a few challenges:

- Managing space for a large number of diverse uses takes up significant staff time. While users are generally responsible for set-up and clean-up, they frequently need assistance: swipe card or key access, guidance about how to configure the space, assistance with classroom technology, access to storage or kitchen facilities.
- Room calendars are publicly available so people can see what space is in use, but scheduling rooms generally runs through LSC Staff so that they can make decisions about competing requests.
- As the use of the LSC space has been gradually increasing some conflicts have arisen. LSC staff are encouraging community members to reserve space further in advance. However, sometimes outside request (e.g. to hold a conference in the space) receive a delayed response while LSC staff/faculty solicit community-internal requests to ensure that the space meets the needs of language scientists.
- While university-internal support (in particular, ARHU Director of Facilities Lori Owen and ARHU IT support) has been extremely helpful throughout the process of renovation and now occupying and using the LSC space, several challenges with outside organizations providing technology and furniture (MCE) have arisen. The room technology in the LSC has been particularly problematic, and contractors have not effectively remedied the problems. This not only costs a lot of LSC staff time, it also erodes trust in LSC, because users get frustrated and (incorrectly) attribute it to incompetence on the part of LSC staff. Ongoing problems with the (otherwise much-loved) garage door have similarly been time-consuming.
- Finally, the potential increase in the number of researchers with a primary affiliation in LSC (particularly those working on campus projects related to ARLIS) means that LSC anticipates future challenges in providing office and research space without sacrificing the current valuable community-building functions of the LSC space.

## Finances

The LSC has a broad mission, with ambitious goals in research, education, partnerships, and dissemination. The creation of this institutionalized unit, with funding from the university, has been critical for advancing those goals:

- LSC staff manage funds for large interdisciplinary research projects. Grant spending has increased every year.  
LSC has recruited talented, high profile senior faculty for cross-appointed positions.



- LSC staff manage innovative interdisciplinary education programs for graduate and undergraduate students, including the NSF-funded Language Science Fellows program.
- The LSC organizes and funds activities to strengthen the community and promote collaborative research.

With institutionalization and financial support comes pressure to invest in efforts that may not reflect the priorities of the language science community that the LSC represents. We believe that the university and its leaders are sincerely committed to the broad mission of the institution, and do not measure success in dollars. But we have also repeatedly seen that institutional memory is greatest for things that appear in automatically generated reports. This creates significant challenges for LSC. **Some activities that are central to LSC’s mission do not contribute to the “bottom line”**; education programs are a prime example. Funding that LSC helps to generate, but that does not appear in LSC’s own ledgers, is another prime example. If funding becomes the only measure of what is valued, the LSC will lose the support of the community and eventually fail.

The LSC was created as **Tier 3 initiative** with three years of operational funding, plus funding for new faculty hires. (See the original Tier 3 proposal in Appendix G, p. 30.) However, a long-term funding plan was not established. The scale of LSC’s direct activity has grown to around **\$1.75 - 2M annually**. Meanwhile, operational funding has been inconsistent since the end of the 3-year agreement.

Operational funding, FY14-19:

FY14	\$275k	} Tier 3 funding
FY15	\$300k	
FY16	\$293k	
FY17	\$125k	
FY18	\$300k	
FY19	\$0	

Core funding has been shared across multiple units, including the Provost, VPR, and a consortium of colleges. This model reflects the breadth of the university’s commitment to language science, and ensures that the LSC is not “owned” by any one administrative unit. However, the need to build consensus across 7+ administrative units has led to significant delays or miscommunications in funding discussions, most notably in the transition out of Tier 3 funding in FY17.

**The instability of core funding has become an existential threat to the LSC.** For the last 3 years, the LSC management team has spent significant time attempting to secure short-term financial stability--seeking stop-gap funding solutions and coordinating with university stakeholders about funding. These efforts take time away from core projects, causing tensions with community members who feel that the LSC’s priorities do not align with those of students

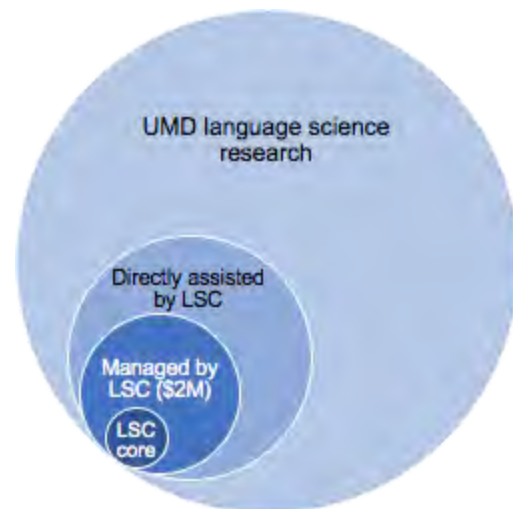
and faculty. The conflict and uncertainty have been extremely detrimental to staff and community morale.

## Financial Overview

LSC's core operations (\$300k/year) provide a foundation for a much larger body of research and education activity.

**LSC manages nearly \$2 million of activity annually, including over \$1 million in grant funding.** It has contributed to the generation of additional grant funding in at least 10 other units that does not flow through LSC accounts (e.g. by recruiting/retaining faculty, facilitating collaborations, supporting grant applications, etc.). **The overall scope of language science research at UMD exceeds \$20M annually.**

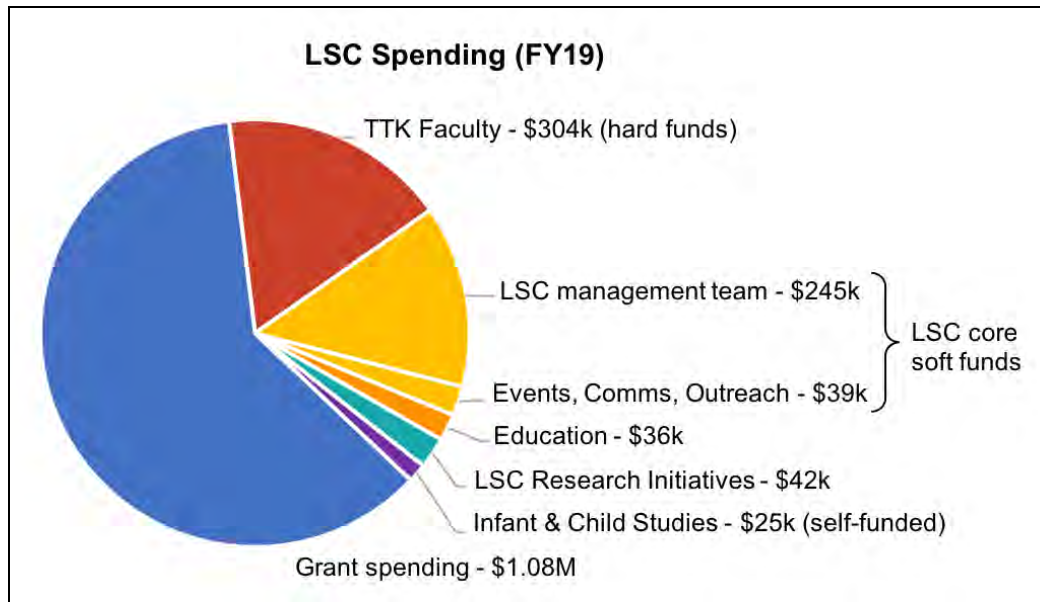
If LSC takes on a new role in hosting researchers and projects funded by ARLIS, the overall scale of language science research at UMD could potentially increase, as well as LSC's share of it. Plans were extensively discussed in early 2019, but they remain uncertain. So far, one former CASL PTK faculty member, Michelle Morrison, has a primary appointment at LSC and she will direct multiple contracts. How this will impact the flow of funds is not yet determined.



In FY19, LSC's total spending was about \$1.8 million. Around \$1.1 million came from grants, and \$300k from hard budget<sup>1</sup> for TTK faculty. Nearly all of the rest comes from soft funds.

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<sup>1</sup> In UMD parlance, "hard" funds are state allocated funds that by default continue on an annual basis, i.e., they are roughly permanent. "Soft" funds are all other university funds, which are committed separately (sometimes annually) as per written agreements.



### ***LSC Funding Sources (FY19)***

Grants		\$1,080,000	61%
Hard funds	TTK Faculty	\$304,000	17%
LSC core soft funds	Management team	\$245,000	18%
	Events, Comms, and Outreach	\$39,000	
	Undergraduate education	\$8,000	
	Langscape	\$12,000	
	Guatemala Field Station Exec Dir	\$15,500	
NRT matching funds (ARHU/BSOS)	Graduate education	\$28,000	2%
Field School participant fees	Guatemala Field Station	\$14,500	1%
Infant & Child Studies consortium		\$25,000	1%
<b>Total</b>		<b>\$1,771,000</b>	

### **Current Funding Model**

The LSC was established as a **Tier 3 Major Research Initiative** with a broad multi-unit funding structure. The Provost, VPR, and a consortium of colleges committed three years of soft funding for core operations, as well as hard budget and start-up funding for several faculty hires. There was no long-term funding plan. Although grant funding has continued to increase, soft funds for core operations have been inconsistent, threatening the future of the center.

## Core operational funding

For its first three years, LSC operations were supported with soft funds from the Provost, VPR, and four colleges.

### ***Tier 3 soft funding for LSC operations***

	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>	<b>3-year total</b>
Provost	\$100,000	\$100,000	\$100,000	\$300,000
VPR	\$100,000	\$100,000	\$100,000	\$300,000
ARHU	\$25,000	\$25,000	\$25,000	\$75,000
BSOS	\$25,000	\$25,000	\$25,000	\$75,000
CMNS	\$25,000	\$25,000	\$25,000	\$75,000
EDUC		\$25,000	\$17,500	\$42,500
<b>Annual total</b>	<b>\$275,000</b>	<b>\$300,000</b>	<b>\$292,500</b>	

From the start of FY16, LSC began discussions with university stakeholders about funding for the following three years. It was not possible to arrange a meeting with the relevant people until August 2016, so FY17<sup>2</sup> began with no plan in place, and LSC operating on carry-over funds (~\$135k) from the previous years. The process continued to suffer from delays (due to the difficulty of convening all stakeholders) and miscommunications, resulting in insufficient funding for FY17 and no funding for FY19.

In August 2016, LSC presented at a meeting with the Provost, VPR, and several deans, and submitted a proposal with a budget of \$385k/year for FY17-FY19 (see Appendix G, p. 34). Seven months later, in March 2017, LSC received notification of FY18 funding commitments (\$300k, see below), but no funding for FY17 or FY19 (see letter in Appendix G, p. 53). It turned out that part of the reason for declining FY17 funds was an inaccurate determination that LSC already had available funds. In April 2017, Caitlin Eaves met with Cindi Hale (Provost's office) to clear up the misunderstanding. LSC's accounts had been reviewed remotely, and some funds which were in fact earmarked for specific purposes (hard funds for faculty salaries, NRT matching funds from ARHU and BSOS) were incorrectly assumed to be available for LSC operations. The Provost and VPR eventually provided partial funding for FY17 (\$125k), but LSC had already lost commitments that the consortium of deans had agreed to, contingent on the Provost's support. Carry-over funds were fully depleted to break even for FY17.

**No funding has been confirmed for FY19 (now concluded) or beyond.** LSC's operational funds were fully depleted in early February 2019.

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<sup>2</sup> UMD fiscal years run from July 1 to June 31. So FY17 was July 1, 2016 to June 30, 2017.

In April 2017, LSC also submitted a proposal for the FY18 Provost Initiative, requesting \$300k in hard funds (see Appendix G, p. 48). This proposal was declined.

***Soft funding for LSC operations, FY17-FY19***

	<b>FY17</b>	<b>FY18</b>	<b>FY19</b>	<b>3-year total</b>
Provost VPR	\$125,000	\$90,000 \$95,000		\$215,000 \$95,000
ARHU		\$30,000		\$30,000
BSOS		\$30,000		\$30,000
CMNS		\$30,000		\$30,000
EDUC		\$20,000		\$20,000
iSchool		\$5,000		\$5,000
<b>Annual total</b>	<b>\$125,000</b>	<b>\$300,000</b>	<b>\$0</b>	

**Hard budget for faculty positions**

Five faculty positions are partially funded through LSC, all shared with tenure units. An additional position is still unfilled. LSC is still awaiting hard budget transfers from the Provost's office for Jan Edwards (requested Fall 2016) and Jordan Boyd-Graber (requested May 2018). Until those funds are transferred, the salaries continue to be paid, but via non-recurring funds.

***LSC hard funded faculty positions***

<b>Jordan Boyd-Graber Ying*</b>	Computer Science, iSchool, UMIACS	25%
<b>Hal Daumé III</b>	Computer Science, UMIACS	25%
<b>Jan Edwards*</b>	Hearing & Speech Sciences	50%
<b>Maria Polinsky</b>	Linguistics	75%
<b>Omer Preminger</b>	Linguistics	30%
<b>Unfilled</b>	SLLC (\$90,000 committed)	--
<b>Total</b>		<b>\$329,500</b>

\*Still awaiting hard budget.

**Grants**

**Grant funding** is a growing portion of the LSC's budget. Since research-based spending has increased every year, LSC developed a DRIF<sup>3</sup> policy (see Appendix F) for affiliated faculty for projects that are led or coordinated by LSC, or that make use of LSC administration and services. MOUs are being developed with individual faculty who have paid appointments in LSC

<sup>3</sup> Designated Research Initiative Fund (DRIF) is the UMD term for the fraction of indirect costs from grants and contracts that are returned to units or investigators.

so that departments are in agreement on the distribution of DRIF, and the policy is understood by faculty and can be followed in practice.

Although the LSC will work to continue to expand grant-funded research activity, **grant funding cannot cover LSC's operating costs**. Most federal funding mechanisms do not allow direct billing of administrative support, and **LSC's grants have very low rates of DRIF return**. This is due primarily to the nature of the awards the LSC team is qualified to seek out and receive, which involve spending primarily on tuition and participant support (for which billing indirect costs is prohibited), or off-campus activities (for which F&A is significantly reduced). DRIF as a source of revenue does not provide a viable path to long-term financial stability for LSC.

#### ***LSC Grant Spending and DRIF Returns, FY16 - FY19***

	FY16	FY17	FY18	FY19
Total Grant Spending	\$264,113	\$390,970	\$1,061,434	\$1,081,407
Total DRIF Return	\$0	\$2,065	\$6,833	\$7,776

**An NSF NRT grant (\$3M, 2015-2020) has funded most of LSC's graduate training program**, including student stipends, research, training activities, outreach activities, and 75% of Assistant Director Shevaun Lewis ([budget detailed above](#)). The grant will end after a no-cost extension in early 2021, with no plausible possibilities for new external funding available (as discussed [above in the section on the future of the graduate programs](#)). **Securing continued investment in LSC's educational mission--and the staff required to support it--is an urgent priority.**

#### **Other external funding sources**

LSC has explored several other avenues for funding for its research and education activities. These have yet to bear fruit, and they have been held back by the recent focus on securing LSC's base operational funding. But they still hold much promise.

LSC has tried two different approaches to **foundations**. In 2014-2015 Phillips and Wood worked with Chandrika Rallapalli, who at the time was the foundations specialist in UMD's central development office (University Relations). Rallapalli showed much enthusiasm for LSC's vision and plans, and encouraged LSC to develop a series of short written pitches, covering LSC's overall goals and a number of its specific initiatives. We created a series of documents that do exactly this. The guiding idea was that different foundations follow each other's activity and hence might be interested in collaboratively supporting different pieces of a broader effort. Unfortunately, these efforts faltered because of changes in Rallapalli's availability, and then she moved to a different office. The way that this effort with University Relations had been managed meant that LSC did not develop connections or elicit interest from others in UR.



On a smaller scale, LSC has worked with Ted Knight (of BSOS/VPR) on developing pitches or very specific projects that could attract interest from foundations. Wood and Phillips had a series of meetings with Knight in 2017-2018, leading to a focus on a joint pitch for Langscape support for LSC and the NGO Translators without Borders (see proposal in Appendix G, p. 91). Knight expressed enthusiasm for the project and its interest to potential funders, but was adamant that the chances of success would be greatly improved if the project had support from a high profile partner, such as the World Health Organization. Wood and TWB developed a proposal, and WHO verbally expressed enthusiasm. But for reasons that are opaque to us, the support letter was not forthcoming. This stalled the process, which was then further held up by the layoffs and closure of CASL, which put the future of the entire project in question.

LSC has laid some groundwork for **philanthropic giving**. Together with LING Chair Bill Idsardi, Phillips has continued to engage alumnus David Baggett, who has been a strong supporter of education programs in LING in the past, notably a post-bac program that has helped launch many successful careers since 2005. Phillips developed further connections through his involvement in the Planet Word museum effort. Planet Word founder Ann Friedman has agreed to be a member of LSC's Advisory Board, and her connections could be quite helpful. Jan Edwards has also developed a possible connection to sources of philanthropic support.

For development of philanthropic opportunities, LSC has worked largely independently. Phillips, Wood and Judi Gorski (Caitlin Eaves' predecessor as LSC business manager) had meetings with college development experts in ARHU and BSOS.

ARHU's primary involvement has been in the relation with one donor. In 2013 when LSC was preparing to launch, there was an effort to arrange a startup gift, with involvement from the Provost. This effort was unsuccessful due to miscommunications.

Successful launching of LSC's advisory board would help to advance these various avenues for other kinds of funding.

## Grants and Contracts Management

LSC has enjoyed a good working relationship with the Office of Research Administration (ORA) since long before LSC was officially launched in 2013. This is essential for LSC's role in supporting complex research projects.

However, there has been recent reorganization of ORA responsibilities for ARHU, and this has created some difficulties for LSC. Resolving these difficulties would be beneficial for LSC's operations.

## Securing stable operational funding

The LSC is at a critical point. It is in a strong position to pursue several significant growth opportunities, including government- and foundation-supported research, as well as programs

related to the center's educational mission and to the Guatemala Field Station. However, the pursuit of these opportunities is hampered by the limitations and risks associated with the current funding situation.

**While LSC was initially funded as a “Tier 3 Major Research Initiative” the center's role and operations have always been more extensive than a typical Tier 3 project.** As a result, continuation of funding has not been straightforward, and after the initial 3-year funding period, there was no explicit plan for how to fund the center in the longer term. LSC has proposed and applied for different funding mechanisms since that time, including a request for an extension of Tier 3 soft funding, as well as an application for hard funds through the Provost's FY18 Initiative, but it still does not have a clear path to stable funding.

The variable and sporadic funding of LSC's base operating and core programming expenses has taken a severe toll on the effectiveness of LSC.

- The LSC risks **losing the support of the faculty and PhD students** who make up the UMD language science community. The management team, especially the Director, has had to spend a significant amount of time attempting to secure short-term financial stability, taking time away from core projects that serve the community.
- As the LSC was required to use all Tier 3 carry-over (savings) to cover the funding shortfall of 2017, the center moved forward with **no funding safety net**. This is particularly difficult as funding requests have often taken over a year to review. A set funding review process and timeline are needed for better planning and stability.
- There is a **risk of losing essential personnel**. The instability of the current funding model has created a difficult environment for the PTK faculty and staff who manage LSC. Retention of these highly specialized team members is an urgent issue that depends on stable funding.
- There is a risk of **losing or being unable to replace the Director**. The focus on simply “keeping the lights on” has made it difficult for Phillips to contribute in the most useful fashion to the initiative and to the community. It also leads to erosion of trust from the community, making him less effective in his role. The **lack of a contract starting in Summer 2018** also led to loss of funding for the RA position that supports his research. There is a risk that the director position will become vacant, and it would be extremely difficult to recruit a replacement without secure funding.
- LSC's status makes it particularly vulnerable to changes in higher administration (and potential changes in their support of the initiatives). For example, a dean may be well aware of the many ways that LSC contributed to their college, even if it's invisible in LSC's accounts. But that knowledge and trust disappears when the dean changes.

**Cumulatively, these risks pose an existential threat to the LSC.** If the current Director and Assistant Directors leave, the language science initiative will have lost essential expertise that

would be difficult to replace, even with a stable funding model. Without a stable funding model, it would likely be impossible to replace the Director and staff. It is hard to imagine a director or a highly qualified staff or PTK faculty member taking a position with LSC if the funding for the position is fragile.

To thrive and grow, LSC needs stable, long-term funding for core personnel: a 50% appointment for the Director, and 100% appointments for three Assistant Directors--two PTK faculty and one staff member. The most straightforward way to achieve this would be **hard funding commitments**, shared across the Provost, VPR, and colleges.

***Proposed hard budget***

Director - TTK faculty, 50%	\$120,000
2 Assistant Directors - PTK faculty, 100%	\$180,000
Assistant Director, Admin. & Finance - staff, 100%	\$80,000
Materials / Equipment / DIT / Web services	\$8,000
<b>Total</b>	<b>\$388,000</b>

Additional soft funding should be budgeted every 2-3 years, and would vary depending on particular initiatives (e.g. graduate and undergraduate education programs). There needs to be **an explicit schedule and procedure for requesting the funds**, convening the relevant decision-makers, and confirming funding. The consortium of LSC stakeholders is a strength, but the complexity of coordinating such a diverse group has led to significant delays. ARHU and BSOS should lead the process, as the units who provide primary oversight of LSC.

In the spring of 2019, the ARHU Dean's office requested a bare-minimum budget of expenses that could not be covered from external sources, shown in the table below. Importantly, this budget would not allow for the continuation of the Language Science Fellows program after the end of the NRT grant in March 2021, or the creation of any new undergraduate programs. It assumes that the Assistant Directors can all be at least partially supported by grants or other sources, which is not at all guaranteed.

**Minimalist annual budget for core operations and education programming: \$307,628**

***BASE OPERATING***

Director - Colin Phillips, 25%	\$59,562
Assistant Director - Tess Wood, 70%	\$66,668
Assistant Director, Grad. Education & Research - Shevaun Lewis 70%	\$59,128
Assistant Director, Admin. & Finance - Caitlin Eaves, 90%	\$71,270
Materials / Equipment / DIT / Web services / Programming (Langscape)	\$15,500
Communications / Constituent support services	\$5,500

### *CORE PROGRAMMING*

PULSAR interdisciplinary undergraduate program	\$8,000
Graduate Training / Interdisciplinary Community Building	\$22,000
Academic Events (Lang. Sci. Day, internal workshops and events)	
Public Engagement (Lang. Sci. for Everyone; K-12; Planet Word)	
Graduate Support/Training (Winter Storm, professional development)	

## Opportunities for growth

If core operational funding can be stabilized, LSC will have more capacity to pursue external funding to advance its mission in different areas and expand the scope of the center's activities. (But to reiterate, there is no possibility of entirely funding the center's operations from external sources.)

### Large scale grants

LSC has submitted proposals for a number of large-scale grant opportunities, some of which (such as the NRT) have been funded, and others not (overview [above under Research](#)). These opportunities are often hard to plan for in advance; while some are regularly-occurring opportunities, others are either new initiatives or are campus limited submissions. Over the past few years, this has resulted in a number of LSC submissions that had to be put together within a very short time frame.

This also makes strategic planning in this area difficult: without advance knowledge of the opportunities that are likely to be available, LSC leadership cannot easily make plans for a particular number of, or timeline for, large-scale grant submissions. However, LSC continues to focus on being "nimble"--able to redirect short-term efforts into grant development and writing quickly. Moreover, now that the LSC has a history of such submissions, new submissions may be somewhat easier (as some text and ideas may be able to be recombined or reused).

For some limited-submission opportunities in recent years, the university has invited particular groups to submit (rather than holding an open competition for slots). The LSC is often not the first group considered for such opportunities; it is not clear if there is some means of strengthening our position such that we remain in the forefront for consideration.

### Government-funded research

There is significant opportunity for increasing the scale of government research in language at UMD. LSC could help achieve this goal by taking a more central role in coordinating the relationship between USG funders and UMD language science researchers. In turn, getting involved in UARC research could contribute to the long term financial security of the LSC. This opportunity is discussed in more detail below, under [Attempts to Coordinate Government Language Research at UMD](#).

## Foundations

Foundations are a promising source of funding. LSC can continue to work with Ted Knight to develop proposals for specific projects. A number of LSC projects could be pitched to foundations, including:

- Language Diversity and Global Health
- Language Poverty
- Non-Mainstream Dialect and the Achievement Gap
- Overcoming Bias in Technology
- Language and Computation Undergraduate Initiative
- PULSAR Undergraduate Program
- Langscape: Portal for Global Language Diversity
- Field Stations for Interdisciplinary Research and Education
- GRAIL: Global Research Alliance in Language
- How language impacts stereotypes

These projects could be attractive for foundations such as the Gates Foundation, the Spencer Foundation, the Oak Foundation, the Carnegie Corporation of NY, the Henry Luce Foundation, and the Hewlett Foundation.

In order to move forward, LSC plans to do the following over the next year:

- 1) Edit the recent *Language at Maryland: More than the sum of our parts* video [\[YouTube\]](#) to a 2-3 minute version that could be shared more broadly, including with past funders.
- 2) Developing concise drafts for 2-3 of the above projects, along with an overarching vision statement that could serve as an umbrella statement, and corresponding project budgets, so as to start the process of beginning conversations with program officers at selected foundations and government funding agencies.
- 3) Develop a written version of the greater LSC vision, and how these projects tie in to that theme, and/or are thematically linked to one another.

This is going to be a long-term process, especially because most foundations begin by funding small projects and only gradually work to funding larger ones. In the long term, foundations could be a major source of funding for LSC initiatives. However, for this approach to succeed, LSC will need support from University fundraising experts. In the past this has been difficult to achieve, since LSC does not fit neatly into the university's hierarchical fundraising system. It would be helpful if the relevant university offices (fundraising, public relations, etc.) had staff who specialized in cross-cutting initiatives. LSC did work with central University Relations at an early stage, and developed materials as part of an ambitious fundraising plan. But those efforts faltered, as described under [other external funding sources](#).

## Philanthropy

The LSC represents an opportunity for donors to contribute to the development of an emerging discipline. Two examples suggest that philanthropic support for LSC activities is a realistic, if difficult, goal:

- A Language Sciences initiative at the University of British Columbia has received substantial funding from a passionate donor (a local-area educator in the domain of language and literacy, Marietta Hurst [\[link\]](#)). It is worth noting the program at UBC was modeled explicitly on the LSC.
- In our immediate vicinity, a new museum in the area of language and literacy is being funded entirely by philanthropy. Planet Word [\[website\]](#) is due to open in late 2019. (Details on LSC's involvement with Planet Word [above](#), under Partnerships.)

Building this type of support will require substantial effort from both the LSC and from campus leadership. As a first step towards this goal, the LSC will convene the first meeting of an external advisory board in 2019. Five individuals have already agreed to be members of this advisory board.

In addition to this board meeting, one of our incoming board members has offered to host a fundraising event (dinner and silent auction) for the Center; our intention is for this event to likewise take place within the next year. This individual already has ties to UMD (she and her father have donated to the Smith School of Business in the past) and she has hosted such events in the past for other foundations on which she was a board member.

## Plans for the remaining strategic hire

In July 2018 all indications were that LSC would successfully complete the final strategic hire from the 2013 plan. Over several years, LSC had worked closely with the deans of ARHU and Education, with TLTC and with the leadership of SLLC and LING to create plans that all parties were happy with. This promised to be a major boost to UMD's capabilities in language and education, and a critical element in LSC's leadership plans. By August the plans had fallen apart, due to circumstances that none of the parties could have anticipated.

We must emphasize that this was not a slow process that failed due to neglect or lack of importance. Many different units worked very well together over a long time towards a key goal.

We hope that this leadership position will not be withdrawn. The need for leadership in the area of language and education, including second language acquisition, remains critical to the goals of the language science initiative. In fact, departures in key units, due to retirements (SLLC), or loss of faculty to Harvard and Stanford (CHSE), or mayor layoffs at CASL have made the need even greater. However, the best way to address this need is uncertain. Finding an individual who can work across different cultures, who can be a scientific leader, and who is also able to



be an effective LSC leader is not easy. We will not find a person whose profile matches our previous target of opportunity, and will need to consider different connections and current needs.



*Holiday book drive 2018. Books wrapped for delivery to 600 Baltimore City first grade students who participated in LSC's Toggle Talk project*

# Organizational relationships and oversight

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LSC was designed to serve the university's efforts in language science, benefiting a number of participating individuals and units. It does not have formal relationships with other units or formal leverage to advance its mission, aside from co-funding a few faculty. This means that it depends almost entirely on individual interest in contributing and voluntary cooperation from chairs and directors. Although the "grassroots" contributions are a strength, the lack of a clear mandate creates persistent challenges.

Below, we briefly describe the nature of LSC's relationships with different departments and centers. While there is no possibility of changing LSC's relationship with departments, the possibility of changing LSC's relationship with centers has been raised repeatedly. We therefore treat these separately.

## Departments and Programs

LSC has no institutionalized relation to the many departments with interests in language science, but it collaborates with departments in many different ways. The nature of the relationship depends on a number of factors within the department, including:

- the proportion of faculty and students engaged in language science research and/or involved with the LSC;
- whether the Chair (or Director) is closely involved with the LSC;
- availability of student funding;
- PhD coursework requirements;
- faculty teaching and service requirements;
- attitudes towards academic vs. non-academic careers for PhD graduates.

As the LSC develops a clear identity and role in the community, it would be helpful for departments to make their relationship to LSC more explicit. For example, they could send representatives to a (not yet formed) Language Science Council, clarify expectations for students and faculty who spend significant time on LSC-related activities, or add information about the LSC to their websites and recruitment materials.

## Linguistics

The Linguistics Department was the initial driver of the effort to organize the interdisciplinary language science community at UMD. When the LSC was created, the department lost its status as the unofficial hub of the community. But interdisciplinary research is still an important strength of the department. Students and faculty from Linguistics are a major force in LSC leadership and activities, and LSC is a major part of life in Linguistics. There have been some growing pains as the LSC gains a more distinct identity, and priorities that don't always match

with those of Linguistics. While all linguists take a scientific approach to studying language, they don't all necessarily identify with "language science" and the emphasis on interdisciplinarity.

- Over half of current students are Language Science Fellows and are involved in student leadership. Nearly all the rest participate in at least some LSC activities.
- Several faculty are partially funded by LSC, and have grants managed by LSC staff. About half of current faculty (including the Chair, Bill Idsardi) are highly active in LSC activities or leadership. Nearly all of them mentor at least one Language Science Fellow, and/or participate in at least some LSC activities.
- Until this year, the Guatemala Field Station was mostly focused on linguistic fieldwork. Its TTK faculty leadership (Maria Polinsky and Omer Preminger) are in Linguistics, and several Linguistics PhD students have visited the field station multiple times.

### **Hearing & Speech Sciences**

HESP has long been home to faculty with interdisciplinary research interests, some of whom were instrumental in building the language science community and the LSC. The visibility of HESP students and faculty in LSC activities has grown substantially as its PhD program has grown over the last few years. (The dramatic recent growth of HESP is [summarized above](#).) The clinical side of the department remains relatively unconnected to LSC. Their dedication to connecting fundamental science with clinical and educational applications has noticeably shifted conversations at LSC.

- Nearly half of current PhD students are Language Science Fellows and are involved in student leadership. Most of the others participate in at least some LSC activities. Few if any of the clinical MA students are involved with LSC, although undergrad HESP majors are a consistent contingent in the PULSAR program.
- Five current faculty members (including the chair, Rochelle Newman) are active in LSC activities and mentor at least one Language Science Fellow. One is partially paid by LSC and has grants managed by LSC staff. A few clinical faculty have used LSC facilities for workshops, with much success.

### **Second Language Acquisition Program**

The SLA program, like Linguistics and HESP, is entirely devoted to language; most of the students and faculty could consider themselves language scientists. However, their level of involvement with the LSC has fluctuated over time. Although many of the PhD students could benefit from the LSF program, they often do not because of funding constraints. Students do not receive full tuition remission from the program after the first two years, so they cannot afford to take additional classes in other departments. Most students are international, and thus not eligible for NSF-funded stipends. They often have no choice but to take on TA- or RA-ships, or even full-time jobs, which leave little time for interdisciplinary activities.

- One current MA student and one recently graduated PhD student are Language Science Fellows.
- Two faculty members have mentored at least one Language Science Fellow (one is a

co-PI of the NRT grant), and have been active in the language science community for many years.

There have been some misunderstandings, where SLA faculty have specifically discouraged students from participating in LSC programs or activities. We have made some efforts to remedy this.

### **Computer Science/iSchool/UMIACS**

The **Computational Linguistics and Information Processing (CLIP) Lab** is a hub of work in computational approaches to language, with members from CS, the iSchool, the School of Business, and Linguistics. Its visibility at the LSC has grown as more students from Linguistics participate. For example, the “ProbMod” (Probabilistic Modeling) discussion group has met weekly at the LSC for the past year. However, few students or faculty from CS participate in other LSC activities with any regularity. The value of the language science community seems less compelling for students in computer science. Most of them have clear career opportunities in industry, and apparently less incentive to deepen their understanding of the science of language.

- One current and one recently graduated CS PhD student have been Language Science Fellows. Several others participate in Language Science Day or Winter Storm.
- Two faculty members (CS/UMIACS/iSchool) are partially funded by LSC, participate in LSC leadership, and have mentored Language Science Fellows.

### **College of Education**

Before the creation of the LSC, the only active points of contact with COE were a few faculty members (and their students) in HDQM, who were involved in interdisciplinary research and the IGERT program. LSC helped establish the **Language and Literacy Research Center (LLRC)**, which has helped maintain contact between researchers in HESP and COE. Few students or faculty participate in LSC activities regularly, in part because of differences in academic culture which can be hard to adjust to.

- One current HDQM student is a Language Science Fellow and very active in LSC activities. A few others have participated in LSC activities, including presenting at LSLT.
- One faculty member in CHSE is part of the LSC Executive Committee. Another leads the evaluation for the NRT program. Several more have mentored IGERT or LSF students, given talks, or attended LSC events.

### **Other departments and programs**

- **Neuroscience and Cognitive Science program:** Students and faculty are a significant presence at LSC, and many Language Science Fellows in other programs pursue the NACS certificate.
- **Philosophy:** Currently relatively little involvement. In the past there was more interaction between Linguistics and Philosophy, including through the “PHLING” discussion group.

There were two strong new hires in philosophy of language in 2019, both very motivated to make use of connections with Linguistics and LSC. This creates promising new opportunities.

- **English:** A few faculty occasionally participate in LSC activities.
- **Engineering:** A few faculty and students participate in LSC activities or the Language Science Fellows program.

## Centers

The relationship with research centers is different than departments, and those relationships are as varied as the number of centers. Some centers are relatively self-contained and have their own FTEs, who work primarily on contracts and have less control over how they spend their time. Other centers are comprised mostly of TTK faculty and GAs who ‘belong’ to departments.

The possibility of changing LSC’s relationship with centers has been raised repeatedly, in various contexts. So it is an issue that cannot be ignored.

The issue of overlap and consolidation arises for multiple reasons. Outside sponsors or partners ask: why does the University of Maryland have multiple units with “language” and “center” in the name? We have heard from government officials that this creates confusion and the impression that UMD’s language experts are either disorganized or unable to get along. University leaders ask whether consolidation might lead to better prospects for grants and contracts. They wonder whether consolidation might lead to administrative cost savings. And they ask themselves whether the language people really are doing something coherent if they cannot create a coherent center. For their part, language scientists sometimes ask whether they might be able to do some things better together if they are organized as part of a single unit.

A reasonable fear that surrounds any talk of consolidation is loss of autonomy. Researchers do not want to be told what to do. Nor do they want to risk losing resources that they control.

For language science groups at UMD, the potential benefits of consolidation or closer coordination include presenting a unified front, greater visibility inside and outside the institution, shared resources, and spread of positive values.

The risks of consolidation include loss of autonomy, “infection” of negative cultures, or tensions due to misaligned values, e.g., prioritization of financial vs scientific value.

Despite lacking a clear mandate, **LSC has assumed the role of advocate and unifier for language science at UMD in general. No other unit has taken on that role.** In practice, the relation with different language-associated entities varies greatly. Also, association with LSC fills different needs for different groups: for some it provides student training, for others it provides useful space, or pre-award guidance, or financial management.



**CASL/ARLIS:** The Center for Advanced Study of Language (CASL, 2005-2018), and the Applied Research Laboratory for Intelligence and Security (ARLIS, 2019-) are successive incarnations of a University Affiliated Research Center (UARC), an entity that allows UMD to receive no-bid contracts from government agencies. The relation between CASL/ARLIS and LSC is so important that it gets its own section (below).

**National Foreign Language Center (NFLC):** NFLC is a large self-sustaining unit that focuses primarily on educational materials and programming for foreign languages, with the US Government as its primary client. Its major projects include Startalk, a large program that trains K-12 students around the country in critical languages. Its annual contracts total over \$10M. In the past it also had a broader profile in language policy. Recently it has begun some efforts to move more into research. But its primary expertise currently is in efficiently managing large implementation projects relating to foreign languages. NFLC is a unit within ARHU. However, it is physically and fiscally relatively isolated. It supports its own operations, and it is located in the M-Square research park over a mile from the main UMD campus.

The main benefits of closer coordination between LSC and NFLC would be (i) potential consolidation of government relations / business development, especially if LSC takes on a larger role in the research previously led by CASL; (ii) sharing of expertise in contracts and project management; (iii) possible sharing of communications efforts; (iv) facilitating NFLC building its research involvement; (v) closer collaboration with the School of Languages and the College of Education. The main risks of closer connection is that the units are so different in their mission and cultures.

**Language and Literacy Research Center (LLRC):** LLRC is a center that LSC has sought close relations with since its inception. LLRC is based in the College of Education. It was created in 2014 in connection with a faculty retention effort. Membership consists of TTK faculty, graduate students, and occasional postdocs. LLRC is not a formal academic unit, and its budget has at most consisted of some funds for a graduate assistant or postdoc, plus some funds for speakers and events. LLRC was established as one among a series of efforts to foster greater collaboration within COE and between COE and other colleges.

From its beginnings, LSC saw two significant opportunities that could be realized by LLRC. First, that it could help to foster closer connections between experts in language and literacy. In practice this would primarily connect HESP with COE. It may seem obvious that research and training in spoken and written language should closely align, but the fields are remarkably disconnected. Speech pathologists and child literacy specialists are similarly disconnected. So, forging a close connection would be rather innovative. Second, it was hoped that LSC could provide support to LLRC and its recently tenured leaders, providing mentoring, staff resources, etc.

There have been some successes, notably the PROPELL and RISE training grants, both of which LSC supported in different ways. But the potential for ties between LSC and LLRC have



not been fully realized. The HESP-COE bridge has not developed as much as it could. And there has been turnover in key personnel in COE. We still see much potential for closer connections between spoken language and literacy research, but it remains underdeveloped.

**Multilingual Research Center (MRC):** MRC is another smaller initiative within the College of Education (COE). It has primarily served as an identity and venue for talks and research meetings among COE faculty with interests in bilingualism. There is limited overlap with LLRC, but to some degree the two COE efforts serve distinct groups of faculty.

LSC has made efforts to highlight MRC activity in venues such as Language Science Day. LSC would be very happy to support closer connections between bilingualism expertise in different parts of UMD. This was one of the desired outcomes from the final LSC leadership hire. Development of greater trust and shared interest among the different participants will lead to further progress in this area.

**Language Flagships:** The Language Flagship programs are a semi-independent unit of the School of Languages, Literatures and Cultures. They provide unusually intensive training in Arabic and Persian, supported primarily by DOD funding. They have a closer connection to LSC than some other centers because they share a building and often coordinate space needs with LSC, and because LSC Assistant Director Caitlin Eaves previously worked for the Flagships.

LSC's science mission has limited overlap with the educational focus of the Flagship programs, and the coordination that already happens between the two units is effective. However, the two main motivations for possible closer coordination with the Flagships are: (i) coordinating a coherent picture of UMD language capabilities to the US Government. We have heard from the Flagship's sponsors that they regard UMD's current fractionation of language units as confusing. (ii) Coordinating UMD efforts relating to the science and implementation of second language learning. These capabilities are currently split among many different units (NFLC, SLLC, COE, ARLIS) and opportunities are missed. Since LSC's core mission is to be a connector, it should be well positioned to help foster connections.

**MCICE:** The Maryland Cochlear Implant Center of Excellence is a joint initiative between UM College Park and the UM Baltimore School of Medicine, with support from the State of Maryland's funding for closer ties between UMCP and UMB ("MPower"). It was recently launched with substantial leadership from LSC Associate Director (and HESP Chair) Rochelle Newman. Many faculty members in HESP are involved in the effort.

There is much potential for further connection between these efforts, without competition. Many MCICE faculty are affiliated with LSC, and there are many shared values. LSC has a broad mission, whereas MCICE focuses on one theme with great intensity. MCICE/HESP likely does not have any need for LSC's expertise in pre-post award support, but LSC could be useful in areas such as space and communications. MCICE will develop strong connections with the UMB Medical School that LSC could learn from (we do not expect UMB to become a major LSC

partner). LSC has expertise in student training that MCICE could perhaps leverage if it seeks training grants. And, of course, the broad expertise in language analysis and language processing that the UMD language science community has is of great relevance to work on cochlear implants.

**Brain and Behavior Initiative/Institute (BBI):** BBI is a university-wide initiative in neuroscience, with an additional nod to cognitive science. It has developed over a number of years with strong support from the Provost.

The relationship between BBI and Language Science is in need of clarification. UMD language scientists have been major contributors to UMD's efforts since the 1990s in Neuroscience and Cognitive Science, and relations have been very good. However, there is a concern that the BBI effort may be a threat to language science, either because language science will be folded under BBI, or because BBI takes priority over language science.

Since the late 1990s UMD has had an interdisciplinary PhD program in Neuroscience and Cognitive Science (NACS). The program offers a flexible alternative to departmental PhD programs. NACS has no faculty of its own, but draws faculty from departments throughout UMD. Although the mission of NACS is focused on graduate education, it has also become the natural home for a research community, and there have been occasional attempts to officially expand the role of NACS beyond graduate education.

Language scientists have played a major role in NACS. Language is UMD's strongest area within neuroscience and cognitive science (and it overlaps with hearing, another long-standing area of strength for UMD). For most of the past 20 years, language scientists from 4 departments have taught 40% of the NACS core courses. A number of language scientists have served as NACS Graduate Director (Idsardi, Newman, Ratner), and from 2010-2019 Phillips served as NACS Associate Director. Many language science students have pursued the NACS PhD program, and many more have pursued a departmental PhD while also pursuing the NACS Certificate Program. NACS' largest foray beyond graduate education was the creation of the Maryland Neuroimaging Center (MNC) in 2009-2012. Language scientists, particularly David Poeppel and Colin Phillips, played a central role in securing the funding for MNC, and Phillips and other language scientists played a central role in designing and creating MNC. The relationship to NACS has been consistently good.

BBI and LSC are both relatively recent initiatives that reach across the entire university. They have distinct but overlapping scientific scope: "brain and behavior" clearly includes language; "language science" clearly includes neuroscience and cognitive science. (Roughly speaking, the psycholinguists and neurolinguists feel that they align with BBI as well as LSC, and other language scientists do not.)

Despite the overlap, LSC and BBI differ along a number of dimensions:

- LSC builds on a pre-existing grassroots community. BBI is more of a top-down initiative.
- The language science initiative is a reaction to a strength that UMD already had. BBI is seen more as a response to a need for UMD to catch up with peers in neuroscience. Universities do not perceive a need to be strong in language, but UMD has an opportunity to be a world leader. Universities currently perceive a clear need to be strong in neuroscience, but it is a highly competitive and expensive market.
- A focus of LSC is on integration of efforts in research, education, and partnerships. In contrast, neuroscience efforts are more disconnected. BBI is primarily a research effort. This is distinct from NACS, which is a somewhat overlapping graduate training unit. And it is unclear how this relates to the research/implementation center being developed in the new Cole Field House as the Center for Sports Medicine and Human Performance (CSMHP), which has a strong neuroscience component (including the moved Maryland Neuroimaging Center) and is driven by different forces than BBI.
- LSC was established as a center (soft-funded) whereas BBI is presented as an institute (hard-funded). This creates a different trajectory towards sustainability.
- BBI is seeking a director who has a strong international profile as a scientist and is willing and able to lead a broad interdisciplinary initiative that is independent of his/her own research. This is not easy, so UMD is ready to make a substantial hard budget commitment to find a suitable individual. In contrast, LSC already has that--not only in Phillips, but also in the collection of other faculty leaders who combine international prominence in their own science with a commitment to broader goals. Yet LSC is fighting to stay afloat because of its fragile funding model.

There should be good prospects for cross-fertilization between BBI and LSC. But it is important that this not undermine UMD's established strength and opportunities in language science.

**Summary:** Some changes in LSC's relationship with centers would likely benefit UMD. Despite much careful planning, LSC was established quickly and within various constraints from existing organizational and funding mechanisms. Now is a good time to explore a rational reconstruction of UMD's structures for pursuing opportunities in language science.

## Attempts to Coordinate Government Language Research at UMD

In principle, the potential for marrying UMD's broad and interconnected capabilities in language science with the US government's diverse needs in language should be huge. In practice, this has proven to be challenging. LSC has invested a great deal of its energy in pursuing this connection, but a sustainable approach is yet to be reached.

### Interest and Potential

The notion of "US Government language needs" can appear vague or even evasive, as a euphemistic cover term for defense or intelligence agency work. There is some truth to this, but

there are many US Government agencies with interests in different aspects of language, ranging from defense to health to international aid to education to transportation.

Many aspects of USG language needs are rather interesting scientifically.

- A key lesson of 9/11 was that you never know on Friday what will be a nationally critical language on Monday. It is necessary to be able to develop human and technological capabilities in any of hundreds or thousands of languages at short notice. In many cases, these capabilities must be built from minimal resources, requiring creative approaches.
- Commercial efforts in language technology, language education, and language-related health issues tend to focus on the largest and wealthiest populations. The USG has concerns that extend to a much wider range of languages and communities. For example, USAID has interests in measuring literacy levels in millions of African children from diverse language backgrounds, and the National Institute of Health has identified limited English proficiency as a significant source of health disparities.
- USG language professionals (from diplomats to intelligence analysts to global public health experts) can no longer rely on a lifelong focus on an individual language or region. The world is changing too quickly. This creates an interest in approaches to training (and retraining, and retraining) highly motivated adults in new languages. This is different than the challenge of motivating a cross-section of students in Spanish 102.
- The USG is keenly interested in challenges relating to the spread of disinformation and “fake news” as well as in the development of “deep fakes” (realistic images or video created with artificial intelligence). Tackling this challenge necessitates exactly the kind of broad interdisciplinary collaboration the LSC was designed to promote, as this would involve researchers in linguistics, communication and rhetoric, political science, sociology, psychology, artificial intelligence, and machine learning, among others.

Just as in academia, USG language needs are spread across many disconnected or loosely connected agencies. There have been attempts at coordination of USG language needs. This was led by the Obama White House Office of Science & Technology Policy (OSTP). But with the demise of OSTP in the Trump administration these efforts have stalled.

OSTP convened an Interagency Working Group on Language and Communication (IWGLC) to map USG language needs, as a step towards developing a more coherent strategy. This presented an opportunity for UMD to position itself as a trusted resource. OSTP solicited input on its initial report and a UMD team, led by Phillips, submitted the most extensive response to the report. Unfortunately, this process appears to have been dissolved shortly thereafter.

[LSC's response to the USG Interagency Working Group on Language & Communication](#)  
(January 2017)

UMD is ideally situated in many ways to serve government language needs. UMD has diverse capabilities with unusually good connections across fields. The Metro Washington DC location is clearly a plus. And UMD has multiple units that have a focus on USG language needs.

- UMD has a university-affiliated research center (UARC) that previously had language as a primary mission (**CASL, the Center for Advanced Study of Language**: 2005-2018) and now includes language in its remit (**ARLIS, the Applied Research Lab for Intelligence and Security**: 2019-). A UARC is a mechanism that allows USG to award no-bid contracts with academic institutions.
- The **National Foreign Language Center (NFLC)** is a UMD unit with a long history of USG work. In recent years its focus has been on creating foreign language education resources for a wide range of languages. Historically it was active in policy matters, and it has made some more recent forays into research.
- The **Language Flagship programs** in Arabic and Persian, a unit within the School of Languages, Literatures and Cultures (SLLC) deliver multiple highly regarded intensive language teaching programs, substantially supported by the USG. (There have been previous efforts to bring flagship programs in additional languages to UMD.)
- The **Computational Linguistics and Information Processing (CLIP) Lab** within UMIACS has a long record of contracts with USG organizations such as DARPA and IARPA.

Despite the strong foundations, it has been difficult to effectively connect USG interests with the full scope of UMD expertise. There is a separation between the researchers and teachers working on USG projects, who are mostly soft-funded and based on the periphery of the campus, and the more centrally located tenure-track faculty and students. And the academic and USG worlds have often proven to be mutually unintelligible.

The advent of LSC offered much potential for creating an effective bridge. In a built-from-scratch world LSC would be an umbrella unit that could help people on both sides navigate a complicated landscape. USG agencies could use LSC as a coherent entry point to UMD's language expertise, and LSC could help UMD language experts to find rewarding ways to work with USG.

This potential was recognized from the beginning of LSC, and LSC has made extensive efforts to support the UMD-USG bridge. The VPR in particular saw LSC as a valuable connector. But LSC was inserted into a web of existing units and relationships, and so it has never had official standing to act as a bridge, and it has had a very limited ability to engage with USG.

## Main Activities

1. LSC has represented UMD language science capabilities in many settings, such as in coordinating showcases for USG officials. It has also helped to advocate for CASL and other USG-focused units within the UMD language science community. Phillips

participated in many meetings that aimed to build stronger connections with USG language interests.

2. LSC led the Langscape project ([details above](#)), together with CASL researchers. This was/is an ambitious effort to create an online portal for resources relating to the world's 7,000 languages. The Langscape project consumed a great deal of LSC's time and energy, and it was one of the most broadly visible things that LSC has done, but it is practically invisible on LSC's balance sheet, as all associated funds came to CASL.
3. LSC has attempted to create cross-appointments that would strengthen links between CASL/ARLIS and the rest of the university. One of the faculty appointments supported by the LSC launch plan was a 50-50 split for Jared Novick between CASL and HESP. Novick had previously been 100% at CASL. The CASL portion of Novick's appointment subsequently ended, leaving him 100% in HESP. In connection with Jan Edwards' recruitment to UMD, LSC arranged a cross-appointment between CASL and HESP for Marios Fourakis. This later became only a part-time appointment in HESP. LSC has more recently tried to make LSC an intellectual and administrative home for former CASL researchers. One of the hoped-for appointments has been completed to date.
4. LSC has engaged with and supported the Flagship programs and NFLC, albeit in more limited ways. LSC is an unfunded partner in a cultural education grant awarded to the Flagship program, and it has supported NFLC in a recent resource center application. LSC has tried to ensure that NFLC and the Flagship programs are represented in broad discussions about language at UMD.
5. LSC has made many efforts to support and engage CASL/ARLIS researchers, who are at risk of feeling isolated from the rest of the UMD language science community. LSC has helped them to connect with graduate students, it has provided meeting and office space, it has helped to connect them to teaching opportunities, it has invited them to participate in diverse events and has sought to highlight their work.
6. In 2019 following the demise of CASL, LSC worked to develop a new arrangement that would provide a more coherent umbrella for language science at UMD, with LSC serving as a base for language researchers who are primarily supported by USG contracts. We also discussed possibilities for closer coordination with NFLC.

## Challenges

The effort to integrate USG language research with the rest of UMD language science has faced a number of challenges.

A clash of cultures has been felt in many ways. Academic researchers do not understand how USG operates, and USG officials find the workings of academia opaque. This leads to a mix of frustration and suspicion. Those who attempt to bridge the divide, in centers such as CASL and NFLC, plus LSC leadership, can feel caught in the middle. For CASL researchers, there was a conflict between academic expectations and the contracts that paid the bills. For example, the criteria for academic promotion were not aligned with the expectations for successful completion of contracts. For LSC leadership, efforts to work with USG interests, particularly in the areas of



defense and intelligence, could be seen as craven or suspicious by tenure-track faculty, contributing to an erosion of trust.

Furthermore, some work of interest to USG is necessarily applied in nature, and may not always align with the interests of tenured and tenure-track faculty members. It is also the case that work on behalf of USG can sometimes be difficult to publish; this makes it harder to engage UMD faculty, because work on those projects may not feed into their personal or departmental goals. Even in cases where USG and faculty interests overlap, it may not always be clear to UMD faculty members how their work is relevant to USG interests and/or how to “sell” their research to a USG client.

The inherent uncertainty surrounding funding can also present a challenge for USG-oriented research. Some USG agencies and departments place a lower priority on basic research and it is often unclear until late in the funding cycle whether a given agency or department has research funds available. Due to the complexity of the contracting process, there can be a lengthy period between when an agency expresses interest in funding a project and when those funds arrive at UMD. In some cases, the funds never arrive at all.

Communication and access has presented ongoing challenges. LSC had limited direct access to USG contacts, which were mostly curated by CASL (or NFLC or Flagships). LSC organized meetings for USG officials without being able to know who was attending. Phillips made multiple visits to a USG facility in Virginia to give presentations, in both instances not knowing who he was talking with. To some degree CASL was understandably protective of its relationships, given their importance. To some degree the USG culture can make everybody nervous about communicating in unclassified settings, even about entirely unclassified projects.

Shifting priorities at UMD and USG have added to the challenges. CASL was built upon an ambitious vision for language research, driven largely by a single IC agency, which was then hit by the cuts of sequestration. Until recently that agency’s control made it difficult for CASL to do business with other USG agencies. By the time the problem was resolved concerted efforts such as the Interagency Working Group in Language and Communication had been discarded by the Trump White House. On the university side CASL received good support from UMD, although the USG often did not perceive the support as sufficient. But UMD’s priority shifted away from a language-focused UARC with a large in-house research staff, i.e., CASL, to a broader contracting vehicle that allowed it to direct no-bid contracts from USG to multiple UMD units, i.e., ARLIS (the Applied Research Lab for Intelligence and Security). The core sponsor of the UARC has also changed, and ARLIS is now sponsored by the Department of Defense.

Normally, a new UARC must be created through an open bid process. This was avoided since CASL was already a UARC. So it was possible to shift to a new sponsor without an open bid process. Once that shift had occurred CASL was largely disbanded and replaced by ARLIS, which is largely a contracting vehicle with a much broader portfolio. It has become clear in this process that language is not a top priority for the UARC, although it remains within the remit of

the UARC. It has been uncertain whether the UARC would invest substantial energy in advancing language research, or what would be the continued role of language researchers formerly employed by CASL.

The limited coordination on the USG side has also presented challenges. Agencies may have shared interests, but may be either unaware or unwilling to share responsibility for advancing them. The Langscape project has been a good example of this. Many agencies would love to benefit from a powerful information portal for the world's languages that can also be integrated with their own classified databases. This should be attractive for a co-funding model in which multiple agencies contribute so that they can collectively benefit. It has not yet been possible to achieve this.

We have also heard from USG officials, directly and indirectly, that it is frustrating for them that they do not have a coherent point of access to UMD's language expertise. UMD has multiple units with "language" and "center" in the name, in addition to the many academic departments. This can appear confusing or redundant.

## Solutions

In spite of the challenges presented above, work with and on behalf of USG clients presents robust opportunities for UMD language researchers in many different arenas, including health, education, defense, intelligence, and others. For example, UMD language scientists are part of a \$14.4M IARPA project on language technology awarded in 2018 [[article, UMD Right Now](#)]

**LSC has proposed to take a more central role, to help create an effective bridge between USG and academic language science research at UMD.** This role for LSC could also significantly improve the financial sustainability of the center, and make it possible to engage more staff. This plan was explored in early 2019 through meetings with language science faculty, deans, and ARLIS leaders.

The LSC can provide a **coherent point of entry** for UMD's world-leading and well integrated capabilities in language science. It is already designed to provide university-wide coordination of language science researchers. LSC could also provide a good **intellectual and administrative home for researchers** who are supported primarily by USG contracts, but also are more closely connected to -- and hence trusted by -- the rest of the UMD language science community. This could help to attract and retain talented language scientists. (UMD currently risks losing almost all former CASL talent and relationships.)

The LSC is able to provide several other important benefits and services, although capabilities would need to be scaled up.

- **Physical space** for meetings, events, community-building, and administrative staff. (However, LSC is not designed to be a physical home for lots of researchers and labs.

New administrative staff could be based at LSC, but researchers need other homes, while feeling closely connected.)

- **Pre-/post-award management** for language science grants and contracts that use the UARC mechanism. Some would not use this; many would involve credit sharing. LSC administrative capacity will also need to scale with increased grants and contracts.
- **Communications**: presenting UMD's capabilities in language.
- **Team building**: connecting TTK faculty, PTK faculty, and students from diverse fields.
- **Professional development** for PTK faculty (mentoring, teaching, training); building on our established strengths in developing students and TTK faculty.

For this possibility to be realized, it will be necessary to have leadership within LSC that has expertise in USG business development, as well as broad understanding of the UMD language science landscape. Current LSC leadership does not have the capability to do this. This role could be filled by a part-time Director of Government Research (or similar).

Some challenges would still remain. There is a risk of government constraints and culture undermining the the intellectually vibrant community that is UMD's greatest strength in language.

Most research carried out at CASL was not classified, and LSC is not eager to develop a classified research program. But some projects do involve working with classified materials, or classified individuals. And even when no classified materials/individuals are involved, key meetings or documents are often available only in classified spaces. Clear plans would be needed on how to address this.

Also, since key information or connections often are shared in classified settings, it is important that relevant PTK faculty have suitable security clearance that allows them to successfully apply for and carry out USG projects. There is a risk that the management of security clearances could have the effect of channeling business opportunities towards or away from different groups. Therefore it is important that there be effective cooperation among different UMD units on security clearances.

If LSC is to take on a larger role with government grants and contracts through the ARLIS mechanism then it is important to address current concerns about how LSC works with the Office of Research Administration.

## Oversight

LSC's oversight model was created as an experiment in how to oversee a university-wide initiative, learning from past experiences. The key feature is that LSC is overseen by two deans (ARHU, BSOS) on behalf of a consortium of deans and VPs. The aim is for this to be small enough to be manageable, but large enough that the initiative is not perceived as belonging to a

single college. The experience to date has been that this model generally works well, but with some challenges.

## Two College Solution

LSC was initiated jointly by the Provost and VPR, with support from deans of 4 colleges. Organizationally, LSC must sit in one place, so it is a unit within the ARHU Dean's Office, and most administrative functions are connected to ARHU. But some LSC functions run via BSOS, e.g., the MLSC course code is under BSOS. On all significant administrative matters LSC coordinates with both colleges. Phillips attends the regular Chairs & Directors meetings for both colleges.

On a day-to-day basis LSC works with both ARHU and BSOS, on behalf of the larger group of campus leaders. On purely technical matters, e.g., processing appointments, IT support, LSC works exclusively with ARHU. On many other matters LSC works with both colleges.

In most regards the joint oversight approach has worked well. The deans coordinate well together. There is no regular schedule of meetings with the deans, but it has been possible to meet with them when needed. The two deans have been effective in communicating with other deans. The Associate Deans and finance experts in both colleges have provided advice on many issues, e.g., MOUs, finances, appointment and promotion plans for professional track faculty. In many situations getting input from two colleges leads to results that are better than we could get from input from one college. For LSC's director it takes additional time to attend two sets of chairs/directors meetings, but this provides useful perspective on working across colleges, and it helps to show that LSC takes its role in both colleges seriously.

There have been a couple of areas where it has been less straightforward to fit a cross-campus initiative into the hierarchical organization of colleges.

In the area of communications, each college has a communications structure that curates messages for the college, and in some cases pushes them to a higher level within the university or beyond the university. LSC has a broad reach and almost all of its personnel are appointed in one or more colleges. College communications teams have been happy to highlight material from LSC that aligns with the departments in that college, but have been reluctant to highlight LSC material that they perceive as belonging to another college. For example, LSC manages large projects led by faculty who are cross-appointed in LING and HESP. The ARHU communications team is more comfortable promoting the LING-related project than the HESP-related project.

The ARHU Comms Team led the development of LSC's website. This was a positive experience, though it was built around a strategy that the college has since dropped. We address this under [Communications](#).

**In the area of (philanthropic) development, LSC has not fit well within existing organizational and incentive structures.** LSC did a lot of work at the beginning on developing plans with central University Relations for approaching foundations. These plans did not survive changes in personnel. There have been some meetings with college experts about philanthropic development, leading towards creation of an advisory board. More recently, LSC had a number of promising meetings about foundation opportunities with Ted Knight, who works on a part-time basis for BSOS and VPR. These efforts were ultimately limited by partner organizations.

## Coordinating with Broader Group

It is understood that the two lead colleges support LSC on behalf of a larger group that includes other colleges, plus multiple higher level units: Provost, VPR, University Relations, International Affairs.

In a typical year there has been an annual meeting with all campus leaders together, as well as occasional individual meetings with the VPR or individual deans.

The investment of the different colleges varies, consistent with the role that language science plays in the college's areas of expertise.

The College of Education has broad interests in language, and language scientists are in all of the college's departments. The COE Dean's office has been generally enthusiastic about efforts to more closely connect COE language work to the rest of the university. Former COE Dean Donna Wiseman was involved in the LSC effort from the beginning, and regarded LSC as a useful contributor to synergies within the college and beyond the college. Her own expertise in literacy was also beneficial. Her successor, Dean Jennifer Rice, did not have the familiarity with LSC efforts to support COE and COE faculty in the same way, but she has been supportive of LSC's goals.

The College of Computational, Mathematical, and Natural Sciences has a very broad footprint, and a relatively small engagement in language science. But the computational linguistics group in CS/UMIACS is regarded as a strength for the college. CMNS has been a consistent contributor to LSC's core staff budget. Under former Dean Jayanth Banavar LSC had a sometimes strained relationship with CMNS. However, LSC had a number of productive working relationships with other key members of the CMNS Dean's Office. Current CMNS Dean Amitabh Varshney was previously UMIACS Director and VPR, so he had a significant head start in knowing about the relevance of language science to the college.

There are other colleges beyond the initial four sponsoring colleges that have some overlapping interests with LSC.

- The iSchool has a clear interest in language and has a number of faculty with language expertise, including Jordan Boyd-Graber, whose appointments include LSC and iSchool.

LSC has supported an iSchool student on a training grant, and has initiated some collaborations involving digital language resources. The iSchool became a small contributor to LSC's core staff funding in FY18.

- The School of Public Health has language-related interests in two main areas. The first is a growing interest in global public health, for which language diversity is relevant. LSC had discussions with previous SPH leadership around this topic. The second is a longer-standing interest in health communication. A conference on this topic was held in LSC's space. LSC has also supported SPH in its (successful) effort to obtain an NSF NRT training grant.
- The College of Engineering has some faculty with language-related interests, particularly in the Institute for Systems Research and the Dept of Electrical and Computer Engineering.
- The College of Agriculture and Natural Resources has limited overlap with LSC, but it has become a partner on a couple of efforts with LSC's Guatemala Field Station.

Coordination among deans has been generally effective, but with two significant caveats.

First, it has worked well to the extent that all deans are motivated to work together and are comfortable with the shared goal. However, **a single dean who has a different view of the process or different priorities has the potential to significantly impact progress.** LSC's rushed creation and some of its structures were the result of such differences of opinion.

Second, **turnover in leadership at the college level and above is especially risky for a unit like LSC that serves many different colleges and departments in many different ways, not all equally visible.** A current dean or chair can observe these contributions and their value to their unit, and can see why it is worthwhile to continue to support LSC. But when there is a change in leadership, much of that relationship disappears, and it is understandably difficult for the new leader to see the value of the cross-campus initiative and LSC.

## Upper Leadership

The Provost and VPR together played a central role in the establishment of LSC.

VPR Patrick O'Shea spearheaded the effort to turn the grassroots language science community into a more formal initiative. He invested significant time and resources in getting the effort started. He also saw the LSC effort as part of a nexus with the university's government-supported language research at CASL, NFLC, and the Language Flagships. From 2011 to 2016 O'Shea and his staff were closely involved in the effort. The LSC Director met regularly with O'Shea and others, including the CASL Executive Director. O'Shea was also an enthusiastic supporter of internationalization efforts via Universitas 21, and saw LSC as a valuable contributor to that effort.



Following the departure of O'Shea and his long-time deputy Ken Gertz in 2016, together with the demise of CASL, LSC has had much less contact with the VPR's office. With the transition from CASL to ARLIS there has been more emphasis on generating government-supported grants and contracts in areas other than language. LSC has continued to receive valuable advice from some parts of the Division of Research.

Provost Mary Ann Rankin played a central role in the rapid establishment of LSC, including a number of key decisions that served LSC well, including space, faculty hires, and the basic oversight model. From 2013 - 2016 there were roughly annual meetings with the Provost, VPR and deans.

There are many benefits to working for a diverse group of leaders, but there are also challenges. These include the difficulty of coordinating many busy schedules. When key meetings are delayed by many months this not only exacerbates LSC's financial insecurity, it also means that key messages are forgotten, leading to potentially damaging miscommunications. Additionally, broad cross-campus initiatives like LSC benefit when different university leaders work well together, and face challenges when they do not.

## Advisory Board(s)

LSC has been encouraged to form an external advisory board consisting of experts and potential supporters from different domains. A number of steps have been taken towards that goal.

We have secured agreement to participate from a small number of outstanding individuals who bring diverse connections and considerable resources. Progress has been slowed, however, by some of the same bottlenecks that are discussed throughout this report, together with loss of operational funding.

LSC has also identified the need for other advisory groups that can help to guide its progress.

A **Language Science Council** would be a group consisting of mid-level university leaders representing departments, colleges, and centers, who can advise on and learn about UMD's capabilities and activities in language science. We envision bi-annual meetings of this group. LSC has developed detailed plans and membership suggestions for this group, and it has requested the support of the Division of Research in convening this group. LSC was encouraged to delay this process while the dissolution of CASL and other organizational changes were underway. We would like to move forward with these plans.

An **academic advisory group** could fill the valuable role played by the advisory group to the IGERT training grant in 2010-2014. That group's annual meetings proved to be highly effective in bringing the community together and ensuring regular feedback and priority setting. This

group could meet once per year in overlap with the non-academic advisory board. Plans for this group have been on hold while the current center review process has been underway.



*LSC students designed this jigsaw puzzle game that teaches elementary schoolers how sentences are formed in the Native American language Nishnaabemwin (Quebec). One of many activities that LSC has developed to help bring language science and language diversity to broader audiences*

# Strategic Planning

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The LSC has significant opportunity to grow by capitalizing on its main strengths: its talented and committed people, its tradition of strong graduate training, and its strong national and international reputation. However, these strengths, and the investment the university has made in them, are at risk due to lack of stable operational funding, and the lack of a clear role in the coordination of UMD language science.

Within the next year, the LSC and its university stakeholders must address the **threats** to the LSC by establishing a long-term funding plan for core operations, normalizing the LSC's relationship with ARLIS, securing funding for graduate student programs after the end of the NRT grant, decentralizing leadership, and increasing management staff. These changes will enable the LSC to pursue **opportunities** including external funding for ambitious research initiatives, and new education programs at the undergraduate level.

## Addressing imminent threats

### Securing core operational funding

LSC has a broad mission, incorporating research, education, and community outreach. In this sense, it is unlike many campus centers/institutes which are focused on a single goal (typically research grants and contracts). The very nature of the LSC makes it unlikely that it can be fully funded by any single mechanism.

In particular, the mission of the LSC is such that it cannot be fully self-supporting without the need for state funding. As discussed [above in the Finance section](#), \$380k of hard budget to support core personnel would provide much-needed stability. In addition, an explicit schedule and procedure should be established for requesting soft funds, so that the consortium of LSC stakeholders can coordinate more effectively. The LSC's budget insecurity has led to the need to constantly be focused on obtaining funding, and this has left the leadership with limited opportunities to focus on long-term strategic planning.

**With long-term operational funding, the LSC can thrive and grow:** it can continue to strengthen the UMD language science community, and pursue external funding to advance research and education initiatives consistent with its mission. **Without long-term operational funding, the LSC will collapse within a few years**, if not sooner: the management team (Director and Assistant Directors) will leave, with no possibility of attracting replacements without stable funding.

## Normalizing LSC's relationship with ARLIS

The LSC proposes to take on a more central role in [coordinating government language research at UMD](#). The LSC could provide a coherent point of entry to UMD's language science capabilities, as well as an intellectual and administrative home for research scientists primarily funded through ARLIS.

The main needs for achieving this are (i) agreement with different stakeholders, including the PTK faculty who are most affected, on shared goals; (ii) plans for effective business development and managing of USG relations; (iii) plans for the division of labor among ARLIS, LSC, and ORAA in managing contracts and the flow of funds; (iv) development of suitable PTK faculty policies and plans that will enhance UMD's ability to recruit and retain outstanding PTK faculty in language science.

## Sustaining graduate programming

The NRT grant supporting LSC's graduate training program will end in March 2021. The end of this grant represents the end of 13 years of NSF support for graduate training in language science at UMD. It is an urgent priority to create a plan for supporting graduate education in the future, both because it directly benefits students, and because graduate training has always been one of the foundations of the community and the LSC.

With NSF support and matching funds from ARHU and BSOS, an average of around \$500,000 per year have been devoted to graduate training in language science for the past decade. LSC could continue to offer some of the most impactful components of the program for around \$80,000 per year, assuming key management positions are also funded (one Assistant Director with expertise in graduate training, plus the Assistant Director for Finance and Administration). Possible forms this program could take are detailed [above in the Education section](#).

## Increasing management staff

The LSC management team has continued to take on more responsibilities without adding additional staff. As discussed [above in the section on Management Needs](#), the addition of three people would be particularly helpful:

- A shared staff person to cover less specialized administrative tasks would free up time for Eaves (Assistant Director for Administration and Finance) to do more work in research administration. This would make better use of Eaves' expertise, as well as potentially help bring in more research funding. The Linguistics Department is interested in sharing a staff person with LSC for this purpose.
- If LSC takes on a greater role in coordinating government language research at UMD, it will need an expert in business development for government projects. This would likely be a part-time role for a research scientist with CASL experience.

- A communications specialist with some background in language science would not only help maintain the flow of LSC communications, but also improve the LSC's ability to create content appropriate for the community of language scientists at UMD. An LSC communications specialist would also serve other language science departments and lab groups with communications needs.

## Decentralizing leadership

LSC has always been managed and led by a relatively small team, and is particularly dependent on the Director, Colin Phillips. This creates a bottleneck that slows progress on essential tasks. It has also contributed to a perception of a disconnect between LSC's "constituents" and its leadership: many faculty and students feel uncertain that LSC represents their priorities.

Decentralizing LSC's leadership will not be an easy task. Few faculty have the broad scientific knowledge and personal network to represent the LSC. Over the next year, the LSC will take several steps to make the LSC Executive Committee (EC) more effective:

- To increase transparency around the LSC's decision-making process, the EC will report regularly to LSC members through annual reports and faculty meetings. For example, the EC could issue a written report in the Fall, and hold a meeting in the Spring.
- The EC will move forward with plans to convene a "Language Science Council" with representatives from all language science units at UMD. This group will both contribute to the EC's decision making process, and serve to disseminate the EC's activities more broadly.
- The EC will solicit nominations for new EC members to join for renewable 2-year terms.
- The EC will assign LSC-appointed faculty specific "portfolios", so they can focus on advancing LSC's mission in particular areas.
- The EC will develop a "succession plan" for the Director. This may require changing or constraining the role of the Director, so that Phillips becomes replaceable.

## Near-term opportunities

### External funding to advance LSC's mission

The LSC will continue to [pursue external funding](#) to advance its mission, including large-scale research grants, foundation grants, and philanthropy.

Creating a sustainable funding model for LSC's core operations could make a big difference to LSC's ability to pursue external funding. The instability of the past 3 years has significantly impacted LSC's ability to pursue external funding, as so much effort was given to staying alive.

LSC's ability to pursue foundation grants and philanthropic gifts is affected by the fact that cross-cutting initiatives do not fit neatly into the university's hierarchy.

LSC will aim to broaden the role of the Associate Directors and other faculty who are paid by hard-budgeted LSC funds, so as to pursue more diverse funding opportunities.

LSC will re-start the process of forming academic and non-academic advisory board(s). It will also aim to form a Language Science Council, consisting of leaders from the many different departments, centers, and colleges that have a stake in the language science initiative.

## New undergraduate programs

LSC currently impacts undergraduate students primarily through its [PULSAR](#) program. PULSAR has been very successful at providing an enriching experience for a relatively small group of motivated students. The LSC is currently exploring options for developing additional undergraduate programs to benefit more students ([discussed above](#)). The most promising possibilities include:

- A **combined major** in Computational and Language Science in collaboration with CS
- A **Living Learning Community** in Language, Technology, and Society
- **Expansion of PULSAR** to a major or minor program, similar to the Individualized Studies Program.

PULSAR has been run by an LSC Assistant Director, on a very small budget of \$6,000 annually (to support graduate student mentors). Any of the options for new undergraduate programs would require significant additional investment.



# Maryland Language Science Center Self Study 2019

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# Appendix A: Participating Units

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## College of Arts & Humanities (ARHU)

- English
- Linguistics
- Philosophy
- School of Languages, Literatures, and Cultures (SLLC)
  - Flagship Language Programs
- National Foreign Language Center (NFLC)

## College of Behavioral and Social Sciences (BSOS)

- Hearing & Speech Sciences (HESP)
- Neuroscience & Cognitive Science Program (NACS)
- Psychology

## College of Computer, Mathematical, and Natural Sciences (CMNS)

- Computer Science
- University of Maryland Institute for Advanced Computer Studies (UMIACS)

## College of Education (COE)

- Counseling, Higher Education, & Special Education (CHSE)
- Human Development & Quantitative Methodology (HDQM)
- Teaching & Learning, Policy & Leadership (TLPL)
- Language and Literacy Research Center (LLRC)

## College of Information Studies (iSchool)

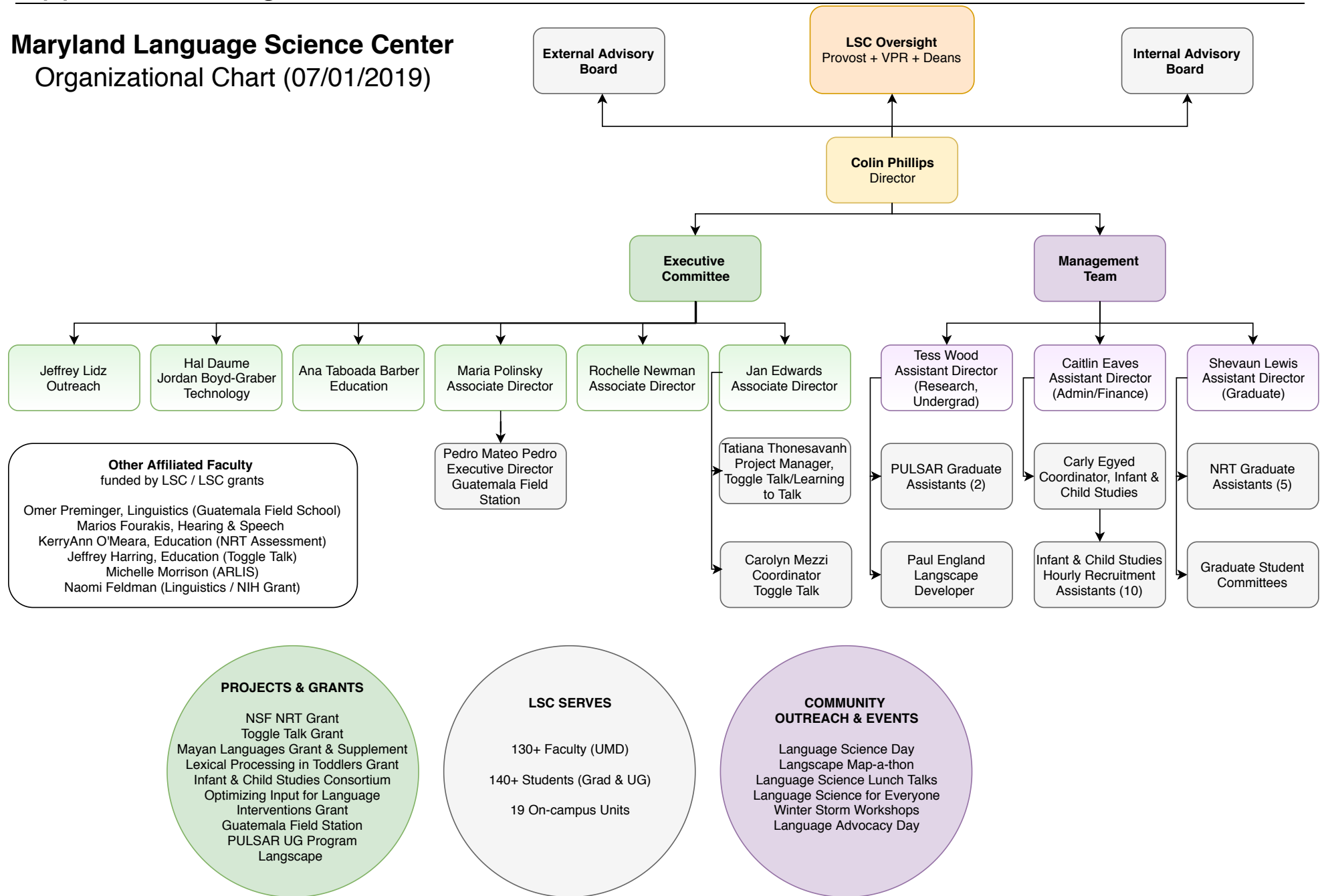
### A. James Clark School of Engineering

- Electrical and Computer Engineering (ECE)
- Institute for Systems Research (ISR)

Center for Advanced Study of Language (CASL, through 2019, now ARLIS)  
Applied Research Lab for Intelligence and Security (ARLIS)

# Appendix B: Organizational Chart

## Maryland Language Science Center Organizational Chart (07/01/2019)



## Appendix C: UMD Language Science Faculty

Official LSC affiliates are marked with an asterisk. Faculty with formal roles in LSC leadership are in bold.

### Current Faculty

<i>Name</i>	<i>Position</i>	<i>Secondary Affiliation</i>	<i>Status</i>
<b>Department of Anthropology (ANTH)</b>			
Janet Chernela	Professor		TTK
Jacqueline Messing	Lecturer		PTK
<b>Applied Research Lab for Intelligence and Security (ARLIS)</b> <b>Formerly Center for Advanced Study of Language (CASL)</b>			
Nikki Adams*	Associate Research Scientist	Center for Substance Abuse Research	PTK
Aric Bills*	Senior Faculty Specialist		PTK
Michael Bunting*	Research Scientist		PTK
Thomas Conners*	Research Scientist		PTK
Joe Danks	Research Professor		PTK
Bonnie Dorr	Adjunct Professor	UMIACS	PTK
Henk Haarmann*	Research Scientist		PTK
Valerie Karuzis	Senior Faculty Specialist		PTK
David Martinez	Research Associate		PTK
Michael Maxwell	Research Scientist		PTK

<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
Michelle Morrison*	Associate Research Scientist		PTK
Polly O'Rourke*	Associate Research Scientist		PTK
Susannah Paletz	Research Scientist	iSchool	PTK
Ian Phillips	Post Doc		PTK
Anton Rytting	Associate Research Scientist		PTK
<b>Department of Biology (BIO)</b>			
Jonathan Simon*	Professor	Electrical and Computer Engineering; Institute for Systems Research	TTK
<b>Department of Counseling, Higher Education, and Special Education (CHSE)</b>			
Susan De La Paz*	Professor		TTK
Ana Taboada-Barber*	Associate Professor	LSC Executive Committee, LSC Grad Committee	TTK
Gulnoza Yakubova	Assistant Professor		TTK
<b>Department of Communication (COMM)</b>			
David Sawyer*		Affiliate Senior Research Scientist	PTK
<b>Division of Information Technology (DIT)</b>			
Martyn Clark	Data Scientist	Center for Advanced Study of Language	PTK
Nina Hamedani	Assistant Director	Center for Advanced Study of Language	PTK
<b>Department of Electrical and Chemical Engineering (ECE)</b>			

<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
Carol Espy-Wilson*	Professor	Institute for Systems Research	TTK
Jonathan Fritz	Research Scientist	Institute for Systems Research	PTK
Shihab Shamma*	Professor	Institute for Systems Research	TTK
<b>Department of English (ENG)</b>			
Linda Coleman*	Associate Professor		TTK
Michael Israel*	Associate Professor	Neuroscience & Cognitive Science	TTK
<b>Human Development and Quantitative Methodology (HDQM)</b>			
Donald J. Bolger*	Associate Professor		TTK
Lucas Butler*	Assistant Professor		TTK
Natasha Cabrera	Professor		TTK
Brenda Jones-Harden	Professor	Center for Early Childhood Education and Intervention	TTK
Min Wang*	Professor		TTK
Allan Wigfield*	Professor		TTK
<b>Department of Hearing and Speech Sciences (HESP)</b>			
Samira Anderson	Associate Professor	Neuroscience & Cognitive Science	TTK
Veronica Builes	Faculty Assistant		PTK
Kristina DeRoy Milvae	Post Doc		PTK
Kathryn M. Dow-Burger*	Associate Clinical Professor		PTK



<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
<b>Jan Edwards*</b>	<b>Professor</b>	<b>Language Science Center</b>	<b>TTK</b>
Sandra Gordon-Salant*	Professor	Neuroscience & Cognitive Science	TTK
Margaret M. McCabe*	Clinical Professor Emerita		PTK
Eusabia Mont*	Assistant Clinical Professor		PTK
Karen Mulak	Post Doc		PTK
Nicole Nguyen*	Associate Clinical Professor	Maryland Cochlear Implant Center of Excellence	PTK
<b>Jared Novick*</b>	<b>Assistant Professor</b>	<b>Center for Advanced Study of Language</b>	<b>TTK</b>
José Ortiz*	Assistant Clinical Professor		PTK
Courtney Overton	Faculty Assistant		PTK
Lisa Rickard*	Assistant Clinical Professor		PTK
Paula Schauer*	Assistant Clinical Professor		PTK
Vivian Sisskin*	Clinical Professor	Maryland Cochlear Implant Center of Excellence	PTK
Kate Battles Skinker*	Lecturer		PTK
Kristin Slawson*	Assistant Clinical Professor	Brain and Behavior Initiative	PTK
Katie Von Holzen	Post Doc	Neuroscience & Cognitive Science	PTK
Colleen Worthington*	Clinical Professor	Maryland Cochlear Implant Center of Excellence	PTK
Marios Fourakis*	Research Professor	Center for Advanced Study of Language	PTK
Yasmeen Farooqi-Shah*	Associate Professor	Neuroscience & Cognitive Science	TTK
Matthew Goupell*	Associate Professor	Neuroscience & Cognitive Science	TTK

<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
<b>Yi Ting Huang*</b>	<b>Associate Professor</b>	<b>Neuroscience &amp; Cognitive Science</b>	<b>TTK</b>
<b>Rochelle Newman*</b>	<b>Professor</b>	<b>Neuroscience &amp; Cognitive Science</b>	<b>TTK</b>
Nan Ratner*	Professor	Neuroscience & Cognitive Science	TTK
<b>College of Information Studies (iSchool)</b>			
Vanessa Frias-Martinez	Assistant Professor	Institute for Advanced Computer Studies	TTK
Katy Lawley	Lecturer		PTK
Doug Oard*	Professor	Institute for Advanced Computer Studies; Computer Science	TTK
Susan Campbell	Lecturer	Applied Research Lab for Intelligence and Security	PTK
<b>Institute for Systems Research (ISR)</b>			
Christian Brodbeck	Post Doc	Neuroscience and Cognitive Science	PTK
<b>Department of Linguistics (LING)</b>			
Peggy Antonisse*	Senior Lecturer		PTK
Tonia Bleam*	Senior Lecturer		PTK
Naomi Feldman*	Associate Professor	Institute for Advanced Computer Studies	TTK
Daniel Goodhue	Post Doc		PTK
Valentine Hacquard*	Associate Professor		TTK
Norbert Hornstein*	Professor		TTK
William Idsardi*	Professor	Neuroscience & Cognitive Science	TTK

<i>Name</i>	<i>Position</i>	<i>Secondary Affiliation</i>	<i>Status</i>
Howard Lasnik*	Professor	Neuroscience & Cognitive Science	TTK
<b>Ellen Lau*</b>	<b>Associate Professor</b>	<b>Neuroscience &amp; Cognitive Science</b>	<b>TTK</b>
<b>Jeffrey Lidz*</b>	<b>Professor</b>		<b>TTK</b>
<b>Colin Phillips*</b>	<b>Professor</b>	<b>Language Science Center</b>	<b>TTK</b>
Paul Pietroski*	Professor Emeritus	Philosophy	TTK
<b>Maria Polinsky*</b>	<b>Professor</b>	<b>Language Science Center</b>	<b>TTK</b>
<b>Omer Preminger*</b>	<b>Associate Professor</b>	<b>Language Science Center</b>	<b>TTK</b>
Philip Resnik*	Professor	Institute for Advanced Computer Studies	TTK
Juan Uriagereka*	Professor	Neuroscience & Cognitive Science	TTK
Amy Weinberg	Professor Emerita	Institute for Advanced Computer Studies	TTK
<b>Alexander Williams*</b>	<b>Associate Professor</b>	<b>Philosophy</b>	<b>TTK</b>
Andrea Zukowski*	Research Scientist		PTK
<b>Language Science Center</b>			
<b>Caitlin Eaves*</b>	<b>Staff</b>		<b>Staff</b>
<b>Shevaun Lewis*</b>	<b>Assistant Research Professor</b>		<b>PTK</b>
Pedro Mateo Pedro*	Assistant Research Professor	Guatemala Field Station	PTK
<b>Tess Wood*</b>	<b>Assistant Research Professor</b>		<b>PTK</b>
<b>Maryland English Institute (MEI)</b>			
Elizabeth Driver	Director		PTK

<i>Name</i>	<i>Position</i>	<i>Secondary Affiliation</i>	<i>Status</i>
<b>Maryland Neuroimaging Center (MNC)</b>			
Jeremy Purcell	Faculty Specialist		PTK
<b>National Foreign Language Center (NFLC)</b>			
Betsy Hart	Director		PTK
Kathleen Kilday	Assistant Director		PTK
<b>Department of Philosophy (PHIL)</b>			
Peter Carruthers*	Professor		TTK
Sue Dwyer*	Associate Professor		TTK
Eric Pacuit*	Associate Professor		TTK
Georges Rey*	Professor		TTK
<b>Department of Psychology (PSYC)</b>			
Jonathan Beier*	Assistant Professor	Neuroscience & Cognitive Science	TTK
Bob Dooling*	Professor		TTK
Michael Dougherty*	Professor	Neuroscience & Cognitive Science	TTK
Elizabeth Redcay*	Associate Professor	Neuroscience & Cognitive Science; Maryland Neuroimaging Center	TTK
Tracy Riggins*	Associate Professor	Neuroscience & Cognitive Science; Maryland Neuroimaging Center	TTK
L. Robert Slevc*	Associate Professor	Neuroscience & Cognitive Science; Maryland Neuroimaging Center	TTK

<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
Barry Smith	Professor Emeritus	Center for Advanced Study of Language	TTK
<b>School of Languages, Literature, and Cultures (SLLC)</b>			
Nahal Akbari-Saneh*	Assistant Clinical Professor		PTK
Lauretta Clough*	Associate Director		PTK
<b>Robert DeKeyser</b>	<b>Professor</b>		<b>TTK</b>
Elisa Gironzetti	Assistant Professor		TTK
Peter Glanville*	Assistant Professor		TTK
Kira Gor*	Associate Professor		TTK
Nan Jiang*	Professor		TTK
Michael Long*	Professor		TTK
Matt Miller	Assistant Professor		TTK
Alene Moyer*	Professor	ARHU Dean's Office	TTK
Bob Ramsey*	Professor		TTK
Steven Ross*	Professor	Center for Advanced Study of Language	TTK
Mary Ellen Scullen*	Associate Professor	French	TTK
Minglang Zhou*	Associate Professor		TTK
<b>School of Public Health (SPH)</b>			
Evelyn King-Marshall	Assistant Research Professor		PTK
Devon Payne-Sturges	Assistant Professor		TTK

<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
Cixin Wang	Assistant Professor	Counseling, Higher Education, and Special Education	TTK
<b>Teaching and Learning, Policy and Leadership (TLPL)</b>			
Shenika Hankerson	Assistant Professor		TTK
Jeff MacSwan*	Professor	Neuroscience & Cognitive Science	TTK
Melinda Martin-Beltran*	Associate Professor		TTK
Megan Madigan Peercy*	Associate Professor		TTK
Kellie Rolstad*	Associate Professor		TTK
Ebony Terrell Shockley	Associate Clinical Professor		PTK
Jennifer Turner	Associate Professor		TTK
<b>Maryland Institute for Advanced Computer Studies (UMIACS)</b>			
Jordan Boyd-Graber*	Associate Professor	Language Science Center; iSchool	TTK
Marine Carpuat*	Assistant Professor	Computer Science	TTK
Hal Daume*	Professor	Computer Science	TTK
Bonnie Dorr	Adjunct Professor	Center for Advanced Study of Language	PTK
Judith L. Klavans*	Adjunct Professor	Computational Linguistics and Information Processing	PTK
James Reggia*	Professor	Computer Science	TTK
Tom Ventsias	Faculty Specialist	Maryland Cybersecurity Center	PTK



## Former Faculty

<i>Name</i>	<i>Position</i>	<i>Secondary Affiliation</i>	<i>Status</i>
<b>Department of Counseling, Higher Education, and Special Education (CHSE)</b>			
Rebecca Silverman	Associate Professor		Former TTK
<b>Center for Advanced Study of Language (CASL)</b>			
Michael Bloodgood	Associate Research Scientist		Former PTK
Amber Bloomfield	Data Scientist	Institutional Research, Planning, and Assessment	Former PTK
Carrie Bonilla	Assistant Research Scientist		Former PTK
Jennifer Boutz	Associate Research Scientist		Former PTK
Claudia Brugman	Research Scientist		Former PTK
Shaina Castle	Faculty Assistant		Former PTK
Gregory Colflesh	Assistant Research Scientist		Former PTK
Svetlana Cook		National Foreign Language Center	Former PTK
Patrick Cushen	Faculty Research Assistant		Former PTK
Anne David	Associate Research Scientist		Former PTK
Meg Eden	Faculty Research Assistant		Former PTK
Amalia Gnanadesikan	Research Scientist		Former PTK
Christopher Green	Associate Research Scientist		Former PTK
J. Isaiah Harbison	Associate Research Scientist		Former PTK

<b><i>Name</i></b>	<b><i>Position</i></b>	<b><i>Secondary Affiliation</i></b>	<b><i>Status</i></b>
Marchon Jackson	Staff		Staff
Scott Jackson	Associate Research Scientist		Former PTK
Valerie Karuzis	Senior Faculty Specialist		PTK
Michael Key	Post Doc		Former Post Doc
Stefanie Kuchinsky	Assistant Research Scientist	Maryland Neuroimaging Center	Former PTK
Jared Linck	Research Scientist		Former PTK
Jace Livingston	Faculty Research Assistant		Former PTK
Keva Marable Blair	Staff		Former Staff
Corey Miller	Research Scientist		Former PTK
Peter Osthus	Faculty Assistant		Former PTK
Paul Rodrigues	Associate Research Scientist		Former PTK
Alexa Romberg	Assistant Research Scientist	Human Development and Quantitative Methodology	Former PTK
Lelyn Saner	Associate Research Scientist		Former PTK
Erin Smith Crabb	Faculty Research Assistant		Former PTK
David Zajic	Associate Research Scientist		Former PTK
<b>Department of Hearing and Speech Sciences (HESP)</b>			
Claire Buxton	Former PTK		Former PTK
Keena Seward	Former PTK		Former PTK
<b>College of Information Studies (iSchool)</b>			

<i><b>Name</b></i>	<i><b>Position</b></i>	<i><b>Secondary Affiliation</b></i>	<i><b>Status</b></i>
Jimmy Lin	Former TTK	Institute for Advanced Computer Studies	Former TTK
<b>National Foreign Language Center (NFLC)</b>			
David Ellis	Director	School of Languages, Literature, and Cultures	Former PTK
<b>Department of Philosophy (PHIL)</b>			
Erin Eaker	Former TTK		Former TTK
Michael Morreau	Former TTK		Former TTK
<b>Maryland Institute for Advanced Computer Studies (UMIACS)</b>			
Jiaul Paik	Former Post Doc		Former Post Doc

## Appendix D: Language Science Graduate Students

These tables include all students who have participated in a formal language science program from fall 2008 to present.

### Current students

<i>Student</i>	<i>LS Program</i>
<b>Computer Science</b>	
Jo Shoemaker	NRT
Carolyn Arnold	Former apprentice
Yogarshi Vyas	Former apprentice
<b>Electrical &amp; Computer Engineering (ECE)</b>	
Neha Joshi	LSF
<b>Human Development and Quantitative Methodology (HDQM)</b>	
Annie (Yixun) Li	NRT
Anisha Singh	Former apprentice
<b>Hearing &amp; Speech Sciences (HESP)</b>	
Michelle Erskine	NRT
Julianne Garbarino	NRT
Allison Johnson	NRT
Christina Blomquist	Apprentice (joining NRT Fall 2019)
Arynn Byrd	Apprentice (joining NRT Fall 2019)
Erika Exton	Apprentice (joining NRT Fall 2019)
Kathleen Oppenheimer	Apprentice (joining NRT Fall 2019)
Madison Buntrock	Apprentice
<b>Linguistics</b>	
Phoebe Gaston	NRT
Mina Hirzel	NRT
Tyler Knowlton	NRT
Paulina Lyskawa	NRT
Adam Liter	NRT
Hanna Muller	NRT
Yu'an Yang	NRT

<b><i>Student</i></b>	<b><i>LS Program</i></b>
Anouk Dieuleveut	LSF
Craig Thorburn	Apprentice (joining NRT Fall 2019)
Hisao Kurokami	Apprentice
Masato Nakamura	Apprentice
Aaron Doliana	Former apprentice
<b>Neuroscience &amp; Cognitive Science (NACS)</b>	
Adam Fishbein (PSYC)	NRT
Zach Maher (HESP)	NRT
Zoe Ovans (HESP)	NRT
Amritha Mallikarjun (HESP)	Former apprentice
Ben Rickles (HDQM)	Former apprentice
<b>Philosophy</b>	
Michael McCourt	IGERT
<b>Psychology</b>	
Alison Shell	IGERT
<b>Second Language Acquisition (SLA)</b>	
Alia Biller	IGERT
Sunhee Kim	LSF
Rosa Lee	NRT (MA)
SoHye Park	Apprentice

## Alumni and former students

<b>Student</b>	<b>Grad Year</b>	<b>PhD Program</b>	<b>LS Program</b>	<b>Current Position</b>
Brian Dillon	2011	LING	IGERT	Associate Professor, University of Massachusetts, Amherst
Alex Drummond	2011	LING	IGERT	Software Engineer, CircuitHub
Sunyoung Lee-Ellis	2011	NACS	IGERT	Curriculum Specialist, Foreign Service Institute, Department of State
Ann Gagliardi	2012	LING	IGERT	<i>unknown</i>
Gisela Granena	2012	SLA	IGERT	Assistant Professor, School of Languages, Universitat Oberta de Catalunya
So-one Hwang	2012	CS	IGERT	Learning Designer and Researcher, Independent Consultant
Derek Monner	2012	CS	IGERT	Senior Software Engineer, Google
Joshua Riley	2012	LING	IGERT	Resident Physician, UPMC Western Psychiatric Hospital
Shannon Barrios	2013	LING	IGERT	Assistant Professor, Linguistics, University of Utah
Ewan Dunbar	2013	LING	IGERT	Assistant Professor, Linguistics, Université Paris Diderot
Erika Hussey	2013	NACS, PSYC	IGERT	Research Psychologist, US Army Natick Soldier Research, Development, and Engineering Center
Joel Koeth	2013	SLA	IGERT	<i>unknown</i>
Dave Kush	2013	LING	IGERT	Associate Professor, Dept of Languages and Literatures, Norwegian University of Science and Technology
Shevaun Lewis	2013	LING	IGERT	Assistant Research Professor, Language Science Center, UMD
Candise Lin	2013	EDHQ	IGERT	<i>unknown</i>
Wing Yee Chow	2013	LING	IGERT	Lecturer, Experimental Linguistics, University College London
Anna Lukyanchenko Chrabaszcz	2014	SLA	IGERT	Senior Research Fellow, Center for Language and Brain, National Research University Higher School of Economics
Yakov Kronrod	2014	SLA	IGERT	Research Science Manager, Amazon
Giovanna Morini	2014	HESP	IGERT	Assistant Professor, Communication Sciences & Disorders, U of Delaware
Dan Parker	2014	LING	IGERT	Assistant Professor of Linguistics, Department of English, William & Mary



<b>Student</b>	<b>Grad Year</b>	<b>PhD Program</b>	<b>LS Program</b>	<b>Current Position</b>
Maria Sol Lago	2014	LING	IGERT	Postdoc, University of Potsdam
Megan Sutton	2014	LING	IGERT	<i>unknown</i>
Susan Teubner-Rhodes	2014	SLA	IGERT	Assistant Professor, Department of Psychology, Auburn University
Alexis Wellwood	2014	LING	IGERT	Assistant Professor, University of Southern California
Dustin Chacon	2015	LING	IGERT	Contract Assistant Professor, Linguistics, University of Minnesota
Kevin Donaldson	2015	NACS, ECEE	IGERT	Research Specialist, Emory University School of Medicine
Suzanne Freynik	2015	LING	IGERT	Adjunct Professorial Lecturer, School of Professional and Extended Studies, American University
Kate Harrigan	2015	LING	IGERT	Lecturer, Psych and Ling, William & Mary
Angela He	2015	LING	IGERT	Postdoc, Dept of Phil and Ling, University of Southern California
Chuchu Li	2015	HDQM	IGERT	Postdoc, UC San Diego
Naho Orita	2015	LING	IGERT	Junior Associate Professor, Tokyo University of Science
Katya Solovyeva	2015	SLA	IGERT	Research Analyst, Publicis Groupe
Aaron Steven White	2015	LING	IGERT	Assistant Professor, Dept of Linguistics, University of Rochester
Yuichi Suzuki	2015	iSchool	IGERT	Associate Professor, Second Language Acquisition, Kanagawa University
Xuan Wang	2015	PHIL	IGERT	<i>unknown</i>
Irina (Stojanovska) Kachinske	2016	SLA	IGERT	<i>unknown</i>
Shota Momma	2016	LING	IGERT	Postdoc, UC San Diego
Zahra Ashktorab	2017	LING	IGERT	Research Staff Member, IBM Thomas J. Watson Research Center
Rachel Dudley	2017	LING	IGERT	Postdoc, Ecole Normale Supérieure, Paris
Chris Heffner	2017	LING	IGERT	Postdoc, University of Connecticut
Kathryn Leech	2017	HDQM	IGERT	Postdoc Fellow, Harvard University
Zoe Schlueter	2017	LING	IGERT	Postdoc, University of Edinburgh

<b>Student</b>	<b>Grad Year</b>	<b>PhD Program</b>	<b>LS Program</b>	<b>Current Position</b>
Alvin Grissom II ( <i>trans. to UC Boulder</i> )	2017	iSchool	IGERT	Assistant Professor, Computer Science, Ursinus College
Rachel Adler	2018	NACS, HESP	NRT	Data Scientist, Bloomberg LP
Lara Ehrenhofer	2018	LING	NRT	New Business Manager, Haus der Kommunikation Berlin
Allyson Ettinger	2018	LING	NRT	Assistant Professor, Linguistics, University of Chicago
Jeff Green	2018	LING	NRT	Visiting Assistant Professor, Linguistics, University of Illinois, Urbana-Champaign
Alix Kowalski	2018	HESP	IGERT	<i>unknown</i>
Anton Malko	2018	LING	NRT	<i>TBD</i>
Eric Pelzl	2018	SLA	IGERT	Postdoc, Center for Language Science, Penn State
Sudha Rao	2018	SLA	NRT	Researcher, Microsoft Research
Kasia Hitzcenko	2019	LING	NRT	Postdoc, Linguistics, Northwestern University
Nick Huang	2019	LING	NRT	<i>TBD</i>
Nur Basak Karatas	2019	SLA	IGERT	<i>TBD</i>
Laurel Perkins	2019	LING	NRT	Postdoc, Ecole Normale Supérieure, Paris
Alayo Tripp (R. Richardson)	2019	LING	IGERT	<i>TBD</i>
Pedro Alcocer	n/a	LING	IGERT	Senior Data Scientist, Boxed
Mike Fetters	n/a	LING	IGERT	<i>unknown</i>
Deepak Mirchandani	n/a	PHIL	IGERT	<i>unknown</i>

# Appendix E: Managing Sponsored Projects & DRIF Policy

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LSC provides various kinds of direct support (e.g. pre- and post-award financial services; research facilities) and indirect support (e.g. faculty salaries; community and interdisciplinary activities which serve as research incubators) for sponsored research projects.

## **Services: managing sponsored projects through LSC**

- Pre-award grant meeting
- Assistance with budget, budget justification, routing, and submission
- Account setup and fiscal management (HR, procurement, travel, contracts, and subawards) in coordination with faculty home unit
- Monthly expenditure reports / quarterly financial meetings
- Assistance with no cost extensions and supplements
- Use of LSC office and meeting space
- Use of LSC communications services (website, social media, email lists, graphic design, photography, etc.)
- Account / grant close-out

## **DRIF Policy**

All DRIF credit should be indicated in Kuali Research. There is no simple one-size-fits-all expectation for DRIF allocation to LSC, but the following are general guidelines.

- 100% of DRIF funds will be allocated to LSC for major LSC-led projects which depend on LSC infrastructure (e.g. field station projects, major interdisciplinary grants like Toggle Talk). No funds will be set aside for individual use. LSC will not receive DRIF from major interdisciplinary projects which are managed outside of LSC. However, when such grants are likely to have significant additional costs associated with them (e.g. internet/phone lines, copying &/or mailing), the unit providing these resources should receive a compensatory proportion of the DRIF, separately from other considerations.
- Faculty who are paid in part by LSC are generally expected to allocate a corresponding percentage of DRIF to LSC for all individual/"PI-initiated" awards, whether managed by LSC or other units. For example, if LSC pays for 40% of an individual's salary, then 40% of DRIF credited to them should be allocated to LSC. When an award includes multiple faculty members, credit should follow effort where discernible.
- Individual agreements (that differ from the above) may be reached based on a variety of factors (LSC faculty/staff effort, researcher appointments, researcher effort); however, these should be indicated in writing before a grant is routed. Awards that depend on LSC services will give LSC at least some minimal credit (e.g. 5%).

## Appendix F: Sponsored Projects

<i>Type</i>	<i>Name</i>	<i>Date</i>	<i>PI, Co-Pis</i>	<i>Award Amount</i>	<i>Indirect Costs</i>	<i>LSC Role</i>
<b>Current</b>						
NSA Contract	Patent License Agreement: Langscape	2013 - 2021	Colin Phillips, Tess Wood	-	-	Managed by LSC
NSF NRT-DESE	Flexibility in Language Processes and Technology: Human and Global Scale	2014 - 2019	Colin Phillips, Hal Daume, Robert DeKeyser, Rochelle Newman, William Idsardi	\$2,969,817	\$466,701	Managed by LSC
NSF - COULD Project	Cleaning, Organizing and Uniting Luiguistic Databases (the COULD Project)	2015 - 2020	Maria Polinsky	\$54,595	-	LSC-funded faculty
OSEP Leadership Preparation Grant	Project ProPELL, Preparing Practice-based researchers with Expertise in Language and Literacy to support high-need students with learning disabilities	2016 - 2020	Susan de la Paz, Rebecca Silverman, Ana Taboada Barber, Kelli Cummings	\$787,691	N/A	Collaborators
NSF - Mayan Languages	Documentation of Mayan Languages in Contact	2016 - 2020	Maria Polinsky, Pedro Mateo Pedro	\$165,574	\$41,473	Managed by LSC
DOD - Language Flagship	Arabic Flagship Program (Renewal)	2016 - 2020	Peter Glanville, Valerie Anishchenkova	\$866,939	-	Letter of Support
DOD - Language Flagship	Persian Flagship Program (Renewal)	2016 - 2020	Nahal Akbari	\$1,462,088	-	Letter of Support
DARPA - TNT	TNT: Enhancing auditory and linguistic learning through peripheral nerve stimulation	2016 - 2021	Polly O'Rourke	\$7,781,504	-	LSC Experiment Space

<i>Type</i>	<i>Name</i>	<i>Date</i>	<i>PI, Co-Pis</i>	<i>Award Amount</i>	<i>Indirect Costs</i>	<i>LSC Role</i>
NSF - RI	EAGER: Collaborative Research: Adaptive Heads-up Displays for Simultaneous Interpretatio	2017 - 2019	Hal Daume	\$150,000	-	LSC-funded faculty
DOD - Language Flagship	Flagship Culture Initiative	2017 - 2020	Valerie Anishchenkova	\$608,143	-	Letter of Support
IES - GOAL 3	An Efficacy Study of Toggle Talk	2017 - 2021	Jan Edwards, Ana Taboada Barber, Jeffrey Harring, (Rebecca Silverman)	\$3,247,480	\$941,650	Managed by LSC
IES Pathways	Project RISE	2017 - 2022	Susan de la Paz	1,070,000	-	Collaborators
NSF NRT-DESE Supplement	Supplement - Flexibility in Language Processes and Technology (outreach)	2018 - 2019	Colin Phillips	\$47,761	\$4,614	Managed by LSC
NSF - Mayan Languages	Supplement #2 - Documentation of Mayan Languages in Contact (UG)	2018 - 2019	Maria Polinsky	\$9,999	\$208	Managed by LSC
NIH - R01	Optimizing input for typical and atypical language learners	2018 - 2020	Naomi Feldman, Jan Edwards	\$434,748	\$159,731	Managed by LSC
Air Force Research Laboratory	E-VERIFY: Strategies for Investigating and Eliciting Information from Nuanced Attackers (SIENNA)	2018 - 2020	Jordan Boyd-Graber	\$164,660	-	LSC-funded faculty
NSF - Mayan Languages	Supplement #3 - Documentation of Mayan Languages in Contact (UG)	2019 - 2020	Maria Polinsky	\$10,882	\$182	Managed by LSC
<b>Ended</b>						
NSF NRT-DESE Supplement	Supplement - Flexibility in Language Processes and Technology (outreach)	2015 - 2016	Colin Phillips	\$29,850	\$7,363	Managed by LSC

<i>Type</i>	<i>Name</i>	<i>Date</i>	<i>PI, Co-Pis</i>	<i>Award Amount</i>	<i>Indirect Costs</i>	<i>LSC Role</i>
NSF - Transfer	Subject Preference and Ergativity	2016 - 2016	Maria Polinsky	\$6,005	\$2,890	Managed by LSC
NIH - Transfer (Subcontract)	Characterizing Lexical Processing in Toddlers with Autism	2017 - 2018	Jan Edwards	\$63,838	\$21,839	Managed by LSC
NIH - R01 - Transfer	Longitudinal Study of Vocabulary Growth and Phonological Development	2017 - 2018	Jan Edwards	\$36,265	\$9,329	Managed by LSC
NSF - Mayan Languages	Supplement #1 - Documentation of Mayan Languages in Contact (RAs/Pedro)	2017 - 2018	Maria Polinsky	\$15,006	\$3,406	Managed by LSC
<b>Not awarded/selected</b>						
BSF Grant	Processing Syntactic Dependencies: A cross-linguistic Investigation	2015	Colin Phillips (subaward), Aya Meltzer-Asscher (Tel Aviv)	\$111,205	\$26,074	Submitted by LSC
U21 Initiative	Global Research Alliance in Language (GRAIL)	2015	Colin Phillips	-	-	Submitted by LSC
NGA BAA	Langscape: language mapping, crowdsourcing and research tools for understanding language diversity and use	2016	Colin Phillips, Tess Wood	\$684,000	\$256,000	Submitted by LSC
NIH T32	Program in Translational Language Science	2016	Jeff Lidz, Rochelle Newman	\$1,787,304	\$72,085	Submitted by LSC
NSF - RIDIR	Integrating worldwide resources for language research	2016	Colin Phillips, Tess Wood	\$1,501,494	\$499,985	Submitted by LSC
Spencer Small Grant	Developing Tools for Early Language Intervention in an Indigenous Population in Guatemala	2016	Maria Polinsky, Nan Ratner	\$50,000	-	Collaborators



<b>Type</b>	<b>Name</b>	<b>Date</b>	<b>PI, Co-Pis</b>	<b>Award Amount</b>	<b>Indirect Costs</b>	<b>LSC Role</b>
NSEP Technology Innovation Center	NFLC Technology Innovation Center	2018				Letter of Support
NSF - REU Site	Language and Community Development in Mayan Communities of Guatemala	2018	Maria Polinsky, Tess Wood	\$434,283	-	Submitted by LSC
MacArthur 100&Change (UMD internal)	Language Poverty	2016	Colin Philips, Rochelle Newman, Jan Edwards, Maria Polinsky	\$100,000,000	-	Submitted by LSC
NSF – STC (UMD internal)	NSF Science & Technology Center in Language Science	2018	Colin Phillips	\$23,996,785	-	Submitted by LSC
NSF – PIRE (preproposal)	PIRE: Global differences and disparities in language learning, use, and technology	2016	Colin Phillips, Jan Edwards, Maria Polinsky	\$3,900,000	-	Submitted by LSC

# Language Science Center Events 2018 - 2019 Academic Year



## Spotlight Events

**Language Science Day 2018**, 10/5/18

**Avoidance Reduction Therapy for Stuttering Professional Training**, 10/19/18

**Health Literacy in Action Conference: Health Literacy 101**, 10/25/18- 10/26/18

**Book Launch - Juan Uriagereka: Language, Syntax, and the Natural Sciences**, 11/1/18

**ALTAS Expo Outreach Event**, 11/9/18

**Winter Storm 2019: Graduate Training**  
1/15/18- 1/18/18 and 1/22/18- 1/27/18

**Family Science Days: Public Outreach**  
2/13/18- 2/16/18

**Language Advocacy Day**, 2/14/19- 2/15/19

**National NRT Student Outreach Training**, 2/15/19

**Northwood High School Outreach Visit**, 4/5/19

**Social Justice Day**, 4/11/19  
**John Baugh (Washington University):** Language and Fair Housing  
**Susan Ehrlich (York University):** Language and Gender  
**Aylin Caliskan (George Washington University):** Language and AI



**Shenika Hankerson (Assistant Professor, TLPL)**, 4/25/19  
Title: African American Language Explained: (Almost) Everything You Need to Know About Its History, Structure, and Evolution

**Dawn Culpepper & KerryAnn O'Meara (CHSE)**, 2/7/19  
Title: Enhancing graduate student agency as interdisciplinary researchers: Key findings from internal evaluation

**Taking Charge of Your Finances Workshop**, 4/19/19  
**Ann Holmes** (Assistant Dean of Finance and Administration in the College of Behavioral and Social Sciences)  
Title: Taking Charge of Your Finances: What you need to know about benefits in your first job

**The Language and Literacy Research Center (LLRC) Speaker**, 2/6/18  
**Amanda Alexander** (DC Public Schools Chancellor)  
Title: Improving language and literacy outcomes for K-2 Students in DCPS: An overview of the current multi-pronged approach

## Language Science Lunch Talks

Food and ideas bring people together. Our weekly lunch talk series provides students and faculty with the opportunity to present their in-progress work to a supportive, interdisciplinary audience.

**Amritha Mallikarjun (NACS/HESP)**, 9/13/18  
Title: What Domestic Dogs Can Tell Us About Language Learning

**Angelica Buerkin-Salgado (Penn)**, 9/27/18  
Title: Outputs as inputs: Sequential model of the products of infant "statistical learning" of language



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at Maryland

**Kasia Hitzczenko (LING)**, 10/4/18

Title: How to use context for phonetic learning and perception

**Nick Huang (LING)**, 10/11/18

Title: Improving access to bilingual education in DC at the DC Language Immersion Project

**Jo Shoemaker (CS)**, 10/18/18

Title: Assisting Interpreters with Technical Terms

**Paulina Lyskawa (LING) and Bethany Dickerson (University of Massachusetts)**, 10/25/18

Title: Phonological representation in two laryngeal systems

**Phoebe Gaston (LING)**, 11/8/18

Title: A mechanism for syntactic category constraints in auditory word recognition

**Tyler Knowlton (LING)**, 11/29/18

Title: Meaning Through the Ages

**Laurel Perkins (LING)**, 12/6/18

Title: Mind the gap: Computationally investigating how infants acquire syntactic dependencies

**Sudha Rao (CS) / Hanna Muller & Phoebe Gaston (LING)**, 12/13/18

Rao Title: Teaching machines to ask useful clarification questions

Muller & Gaston Title: Gender bias in representation and publishing rates across subfields [of linguistics]

**Allie Johnson (HESP)**, 2/14/19

Title: Production of the /t/-/k/ contrast in children with cochlear implants

**Julianne Garbarino (HESP)**, 2/21/19

Title: Um...let me explain: Social and task determinants of “um” and “uh” use in speakers with and without ASD

**Adam Fishbein (NACS)**, 2/28/18

Title: Messages in the details: What do birds listen to in their songs?

**Anouk Dieuleveut (LING)**, 3/7/19

Title: Learning modals: Sig you guess what sig means?

**Mina Hirzel (LING) / Zach Maher (NACS)**, 3/14/19

Hirzel Title: Young children’s elicited productions of modal words: children differentiate modal “flavors” and force

Maher Title: The road to rope: Lexical cohort competition and executive functioning in early school-age children.

**Michelle Erskine (HESP), Yu’an Yang (LING)**, 3/28/19

Erskine Title: Dialect mismatch influences language comprehension in young children

Yang Title: Acquiring the ambiguity of wh-words in Mandarin

**Adam Liter (LING)**, 4/4/19

Title: Medial *wh* productions in child English: Grammar or performance?

**Annie Li (HDQM) / Neha Joshi (ECE)**, 4/18/19

Li Title: Self-Teaching in Orthographic Learning among Learners of English as a Second Language

Joshi Title: Cortical mechanisms underlying speech segregation in the ferret cocktail party

**Zoe Ovans (NACS)**, 5/2/19

Title: The (Un)surprising Kindergarten Path

**Nur Karatas (SLA)**, 5/16/19

Title: Case-Marking Processing in Native and Nonnative Speakers of Turkish

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## Events in the Language Science Center

Toggle Talk Team Meetings, Tuesdays Weekly

ProbMod Meetings, Wednesdays Weekly

PULSAR Seminar, Thursdays Weekly

Huang/Novick Lab meetings, Thursdays Weekly

Learning to Talk Lab Meeting, Mondays Weekly

Jeff Lidz Course, Fall Semester Weekly

Field Station Meetings, Tuesday’s Weekly: Spring

Linguistics Club Meeting, Wednesdays Weekly

Kuchinsky Lab Meeting, Monthly



HESP Faculty Retreat, 8/23/18	Language Science Center Book Wrapping Party, 12/14/18
Lee Silverman Voice Treatment (LSVT) Training Workshop, 8/23/18	Question Answering is Not a Trivial Activity (QANTA) Event by Dr. Boyd-Graber, 12/15/18
AAC Info Session (HESP), 8/28/18	Linguistics Lab Poster Session, 12/17/18
Arabic and Persian Summer Language Institute, 7/3/18 - 8/2/18	Zukowski Final Exam Review, 12/17/18
UMD Ombuds Office Talk: Mark Shayman (UMD Ombuds Office), 9/6/1	Senior Staff Meeting, 1/28/19
Hyattsville Summer Reading Program, 9/12/18	OIA Candidate Presentation, 1/28/19- 1/31/19
Assessor Training - Toggle Talk, 9/14/18	Infant and Child Studies RA Training, 2/1/19
Infant and Child Studies Outreach Training, 9/14/18	J. Werker Meetings and Reception, 2/1/19
Trevor Muñoz (MITH) Talk, 9/14/18	HESP PhD Student Meetings with Jared Novick, 2/6/19
Graduate Research Fellows Meeting, 9/18/18	ECO-5 Conference, 2/9/19
Graduate Field Committee in Developmental Science - Welcome Reception, 9/21/18	Infant and Child Studies Outreach Training, 2/11/19
Developmental Science Fall Reception, 9/21/18	National Scholarships Office Training Session, 2/14/19
Black Faculty Reception, 10/8/18	International Coffee Hour, 2/27/19
LSC Committee Chair Meeting, 10/8/18	Assessor Training - UMD Toggle Talk Project, 3/1/19
Speech-Language Pathology Supervision and Ethics Professional Training Event, 10/12/18	Linguistics Recruitment, 3/1/19
CHESE - Research Lab Meeting, 10/16/18	Langscape/iSchool MIMS Meeting, 3/4/19
PULSAR Information Session, 11/8/18	North American Computational Linguistics Olympiad (NACLO) Invitational, 3/7/19
Linguistics Workshop (Florian Schwarz, UPenn/Ibex), 11/9/18	Latin American Studies Center (LASC) Residents' Presentations, 3/13/19
EA Program Leader Workshop, 11/6/18- 11/9/18	Computer Science Recruitment, 4/1/19
NSSLHA/SAA Event, 11/6/18	School of Languages, Literatures, and Cultures (SLLC) Graduate Colloquium, 4/5/19
Language Science Center Self-study Committee, 11/13/18	Gender Bias in CSD Meeting, 4/8/19
Peace Corps - Meet and Greet, 11/13/18	ODNI Meeting, 4/8/19
Ibex/PennController Workshop, 11/9/18	Graduate Committee Meeting, 4/10/19
Hyattsville Reading Program Meeting, 12/4/18	Defense: Julianne Garbarino (HESP), 4/11/19
LSC Self Study Committee Meeting, 12/4/18	Dissertation Defense: Mattson Ogg (NACS/PSYC), 4/17/19 Title: The Acoustic Factors That Influence Auditory Object And Event Recognition Over Time
Office of International Affairs Training, 12/6/18	Wendy Osirus Visit - Workspace, 5/1/19
International Risk Management Committee Meeting, 12/13/18	LASC Annual Student Conference, 5/2/19
	LSC Undergraduate Initiatives Meeting, 5/3/19

Huracan, Tormenta, Storm: Winds of Change Latin  
American Studies Center Event, 5/2/18- 5/3/18

HESP & Gender Discussion Group, 5/6/19  
Dissertation Defense: Nur Basak Karatas (SLA), 5/8/19  
Title: The Comparison of L1 and L2 Case Processing: ERP  
Evidence from Turkish

Language Science Fellows Information Session, 2/25/19

Mayfest 2019: Workshop on Structure and Constituency  
in Languages of the Americas (WSCLA), 5/9/19

Defense: Becca Higgins, 5/9/19

Defense: Peter Osthus, 5/9/19

Defense: Michelle Erskine, 5/14/19

Cognition and Development Lab Meeting, 6/3/19

Dissertation Defense: Nick Huang (LING), 6/7/19  
Title: Variation and learnability in constraints on  
wh-movement

Honors College Meeting, 6/21/19

## Maryland Language Science Center – OVERALL STRATEGY

**Rationale:** Building on established interdisciplinary research efforts in Language Science at the University, we propose a campus-wide center that will raise the university's profile (inter)nationally, and will showcase the institution's capacity for bridging diverse fields, linking basic science to solutions to real-world problems, developing innovative student training, and local and global engagement.

**Goal:** The University of Maryland aims to become the #1 institution in the world for Language Science. The specific goals of the Center, and the services that it will provide, include the following:

- Indicate the university's commitment to Language Science as a **strategic priority**; create an **institutional voice** for the broad established community, and establish a framework for **sustainable leadership** of existing efforts
- Enhance the **international profile** of the already strong departmental and interdisciplinary programs at the university
- Create a **'one stop shop'** for language-related expertise in education, health, technology, and national security, serving government institutions (federal and local), corporations, and media.
- Serve as a target for **philanthropy**
- Serve as a focal point for **outreach and publicity** beyond academia, highlighting the university's unique strengths in language, and serving as a 'rapid response unit' for major support opportunities from government and foundations
- Support efforts by faculty, departments and centers to raise their visibility and funding, via **collaborative grants, consolidation** of training clusters, and enhanced **online presence**
- Expand a **training program** in language science that is already the most innovative and integrative in the nation; help individual departments to 'punch above their weight' in recruiting students, through leveraging combined strengths
- Serve as an incubator for development of **new research areas** that intersect with language, e.g., culture, genetics, automatic speech recognition, and K-12 language education; and potentially for language-related technology start-ups
- Host **space** to serve as hub for Center activity, outreach, and administration, and to promote integration of key campus-affiliated research centers such as the Center for Advanced Study of Language (CASL) and the National Foreign Language Center (NFLC).

The Center builds on an established grass-roots network, growing recognition, and strong support. Its educational mission is currently supported by NSF through the University's only successful IGERT proposal. A donor has already indicated interest in supporting the center—particularly its efforts in training young scientists and in bridging basic science and technology—*on the condition that these represent university priorities*. Sponsors in the DoD with close ties to CASL see research enhancing K-16 education as a priority in enhancing their current university partnership. The Center's success will benefit the state and local community and will serve both national and local societal needs. The Center will build ties to the commercial sector through research in human language technology and language training for global commerce. Being a national model in language education would enhance the State of Maryland's prominence in education. The local community could benefit from the Center's contributions to a language focus at the proposed Charter School.

### Achieving the Goal

1. The **Tier 3 Major Campus Research Initiative** (VPR/Provost/Deans) is a plan to dramatically expand nationwide visibility and increase private, governmental, and commercial partnerships. It focuses on research development, publicity and developing external partnerships. Our outreach strategy will add to the University's global research reputation.
2. The **Training and Research Development Plan** builds upon the success of the NSF-IGERT training program, which has transformed the UMD Language Science community over the past 5 years. This program has shown that students are powerful catalysts for research innovation. This plan targets private donor, foundation, and agency funding for the sustainability and institutionalization of UMD's interdisciplinary training in Language Science.
3. **Targeted senior faculty hires** (Deans/Departments/Provost) address the need for a cadre of world class faculty who will serve as leaders and 'talent magnets' in diverse areas. The plan targets recognized leaders who are known for their broad interdisciplinary reach and integrative energy. The Center's ambitions cannot be realized with narrow leadership.
4. The **Space Plan** has short-term and longer-term goals. There is an immediate need for space to allow integration of groups that currently lack good campus research space (e.g., CASL, SLA), and for space for running the Center's core functions. In the longer term, the center's success could lead to more ambitious efforts to consolidate language groups/departments, with private support.

### Colleges (6) and Departments/Programs (13)

- ARHU (Linguistics; School of Languages, Literatures, & Cultures; Philosophy; Communication)
- BSOS (Hearing & Speech Sciences, Psychology, Neuroscience & Cognitive Science)
- CMNS (Computer Science)
- EDUC (Human Dev. & Quant. Meth.; Teaching & Learning, Policy & Leadership; Counseling, Higher Ed., & Special Ed.)
- ENGR (Electrical & Computer Engineering)
- iSchool

### Research Centers (4)

- Center for Advanced Study of Language (CASL – VPR)
- National Foreign Language Center (NFLC – ARHU)
- University of Maryland Institute for Advanced Computer Studies (UMIACS – CMNS)
- Maryland Neuroimaging Center (MNC – BSOS)

### Proposed Center Director

Colin Phillips. Professor & Distinguished Scholar-Teacher, Linguistics; IGERT Director; NACS Associate Director



**A. Tier 3 Campus Research Initiative in Language Science – Rationale, Goals, and Tactics**

**Goal:** the University of Maryland should become—and be recognized as—the #1 institution in the world for Language Science, providing the best in basic and applied research on language, and serving as a ‘one stop shop’ for government institutions, corporations and private sources seeking expertise related to language.

**Motivation:** UMD’s Integrated research core is unique, and already in place. (Strong foundation for publicity and outreach.)

UMD has already built a strong interdisciplinary language science community capable of tackling a wide range of basic research questions. This is different than most other universities, where the many fields with interests in language science function independently, with at best limited overlap and interaction. In contrast, UMD scientists conduct intensive basic interdisciplinary research to understand the neurocognitive foundations of normal language learning, language diversity, the dynamics of brain networks for language use, and the special status of bilinguals & heritage language learners. These efforts have already been applied to commercially- and security-relevant concerns of analyzing natural language to predict the plans and intentions of negotiating partners, business competitors, consumers, or potential adversaries. UMD scientists are building improved technologies to support language understanding, distance applications for language learning, sentiment detection, and machine translation. Other UMD experts are supporting improved language training efforts for adults that can be migrated to the K-12 context. Yet other UMD researchers are conducting language research that contributes to health needs related to language and communication. They combine behavioral and neuroscientific approaches with expertise in language diversity and for understanding the underlying causes of language deficits and for the early identification of children at risk for language and learning disabilities.

The Language Science website (<http://languagescience.umd.edu/>) shows the unparalleled interdisciplinary opportunities at UMD. This foundation has been strengthened by an NSF Integrative Graduate Education and Research Traineeship (IGERT) program, the only proposal of more than 40 UMD attempts at such awards. As an example of the existing community, the recent 3<sup>rd</sup> annual Language Science Day attracted 170 faculty, researchers, and students from more than a dozen departments and centers. No other university could do this.

**Motivation: The theme has enormous societal/global importance**

Language is our most distinctive ability as a species. Understanding the evolutionary adaptations in the brain that made language possible is one of the most interesting puzzles in all of science. And from a practical perspective, language is essential to countless areas of life. Language is important across fields that span the entire university, perhaps more so than any other topic. It is such a central area that it should be seen as *at least* as important as other STEM fields. Language is critically important for the US as a nation, and it is at least as important for other nations, whose security and economic success depends on people and technologies who can communicate effectively in a global, multilingual world.

Initial euphoria about how the Internet would “flatten” the worldwide marketplace for products, services, and ideas turned out to be unrealistic. It was promised that anybody, anywhere could access information, market their expertise, and publish ideas in a massively accessible manner, but results so far have been disappointing. The lack of progress is due to two types of inflexibility. First, natural language technologies are highly inflexible: their successes to-date depend on huge investments in data resources for individual languages (e.g., at *Google*), which do not readily transfer to other languages, and on narrowly scripted situations (e.g., Apple’s *Siri* app for iPhone). Development of new, more flexible language technologies, is critical for countries to have broader impact on the global marketplace. Second, adult human brains are notoriously inflexible in learning new languages, despite superior abilities in many other areas. This inflexibility makes it hard for speakers to rapidly adapt to a changing global community where new languages can become important – for economics or for security – in a very short time.

So it is perhaps surprising that other universities have not succeeded in pursuing language science in an integrative fashion, with strong institutional backing. The reasons for this failure are that the breadth of language science makes it a poor fit to the dominant department-centered organization of university research, and that the fields that are best positioned to connect the pieces together (especially linguistics) have traditionally shied away from broader engagement. This is where UMD faces an unusual opportunity.

**Motivation: Thinking outside the box for institutional advancement**

In order to continue its upward trajectory as an institution, the University of Maryland needs to outwit the competition. There are some ‘hot’ research areas that scores of universities are trying to pursue. This creates crowded marketplaces where it is difficult to stand out, and difficult to compete against institutions with cachet and large endowments. In contrast, language science presents an opportunity to assume leadership in a new field before other institutions catch on. Language is not a small or insignificant area, for science or for society, but few other institutions have recognized the opportunities that it presents for integration of greatly different fields.

**Motivation: Advancing departments, colleges, and research clusters**

Participating units include a number of highly ranked programs. Linguistics (ARHU) already ranks among the top programs in the country, and is recognized as an innovation leader, but it faces threats to its continued advancement. Hearing & Speech Sciences (BSOS)



can realistically target top-10 status (currently top-20) through a strategy that is more integrative than its peers. Second Language Acquisition (School of Languages: ARHU) has the potential to move to top-3 status (currently top 5-8). Plans for consolidated efforts in language and literacy within the College of Education can help to establish it among the best in the nation. The university has a long-standing strength in language technology, drawing on faculty from multiple colleges in the UMIACS group in Computational Linguistics and Information Processing (CLIP). The new program in Translation & Interpreting (Communication: ARHU) can be a national model as educators and health professionals tackle the challenges of an increasingly multi-lingual society.

Equally important: the unique university strength in language science does not exist in a vacuum. The university can, and should leverage its strength in language science to build strength in adjacent areas, e.g., machine learning, hearing, cognitive neuroscience, computational social science, the genetics of language, and culture science. This is particularly relevant to units that include language among a broader portfolio, e.g., Psychology, Philosophy, Computer Science, and NACS.

### **Motivation: Serving strategic priorities**

The Language Science Center will serve many of the University's strategic priorities.

**ADDRESSING IMPORTANT SOCIETAL CONCERNS.** Understanding (un)successful language learning is critical for K-12 and adult education, clinical practice, and technology. It has become a pressing government concern, due to its impact on global competitiveness and national security.

**STUDENT OPPORTUNITY AND ACHIEVEMENT.** Establishing the most ambitious interdisciplinary language science community in the world will provide unparalleled training opportunities for top-class students. The appointments would dramatically change the competitiveness of multiple graduate programs at UMD, and would open up new streams of outstanding students from abroad.

**GLOBAL IMPACT AND INTERNATIONALIZATION.** The Center's concerns are unavoidably international in their reach. Whereas some scientific challenges can be solved via intensive investment within a single country, language science seeks solutions that apply to all languages of the world, and so an international perspective is inevitable. Many international partnerships will be leveraged, and the faculty hiring plan seeks to move the international engagement to a new level. Polinsky and Phillips recently led a team that entered a competition for a \$60M US-Russia center competition.

**INNOVATION, ENTREPRENEURSHIP, AND COLLABORATION.** Center participants are already highly collaborative, and its research and training place strong emphasis on innovation and entrepreneurship in the broadest sense, extending beyond physical sciences and engineering to humanities and education.

**SERVICE TO THE COMMUNITY AND STATE.** The Center's health-related efforts will have direct relevance for the community, and will strengthen the impact of UMD's Clinic and LEAP preschool for children with developmental disorders. The Center's education-related efforts will have direct impact for children, including children in bilingual and heritage language education programs. The Center could potentially contribute to language programming at UMD's new charter school in College Park. By working with NFLC and CASL, the Center aims to raise the profile of K-12 language education in the State of Maryland. The Center's efforts in technology will develop the highly skilled workforce that attracts technology companies to the region.

**EXTERNAL PARTNERSHIPS.** The Center will have many partnerships, ranging from local and government institutions to corporations to international partners and field stations. Examples include the Center for Applied Linguistics ([CAL](#)), a Washington DC center focused on research and policy related to language teaching, various governmental agencies with language needs, Gallaudet University, companies with interests in natural language processing, and universities in Germany, Russia, Brazil, Japan, China, and elsewhere.

**EMERGING STRATEGIC PRIORITIES.** The Center can also contribute to specific priorities that are emerging across the university, including

- Neuroscience (university wide)
- Computational social science (BSOS)
- Language and literacy (EDUC)

### **Motivation: Why now?**

The university currently has a good mix of prominent mid-career faculty and talented junior faculty that make it ripe for pursuing an ambitious integrated vision for language science. The prospect of recruiting the high-profile leaders in the hiring plan aligns well with this goal. This opportunity will not exist a few years hence.

The call from the Department of Defense for increased language capacity is being issued NOW, and leaders from the DoD are looking for the University of Maryland to show a return on its already considerable investment in language science through CASL and NFLC, by demonstrating its campus-wide commitment to tackling fundamental problems in language science. The university has the resources to provide this demonstration in a way that will also enhance its research profile in significant ways right now.

A donor has been identified, who is interested in the Center's interdisciplinary educational approach, and in research at the intersection of linguistics, neuroscience, and technology. He is willing to leverage his gift by helping to develop other donor prospects.

There is substantial momentum in language science across the university, due to the success of the IGERT program established in 2008. If this momentum is lost, then it will be difficult to recreate it.

### **Opportunities**

**Shedding the 'invisibility cloak':** Although individual departments are recognized for their strength in language science, there is only limited university-wide branding in this area. Language Science is a well-kept university secret on the international and national stage.

3/20/13

In addition, outreach to government and industry has been targeted mostly through the university's applied centers. Faculty typically seek extramural funding as individual investigators or in teams responding to requests for proposals: UMD should aspire to be an instigator of new research directions for policy makers beyond the outreach of its applied centers.

**Government:** The Center will benefit from the University's unique research migrators: the Center for Advanced Study of Language (CASL) and the National Foreign Language Center (NFLC). There is a recent sharp increase in government interest in Language Science; in particular, improvement of language expertise has become a priority for DoD at the highest levels. Directives from the Secretary of Defense and Director of NSA have mandated improvement of the language proficiency of US government professionals and have recognized the importance of research for achieving these goals. Importantly, the government has further recognized the critical importance of improved K-16 language education as an enabler for this goal, and for the more far-reaching goal of maintaining peace.

**Rapid response to funding calls; shaping funding opportunities:** A barrier to pursuit of large funding opportunities (e.g., center grants, training grants) is the need to build large teams from scratch. The Language Science Center will be able to serve as a 'rapid response unit' for RFPs in diverse areas of language, allowing the University to flexibly respond to opportunities. Through its outreach the Center will also hope to actively shape the kinds of funding opportunities that arise.

**Incubator for new research areas:** The Center aims to foster the development of new research priority areas that are currently underdeveloped. Possible examples include:

- Language and culture
- Language and genetics
- K-12 foreign language education
- Automatic speech recognition

#### Threats, Needs

- Current leadership in Language Science is too narrow, not suitable for long-term success
- The university needs recognized star faculty in diverse fields and departments
- The breadth of Language Science across departments and colleges dilutes its voice, e.g., it is not viewed as a priority by any large department. For the same reason, institutional awareness of the strength in language remains low
- CASL-campus integration is too limited. CASL struggles to retain some of its strongest recruits
- The current IGERT program is approaching the end of its initial funding; need to be competitive for renewal or for other training grants
- In certain constituencies faculty worry that the broad emphasis on Language Science may undermine departmental priorities

#### Competitors

The University of Maryland has the largest and most integrated community of language scientists in North America. And we are ahead of the competition in developing an integrated strategy. But we are not alone.

In the US:

**Cambridge, MA** (MIT, Harvard) has a high profile in many areas of language. It lacks the integration found at Maryland, but it is a formidable competitor. It is pursuing innovative efforts in linking language science with accelerated foreign language teaching.

**Stanford** has strong groups in a number of language-related areas, especially in the area of computation, where it benefits from its Center for Study of Language and Information (CSLI) and ties to Silicon Valley companies.

The **University of Pennsylvania** has a long-standing strength in language, centered around its Institute for Research in Cognitive Science (IRCS). New plans are afoot to try to consolidate and broaden its language efforts, and it is watching Maryland closely.

**UC San Diego** has a long-standing Center for Research in Language (CRL) that brings together expertise from multiple departments. One of the faculty targets is a former CRL director.

**Penn State** is building a Center for Language Science. It lacks the breadth that Maryland enjoys, but is a current leader in the area of bilingualism and has strong international partnerships.

Internationally:

**Cambridge University** (UK) recently started an ambitious Cambridge Language Sciences initiative, that is large and broad in scope. The **University of Edinburgh** (UK) has strength across many areas of basic language science, and there are strong cross-area ties, plus an institutional home in the School of Philosophy, Psychology, and Language Sciences (PPLS).

**Nijmegen** (Netherlands) is a world-leading center for the psychology, neuroscience, and genetics of language, spanning the Max Planck Institute for Psycholinguistics, Radboud University, and the Donders Institute for Brain, Cognition, and Behavior.

**Berlin** (Germany) is rapidly emerging as an important center for language research, between Humboldt University, the University of Potsdam, the Zentrum für Allgemeine Sprachwissenschaft (ZAS) and the new Berlin School of Mind and Brain.

## Maryland Language Science Center

"Tier 3.2" Proposal, June 29th, 2016

Language Science offers an exceptional opportunity for UMD to be the world leader in something really big, that reaches across the entire university. Achieving this would have major impact.

Maryland Language Science offers a unique opportunity because it:

- Tackles a key contributor to the achievement gap, nationally and globally
- Addresses health problems that isolate tens of millions from their families
- Is integral to the communications technology that is transforming modern life
- Is critical for global readiness (for economy, security, and public health)
- Does all this by solving the mysteries of our most distinctive ability as humans
- Integrates experts from the entire university
- Is at the forefront of interdisciplinary training, nationally
- Opens doors for the university due to its global reputation
- Has 'first mover advantage' in creating a broad field; it's not on everyone's radar ... yet
- And has a broad team of successful scientists in their prime, who work well together, have the support of their peers and are committed to more than themselves

This ambition could become a reality if many different parts of the university -- faculty, colleges, and university leadership -- devise a clear plan and work together to achieve this.

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## Background

The Maryland Language Science Center (LSC) was created in Fall 2013, building on an existing grass-roots community. LSC reflects a strategic choice by the University of Maryland to identify a big opportunity before other universities do. Language does not appear in standard lists of Grand Challenges that many universities are talking about, but it should. The fact that it is not yet on everybody's lips is where UMD has an advantage. Few things are more important to humans than communication, and language is central to global problems involving poverty, technology, public health, migration, and security. Language makes connections across the entire university, from Education to Engineering. Maryland already had many advantages, and the aim is to make UMD the world leader in an integrated field. This is an exceptional opportunity for Maryland to take the lead in a field of this scope.

LSC is a university-wide initiative, overseen by the Provost. Ongoing oversight is shared by the VPR and the Deans of BSOS and ARHU. LSC was created as a temporary center (2013-2016), with the goal of ultimately becoming a permanent institute. The initial investment had 4 main elements.

- (i) Base support: "Tier 3 Campus Research Initiative", \$300k/year; Provost + VPR + 4 colleges
- (ii) Leadership hires: 4 senior faculty appointments in diverse fields
- (iii) Space, centrally located to foster synergy
- (iv) Institutional support for communications, development, partnerships, etc.

## Goals & Measures of Success

LSC's goals are straightforward.

1. Make the University of Maryland the world leader in language science.
2. Address grand challenges involving language, e.g., language and poverty, universal language technology, and global readiness.
3. Create scalable models for interdisciplinary research, training, and broad engagement.

LSC's success should be measured in terms of its impact, inside and outside academia. Its activities are broader than many research centers, combining education, research, and partnerships. External funding is a key enabler for impact, but it is not the primary measure of impact. A university's enduring currency is its reputation and visibility, and LSC's contribution should be seen via the talent that it attracts, the peers that imitate our model, and the impact on policy and public understanding.

## Request for Phase 2

We request support to continue the language science initiative for a "Phase 2" period (2016-2019), with updated objectives. This proposal was invited following a well-received review meeting with the Provost, VPR and lead deans in late 2015. A more detailed request is in an appendix.

- |                           |   |           |                                   |
|---------------------------|---|-----------|-----------------------------------|
| 1. Base support:          | Personnel   | \$270k/yr | (new: communications/development) |
|                           | Activities  | \$115k/yr | (new: UG activities, adv. board)  |
|                           | Total   | \$385k/yr |                                   |
| 2. Advocacy/collaboration | strategic plan - development - government - academic coordination |           |                                   |

## Objectives for Phase 2

LSC's overall goal is unchanged, and it is increasingly clear what it will take to achieve it, through combined efforts from LSC and university leaders. Years 4-6 bring new focus areas and new milestones.

#1 - #3 are requested by VPR and deans. They align with LSC's aims. #4 - #8 are additional priorities.

### #1: Visibility

LSC has laid groundwork for spreading its vision and results, but potential exists for much more. UMD should aim to be viewed as a key information source and ‘think tank’ for expertise on language. This could be a target for philanthropic support (cf. USC Annenberg’s visibility in [religion](#)). LSC has built creative websites ([main](#), [Landscape](#), [director](#), [meeting](#)), growing social media channels ([Facebook](#), [Flickr](#)), and has had some print and online media success (e.g., [MentalFloss](#) on Landscape). Current strategies include:

- (i) Building connections with language-focused journalists;
- (ii) Organizing events such as the *Language Science for Everyone* event at the 2016 AAAS conference, highlighting the idea that LSC brings people together in unique ways;
- (iii) Low-cost / high value appointments for “Distinguished Scholars-in-Residence”, e.g., retirees from academia, NSF, government.

LSC would like to hire a Director of Communications and Development for Phase 2.

### #2: Fundraising

LSC’s development strategy includes: (i) Building a non-academic advisory board. We are currently working with help from the colleges on this. We have strong initial recruits in Dave Baggett and Ann Friedman. (ii) Continuing work begun with the Foundations Office in University Relations. (And we hope to strengthen connections with UR.)

### #3: Major Funded Initiatives

LSC aims to have multiple initiatives that draw significant external funding. Multiple promising candidates exist: training grants, Landscape, ToggleTalk & literacy, the Guatemalan field station, and more. The attached list illustrates funding efforts already underway.

### #4: Leadership in Interdisciplinary Education

GRADUATE: LSC was built on the success of an interdisciplinary graduate program. It is hard to overstate the importance of the success of the current training programs, despite the other demands on LSC’s attention. It is already time to seek funding support beyond the NSF-NRT award. NSF will not support a third round. Current applications to NIH and DoE can enhance but not replace existing support. LSC’s success in attracting, training, and placing students should make it an attractive target for gifts. UNDERGRADUATE: The main goals are to (i) broaden the reach of PULSAR, which currently serves mostly ARHU and BSOS students; (ii) develop new offerings that promote jobs and partnerships, e.g., at the intersection of language and computer science (a Spring ‘16 joint LSC-CMSC course developed by Naomi Feldman, LING/UMIACS, was a hit), or at the intersection of language and global health.

### #5: Head-turning Research

LSC cannot claim to be a leader in language science unless it makes research breakthroughs that depend on cross-discipline connections. Many exciting possibilities exist, and these must be developed further. Promising cross-cutting initiatives include language and poverty, flexible speech recognition, universal language technology, and adaptable adult learning. LSC has devoted less time to this than originally planned, due to the many other commitments. Fundamental science must not be neglected, particularly since it is an area of strength for UMD.

### #6: Sustainable Partnerships

LSC has initiated many partnerships, on a local, national, and global level. Partners include school districts, the planned Planet Word museum in Washington, D.C., national Title VI centers, Washington

DC national and international organizations, the GRAIL worldwide alliance, public health NGOs, and many others. We must ensure that these are a success.

#### #7: Strengthening Departments

LSC's success should be leveraged to strengthen departments and other centers. Individual units punch above their weight when they leverage the university-wide strength: they can attract top faculty, stronger students, and individuals are more successful. But this will require strategic investments from departments and colleges. Example: HESP is now on a roll, and it may offer UMD's best shot at its next top-10 department in US News rankings (currently #17-#20).

#### #8: Sustainable Structure

LSC's internal organization and integration with units across the university, including CASL and NFLC, must be strengthened. These fundamentals have been underdeveloped during Phase 1. LSC's long-term success relies on it being less dependent on a few key people. Specific plans are in an appendix.

### **Accomplishments from Phase 1**

LSC is making an impact in many ways, locally, nationally, and globally.

#### Personnel

Faculty hiring has been successful, despite delays caused by a deep hiring freeze. LSC is securing the very best talent for its priorities, and the new leaders are already developing important initiatives. (i) Maria Polinsky (Linguistics) moved from Harvard to Maryland, starting in Fall 2015. Her Guatemalan field station initiative is attracting talent and visibility, and is stimulating new partnerships, e.g., with Public Health. (ii) Jan Edwards (Hearing & Speech Sciences) moved from Wisconsin (ranked #3) to Maryland in Summer 2016. She is already leading an important new partnership with College of Education researchers to overcome language-related barriers to school readiness in African American children. (iii) Marine Carpuat (Computer Science) was a junior appointment in Spring 2015. She is stimulating new research on language technology for "low resource languages".

Two hires remain from the initial plan. (iv) A senior target-of-opportunity hire in Second Language Acquisition is making good progress. It connects to new initiatives in multilingualism (COE) and virtual reality (CMNS). (v) A second early/mid-career CS appointment is currently being pursued.

LSC has recruited excellent staff, who have been essential to building creative new initiatives.

#### Physical & Digital Infrastructure

The university's strong commitment to space for LSC will yield fruit in early 2017, when LSC moves into the [newly renovated](#) HJ Patterson Hall (HJP), adjacent to the new Edward St. John Teaching and Learning Center (and the construction site for the Purple Line station). HJP will be the university's "global hub", including International Affairs, the Flagship Language Programs and LSC. LSC has worked closely with architects and facilities staff to design new space that will enhance its ability to build community and partnerships. Through 2013-2016 LSC has used temporary space in the basement of Taliaferro Hall.

LSC's efforts in building digital infrastructure already contribute to its broad reach, e.g., through websites and online resources that illustrate its vision: [1](#), [2](#), [3](#), [4](#).

#### Interdisciplinary Education

LSC is a creative leader in student training, with a reach beyond language science.

At the graduate level, LSC faculty have won training grants from [NSF](#) (\$3M) and [IES](#) (\$1.25M), and two more training grants are in resubmission (NIH, DoE). These successes are unusual. NSF training grants



have a ~3% success rate, and UMD now has the only group, in any field, anywhere in the US, to receive both IGERT and NRT training grants from NSF. It is in an out-of-the-ordinary STEM field (and it almost didn't happen, because LSC was given only a couple of weeks to pull together a complex submission).

At the undergraduate level, the [PULSAR](#) undergraduate program, launched in Fall 2014, has created a vibrant community of students representing 10 majors. PULSAR is a seed for new connections, such as an effort to train students at the intersection of language and computer science. The program has a big impact for modest investment, and it is already inspiring emulation at other universities (see below).

Beyond language science, LSC is leveraging its success to stimulate broader change in interdisciplinary education. In May 2016 it hosted the [Future STEM Leaders](#) meeting in downtown Washington, D.C., sponsored by NSF, connecting experts in graduate training from academia, government, industry, and foundations. This is stimulating new collaborations on graduate training across colleges.

#### Integrative Initiatives (selected)

Much of LSC's effort in its first 3 years has focused on initiatives that we could not have imagined when LSC was launched.

LANGSCAPE. More people will learn about LSC via [Langscape](#) than via any other route. There were over 30,000 unique users in 2015, despite minimal attempt to advertise. Jaws drop when we illustrate the scope of language diversity by zooming in on a region of Africa or Asia in Langscape. The current release is merely a proof of concept. The potential for worldwide visibility and research impact has barely been tapped (media examples: [1](#), [2](#), [3](#)). Langscape is the first ever tech transfer from NSA to academia, and much LSC staff effort has gone into transforming it into a compelling public resource. The effort is worthwhile, but it was not even on our radar when LSC was launched.

LITERACY & SCHOOL READINESS. LSC's biggest impact on the state and region may be through its work on language and the achievement gap. This is a nationally visible problem ([nytimes.com](#)) where UMD could become a leader in linking fundamental science to education. New synergies between faculty in Education and HESP are creating partnerships with school districts to improve language and reading outcomes. The [Language & Literacy Research Center](#), led by Rebecca Silverman and Ana Taboada Barber (CHSE), the [ToggleTalk](#) project, led by Jan Edwards (HESP), and new parent-child literacy initiatives, led by Kathy Dow-Burger (HESP), are laying the foundations for UMD to become a prominent voice in this area.

GUATEMALA FIELD STATION. Led by Maria Polinsky (LING), LSC's [field station](#) in [Sololá](#), Guatemala is creating a model for connecting language science to broader challenges involving health, child development, migration, education, and sustainability. The Mayan communities of Guatemala and Mexico speak more than 20 languages. The field station can support research on these languages, and scientists in diverse fields who work with those communities. Banneker-Key scholar Neomi Rao led a pilot project in summer 2015 (see her [blog](#)). A spring 2016 seminar fed into a [summer school](#) in 2016 ([blog](#)). LSC is partnering with the [Wuqu' Kawoq](#) Mayan Health Alliance NGO and is pursuing long-term partnerships with the School of Public Health. Global public health is a [priority area](#) for SPH. The intersection of public health and minority languages is an area where UMD could be a pioneer. If the Guatemala initiative is successful, LSC may launch field stations in additional research hotspots.

GLOBAL RESEARCH ALLIANCE IN LANGUAGE (GRAIL). The [GRAIL initiative](#) could have the greatest impact on the worldwide reach of LSC's vision. It can also serve as a broader model of how to get more return on investment in internationalization. Presidents from the [Universitas 21](#) alliance of 25 leading universities (UMD joined in 2013) voted in May 2015 to make language science a signature research

initiative, led by Maryland. This follows two years of groundwork laid by Colin Phillips (LSC), Ross Lewin (OIA) and Pat O'Shea (VPR), including an April 2016 workshop in Edinburgh led by Colin Phillips. GRAIL aligns the internationalization interests of students, researchers, and institutions, something that rarely happens. It is already fostering LSC-like synergies in other institutions. It could draw in leading institutions beyond U21, e.g., via [LERU](#), and it could have visibility and policy impacts beyond the reach of individual institutions or countries, e.g., Fall 2017 Migration Conference at University of Hong Kong. GRAIL has huge potential, if sufficiently nurtured.

**CONCUSSION.** The news is full of reports about the long-term neurological impact of sports injuries (NYTimes [editorial](#)). Hundreds of thousands of children now undergo baseline testing that can be used to help diagnose concussion. But effective tests for K-5 children are lacking. An LSC project led by Rochelle Newman (HESP) is partnering with regional trauma clinics and international app developers to carry out research for a new language-based test for traumatic brain injury. If successful, the initiative could impact treatment for thousands of children, and it could generate licensing revenue.

Would any of these initiatives have existed without LSC? Highly unlikely. They all depend on the infrastructure, personnel, or visibility that LSC created. Only one was even on our radar in 2013 -- the field station, which depended on recruiting Polinsky. This shows that LSC is creating unprecedented opportunities. But they also strain LSC's ability to meet its initial goals.

## Appendix: Threats, Challenges, Responses

LSC's success, wealth, and fame are not guaranteed. Threats must be taken seriously.

- **OPPORTUNISM THREATENS THE CORE.** LSC has responded strongly to unexpected opportunities (e.g., Landscape, GRAIL), but this has slowed progress on developing a robust internal structure, including research connections and training programs. Importantly, perceptions differ on this issue. Some in the administration have told us that LSC is too inward-looking, but many faculty and students perceive the opposite, that LSC is so outward-looking that it neglects its core.
- **BREADTH OF UNIVERSITY BUY-IN.** UMD cannot be the world leader in language without a close and sustained partnership between university leadership and faculty. We encounter uneven levels of interest from above. Some share LSC's vision, while other key figures apparently regard language as uninteresting. We are told to be bold, to pursue risky topics that the world is not already talking about, to embrace "fearless ideas." But this requires UMD to embrace the risks associated with leading, rather than sticking to established pathways. Topics that deep-pocketed institutions are aggressively pursuing are easy sells to the public and legislature, but they are less likely to be winners for UMD.
  - LSC's hiring initiative was a losing entry in the 2012 cluster hire competition, but it has fared well.
  - University Relations reportedly regards language science as "not very interesting".
  - Language Science does not appear in university or college Capital Campaign priorities.
  - We were UMD's only ever winner of an NSF training grant, from ~50 attempts, and the program was highly successful (IGERT: 2008-2015). We were allowed to apply for NSF's new NRT training grant only after another team withdrew. LSC prepared a submission at short notice, and again won (NRT: 2015-2020). LSC is the only team in any STEM field to win both of these awards. It is a recognized leader in interdisciplinary training, and is shaping other programs nationally.
  - LSC's cross-campus reach is both a strength and a handicap. At its best, it leads to productive institutional collaborations. Other times, we fall between the cracks. There is a risk that turnover in a couple of key leadership positions could kill the momentum.
- **TOO MUCH DEPENDS ON TOO FEW.** Leadership resources are stretched to breaking point. Staff are stretched very thin. LSC's current startup mode is not sustainable, and it cannot realize the potential of the various initiatives. The language community has a number of very active younger faculty, but they are not in a position to assume leadership roles. Too much currently depends on Phillips, who needs to become useful-but-replaceable.
- **SUSTAINABLE STUDENT PROGRAMS.** The student training programs need long-term support (and leadership). NSF will not be back with a third round of support, and other agencies won't provide the broad support for fundamental science that NSF offers. We cannot wait until 2020 to resolve this. There is a risk that after 13-14 years of unprecedented federal support the interdisciplinary programs that generated LSC's success will fade away.
- **UNIVERSITY-GOVERNMENT BRIDGES.** CASL does language research in service of government needs. The National Foreign Language Center serves similar clients, with a language teaching focus. Both of these need to thrive and grow, and be closely integrated with the rest of the university. UMD should be a one-stop-shop for government needs in language. We should be able to leverage our strengths to attract exceptional talent to these centers. Connections need to be strengthened.

### Suggested Responses:

- LSC needs to prioritize broadening leadership and engagement from language scientists.
- There needs to be a discussion with university leaders about whether LSC's goals are credible, interesting, and worthwhile for UMD; and a candid analysis of what it will take to attain the goals.

## **Appendix: Metrics & Milestones**

The Language Science initiative has multiple goals, requiring multiple measures. We welcome accountability, but must apply relevant measures. Example: if the question is “Are you changing how language research is pursued?”, then the answer “\$10 million dollars!” doesn’t fit.

We take seriously the need to work to secure funding. LSC needs it, and UMD does too. But LSC’s success should not be measured in dollars. Funding is an enabler of impact, not a reflection of impact.

Goal: Create an integrated field, be the world leader.

Metrics: (1) imitation of LSC’s vision, programs, and approach; (2) attracting the best talent; (3) be a sought-after destination, where established and up-and-coming researchers want to spend their research time, e.g., via sabbaticals and research visits.

Goal: Address grand challenges in language science.

Metrics: (1) Do we agree on the challenges, and have the resources to pursue them, i.e., talent, funding, tools, and partners? (2) Are we actually pursuing them, preferably better than the competition? (3) Is the academic and non-academic world turning to us for answers?

Goal: Create scalable models for training, research, and partnerships (local to global).

Metrics: (1) Have we defined and built the models? (2) Can we identify what is distinctive, and what are the benefits? (3) Are the models scalable, and are we engaging with organizations who can scale them? (4) What is the evidence that the models are spreading?

Goal: Build successful departments, programs, and individuals (faculty, students, and alumni)

Metrics: In this case more standard metrics are suitable, since we are dealing with things that others routinely measure: rankings, citations, funding, honors and awards, etc.

### **Did we do what we promised in Phase 1?**

Yes! (with amendments)

Our Tier 3 CRI proposal ([here](#)) summarizes our plans as of March 2013. LSC was launched 6 months later. LSC has made major progress since that time. In broad strokes, it has done what we said it would. Some activities are further along than others, and many of LSC’s successes are things that were not even on our radar in 2013. We have learned much about what it will take to achieve LSC’s long-term goals. The grass-roots community that LSC was built on top of has been transformed.

Areas where LSC is ahead of its initial goals:

- (1) Graduate funding - success to date exceeds our dreams
- (2) Undergraduate training - PULSAR came earlier than expected, and is better than expected
- (3) Collaborative research within and between Education and HESP is richer than expected
- (4) Public visibility via Langscape, which we were not aware of
- (5) International activity could have a big impact sooner than we could have imagined

Areas where LSC lags behind its initial goals are:

- (1) Creating robust internal structures and advisory board
- (2) Facilitating government connections
- (3) Hiring - about 1 year behind, due to the freeze
- (4) Space - about 2 years behind, due to an exceptional opportunity that is taking a while to be ready
- (5) Communication - a lot has been achieved, but a great deal has been learned about what it takes to really get people’s attention

## Appendix: Imitation

Imitation is the Greatest Form of Flattery. From the beginning we have emphasized that the best evidence of success would be that others are trying to copy us. This goal has often been met with skepticism, but we are starting to see results. LSC's approach is attracting attention, nationally and internationally among language scientists, and in other fields at UMD.

Name. The term 'language science' is becoming more widely used as a cover term. This matters.

Vision. Institutions are starting to recognize the promise of integrated language research.

BRITISH COLUMBIA. In early 2016 UBC launched a [Language Sciences Initiative](#), with leadership from some of Canada's best language scientists, plus donor support. It was inspired by the UMD initiative and by discussions about the U21-GRAIL initiative.

IRVINE, WISCONSIN. UCI is attempting to create a new unit on the "Maryland model", and there is a proposal under consideration at Wisconsin to create a similar new unit.

UTRECHT. The University of Utrecht is a leading European center for linguistic research. They are drawing upon our model.

UNIVERSITAS 21. The GRAIL initiative connects to prominent research universities around the world, and it is triggering cross-department discussions of shared language expertise.

OTHERS. A number of universities have sought advice on how to emulate what Maryland is doing, e.g., Carnegie Mellon, UC Davis, Florida, Michigan. There is interest in a CIC language science network.

Undergraduate: Queen Mary, University of London, has one of the best linguistics programs in the UK. They are looking to replicate our undergraduate PULSAR program.

Graduate: A [provocation](#) by Colin Phillips triggered a nationwide conversation on the restructuring of linguistics graduate curricula, in a way that supports language science. Change is happening.

Public Engagement: LSC's role in bringing language science to broad audiences is drawing broader attention. We received NSF funding to create a multi-university "Language Science for Everyone" alliance, which has proselytized at multiple events. More institutions are now getting on board. Maryland is a national model, and LSC is guiding the Linguistic Society of America's efforts for public engagement.

Long-term Visitors. When established or up-and-coming researchers pay to spend time with you, something is going well. We see a steady increase in the number of high quality long-term visiting faculty (i.e., sabbaticals) and domestic and international PhD students. These visits greatly enrich the community: they generate new research, and they create ambassadors. Example institutions: UCLA, Tübingen, NYU, Amsterdam, Paris, Bristol, São Paulo.

## **Appendix: Impact on Colleges**

LSC is a university-wide initiative, serving participants in at least 17 departments and centers. But it is reasonable for colleges to ask “What have you done for me lately?” We focus here on the four colleges that together contributed a third of the Tier 3 support.

### **ARHU**

- Faculty recruitment: 1 senior appointment (Polinsky, LING), 1 junior appointment (Preminger: LING), and 1 more senior appointment in progress (SLLC). All directly connected to LSC, and drawing support beyond the college.
- Faculty retention: some key faculty would no longer be here without LSC.
- The PULSAR program benefits some of ARHU’s strongest students
- ... and so much else of what LSC does

### **BSOS**

- HESP is on a roll, and its connection to LSC is central to this. This extends across faculty recruitment and retention, the PhD pool, partnerships across the university, and national visibility. HESP is poised to make dramatic improvements in its standing, if suitable investments are made.
- The Language Science community is an important contributor to NACS and is a strong asset for the Brain & Behavior Initiative. Language scientists are also key contributors to the Maryland Neuroimaging Center, and provide most of the funding for the MEG facility.
- The PULSAR program (based in BSOS) benefits outstanding BSOS students.
- LSC has contributed to Psychology (though key opportunities remain unrealized).

### **CMNS**

- LSC helped to retain Hal Daumé and to recruit Marine Carpuat (with a hard budget investment). These are high value appointments for CMSC and UMIACS.
- LSC holds an additional hard budget investment for a further faculty appointment; in progress.
- LSC brought a prestigious NSF training grant that CMNS plays a key role in (and helped another)
- LSC is leading new efforts to create undergraduate opportunities at the intersection of language & computer science. This is a high-demand area, with opportunities for jobs and sponsorship.
- LSC’s Future STEM Leaders initiative involves a partnership with CMNS that can benefit the college’s graduate training efforts internally and externally.

### **EDUC**

- LSC helped to retain Rebecca Silverman and to recruit Ana Taboada Barber, leading to multiple new initiatives, including school partnerships and an IES training grant.
- LSC provided staff support that allowed a second training grant submission (De La Paz, in rev.)
- By recruiting Jan Edwards, LSC is helping COE to pursue important new funding streams.
- Language Science played a key role in recruiting Prather and Romberg to HDQM.
- LSC’s NSF training grants have provided funding for COE students in HDQM.
- LSC contributed significant effort from Phillips in recruiting the new HDQM chair.



## Appendix: Detailed Request (budget + collaboration)

The Tier 3 Initiative invested \$300k/year for 3 years, and yielded strong results. We propose a three-pronged approach to moving to the next level:

- (i) Tier 3.2 funding: base support for 2016-2019; extended to include communications/development
- (ii) Advocacy & Collaboration: help in realizing the vision
  - (a) Strategic Plan: initiate broader plans with Deans, VPs, and Chairs to achieve the big goals
  - (b) Development: building connections with University Relations, Foundations, donors
  - (c) Government & Industry: building connections with government/industry, reshaping CASL
  - (d) Academic Planning: coordinate hiring planning to leverage UMD's strength in language
- (iii) Permanence: Develop a "path to permanence" roadmap

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<b>TOTAL ANNUAL BUDGET</b>	<b>\$385,000</b>
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<b>BASE OPERATING BUDGET</b>	<b>\$278,000</b>
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Personnel	\$270,000
Director - Colin Phillips, 25%	
Assistant Director - Tess Wood, 100%	
Business Manager - Caitlin Eaves, 100%	
Development/Comm. - TBD, 100% (new position, for UMD goals #1 and #2)	

Materials / Supplies / Equipment	\$8,000
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<b>ESSENTIAL TRAINING, PUBLIC ENGAGEMENT &amp; COMMUNITY DEVELOPMENT</b>	<b>\$57,000</b>
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Travel	\$5,000
Events / Activities	\$22,000
Academic Events, e.g., Language Science Day, internal workshops and events	
Public Engagement, e.g., Language Science for Everyone; AAAS; fairs; MD Day; K-12	
Language Science Lunch Talks	\$3,500
PULSAR undergraduate program	\$8,500
Mentor fellowships / student research funds	
Student activities and professional development	
Advisory Board	\$18,000

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<b>PROGRAM EXPANSION / SUPPORT</b>	<b>\$50,000</b>
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UG initiatives in Language & Computation, Language & Public Health	\$11,000
Mentoring / Advising / Visiting Speakers	
Course / Materials Development	
Research	\$39,000
Seed Funds - Language Science Research Initiative Start-up Funds	
Distinguished Scholars-in-Residence	
Language Science Summer Scholars (UG scholarships)	
Meetings / Conferences / Speakers	

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## Budget Notes

### Targets for external funding

Several of the budgeted efforts are in early stages but are plausible targets for attracting support from foundations, donors, or other grants. In addition to the current and pending support for graduate training programs, we are exploring potential funding for undergraduate activities via industry partnerships and foundations, as well as potential funding for U21-GRAIL network activities and other institutional partnerships. We are actively working on securing funding for LSC for Langscape. Until now, LSC has supported Langscape tech costs (e.g., hosting and licenses) and key staff time (e.g., Tess Wood) from our base operating budget.

### Personnel

LSC's Tier 3 funding in 2013-2016 has primarily supported two core staff members (Tess Wood, Judi Gorski → Caitlin Eaves), plus 25% of the LSC Director.

The proposed new position for development and communication addresses high priorities for LSC's next phase. A key lesson from the initial phase is that successful development efforts require specialist communications expertise. In order to work most effectively with UMD's development and communications experts, we need to do more groundwork in house.

Most LSC personnel are supported through different funding streams. LSC contributes up to half of the 9-month salary of faculty leaders appointed via the Language Science initiative, via separate hard budgeted commitments. A number of additional LSC staff are supported via existing or submitted grants and soft funds, e.g., Infant & Child Studies coordinator, Assistant Director for Graduate Research, Langscape coordinator and developers, U21-GRAIL coordinator. The [Org Chart](#) shows which positions are funded by the Tier 3 vs other sources.

### DRIF Income

The NSF-NRT training grant yields only minimal DRIF income, as much of the award is in a category that does not bring DRIF. The revenue from DRIF could increase if current funding efforts are successful, e.g., \$2.2M Langscape proposals in February, \$3M IES proposal coming in August, but these will not come close to covering LSC's base expenses.

## Appendix: External Funding Activity

LSC faculty are involved in many different research initiatives. Here we list only those proposals that are more closely tied to LSC and/or received LSC pre-award support.

### TRAINING

NSF Research Traineeship (NRT)	Phillips	\$3M	Funded (2015-2020)
OSEP ProPELL	Silverman	\$1.25M	Funded (2015-2020)
NIH T32	Newman/Lidz	\$2M	Resubmitted May '16
IES Project RISE (UMD & Bowie St)	De La Paz	\$1.25M	Resubmit Aug '16
NSF, for Future STEM Leaders mtg	Phillips	\$100k	Funded (2015-2016)

### RESEARCH

Langscape: NSA	Phillips/Wood	\$~200k	Funded (2014-2015) <sup>1</sup>
Langscape: NEH [MITH-Persian]	MITH/Wood	\$25k	Submitted Aug '15 †
Field Station: NSF-NEH	Polinsky	\$120k	Funded (2016-2018)
Langscape: Natl. Geospat. Int.	CASL	\$900k	Funding anticipated <sup>2</sup>
Langscape: Natl. Geospat. Int.	Phillips/Wood	\$684k	Submitted Feb '16
Langscape: NSF RIDIR	Phillips/Wood	\$1.5M	Submitted Feb '16 †
IES Goal 3 - Toggle Talk	Edwards	\$3.3M	To submit Aug '16

### PARTNERSHIPS

U of Edinburgh Soc Sci Partnership	Phillips	£50k	Submitted. May '14. †
NSF, for Language Sci for Everyone	Phillips	\$30k	Funded (2014-2015)
NSF PIRE (Intl. w/ OSU, UConn)	Phillips	\$3M	Declined internally Sep '14 †
	Phillips	\$4M	Re-apply Summer '16
U of Tübingen Partnership	Idsardi	\$~40k	Renewed Summer '15
US-Israel BSF (UMD + Tel Aviv)	Phillips	\$230k	Near miss, resubmit Nov '16
U21-GRAIL (25 universities)	Phillips	\$450k	In negotiation
US-Chile (CONICYT; w/ CEDETi)	Newman	\$~146K	In review
Humboldt Foundation Meier award	Phillips	€250k	Nominate in next round <sup>3</sup>

<sup>1</sup> Indirect route. LSC wrote proposal on Langscape success that generated funding to CASL.

<sup>2</sup> CASL's contract from NGA for work on Langscape's non-public counterpart directly benefits from LSC's work on Langscape as a public-facing resource.

<sup>3</sup> This award will be submitted jointly by the universities of Tübingen and Potsdam, and will support UMD ties to two of Germany's best language science groups. Planned for '16, but no competition this year.

## Appendix: LSC Organization

As an “umbrella” organization, LSC has many pieces. The structure has become clearer over the past 2 years, but is only partly implemented.

### LSC’s Personnel

This [Org Chart](#) shows LSC’s personnel structure, partly current, partly aspirational. It highlights what the Tier 3.2 will directly support, and what is supported by other funding streams.

### LSC’s Scope

RESEARCH: fundamental science, and applications in education, technology, and health.

ACTIVITIES: infrastructure, education, research, and partnerships.

### LSC Governance

#### OVERSIGHT

- UMD Leadership: Provost, VPR, Deans of BSOS & ARHU;  
Dean of Education oversees Lang. & Literacy Res. Center; Dean of CMNS oversees UMIACS
- External Advisory Boards (in development, with expert guidance)
  - Non-Academic: Dave Baggett, Ann Friedman, ... more needed
  - Academic: academic leaders who will serve as advocates for LSC’s vision
  - Specific Projects, e.g., Graduate Training Grants, Langscape
- Internal Steering Group (new): chairs, directors, etc. from across the university who are invested in language science, e.g.,
  - Directors from CASL, NFLC, SLLC, UMIACS, NACS/BBI, MD English Institute
  - Chairs from HESP, LING, PSYC
  - Associate Deans from EDUC, ARHU, CMNS, BSOS, iSchool, SPH
  - Representatives from OIA, Research

#### MANAGEMENT

- Executive Committee (monthly): Director + Associate Directors + Faculty Leaders + Staff
- Management Team (weekly): Director + Staff  
 (“staff” includes research faculty primarily involved in running LSC)

#### SPECIFIC INITIATIVES

- Undergraduate Committee
- Graduate Committee
- Graduate Student Executive Committee
- Language & Literacy Research Center
- Infant & Child Studies Consortium
- Langscape Steering Group
- Field Station Steering Group
- Outreach Committee
- GRAIL: (with representation from institutions around the world)

# Building an Integrated Language Science

## Summary and Background

This proposal seeks support for the base operations of the Maryland Language Science Center (LSC). 5 colleges, together with the Provost and VPR, have already committed soft funds for FY18. The current request is to transition to permanent funds in the coming years.

Language Science offers an unusual opportunity for the University of Maryland to be the world leader in a new, integrated field that reaches across the entire university. Language does not appear in standard lists of Grand Challenges, but it should, and UMD currently enjoys first mover advantage. Few things are more important to humans than communication, and language is central to global problems involving poverty, technology, public health, migration, and security. Language makes connections across the entire university, from education to engineering, and UMD is already a model of integration in language, internationally.

Realizing this vision takes time. Here we request support for Phase 4 of an effort that has transformed UMD's profile in language over the past 15 years. Phase 1 (2001-2006) was an "extreme makeover" of Linguistics that prepared it to be a central node in an interdisciplinary network and propelled it to national prominence. Phase 2 (2006-2013) built a multi-college grassroots network, aided by the emergence of new units such as CASL and SLLC, and by the success of UMD's first NSF interdisciplinary training grant. Phase 3 (2013-2017) institutionalized the grassroots network as the Maryland Language Science Center (LSC), leading to sharp growth in education, research, and partnerships. This was achieved via temporary funds from a Tier 3 Campus Research Initiative, via targeted leadership hires, and development of new space that opened only weeks ago. LSC is a model for cross-campus collaboration and for positioning UMD as a leader. But this breadth and outside-the-box approach mean that the initiative is at risk. Launching LSC required an 18-month process that culminated only with a threat of key faculty losses; continuing LSC has been another 18-month process (so far), and it has substantially impacted LSC's ability to focus on external development. The goal for Phase 4 is to turn the startup into a sustainable operation, building opportunities developed during Phase 3.

## Results, Opportunities, and Threats

The creation of LSC has had a major impact on the UMD language community and its visibility. It has created outstanding opportunities that are ripe for development and fundraising in the next phase. We highlight here just a selection. Fuller details are available on request.

Talent: LSC has made a big difference to the talent pool at all levels, recruiting or retaining star faculty, attracting sought-after graduate students whose choice was directly influenced by LSC. In this year's cycle it helped both Computer Science and Hearing & Speech Sciences to recruit a caliber of student that they were unable to attract previously.

Education: Results since 2013 strengthened UMD's status as an innovator in interdisciplinary education in language. We are the only group, in any STEM field, to win both IGERT and NRT training grants from NSF (2008-2015, 2015-2021, \$6M total). These are now joined by two training grants awarded to Education faculty. In 2016 we hosted a national meeting on the future of graduate education. In 2014 we launched PULSAR, a successful interdisciplinary program at the undergraduate level. Priorities for the coming years are to make the graduate training programs sustainable and scalable; to become competitive for an NIH training grant in language and health (2 submissions already); and to develop undergraduate training at the intersection of language & computer science. NSF support will end in 2021, and there is a risk that our unique run of success will falter if we do not spend the coming years securing external funding. We currently support one full-time research faculty position via NSF funds, and we need to pursue funds for this beyond 2021.

Research:

Field Stations: As a consequence of recruiting Maria Polinsky from Harvard, LSC has launched a research field station in the Mayan highlands of Guatemala and is working on another in Tbilisi, Georgia. The field stations support research on language, and also on areas that benefit from engaging with speakers in their native language, such as health and small business development for indigenous women. 20 researchers will be attending our 2nd Mayan research school in Summer 2017. Our priority is to build out the research operations for the field stations and develop streams of external funding to make them sustainable.

School Readiness: LSC Associate Director Jan Edwards, a senior recruit from Wisconsin, has developed a partnership with Education faculty and with the DC and Baltimore public schools to improve school readiness for African American K-1 children via dialect mismatch awareness. This has already yielded a \$3.3M "Goal 3" award from IES (pending budget approval), UMD's first ever award of this type. Our priority now is to make this program a successful foundation for further partnerships that link fundamental science with education.

Government: LSC is working with CASL to position UMD as the government's leading source for expertise on language. Following a Fall '16 language showcase organized by LSC, the Office of the Director of National Intelligence requested that UMD host quarterly briefings for senior language authorities from all 11 intelligence agencies. The first, on 4/12/17, was a clear success. This is an important step that can be built upon in the coming years.

Langscape: Langscape is an engaging online portal for resources about the world's 6400 languages, serving academia, government, and the public. LSC invested substantial effort in launching a proof of concept in 2014-2016 that has already reached tens of thousands of users. It is now ripe for pursuing diverse funding opportunities.

Language and Poverty: Fundamental science has shown how dietary nutrition supports physical development, and how to source key nutrients in diverse settings around the world. "Linguistic

nutrition” is similarly important for children’s intellectual development, but little is known about how it works and how to provide effective interventions around the world. UMD is poised to become a leader in this important area, thanks to LSC’s ability to incubate collaborative research via events, seminars, student training, and grants development.

Partnerships: During its startup phase LSC initiated many very promising partnerships. The priority now is to convert this promise into results. (i) School Districts: partnering with school districts, especially in low income communities, allows UMD’s research on language and literacy to impact regional communities. (ii) Planet Word Museum: philanthropist Ann Friedman is launching the nation’s first permanent museum of language, opening in late 2019 in the historic Franklin School in downtown DC. LSC Director Colin Phillips shaped the vision for this museum, and LSC faculty are poised to lead a living laboratory inside the museum. This partnership is comparable to UMD’s partnership with the Phillips Collection, except that UMD is more centrally involved and it creates a more unique platform for UMD’s expertise. It also creates opportunities for fundraising and influence. (iii) Global Research Alliance in Language (GRAIL): LSC has worked closely with UMD’s Office of International Affairs to develop a network of top language groups worldwide, making language science a signature research theme of the Universitas 21 consortium. The initiative has great potential to spread UMD’s influence in language and create a model for ‘vertical integration’ of students, faculty, and institutions in internationalization. It received a green light from U21 presidents at their May ‘16 meeting in Singapore, but it requires substantial effort to deliver on its potential.

## How language science fits the criteria

This proposal closely fits the criteria for the Provost’s initiative. The language initiative is central to UMD’s strategic goals: it creates an opportunity to be a world leader and influencer in a field that spans the entire university; it involves broad engagement with state and regional partners, and leverages the national and international potential of our Washington DC location; it closely links innovation in education and research. The initiative is relevant to identified priority areas: language is UMD’s strongest area in the neural/cognitive sciences; VR and language is an active research area between UMIACS and CASL, and is an interest for a planned senior LSC hire; data analytics on a global scale depends on expertise in hundreds or even thousands of languages, and UMD has special capabilities in this area; cybersecurity needs technologies for authentication and identification that are robust across speakers, dialects, and languages. Managing undergraduate enrollments is addressed through our goal of building training at the intersection of language and computer science, a valuable combination for employers.

The potential for advancing excellence and quality is excellent, building upon UMD’s steep trajectory in language over the past 15 years. For example, LSC is helping to propel HESP to be UMD’s next top 10 department. The proposal has a high level of college and department commitment: it reflects a commitment that 5 colleges have already agreed to. The expected impact is high: the initiative already creates opportunities for global visibility and influence, and it has practical benefits for our regional communities, e.g., partnerships with school districts. The



quality of leadership is strong on multiple dimensions. LSC Director Colin Phillips has a proven record, and he has assembled an enviable team of co-leaders, from fields as diverse as special education and computer science, attracting leading figures from top institutions (e.g., Wisconsin, Harvard). Importantly, the tenure-track faculty who are leading LSC are also intellectual leaders in their own fields. Just as important, LSC has vertically integrated leadership: it has outstanding PTK faculty and staff, and has developed a strong culture of student leadership.

## What's New?

There is a danger of regarding LSC as 'old news' or of viewing it through the lens of the many different entities on campus known as 'centers'. UMD's efforts in language are a long-term project, but institutionalization of these efforts is new. There are no permanent funds for operations, director, or key staff and infrastructure. LSC's space opened in early 2017. Key hires are very recent or (in one case) in progress.

LSC is not a self-contained center, and managing sponsored research is just one component of its mission. LSC coordinates many different activities in interdisciplinary education, research, and partnerships that are beyond the scope of what an individual department could do. All of these are essential to the LSC's metrics of success: attracting talent, supporting ambitious research, and achieving influence. Many of the returns on investment in LSC are not captured by standard financial reports, but they are very apparent to the units that benefit.

## Metrics

Metrics: In order to claim to be a world leader in language UMD needs three things: (i) top talent at all levels, (ii) ambitious research and results, and (iii) impact and influence, in academic and society. Grants, contracts, and donations play a key role, but as a means rather than an end. LSC has developed a more detailed summary of metrics for its next phase, available on request.

### Budget Request

- \$300k - Colleges should convert to hard in due course

## Additional Information Requested

This page addresses two additional questions posed by ARHU on 4/14/17.

### Amount requested of ARHU & BSOS

ARHU and BSOS have each committed \$30k/year towards LSC's core operations. For FY18 this is part of a total budget of \$300k (5 colleges + Provost + VPR). The current request does not seek additional total funds. Rather, it seeks to convert existing commitments from soft to hard, with timing and conditions for the transition to be mutually agreed upon.

Note that VPR's existing FY18 contribution is \$95k. The VPR cannot make hard budget commitments. Therefore, any transition plans should take into account VPR's ongoing role.

### Contribution of Center or Department (in funds or staff/faculty time)

The language science initiative is the institutionalization of a grassroots effort. There is enormous commitment of resources from participating units. The core support requested here allows these diverse commitments to have greater impact.

#### Center contributions in funds.

1. Any hard funds will replace existing soft-funding commitments.
2. All DRIF resources secured by LSC will go towards this effort. This includes DRIF from a \$3M NSF training grant (small), an anticipated \$3.3M IES grant, and various other awards.

#### Center contributions in faculty/staff time

1. Dr Shevaun Lewis' position is funded by our NSF training grant through at least 2020; this includes 25% of her salary that comes from redirecting Phillips' salary as PI to her.
2. All of LSC's hard-budgeted faculty are devoted to this effort. In FY18 this consists of two 50% TTK Associate Directors and three 25% TTK faculty leaders. These positions are hard-funded, whereas LSC's core team (Director - 25% position, 100% PTK faculty and business manager) is soft-funded. The current request aims to more effectively leverage existing hard-budgeted positions.

#### Department contributions to faculty leaders

1. LSC Director Phillips has a 25% appointment in LSC, which takes substantially more than 25% of his time. Hence the additional time amounts to a substantial contribution from LING.
2. LSC Associate Director Rochelle Newman has a 0% appointment in LSC, as she is also Chair of HESP. Hence her substantial contributions to LSC are contributions by HESP.

#### Department contributions to faculty & students

1. The university-wide language science effort reflects an enormous commitment from faculty and students across the university, almost none directly funded by LSC.
2. In the case of contributions from researchers in grant-supported centers such as CASL, NFLC, and the Language Flagships, this is a commitment of externally funded time.



OFFICE OF THE SENIOR VICE PRESIDENT AND PROVOST

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301.405.5252 TEL 301.405.8195 FAX

March 17, 2017

Professor Colin Phillips, Director  
Maryland Language Science Center  
1413F Marie Mount Hall  
Campus

Dear Colin:

We write in response to your request for an extension of the Tier 3 funding for the Language Science Center (LSC) in the amount of \$385,000 per year for three years.

The deans of the Colleges of Arts and Humanities (ARHU), Behavioral and Social Sciences (BSOS), Computer, Mathematical, and Natural Sciences (CMNS), Education (EDUC), and Information Studies (INFO), along with Denise Clark and Cindi Hale, met to discuss the Center's progress to date and the request for additional resources.

Please be assured that we are impressed by the accomplishments of the LSC. There have been exceptional faculty appointments, your success with securing NSF funding is impressive, and you have provided an effective model of cross-campus collaboration. In addition, we are pleased that you have moved into a new space that was designed to meet your needs.

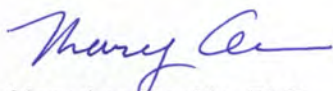
It is our expectation, however, that the LSC will become increasingly self-sustaining and the campus subsidy will decrease in the years ahead. According to our records, the LSC should end FY17 with a positive balance, and so we assume you are requesting additional funding to start in FY18. We have reached consensus that in FY18 the LSC will receive \$300,000 total, which will include \$30,000 each from CMNS, BSOS, and ARHU; \$20,000 from EDUC; and \$5,000 from INFO in addition to \$90,000 from the Provost and \$95,000 from the Vice President for Research.

We ask that you develop a strategy in FY18 to reduce staff costs either by identifying external funds to support some of the staff costs or through a shared service model with other units, such as NFLC or CASL or your neighbors in H.J. Patterson. We also ask that you develop a plan to increase the number of proposals and the types of funding that the Center will pursue, collaborating closely with CASL and other programs, with the goal of expanding the Center's sponsored research portfolio. If you would like assistance or advice with these items, please feel free to contact Cindi or Denise.

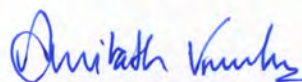
If you are able to make progress on these items and provide us with a clear strategy for LSC to become increasingly self-supporting, we will consider continuing some level of funding into FY19.

We hope this is helpful, and we are available if you wish to meet to discuss this.

Sincerely,



Mary Ann Rankin, PhD  
Senior Vice President and Provost



Amitabh Varshney, PhD  
Interim Vice President for Research

MAR:ch:br

cc: Dean Bonnie Thornton Dill, College of Arts and Humanities  
Dean Greg Ball, College of Behavioral and Social Sciences  
Dean Jayanth Banavar, College of Computer, Mathematical, and Natural Sciences  
Dean Donna Wiseman, College of Education  
Dean Keith Marzullo, College of Information Studies

## GRAIL: Global Research Alliance in Language

Proposal for an initiative of the *Universitas 21* global network

Concept Plan - March 2015

This is a draft plan. We are seeking feedback on the structure of the initiative, as well as on the form of the proposal, from key participants at U21 and U21 member institutions (researchers and key university administrators/leaders).

1. <a href="#">GRAIL sketch</a>	2pp
2. <a href="#">Executive Summary</a>	2pp
3. <a href="#">Benefits for institutions (and risks)</a>	2pp
4. <a href="#">Student mobility: undergraduate</a>	2pp
5. <a href="#">Student mobility: graduate</a>	2pp
6. <a href="#">Global Classrooms</a>	2pp
7. <a href="#">Public-facing initiatives: outreach</a>	2pp
8. <a href="#">Public-facing initiatives: policymakers</a>	2pp
9. <a href="#">Research partnerships</a>	2pp
10. <a href="#">Management, budget, evaluation</a>	3pp
11. <a href="#">Feasibility and qualifications</a>	1pp
12. <a href="#">Institutional expertise</a>	1pp
13. <a href="#">GRAIL plans, institutional profiles</a>	separate file (slides)

Some key agenda items for discussion with U21

- Strategy for engaging diverse partners, including upper administration and language scientists, and ensuring breadth of ownership.
- How to make the benefits of GRAIL understandable to potential contributors
- Funding strategy, including cooperative fundraising efforts
- How to achieve a coherent central management strategy but with broad leadership. Roles of different participants (including U21 Secretariat).
- Strategy for upcoming U21 meetings (Shanghai, Chile, etc.)

## U21-GRAIL: Global Research Alliance in Language

### Objectives

1. Raise profile of science of language: on global scale, and within U21 institutions
2. Scientific breakthroughs and public impact; emphasis on language diversity
3. Integrating student mobility with research

### Opportunities

1. Theme is necessarily global (... and globally necessary)
2. Theme extends throughout institutions: STEM + Humanities + Education + Health
3. U21 network would be unique, lead development of new integrated field
4. Distinctive contributions from many U21 institutions; low cost of entry

**Coordination:** University of Maryland + U21 Secretariat + Participating Institutions

*UMD Upper Administration:* International Affairs, aided by Division of Research + Grad School

*UMD Area Expertise:* Maryland [Language Science Center](#) (connects 17 academic units)

**Oversight Group:** drawn from institutional U21 managers (connect to existing meetings)

**Steering Group:** drawn from key faculty leaders at multiple institutions + U21

**Project Teams:** drawn from multiple institutions, focused on specific activities below

**GRAIL-specific Staff:** Director, Colin Phillips (UMD); GRAIL Asst. Director: expertise in language [@UMD]; GRAIL Director of Public Activities: events, visibility [varying location??]

### Initial Elements

1. Student Mobility
  - a. Undergraduate: students as research ambassadors
  - b. Graduate: research partnerships, split-funding between home and host
2. [Global Classrooms](#): cross-institution collaborative seminars and courses
3. Public-facing activities
  - a. Public outreach: building on excellent models across U21 [e.g., [1](#), [2](#)]
  - b. Policy: engaging government, (inter)national organizations, agencies
4. Language Diversity
  - a. Leverage network connections for cross-language research projects
  - b. Building [digital portal](#) for language diversity (cf. [Encyclopedia of Life](#))

**Timeline:** a sustainable network of exchanges and research partnerships cannot be built overnight. Initial focus on collaborative activities that will facilitate long-term connections.

#### Year 1

build network infrastructure; develop teams within institutions; publicize opportunities  
pilot student exchanges; build web portal & student/researcher marketplace  
international summit in Washington DC linking language science & public policy  
global language diversity resource: collaborate & raise visibility via [Langscape](#)

#### Year 2

initial Global Classrooms offerings



student exchanges (grad + undergrad) underway, online marketplace operational  
coordinated public-facing activities - outreach activities

### Year 3

products from public-facing activities (books, reports)  
research programs build on student exchanges

### Costs

1. Public-facing activities: events, e.g., global summit event
2. Student exchanges: competitive matching funds for undergrad & grad exchanges
3. Global Classrooms: depends on institutional teaching constraints
4. Language Diversity: research seed funds, IT costs for digital hub enhancements
5. Management: staff resources for coordinating network, building GRAIL portal

Institution	Senior Admin Contact	Researcher Contact	Existing Connections
Amsterdam	yes	yes	yes
Auckland	yes	yes	yes
Birmingham	yes	yes	yes
British Columbia	yes		yes
Chile	yes		
Connecticut	yes	yes	yes
Delhi		yes	
Dublin	yes		
Edinburgh	yes	yes	yes
Glasgow	yes		yes
Hong Kong U	yes	yes	yes
Johannesburg	yes		
Lund	yes	yes	yes
Maryland	yes	yes	yes
McGill	yes	yes	yes
Melbourne	yes	yes	yes
Monterrey	yes		
Nottingham		yes	yes
Ohio State	yes	yes	yes
Queensland	yes	yes	yes
Shanghai Jiao Tong	yes		
Singapore	yes	yes	yes

U21 institutions not yet reached: Fudan, Korea U, New S. Wales

Potential for **further international connections** via network, to other leading groups (e.g., Melbourne & Queensland are in \$28M ARC [Center of Excellence](#) w/ ANU, 2014-2021), and countries with no U21 members.



## 2. GRAIL Executive Summary

**Vision and Goals:** Language Science offers an unusual opportunity for U21 and its member institutions to build a global network that can achieve high visibility in a relatively short period of time. The aims of the *Global Research Alliance in Language* (GRAIL) is (i) to create a model network of collaboration that spans diverse fields, nations, and spheres (research, education, public engagement); (ii) to increase the impact of the science of language, within U21 institutions and on a global scale; (iii) to integrate student mobility with research; (iv) to foster scientific breakthroughs and public impact, with an emphasis on language diversity.

**Why Language Science?** It is necessarily global, and globally necessary. And everyone can contribute. Some fields are best advanced via major facilities in individual countries. Not so for language. Given the diversity of the world's languages -- there are around 7000 of them -- and the fact that each language offers distinctive insights into the human capacity for language, major advances depend on worldwide expertise. Language Science is an emerging 'umbrella field' that reaches across entire institutions: the fundamental science stands at the intersection of humanities, biological, and computational sciences, and applications reach into education, technology, and health. All U21 member institutions can provide unique expertise, ranging from rich language diversity, to unique multi-lingual populations, to computational and neuroscientific infrastructure.

Language science is critically important to current societal concerns: the information revolution has made language technology an integral part of our daily lives, but it has created a new "linguistic elite", since the best current technologies are available in only a small handful of languages. Economic upheavals have resulted from globalization, which calls for flexible language skills (and the science that makes this possible). International security has been undermined by the disruptive influence of small groups, that can emerge at a moment's notice, using a language about which almost nothing is known. In education, many nations have been challenged by the increasing diversity and language needs of their students.

**The Scientific Challenge:** In language learning, an average five-year old leaves Google's computers in the dust. Our main scientific challenges build on this fact: we want to understand how a young human brain can easily learn any language that it is immersed in, using far less information than *Google Translate* or Apple's *Siri* are trained on. We want to understand why adult brains learn languages less well, and how computers can better emulate human feats with language.

**The Organizational Challenge:** A multi-disciplinary web of international collaborations won't easily arise overnight. Solving the big problems in Language Science requires insights from diverse fields, which in some countries have limited connections or even mistrust one another, and different scientific cultures. It requires experts who are geographically broadly distributed. Institutions want to see near-term changes with publicly visible impacts, but faculty will not reorient their research on a whim, and are skeptical of "arranged marriages".

**Our Strategy:** Focus on activities that yield near-term, visible outcomes, while building longer-term trust between researchers across diverse locations and fields. This translates into 4 types of activities:

1. Student mobility: students as ambassadors, integrating study abroad with faculty research.
2. Global classrooms: international engagement without international travel
3. Public-facing science: (i) outreach and broad engagement; (ii) reaching policymakers via "summits".
4. Language diversity: promoting cross-language research and broad awareness

**Why U21:** By sheer good fortune, U21 includes some of the world's strongest institutions in language science: many member institutions have broad and deep strengths, covering different sub-disciplines. U21 can play a key role in establishing this new interdisciplinary field, and it can be the envy of other institutions. (We have already heard from colleagues elsewhere: "Can we take part, too?") It would be very difficult to create a network like this without the infrastructure that U21 provides -- member institutions are already motivated to collaborate -- and no other international network has the strength and leadership in language science that U21 members offer.

**Benefits for Institutions:** The interdisciplinary theme fosters connectivity within institutions, as well as internationally: language science spans areas that might rarely connect within a university. GRAIL can open doors to world-class opportunities, and it can connect different university functions (research, education, public engagement, administration).

**Benefits for Researchers:** GRAIL raises the profile of their field, makes them more visible within their institutions, and increases the standing of their field internationally. It facilitates connections with internationally prominent research groups, including via student research ambassadors or innovative teaching opportunities.

**Benefits for Students:** Students will benefit from enriched study abroad experiences, where they can play a key ambassadorial role. Undergraduate students will benefit from the fact that faculty will be more invested in their international experiences, seeing it as less of a distraction from 'real' research training. Graduate students will benefit from the ability to connect to world-class researchers around the world. Even students who do not travel will benefit, via research collaborations, visiting scholars, and global classrooms.

**Coordination:** The success of GRAIL will depend on broad buy-in and broad 'ownership' and initiative. If the network depends too strongly on a single institution, or on a single group (e.g., graduate students), then it will fail to flourish. Many different institutions can contribute unique expertise to the initiative, and this should be reflected in the management structure for GRAIL.

Across Institutions: GRAIL will be coordinated by the University of Maryland, together with the U21 Secretariat, and leaders drawn from participating universities.

Within Institutions: GRAIL will depend on the combined efforts of language scientists from multiple fields, together with experts in international partnerships, research management, and graduate studies.

Oversight: U21 CEO / Sec General + institutional U21 "managers" (using existing annual meetings)

Steering Group: drawn from key faculty leaders at multiple institutions, rotating membership

Project Teams: drawn from multiple institutions, focus on specific activities; includes student steering group

GRAIL-specific staff: Director, Colin Phillips (UMD); GRAIL Assistant Director (PhD level staff, based at UMD); GRAIL events/communication coordinator (location depends on activities).

The University of Maryland is willing to take on a major role in building the GRAIL initiative. It is well positioned to play this role initially, due to: (i) the Maryland Language Science Center (LSC) is an institutionalized 'umbrella' unit that serves all areas of language science, connecting 17 departments and centers; (ii) UMD leadership is prepared to commit significant time/effort of its staff to the initiative, including its funding of the director's part-time position; (iii) UMD is investing in centralized new space that will locate its Office of International Affairs and the Language Science Center together, allowing for close collaboration.

### 3. Why U21-GRAIL is a valuable investment **[CAN BE TAILORED FOR INDIVIDUAL INSTITUTIONS]**

When we mention U21-GRAIL to colleagues, university leaders, and students, we are often met with puzzled looks. What is this initiative, why are we doing it, who's going to pay for this, and don't we have plenty of other things keeping us busy already? All good questions. U21-GRAIL is out-of-the-ordinary, and it is not easy to fit into pre-existing categories. (It's not just that we're poor explainers. There are other interesting initiatives that we tell people about that are understood immediately.)

Why should language scientists commit energy to U21's "Wow Initiative"? Why should university administrations invest valuable resources (time and money) in this?

Why it's harder to understand: Because people are unclear on how this serves their own needs. And because it's difficult to see how different elements serve different participants' needs (researchers, students, institutions). There is broad support for collaboration, and international engagement seems like something that everybody can agree with. But people are less clear why institution-level partnerships are valuable, and are fearful of "arranged marriages". And people who do see value in one-on-one institution-level partnerships may be skeptical of network-level partnerships ("I like this one song, but I don't want to buy the whole album").

Bottom line: U21-GRAIL is an unusual opportunity to advance priorities that researchers, institutions, and U21 are already committed to. The network-level strategy makes it possible to advance something that is both broad and distinctive, on a relatively short time scale.

#### How do institutions benefit?

- U21 members are already committed to raising their profile globally.
- *[Edit as appropriate]* Language science is already an area of distinctive strength at *[insert institution here]*, especially in areas such as *[insert here]*. Strong interdisciplinary connections are *[already in place | a highly desirable outcome]*. For our researchers, connections with U21 institutions such as *[insert here]* would be very attractive.
- U21 is a valuable avenue for international advancement: it already provides good institutional connections, and hard-to-match levels of contact at a high-level (through its various annual meetings). This makes rapid progress more feasible.
- U21 is committed to its "wow initiative" effort, and its members are keen to try something different, i.e., the motivation is already there.
- We are backing a winner: Language Science is a great topic for a big initiative, due to its breadth, accessibility, and obvious global need. Many institutions are enthusiastic about partnering on this theme, and they recognize that they can contribute unique expertise in many different ways, i.e., it's not just about the institutions with the most money or costliest facilities.
- U21-GRAIL can open doors for multi-institution fund-raising efforts that are not normally possible.
- Success with U21-GRAIL could open doors for institutional partnerships in other fields.
- The strategy for U21-GRAIL directly addresses the challenges of linking institutional global ambitions with the interests of individual researchers and students (their interests are different).
- U21-GRAIL brings together different pieces of individual institutions -- academically and administratively -- fostering improved within-institution collaboration.

#### How do institutional language research communities benefit?

- If GRAIL succeeds, then it is good for the future health of our field(s). It raises our profile internationally, countering the normal challenges of being spread across many different disciplines and departments.
- If our language research community is an effective part of this international initiative, then it increases the value and visibility of the community within our institution.
- GRAIL makes it easier to share innovative training approaches, which can benefit our programmes.

- GRAIL creates opportunities to seek types of funding that would not otherwise be available, thanks to the scope of the vision, e.g., international foundations and donors.

#### How do individual researchers and students benefit?

- It creates new mobility opportunities for students and for faculty (in some attractive places/institutions).
- It creates new opportunities for interesting visiting students and faculty.
- It creates new opportunities to teach or enroll in creative courses.
- It opens doors for new collaborations, including access to new language populations
- If GRAIL succeeds, it will increase demand for our graduates, for our programmes, and for our ideas.
- It could open the door to new funding opportunities.

#### Challenges

Investing time and resources in U21-GRAIL also carries risks. Success is not guaranteed.

- The success of the initiative requires multiple parts of U21 and our university to see this as a winner for them. We already have enthusiasts at multiple levels, but the full case has yet to be made. Especially to *[insert here, e.g., VC, department X, graduate school, fund-raisers]*.
- The initiative could be too much dominated by a small number of institutions or sub-fields, making it less attractive for others. Broad ownership is necessary, and diverse voices must be heard.
- U21's degree of commitment might waver. U21 member institutions may be too impatient to see dramatic outcomes. Success will depend on incentives.
- Funding could benefit greatly from collaboration among development officers and university leaders at different institutions. But this kind of collaboration is not business as usual.
- We have other valued partnerships that are not part of U21. What about those? (E.g., Big10 (USA), ARC Center of Excellence (Australia), LERU (Europe), or individual partnerships.) Are we supposed to ignore those?

We take these challenges seriously. We currently think that the potential benefits outweigh the risks. For language scientists, this is also the kind of opportunity that does not come around too often.

Response to Risks #1: Advocacy and Ownership. University leaders need to be advocates for the initiative, to different parts of institutions and to our partner institutions. Leaders need to make the case that this presents a strong opportunity for many different constituencies -- and that success depends on their expertise. The more groups within an institution see the benefits, the more likely is success.

Response to Risks #2: Broad Leadership. Although Maryland is willing to invest time and money in setting up GRAIL, it should not dominate (nor does it want to). Different institutions should take a leading role in different elements of the network. ... And should weigh in with suggestions on how to improve this draft plan!

Response to Risks #3: Prestige. It is valuable for participants to see that this is a broad international contest, involving 25 leading universities and proposals from many different fields. For language scientists to be selected as the winner would be an honour, bringing prestige and visibility.

Response to Risks #4: Support. This initiative can be a great success if it attracts sufficient support (time and other resources).

#### 4. Undergraduate Student Mobility: Connecting Study Abroad to Research Communities

**Summary:** Undergraduate students are already internationally mobile. But faculty generally don't care. The students simply disappear from the university's education and research mission for a few months to a year. This is a missed opportunity. GRAIL aims to enrich the student experience and improve faculty engagement by linking undergraduate mobility with research. Students will serve as research "ambassadors", facilitated by a marketplace that GRAIL will maintain.

**Context:** Undergraduate students increasingly seek out study abroad/exchange programs as part of their education. They recognize the value of international experience in an increasingly global job market. Universities make great efforts to provide quality international experiences for their students, but the choice of destinations and specific experiences are often disconnected from students' other plans. (E.g., Spend a semester in Florence: learn some Italian, take an Art History course, fulfill a breadth requirement.) Students might benefit from experiencing a new culture, and they might connect to the local community. But just as likely they mostly interact with fellow visiting students, and leave without making a mark.

Meanwhile, faculty typically show no interest in study abroad. It merely serves to take students away for a while, and has no connection to the research that faculty care about and are rewarded for. Faculty are rarely involved in advising students on study abroad choices, nor are they likely to come into contact with students who are visiting from abroad. And the professional international advisors who guide students' choices are not in a position to know about opportunities in specific foreign universities that might align well with a student's individual academic focus. Faculty are often engaged in international collaborations, or would like to be involved, but the connections come about haphazardly, universities typically do not know about them, and provide little or no support for them. So a university's internationalization goals become disconnected.

**Goal:** GRAIL aims to repair the disconnect by integrating research into undergraduate exchange, and by connecting students to related communities of students at partner institutions. It will seek to engage individual faculty in the home and host institutions in the process. In the ideal case, students will contribute to fostering a research connection between institutions.

**Benefits for students:** Undergraduate students will broaden their research experience and skills, and connect their study-abroad experience more closely to their overall goals and program at the home institution. Language research specializations vary across U21 member universities, and local language science expertise - as well as varying local languages and dialects - will enable students to get involved in research that could not take place at their home institution. Also, the close collaboration between faculty and a small group of students that occurs in a research setting is very different from the more limited interactions found in lecture classes, and has the potential to greatly enrich the exchange experience for students. In cases where institutions already have a community of undergraduate language science students, then visiting students can connect to this resource. In some cases, visiting students could be inspired by communities that they encounter at the host university and could use this experience to enhance their home institution. Above all, GRAIL will provide a mechanism for talented students to assume greater responsibility in their role as international travelers.

**Benefits for faculty:** Student exchanges can be a valuable way to establish or expand connections between faculty at different institutions and potentially spark research collaborations. Faculty members and departments in language science fields across the U21 network will develop connections through student exchanges as well as through GRAIL research- and outreach-focused initiatives, plus co-taught or collaborative global classrooms courses.

**Perspective for institutions:** This is not a 'light touch' exchange model. It requires above average time commitment from faculty and administration. It is not a vehicle for efficiently generating enrollment or fees, or for boosting raw numbers of international students. Students have two valuable resources that faculty lack:

time and flexibility. These exchanges aim to leverage this resource to achieve far greater institutional benefit than the typical undergraduate study abroad experience.

**Proposed model:** The key ingredients of the model are:

- Central marketplace for coordinating GRAIL opportunities, managing online applications, identifying potential faculty mentors, coursework options, and required experience/qualifications.
- Within participating institutions, collaboration between language scientists and international offices to manage student needs and opportunities.

We envision two possible routes for establishing student exchanges. In the first scenario, individual faculty or institutions advertise opportunities that are available to the GRAIL community, and students apply for these. In the second scenario, pairs of faculty at two institutions indicate a specific interest in co-mentoring a student ambassador.

Student applications will provide information on prior academic background and research experience (where applicable), and students can indicate interest in specific opportunities at host institutions, e.g. identifying their top three choices, and indicating whether they are willing to accept other opportunities. The GRAIL Assistant Director will route student applications to the appropriate faculty members, who will review the applicants and choose whether to accept students. If the selected opportunities are not available but the application is otherwise eligible, the application can be forwarded to other appropriate faculty members.

Infrastructure:

- Online marketplace for students to find opportunities and apply for research exchanges. This will include a listing from each PI/faculty mentor outlining research areas and required qualifications and expectations for students. For each institution, the site will provide details of language science course options as well as level of support for exchange students, e.g. language requirements, housing.
- Individual institutions will decide who is eligible to apply for exchanges, and will be responsible for ensuring these requirements are met (e.g. in order to count towards degree requirements).
- MOUs between potential exchange partners - in many cases, via amendment to an existing MOU.
- Mechanisms for students to pay fees and earn credits. Paying fees at the home institution is preferable for some institutions.
- 'Load balancing': if each pair of institutions insists on exact numbers of students flowing in each direction, it will be challenging to manage a network with 300 potential institutional pairs.
- Effective communications and publicity to encourage participation - reaching institutions, faculty mentors and advisors, and students. The benefits for participants at both student and faculty level should be made clear.
- Outcomes and assessment of the programs. Student feedback on research experience, learning outcomes, and on whether the experience matched expectations based on database information.

Undergraduate Mobility Pilot program:

- A group of U21 institutions volunteer to participate in a pilot program, for exchanges in Spring 2016, with the goal of expanding to a full program by Spring 2017.
- Spring-Summer 2015: identify constraints on exchanges between many nodes in network, including cost and credit mechanisms, legal and visa issues. *Bilateral mechanisms involving 1-for-1 exchanges won't automatically scale to a network with 300 pairs.* [UMD: OIA, U21-central and partner universities]
- Summer 2015, create initial online marketplace, providing templates for future use. [UMD: LSC & OIA]
- Summer-Fall 2015: recruit students and process applications [pilot institutions, plus UMD: LSC & OIA]
- Spring 2016: students go on exchanges

## 5. Graduate Student Mobility

**Summary.** Increased graduate mobility accelerates research collaborations and training innovations.

**Context.** At the graduate level, the goals and the challenges are different than at the undergraduate level. At this level, the link between student mobility and research is already obvious, and faculty very much care about what students do when they leave the nest. But student mobility is less common, its value is less widely recognized, and there are additional barriers to mobility (tight degree schedules, restrictions and responsibilities tied to funding and teaching, and, more common family restrictions). Also, graduate training models are more diverse across disciplines and across countries than they are at the undergraduate level.

However, there is widespread recognition in many countries that graduate training models need to adapt, to meet the changing expectations on young scientists. Graduate students need to be flexible, adaptable, able to work outside their comfort zone, ready for diverse careers, adept communicators and collaborators. Interesting experiments are underway in multiple countries, but innovations in training do not spread as effectively as innovations in research.

Graduate students are motivated by: (i) making an impact in research, (ii) obtaining future employment; (iii) finding a network of peers and mentors that support their success; and (iv) funding -- they were the star students, but now are poorer and less secure than their peers outside the academy. GRAIL must address these needs.

**Goals.** Support graduate student research by facilitating international research visits. Support faculty research by helping graduate students to serve as “ambassadors”. Enhance graduate student preparation via access to innovative training opportunities.

**Benefits for graduate students.** Graduate students will have improved access to research and training opportunities. These can lead to greater research productivity, higher impact publications, and connections that could aid in employment opportunities. Students will be able to connect to leading international research groups, and may benefit from special training opportunities not available in the home country. Students will be able to access new tools, languages, skills, and co-mentors. By serving as “ambassadors” for research collaborations, students will gain greater responsibility, and by working outside their home environment students will gain independence and adaptability that will prepare them for future careers.

**Benefits for faculty and institutions.** Student ambassadors will facilitate collaborations and transfer of expertise and best practices. Faculty benefit when their students have access to leading international researchers or groups, or to interesting languages and populations. Research groups that host visiting students from other leading institutions benefit by added energy, new perspectives, and increased visibility. Institutions benefit -- as long as the visitors have an enriching experience -- because the visitors turn into advocates for the host institution. Institutional involvement in graduate mobility also helps institutions to be more aware of its researchers’ international activity.

**Proposed Model.** GRAIL does not seek to offer joint degrees. The key ingredients of the model are:

- GRAIL will use its online resources and its network to guide students to opportunities for research, training, and funding. Ideally it will coordinate a competition for funding incentives.
- Within U21 member institutions, language science researchers, Graduate Divisions, and International Divisions will collaborate to facilitate student mobility, funding, and preparation.

GRAIL’s role in facilitating graduate mobility will be different than at the undergraduate level. Well-designed research visits are closely tied to the expertise of the host and the visiting student, so it would be impossible for GRAIL to provide sufficient information. GRAIL can, however, help to advertise special training opportunities throughout the network, and it should aim to be involved in coordinating funding incentives.



### Infrastructure

- Funding is essential for this to work. Various models exist, and local constraints should be acknowledged. The World Universities Network (a competitor to U21) has dedicated funding for [junior researcher visits](#) to partner institutions; in some countries student funding comes from government, who offer partial funding for international visits; UMD has a [split-funding model](#) where host and home institution contribute to funding the visit. [Graduate leaders will need to commit to navigate the options.]
- Graduate Divisions and International Divisions will ensure that appropriate agreements are in place to support graduate student mobility, including minimizing fees, access to research and IT resources at the host institution, etc.
- The marketplace for undergraduate mobility can be extended to provide some guidance for graduates.
- Research trips require extensive planning; GRAIL can offer guidelines for students and hosts.
- Training trips (as opposed to research trips) can be built around advertised opportunities, e.g., [Winter Storm](#) (UMD) or the [LOT School](#) (Netherlands).
- GRAIL will keep track of who's going where.

**Challenges.** An attraction of graduate student mobility is its flexibility: graduate students face fewer time restrictions than faculty, and they are often less bound by academic year schedules than undergraduates. This group is unusually free to focus on research. But this also brings challenges for GRAIL.

- Balance. It is unrealistic to expect the flow of student traffic to be balanced across the network. Students (and their mentors) will target only those places that serve their specific individual goals. Institutions have strengths in different areas, and some will attract more interest. Therefore, graduate mobility must be configured to make it equally attractive for hosts and visitors.
- Funding models. Graduate funding models vary greatly across countries, institutions, and fields. This includes much variation in students' responsibilities at their home institution, and access to local funding that could support a co-funding model. One size might not fit all.
- Training flexibility. Graduate training models vary greatly across countries, from 3-year research-only degrees to 5+ year degrees with extensive and inflexible coursework, internship, teaching, and other requirements. This impacts when students are able to travel, and for how long.
- Host expectations. Relations between graduate students and their research mentors vary greatly across labs, fields, and countries. Whereas local practices for undergraduate engagement tend to be transparent from the outside, practices for graduate mentoring are typically inscrutable until the student arrives. Mechanisms are needed to ensure that expectations are appropriately calibrated.

### Graduate Mobility Pilot Program

- There may be less need for a pilot program than there is at the undergraduate level.
- Data gathering will be needed to identify existing funding mechanisms across institutions and fields. [UMD: GradSchool, and peers, and U21.]
- An initial competition should be advertised in Summer 2015 for visits to take place in early-to-mid 2016. Funding should be used to incentivize participation, and a condition of funding is that successful students should commit to participating in the design and assessment of this pilot program.
- Opportunities for graduate student mobility will be advertised via the GRAIL website, leveraging the marketplace designed for undergraduate exchanges.
- The pilot should be open to graduate students from all U21 institutions. This will increase the number of institutions affected by GRAIL, and it will help to test the impact of the 'balance' issue (above).

## 6. Global Classrooms

**Summary:** *Global Classrooms* provide benefits of international partnerships without the need to travel.

**Goals and specifics:** Global Classrooms are internet-enabled cross-institution courses. They bring together faculty who are interested in collaborating, and they foster connections between students by adopting a project-based approach, where students from different institutions will collaborate in international teams. We envision initially a series of courses that are led by two institutions, with one faculty member and a core group of students from each. Course delivery models could vary, according to the constraints of the subject matter and time zones, but they will all involve a high degree of interaction between students and instructors across institutions, and they will all aim to build on a combination of expertise and perspectives not available at either institution by itself. Courses could be at the graduate or undergraduate level, and may offer opportunities for highly motivated students at other institutions to participate remotely, allowing more U21 members to benefit.

**Benefits:** Global Classrooms will allow more faculty and students to benefit from international partnerships.

For students, Global Classrooms provide an opportunity to gain global perspectives on language science and to work with students and faculty in a very different environment. This helps to develop skills that are highly valued in the current employment market: collaborating in international teams and negotiating linguistic and cultural diversity in a work environment. Language science classes have strong potential to include projects that connect to local communities around participating institutions. For example, a class on bilingualism and biliteracy could address very different kinds of language context in the US and Singapore, or Sweden and South Africa.

For faculty, Global Classrooms offer an opportunity to integrate international collaboration into their existing commitments, and to engage students in these collaborations. They can make it possible to bring in disciplinary or language-specific expertise that is not available in the home institution. And they could even facilitate collaboration within an institution: a cross-taught seminar course led by prominent faculty from two institutions could be a draw for colleagues to participate.

### Example model:

The following is one possible model. Technology may not be comparable at all institutions, but there are a number of freely available or low-cost software platforms that can be used for live interactions and for asynchronous discussions, as well as for small-group meetings. (Google Hangouts, Skype, Moodle, Camtasia, etc.)

- Co-taught class, one instructor at each of two institutions.
- Class is listed at each institution and students register at home institution.
- Joint faculty syllabus design and planning of assignments.
- Simultaneous video interaction OR short recorded lectures with asynchronous online discussions.
- Small group projects, involving teams of students drawn from both institutions.
- Student assessments/grades are directed by the home institution instructor, in consultation with the partner instructor, allowing sensitivity to local conventions and expectations.

### Other considerations

- The success of the program will depend on pilots that attract influential faculty and provide them with an enriching experience. Nothing will help more than having leaders who say “We’re so glad that we tried this: here’s what we got out of it.”

- Achieving initial successes will require incentives and support for course development and course logistics, especially considering constraints of time zones, academic calendars, student expectations. Faculty and students should be able to focus as far as possible on the core benefits of the courses. And the faculty whose engagement will most benefit the program face many other demands and constraints..
- Courses should be small enough that students and faculty from both institutions have ample opportunities to interact and work closely together across institutions.

## 7. Public-facing activities: broad public engagement (in prep)

**Summary:** A long standing problem in language science is the disassociation between how much has been achieved by the field and how little the public is aware of these achievements. Public-facing events provide a mechanism to create broader awareness of core results of language science while also providing critical opportunities to develop best practices for communicating language science with the public.

**Context:** The public is in general quite interested in language -- people use language every day and educational systems specifically train people in how to use language in particular contexts (such as in formal writing). However, from the perspective of language science the public's knowledge about basic principles of language representation, structure, and use is almost completely absent. Also, many widely believed claims about language are strikingly at odds with the evidence uncovered by language scientists. This combination of public interest and ignorance provides a classic "teaching moment" and one that can be usefully exploited by language scientists. In fact, recent experiences by a number of groups across U21 suggest that one of the biggest blocks to creating public awareness about language is the lack of language scientists willing and able to communicate what they do in an accessible manner.

### Goals:

GRAIL's public-facing activities serve multiple goals.

- (i) They serve a broad need: the science of language flies under the radar, and faculty and students are motivated to raise broad awareness. Improving the public's understanding of language science creates a positive climate for conducting language science research, bringing both tangible forms of recognition (such as grant funding and new positions within departments) as well as more ephemeral forms of recognition (such as respect from one's friends and neighbors).
- (ii) They serve as a vehicle for building connections among researchers: collaborations on these activities can build relationships that lead to research partnerships. Improved skills in communicating about one's work also increases the possibility of cross-disciplinary collaborations. Language science is a broad field and accessible communication skills are non-trivial to have even within the field.
- (iii) They can achieve external visibility (locally, nationally, or internationally) on a relatively short time scale. This is what university leaders and sponsors crave. (They are less interested in the slow-to-mature research connections.)
- (iv) They contribute to spreading best practices, and creating engaged researchers. These things are necessary to maintain and improve the long term health of language science.

### Challenges (and Solutions):

There are two primary reasons that academics tend to avoid public-facing activities: they lack training to do it, and they receive little credit for doing it. Language scientists are trained to be researchers and rarely receive any instruction or guidance in how to communicate their work to the public. This problem is compounded by the fact that few research-oriented academic institutions provide incentives to engage with the public: it is almost never a component of a researcher's job description and the academic reward structure depends primarily on research outcomes (grants, publications, citations). GRAIL will address both these challenges. Through the program of visiting outreach workshops, U21 members will have the opportunity to learn existing methods for engaging the public and develop new ones that accommodate local needs as well as take advantage of the international network. Also, the development of an online repository of resources will help maintain the knowledge gained and support others as they take on the cause of public engagement. In this way GRAIL will help address the training problem that stops researchers. In addition GRAIL provides recognition and incentives to engage the public. Participation in the visiting outreach

workshops will involve desirable travel opportunities for researchers that allow them not only to see the world, but also to build relationships with potential collaborators for research and outreach.

### **Role of the GRAIL network**

- Maintain and update an online repository of outreach activities and public engagement resources. A preliminary model for this is found on the [Language Science for Everyone](#) website, which Maryland and Ohio State teams contributed to, but GRAIL will extend this. Engaging the public will need to be tailored for different linguistic and cultural environments and the website will include a wiki/chat room where U21 researchers can help each other.
- Disseminate established outreach models to new U21 institutions. Several U21 institutions have established methods of public engagement already in place (see list below). These models can be disseminated through visiting outreach workshops in which U21 researchers come to the established model and see how it works, as well as visits from researchers from the experienced teams to locations that hope to adapt that model to their home site. These outreach visits can work in concert with the plans for undergraduate and graduate student mobility.
- Development of new outreach practices. Existing models of public engagement may not be appropriate for all U21 institutions -- public engagement is a cultural practice and needs to be sensitive to cultural differences. Teams of GRAIL researchers who have an idea for a new model of outreach can be brought together to develop it, and disseminate it to others in the network.

### **Existing Opportunities & Examples of Established Public Engagement Models**

- Ohio State: lab-in-a-museum attracts thousands of visitors, serves as base for training in public engagement.
- Lund: scientists-in-schools program (faculty mentors for high school research projects) brings a research mindset to a younger population
- Edinburgh: Bilingualism Matters is an international network of groups that provides support for bilingual communities and families
- Melbourne & UBC: extensive engagement with indigenous communities
- Maryland: broad-based school engagement program; Langscape portal serves public needs

### **Implementation:**

- Collaborate on expanding "Language Science for Everyone" website
- Adapt Langscape for use in local settings (museums, schools, different countries)
- Pilot visiting workshop program. Focus at first on disseminating existing models. Established models can propose short workshops (3 day events) where they will teach others their methods and talk about how to adapt them for new environments. These can be attended in person by other U21 members and virtually by more. Success will be seen by having other U21 institutions implement these models in some form or other, and also in the expansion of the website as a tool for driving cross-talk among institutions conducting outreach.

## 8. Public-facing activities: targeted engagement with policymakers, funders, media

### Goals

- Raise the profile of language science on an international scale
- Enhance the visibility of U21 and its member institutions
- Build partnerships between GRAIL members to catalyze research and teaching connections
- Do something with sufficiently high profile to hit the radar of university leaders and their peers
- ... while also serving the research development goals of the network

### Possible Activities

- GRAIL “Summit” on Language Science in mid-2016, directed at key stakeholders in language science. Not just for media or congress. Target is professional organizations, government, industry, foundations, academia.
- Summit could lead to report on broad based needs relating to language science -- highlighting the need for a coherent approach to language problems, emphasizing the link between language science and global competitiveness.
- Report could lay groundwork for future international surveys, comparing national policies/resources relating to language science (e.g., educational programs, electronic corpora to support language technologies, high school training in language, etc.). Inspired by U21’s [Ranking of National Higher Education Systems](#) (based at U of Melbourne).

### Implementation

- Washington DC is a natural venue for an initial high profile event, due to easy access to major international organizations and close proximity to the University of Maryland.

### Summary

A 2016 summit in Washington DC could bring together a broad audience including researchers from U21 institutions, policymakers, funders, media and the general public.

### Goals

A high profile summit event will serve to raise awareness among policy-makers and the public of the significance of language science to a broad range of social, political and economic issues, and to identify key international priorities for language research that will have significant impact in areas including education, health and technology. At the same time, it will build connections between U21 researchers and institutions which will foster long-term collaborative relationships, and enhance the visibility of the U21 network. Washington DC is a natural venue for such an event, due to easy access to major international organizations and close proximity to the University of Maryland

### Specifics

A 2-3 day summit in Washington DC has the potential to serve multiple audiences and offer significant value for U21 as well as for individual researchers and institutions, as well as for the visibility of language science to an external audience. In order to serve these very different audiences’ goals, it will be important to combine a number of different types of events.

#### Public talks: the future of language science

High-profile speakers will offer their perspectives on global language challenges, their social and economic significance, and the most important opportunities for the field to impact these issues. These talks would be aimed at a diverse (external and internal) audience.

#### Public science Q&A panels

Panels where questions of significant broad interest can be submitted and are addressed by prominent language scientists (potentially including scientists from industry and government agencies as well as U21 universities). Panel sessions would be aimed at engaging media, public policy organizations and others, and to allow for their input and questions on priorities for language science research.

#### Working groups

A major component of the event will be meetings of working groups (primarily made up of researchers, but potentially including other participants e.g. from NSF or Horizon 2020), organized around relatively broad themes (e.g. multilingualism and language policy; language technology for minority and low resource languages). Outcomes of these groups will include reports that will help to set the research agenda internationally, bring visibility to specific research areas and give them public legitimacy and recognition for funding, etc. Each group will lead to a report which highlights urgent priorities, potential impacts and major challenges, along with opportunities for U21 collaboration to address these priorities.

Within each topic stream, a small number speakers in each session could be invited to present their perspective on major issues and opportunities to help focus and stimulate the discussion, but to a large extent the working groups would provide an opportunity for researchers to engage with each other and build a collaborative vision for advancing the field, as well as sowing seeds for research partnerships

#### Public exhibit/Public education event

One function of the summit will be to support the broad public engagement goals of GRAIL. This could be done either with an exhibition (e.g. in collaboration with the Smithsonian or the National Academies), or with a “live” education event in which each participating U21 institution contributes an exhibit or activity on a language science research area which is part of their specialist focus or is particularly relevant to local or national issues for their institution. This public event might be a particularly appealing target for potential company and foundation sponsorship opportunities.

#### UMD-hosted research day(s)

In order to gain maximum engagement from researchers across the network, the summit event must also advance individuals’ research goals. Following the public events, we suggest a purely research-focused section of the summit, focused on developing collaborative opportunities among researchers.

Instead of traditional workshops consisting of tightly scheduled talks, which rarely achieve much, we could instead organize real work-shops in which researchers work collaboratively on research planning. The UMD team tried this model successfully in a recent 3-day joint workshop with Tel Aviv University, which in turn was modeled on a successful [workshop](#) that Phillips organized at UMD’s Kiplin Hall Study Center in the UK.



## 9. Research Partnerships **[in prep]**

Building sustainable research partnerships is a primary goal of GRAIL. It is also the hardest thing to do quickly. Researchers do not take kindly to “arranged marriages”. All components of GRAIL will facilitate connections that could lead to joint research, but we must also dedicate specific efforts and resources to fostering research.

### Goals

- Foster bilateral and broader research partnerships
- Increase cross-language research
- Create research resources that are valuable (and visible) to a broad audience

**Some Opportunities & Possibilities.** This is a component of GRAIL that researchers already care strongly about, and that is closely linked to how they are evaluated, by administrators/governments, and by their peers.

Special Research Resources. Some special research sites or connections could benefit researchers from other institutions. Here we list just three.

- Lund’s *Humanities Lab* has a highly unusual classroom research facility that includes over 30 eye-trackers, making it possible to study the reading behavior of a large group of students simultaneously. This could be an invaluable resource for researchers on reading, classroom interaction, or second language learning.
- Maryland is currently establishing a research field station in Guatemala, opening doors for research on the many Mayan languages of the region. McGill also has expertise in that domain.
- Melbourne and Queensland have special expertise in working with indigenous languages of Australia, and in connecting fieldwork to other domains of language science. Via the new ARC Center of Excellence, there are opportunities for GRAIL researchers to gain valuable skills.

Language Commons. One potential focus of collaborations between U21 institutions is the *Language Commons*. This is a proposed worldwide language resource, containing information about language structure and use as well as written and spoken materials for all of the world’s ~7000 languages. This resource would have huge value across multiple fields, including language technology, education, linguistics, language and cultural preservation, and would be a broadly accessible, encyclopedic public resource - comparable to something like the [Encyclopedia of Life](#) in the domain of biodiversity. The only way such a large-scale resource could be developed is through broad collaboration, including language experts in a range of fields and holders of language resources (linguists, publishers, libraries, speaker communities) around the world. A Language Commons working group has previously developed ideas and proposals for creating this resource, and one of the leaders of this group is Steven Bird, a computer scientist at the University of Melbourne.

UMD’s [Langscape](#) project provides a potential base for the Language Commons: as a global, publicly accessible, discipline-neutral resource, Langscape already has global coverage and is attracting attention from diverse linguists and language experts, but developing the much larger and more diverse language resources envisioned by the Language Commons is beyond the capacity of a team at a single institution. Researchers at almost every U21 institution have expertise and/or language resources which would allow them to make vital contributions to a Language Commons, and to benefit from it.

### Challenges & Needs

- Researchers are motivated by the publications, grants, and awards that they are rewarded for.
- Research programs cannot change direction on a moment's notice.
- Strong personal connections are essential for enduring partnerships
- International research grants are hard to obtain from national funding agencies
- Researchers are skeptical of pressure on who to collaborate with
- U21 leaders are skeptical of “workshops that lead nowhere”

### Implementation Strategies

- All of the other elements of GRAIL are designed to contribute to building connections that will lead to research partnerships. These should not be understood as independent elements.
- Intensive research planning workshops. Build around collaboration, not around structured talks. Main cost is travel. Example: UMD has a Study Centre at [Kiplin Hall](#) in Yorkshire, UK. It is a hostel-like facility in the grounds of the estate once owned by Lord Baltimore, founder of the State of Maryland in 1632. It has been used mostly for undergraduate study abroad activities in the past. Phillips ran a pilot research workshop there in September 2014. It was a [great success](#). The UMD group ran a research planning workshop following a similar model in Tel Aviv in December 2014.
- [Seed funds](#) for collaborative research projects would provide a strong incentive for collaboration. These could be linked to other components of GRAIL, such as student mobility or to Global Classrooms, or could be offered independently.

## 10. Management, Budget, and Assessment

### Goals

- (i) Ensure that GRAIL is an effective investment of time and money from its many participants
- (ii) Ensure broad ownership of GRAIL activities by member institutions and subfields of language science

A “wow initiative” will not succeed without broad engagement. GRAIL requires collaboration between U21 member institutions at multiple levels: university leaders, faculty, students, fund-raisers, communicators.

**Management Structure.** In order to have broad and lasting impact across multiple fields and countries, GRAIL will need many components, and it will need commensurate management commitments. The initiative will initially be coordinated at the University of Maryland, jointly by the Office of International Affairs (OIA) and the Maryland Language Science Center (LSC). These two groups will report to an oversight group consisting of upper administration at U21, Maryland, and U21 member institutions.

GRAIL Oversight:	U21 Secretariat + Maryland Administration + Institutional Managers
Director	Colin Phillips (Maryland: 10%)
Staff	GRAIL Assistant Director: full-time PhD-level position (based at Maryland) GRAIL Events and Communications Manager: % tbd (location flexible) LSC Business Manager: Judi Gorski (Maryland: 10%)
Steering Groups	U21 Managers: directors of international affairs from U21 member institutions GRAIL Faculty: 1 per institution GRAIL Students: 1 per institution (could separate grad + undergrad)
Working Groups	Public-facing Activities Undergraduate Mobility Graduate Mobility Research Groups Teaching & Training Group Development Team: representatives from institutions' development staff Communicators Team: representatives from institutions' communications staff
Institutional Groups	From each institution, steering group members + other representative participants

Management activities will be coordinated by the GRAIL Assistant Director and by relevant members of the U21 Secretariat in the UK. Where possible, they will make use of existing U21 meetings for administrators, and video-conferencing. Faculty and student steering groups will meet monthly, and the working groups at least quarterly; more frequently initially. Owing to the diversity of time zones (from Vancouver to Auckland) many remote meetings will need to be held twice, to allow for full participation.

### Funding

GRAIL is relatively inexpensive, compared to other Big Idea themes. But it is unrealistic to think that we can achieve “wow”-level impact on a shoestring. GRAIL will require a concerted effort from multiple groups.

#### Funding Sources:

- (i) U21 Central
- (ii) member institutions
- (iii) multi-institution fund-raising efforts from development offices (foundations, donors, corporations, etc.).
- (iv) multi-institution fund-raising efforts from faculty

Item (iii) is important, as it is an opportunity that is beyond the scope of individual faculty or individual institutions. Government funding agencies typically endorse internationalization, but rarely allow funds to cross borders. Foundations, corporations, and individuals are less beholden to individual countries.

- GRAIL Personnel
  - Full-time Assistant Director: \$100k/year, incl. benefits; PhD level
  - Communications and events manager: % time tbd.
- IT & Communications
  - Website development and maintenance. U21-branded, but UMD-hosted. \$20k and up, depending on internal/external developer and specialized application needs.
  - Other electronic and print communications
  - Tech support for electronic collaborations: member institutions commitment
- Travel
  - Member travel for GRAIL activities: requires institutional commitment
  - GRAIL network development, network leaders: funded by who?
- Student mobility
  - Undergraduate: facilitated by institutional or private support, enhanced if GRAIL can offer incentives for GRAIL-related exchanges. Requires institutional commitment to supporting arrangements for tuition, housing, etc.
  - Graduate: a split-funding model requires institutional support, enhanced if GRAIL can offer further incentives for GRAIL-related research partnerships.
- Global Classrooms
  - Requires support of participating institutions for use of faculty/staff time and incentives for participation. Success depends on engaging influential faculty at an early stage.
- Public-facing activities
  - Activities for broad public: greatly varying costs, depending on goals
  - Global Summit targeting key stakeholders: cost varies based on size and location. LSC has some estimates from a 125-person event organized by UMD's Smith School of Business at its downtown Washington DC location in the Ronald Reagan Building.
  - Event-specific costs: could be done for \$30k to \$100k+.
  - Event planning, recruitment and management: requires substantial staff time.
- Research
  - One of the first questions that faculty ask is: will this provide funding for research collaborations?
  - Possible funding targets: student ambassadors (\$4-6k each), seed funds for projects (\$10-30k each), research incubator workshops (\$15-20k each).
- UMD commitments
  - LSC staff time (Phillips & Gorski, 10% each) = \$40k/year, incl. benefits
  - Institutional personnel time (OIA, VPR, GradSch, Development, MarCom)
  - Funds for high-profile event
  - Direct funding for GRAIL activities: TBD
  - New space, co-locating OIA & LSC = 25% of a \$12M building renovation project
  - Travel for participants to GRAIL events
- U21 commitments
  - Secretariat time and support
  - Specific funding listed above
- Member institution commitments
  - Faculty leaders' time

- Administrative staff resources (international affairs, research, fund-raising)
- Engagement from institutional leaders
- Travel for participants in GRAIL activities
- Incentives for participation, e.g., in Global Classrooms
- Translation of key materials (where applicable)

### **Evaluation Metrics & Timelines**

A focus of GRAIL is on improving the quality and impact of international engagement, and not merely on moving raw numbers. The evaluation metrics must reflect this.

- Student mobility programs:
  - Number of students, faculty, and institutions served (important that many members benefit)
  - Impact of student mobility on fostering new collaborations, disseminating best practices etc.
- Global classrooms
  - Number of courses, scope of engagement (number of students and number of institutions served)
  - Impact of courses on fostering lasting connections
- Public-facing activities
  - Number and scope of activities, especially those that involve cross-institution collaboration
  - Impact of events and activities
- Research partnerships
  - New research projects implemented
  - Collaborative funding requests and successes

Formative assessment is important, and can lead to greatly improved outcomes. But it easily falls down the list of priorities, unless oversight measures are in place. Possible measures would include creating an external advisory board (cost = travel; rotating locations?), or having select GRAIL leaders meet with U21 leaders at an existing U21 meeting (cost = travel).

### Timelines: key initial steps

- Summer 2015: recruit GRAIL staff. Assemble GRAIL management structure.
- Summer-Fall 2015: develop pilot programs for student mobility, assemble network-wide information on researchers and programs. Build GRAIL website and marketplace.
- Fall 2015: develop initial Global Classrooms offerings. Plan and recruit for Global Summit.
- Spring 2016: initial student visits
- Summer 2016: U21-GRAIL Summit on Language Science

## 11. Feasibility and Qualifications

*The rationale behind this piece is to address the question, coming from somebody who sees the proposal and does not know about it: “Who do they think they are? Why should we take this proposal seriously?”*

**Member Institutions.** U21 contains a remarkable wealth of talent in language science. The network includes multiple word-class hubs for language research, spanning multiple fields. Also, the network has an unusual concentration of institutions where coordination between language scientists in different fields is already strong, together with a number of individuals who are prominent interdisciplinary leaders. This is an excellent foundation, and we would not be proposing GRAIL if these fundamentals were less strong. (Language scientists: check out Wikipedia’s list of [university alliances](#), and see if you can find one that’s stronger in language.)

**University of Maryland and the Language Science Center (LSC).** GRAIL will be coordinated by LSC, which is an umbrella for 17 academic units and 200 researchers across the entire university, and with many links beyond the university. Participating departments range from education to engineering, from philosophy to neuro-physiology, and including centers with close ties to government and industry. LSC was founded in 2013, building on a pre-existing network of collaborations spanning many different units. LSC represents an unusual university commitment to language science as a big-but-coherent theme. It has dedicated staff and space resources that can contribute to GRAIL, and UMD is currently designing new physical facilities that will soon co-house LSC together with its International Affairs division, creating an ideal setting for collaboration. LSC is a leader in innovative student training, being one of very few groups (in any field of science) to be recognized twice with prestigious National Science Foundation awards for interdisciplinary graduate training. UMD’s setting in the Washington DC area confers many advantages for international connections that can support GRAIL, due to government, embassies, NGOs, and many other organizations.

**Leadership.** Colin Phillips is well qualified to serve as GRAIL’s initial director. He has a strong international profile in interdisciplinary language research, and he is a tireless promoter of integration across sub-fields of language science. He has substantial experience in building innovative multi-department training programs, and is (increasingly) experienced in public-facing science.

### Existing Connections and Contacts

- We have already been in contact with most U21 member institutions, either at the researcher level or the managers/leaders level, or both. Initial plans have met with broad enthusiasm.
- Many existing researcher connections across the network, certainly not emanating from a single node
- Strong connections exist via \$27M ARC CoE on Dynamics of Language, which includes Melbourne and Queensland as key participants (lead institution is ANU), plus links to Lund, Singapore, Hong Kong U.
- The 3 US institutions are already closely connected, via (i) Language Science for Everyone initiative [OSU-UMD], (ii) interdisciplinary training awards [UConn-UMD], (iii) CIC [OSU-UMD], (iv) collaboration on an NSF-PIRE proposal designed to support GRAIL [UMD-UConn-OSU]. Given the large number of institutions in the US, this degree of alignment is very fortuitous.
- There are already strong ties between language researchers at the 4 UK institutions (Edinburgh, Birmingham, Glasgow, Nottingham)
- Haskins Laboratories (New Haven, USA) is part of the UConn language science community, and has joint projects with McGill, UBC, Lund, and Hong Kong, among others.
- ... and many more examples than these.

## 12. Selected Strengths and Connections

The network contains many world-class centers of excellence in one or more areas of language science. Many of the nodes include leaders with broad connections across multiple fields. There are many existing connections across the network.

- **Maryland:** largest community of language scientists in N America, spans 17 units across university.
- **Edinburgh:** largest community of language scientists in UK, with very strong groups in Psychology, Linguistics, and Informatics; a world-leader in language and computation; leading a broad international engagement network in multilingualism (“Bilingualism Matters”).
- **Connecticut:** language science is key strength, across Psychology/Neuroscience, Linguistics, Speech, Language & Hearing Sciences; recent \$3M NSF-IGERT interdisciplinary award; includes strength in sign languages, linguistics, psychology/neuroscience/genetics, autism, evolution; Haskins Laboratories.
- **Lund:** strongest language science group in Scandinavia; expertise in linguistics, literacy, neuroscience, language learning (first, second, bilingual), multimodality; innovative Humanities Lab.
- **Ohio State:** strong multi-department language group; innovation leaders in scientific engagement; strengths in speech, clinical language, learning, computation, language variation, second language studies.
- **McGill:** leading interdisciplinary language group in Canada, spans linguistics, neuroscience, communication disorders; strengths in language diversity, language & music, bilingualism, neuroscience.
- **Amsterdam:** Many language scientists; ‘ground zero’ for the field of language & logic (intersection of Philosophy, CompSci, and Linguistics).
- **Birmingham:** strength in psychology of language, e.g., *Language in Mind* workshop, June ‘14.
- **Melbourne:** expertise in language diversity (e.g., fieldwork in Australia, the Pacific and Papua New Guinea), overlapping with language learning, and with language technology, e.g., Steven Bird’s *aikuma* app, [lp20.org/aikuma](http://lp20.org/aikuma); world-class machine-learning group.
- **Singapore:** growing strength in linguistics and language learning; special interest of Singapore’s multi-lingual society, including diverse varieties of Chinese.
- **British Columbia:** world-leading expertise in infant language development (Janet Werker), internationally prominent research on language diversity, especially via First Nations languages (e.g., Lisa Matthewson).
- **Nottingham:** strong bilingualism research group spans Schools of Psychology and English Studies; existing ties to Glasgow and others.
- **Glasgow:** internationally prominent in psychology of language (Simon Garrod, Tony Sanford, Linda Moxey, Christoph Scheepers), and in sociolinguistics and language variation (e.g., Jennifer Smith).
- **Korea U:** strong group of linguists, exploring interdisciplinary connections.
- **Auckland:** strengths in bilingualism/second language learning, Oceanic languages, evolution, neuroscience.
- **Hong Kong:** strength in Chinese and minority languages of China, bilingualism, psychology and neuroscience (e.g., State Key Laboratory in Cognitive Neuroscience - unusual for Hong Kong)
- **Queensland:** language disorders, computational models of evolution of language, Aboriginal languages and song-poetry.
- **Shanghai Jiao Tong:** investing strongly in cognitive science
- **Delhi:** coordinates internationally known linguistics school in Himalayan mountains
- **Fudan, UCD, Monterrey, PUC, UNSW, Johannesburg:** [...]



## **Language Poverty**

Proposal for the MacArthur Foundation 100&Change Competition

### **Maryland Language Science Center (LSC)**

Faculty leads: Colin Phillips, Rochelle Newman, Jan Edwards, Maria Polinsky

### **UMD Partners From**

ARHU, BSOS, CMNS, ENGR, EDUC, SPH, iSchool, VPR/CASL, OIA

Marine Carpuat (CompSci), Hal Daumé (CompSci), Carol Espy-Wilson (Elec. Eng.), Naomi Feldman (Ling.), Jon Froehlich (CompSci), Amalia Gnanadesikan (CASL), Yi Ting Huang (HESP), Jeff Lidz (Ling.), Mike Maxwell (CASL), Michelle Morrison (CASL), Omer Preminger (Ling.), Nan Ratner (HESP), Philip Resnik (Ling.), Anton Rytting (CASL), Rebecca Silverman (CHSE), Ana Taboada Barber (CHSE), Tess Wood (LSC)

Potential additional expertise from Economics, Human Development, Public Health

### **Institutional/Organizational Partners**

University of British Columbia, University of Edinburgh,  
University of Johannesburg, Universidad del Valle de Guatemala Altiplano  
Wuqu' Kawoq Maya Health Alliance, Tostan Foundation

### **Individual Partners**

Anne Fernald - Stanford University  
Kathy Hirsh-Pasek - Brookings Institution & Temple University  
Meredith Rowe - Harvard School of Education

**What is language poverty, and why does it matter?** Just as malnutrition is a primary risk to physical health worldwide, inadequate linguistic interactions are a leading risk to intellectual development. “Language poverty” refers to a shortage of quality linguistic nutrients that support learning, both in early childhood when the nutrients come mostly from caregiver interactions, and later when the nutrients for learning include print and digital materials. Millions of children are affected worldwide, with profound consequences for economic opportunity, health, and stability in increasingly globalized societies.

Language poverty\*\* has multiple causes, including extreme stress and financial instability, maternal depression, and limited understanding of child development. It is exacerbated by migration and by the digital divide: 99% of the world’s 6000+ languages have minimal or zero resources, so speakers cannot access the information that people in privileged settings now take for granted. The problem is attracting attention in the US as a public health issue (e.g., the “30 million word gap”), but it remains largely overlooked on a national and global scale. This is because it is typically viewed as a series of disconnected problems, handled by different experts; because we lack good ways to measure the impact; because we take language skills for granted; and because individuals with the power to address the problem are less affected. Globalization, the internet, and automation have increased the importance of strong language skills, literacy, and information access, and have increased the costs of language poverty, but they also offer opportunities for new solutions, given a suitable combination of expertise.

*\*\*The term ‘language poverty’ is controversial, as it is sometimes taken to imply de-valuing of non-prestige languages or cultures. We assume that all languages can provide the scaffolding for rich interaction and learning. Our concern is with barriers to realizing that potential.*

**What is our solution? What is distinctive about it?** Our aim is to create models that dramatically improve young children’s access to rich linguistic interactions and that are readily scalable across languages and cultures. The elements of our solution involve: (i) identifying key linguistic nutrients - surprisingly little is known about this at present; (ii) tracking the delivery of the nutrients, and (iii) actively promoting improved delivery of the nutrients (e.g., “language fitbit” app). We will focus on using resources with little or no marginal cost through caregivers and mobile technology. Unlike food nutrients, language costs nothing and any caregiver can provide rich interaction. Mobile technology is widespread in developing countries, and low-cost smartphone technology will spread rapidly in coming years.

The pieces of the solution currently exist in only very basic form. Using a nutritional analogy, the state of the art is: a rich diet matters, but the essential elements are unknown; costly devices can track the overall quantity of ‘food’ (language input) in the diet, with no information about nutritional quality; parent education programs are effective, but they are coarse-grained and focus on encouraging regular feeding. These components do not scale, as they depend on costly expertise and technology, and there is little generalization across languages and cultures.

We have assembled a team of experts that can greatly advance all pieces of the solution, in a way that potentially scales across hundreds of languages and cultures. Our understanding of the nutrients and how they are realized across languages can advance through a combination of comparative linguistics, computational analysis of child interactions and outcomes, and experimental research on the effects of specific nutrients, carried out in university labs and in the field. Our ability to automatically track delivery of quality nutrients can be improved through state of the art language technology and automatic speech recognition (ASR), together with collection of digital resources and tools that allow scaling to many new languages. We can

## Language Poverty

actively promote quality linguistic nutrition via behavioral feedback, delivered via caregiver education and mobile apps. Interactive apps have the potential to facilitate rich human interaction, or to partly substitute for it in settings where it is less available, e.g., due to maternal depression or work demands. This requires expertise in education, motivation, and interactive technology. Also, the value of individual-focused solutions is increased if it is accompanied by broader public understanding and valuing of language skills.

**Our team and partners.** Our deep existing network of connections has allowed us to assemble a formidable team and partners for this proposal, covering diverse fields and locations.

Maryland Language Science Center (LSC). [LSC](#) brings together researchers from 17 units, with research that spans fundamental science and applications in education, technology, and health. No group in the world matches LSC's ability to connect pieces of the language poverty problem.

Field sites. We will test and implement our solution in 4 settings. In each case we will work closely with communities and local institutions, and can build on existing partnerships.

#1: USA - Baltimore & Washington DC. Language poverty and school readiness are already recognized as a major concern. We can work at an advanced stage, since so much is known about early learning of English, digital tools are easier to build, and smartphone access is widespread. In Baltimore we are collaborating with BCPS on language readiness for K-1 children, and we have local opportunities to move from English to Spanish.

#2: Guatemala - Sololá. This site allows us to work Spanish and with indigenous Mayan languages and communities, where poverty and widespread maternal depression lead to significant child language disadvantages. We recently established a field station and organized a 13-person [research expedition](#). Our partners there include the [Wuqu' Kawoq](#) Maya Health Alliance NGO, and the Universidad del Valle de Guatemala Altiplano. Our local research director, Pedro Mateo Pedro is an indigenous researcher with a US PhD. 20 Mayan languages are spoken in the region, creating a fertile ground for testing scalability across languages.

#3: Africa - Kaolack, Senegal OR Johannesburg, S. Africa. Africa is incredibly rich in languages, and is facing dramatic population growth. Many of [its 2000 languages](#) have almost no digital footprint and little available information. We have concrete opportunities via a US partner who works closely in Senegal with the [Tostan](#) NGO on language poverty. We have a connection via our GRAIL network with the U of Johannesburg, which is active in education for speakers of Bantu languages. UMD's [CASL](#) has unusually rich expertise in African languages.

#4: Asia. We have two promising opportunities: one of our key faculty, Rebecca Silverman, is starting a two-year placement in Burma; LSC and CASL both have connections in Indonesia.

Institutional partners. Our project draws on a series of institution-level partnerships under the *Global Research Alliance in Language* ([GRAIL](#)), a model of internationalization that was developed by LSC and that university presidents from the [Universitas 21](#) network recently approved as a signature initiative. For this project we can tap into world-class language groups at the U of British Columbia (especially for infant language and speech technology), the U of Edinburgh (#1 in Europe, especially strong in language technology), and the U of Melbourne, plus valuable community research connections via the U of Johannesburg.

Additional partners. Our team also includes researchers who are leaders in their area. [Anne Fernald](#) (Stanford - caregiver input and language development), [Meredith Rowe](#) (Harvard - SES and language development), [Kathy Hirsh-Pasek](#) (Brookings Inst. & Temple U - bridging the research-to-practice gap for families in poverty), [Jon Froehlich](#) (UMD CompSci - interactive

## Language Poverty

technology). We are also in discussions with UMD experts in global public health, cross-cultural parenting, motivation, and economics. We will seek in-kind contributions from organizations with resources and expertise that we could not hope to match, e.g., in technology and education.

**What can be achieved in the first 3 years?** We envision at least a 10-year commitment to this effort, with the MacArthur investment in Years 1-6. In 3 years we will build the project to full capacity, from basic developmental measures to app delivery. The starting conditions differ across sites. In our US site we benefit from basic developmental scales, digital resources for app development, and smartphone availability. More groundwork is needed for our other languages/sites, where language development is barely studied, digital resources are scarce-to-absent, and technology is less advanced. These differences allow us to work on all stages of the problem in parallel.

After 3 years we aim to have a full research-to-application pipeline in place for the US site, connecting research on linguistic nutrients to technology that tracks delivery of the nutrients, provides feedback, and actively elicits specific types of interaction, e.g., using GPS to elicit dialog based on location information (grocery store, park). Once a full pipeline is in place we can progressively improve the technology to track more detailed indicators of interaction, e.g., lexical diversity, utterance types (questions vs. commands). Even the initial release will be a significant advance over current resources, which are costly, coarse, and not scalable.

At our international sites our 3-year goal will be to build models for measuring language skills and access to nutrients, i.e., human interactions and print/electronic resources, and to make these readily transferable across languages and communities. This serves the key goal of identifying the extent and importance of language poverty, which is needed for motivating communities to address the problem. These sites lack the technology and digital resources available in English, and so we will work in parallel on developing tech-free programs for fostering interactions with caregivers and educators, and building the digital resources needed to begin to adapt technology from English to under-resourced languages.

### **What differentiates our problem, approach, and team? How do we meet scoring criteria?**

Our problem is distinctive due to the remarkable mismatch between the global benefits of reducing language poverty, the availability of low-cost delivery methods, and the limited awareness of the issue. It is tractable and scalable, and not about to be solved by governments or industry, though both could get behind the effort and make invaluable contributions.

Our team has a unique ability to put the pieces of the solution together. We include individuals who are international leaders in the different pieces of the problem, and the core of our team is an interdisciplinary group that has an unusual record of collaboration and success. The Maryland Language Science Center, founded in 2013, is the institutionalization of a grassroots initiative started 10 years ago that spans 200 researchers from 17 units, from special education to electrical engineering. We are able to draw on a rich network of global connections: through our new Guatemalan field station, through the worldwide institutional partners in the GRAIL initiative, and through our overall profile. We reach well beyond academia, through established relations with school districts, industry, writers, and DC-area professional and policy groups. Over the past 3 years we have built a wealth of new programs, research initiatives, and partnerships; we have competed successfully to recruit and retain top talent, at all levels. For example, two of the four faculty leads (Polinsky, Edwards) on this proposal are new senior recruits who already lead significant initiatives that this proposal builds upon. An example of collective success is that we are the only group, in any STEM field, to win both IGERT and NRT

## Language Poverty

training grants from NSF (3-5% success rates). The strength and cohesion of the core team made it possible to assemble a team of experts in diverse fields from around the world on short notice. In the longer term, it ensures sustainability.

Our approach is distinctive because it is uniquely comprehensive. We build upon promising efforts involving individual pieces, some of them involving our team members, but the integrated approach has many advantages. The focus on caregivers and on readily available technology makes our approach more scalable than one that depends on physicians or custom technology. Our emphasis on portability across languages and communities improves scalability and durability. And the comprehensive approach, creates a unique opportunity to analyze the relative benefits of different actions in different linguistic or cultural settings.

The MacArthur scoring criteria are addressed throughout this proposal, but in brief: our problem is meaningful because it profoundly affects societies worldwide, and our solution aims for broad scalability. Our approach is verifiable because it builds on components that have shown value (behavioral change programs, multilingual technology), but it greatly increases their scalability. Replicability is built into the project via multiple test sites. The project is feasible given the records of the team members. Our team members have achieved exceptional results across multiple fields. Collectively, the team has remarkable success in fostering collaboration and building new programs, projects, and partnerships across disciplines and institutions. Finally, the project is durable to the extent that it relies on readily available resources, generalizes across languages and cultures, and builds on a set of established connections.

**Budget outline.** We will ramp-up and ramp-down expenditures to maximize sustainability, and balance investments so that individual components do not fall behind. We have experience of running a field site, and in app development. Annual spending over 6 years will be \$5M, \$15M, \$20M, \$20M, \$15M, \$10M, with \$15M held back in endowment for long-term evaluation and infrastructure for scalability. Annual allocations: Research - 20%, Field Sites - 25%, Personnel - 20%; tech/app development - 30%; operations (admin, meetings) - 5%.

**Leadership & Management.** Our team is well qualified to define and implement an ambitious vision. Over 10 years UMD's language science initiative has been transformed from a small grassroots effort to the world leader in a new integrated field. The talent and partners that we have recruited in the past 2 years greatly extend our capacity. Many years of collaboration have shown us what we do well, and where we would need help for a project of this scale. The project will be led by the Director and Associate Directors of LSC, in roles that fit their leadership expertise. [Colin Phillips](#), [Rochelle Newman](#), [Jan Edwards](#), and [Maria Polinsky](#) will focus, respectively, on overall external and internal direction, bridging research and applications, and international sites. All are distinguished scientists with strong experience of leadership and connecting divergent fields. The rest of the team brings a remarkable wealth of intellectual leadership in different areas, providing the talent needed to lead specific subprojects and sites.

Although we are ambitious, we are also realistic. We recognize that we would need to recruit a senior project manager for an effort of this scale, e.g, somebody who has directed a DARPA program. Our board of directors will be diverse and demanding. They will bring key external connections. For example, technology entrepreneur and UM Foundation Board member Dave Baggett can help with tech industry connections, and Ann and Tom Friedman can help us build connections in early learning, globalization, and public engagement.

## NSF Science & Technology Center in Language Science

Language has played an outsized role in changes in the world in the past 20 years - in ways that are often unacknowledged and not always positive. Technologies built around human language have revolutionized daily lives for many, but the effects have been less democratizing than hoped. The rich (individuals, countries, languages) have gotten richer, while billions are left behind in "language poverty". Linguistic barriers and inequalities hamper the flow of information and the health and stability of populations at both global and local scales. In a globalized economy where markets for goods, services, and talent all change rapidly, flexible language skills and access to reliable information are essential for social and economic opportunity. In the U.S., language and dialect differences widen the achievement gap in K-12 education, employment and housing discrimination, and reduce access to healthcare and other services. Language inequality also has significant costs for security and economic stability. Expertise in little-known languages, from the 7000 worldwide, can become critical at a moment's notice due to security threats or humanitarian crises that displace large populations.

We propose an STC that focuses on the science that underlies these disparities and lost opportunities, as the focus of a broad effort to advance the emerging field of language science. The research encompasses a range of disciplines, and the applications extend to technology, education, and health. All are united by some core questions. What are the relative strengths and weaknesses of humans and technology, and how can we optimize performance by combining them? How can humans and machines learn from impoverished data, 'bootstrapping' missing information based on what they already know? How do we develop an understanding of language that is deeply informed by diverse languages and populations, and use this to build more flexible resources?

Our STC's efforts in education, broadening participation and knowledge transfer are inseparable from the research efforts. Our research is impossible without interdisciplinary training. Our research themes will attract broader participation in science and would be impossible without it. Our diverse partners will be springboards for knowledge transfer. We are well-positioned to create a strong STC, thanks to years of groundwork, where we have leveraged successful NSF-supported training grants to lay foundations for a broader effort.

**What is Language Science?** 'Language Science' is a cover term for a broad field that is concerned with the fundamental science of human language, and applications in education, health, and technology. It encompasses many disciplines, including linguistics, cognitive science, human development, neuroscience, hearing and speech sciences, computer and information sciences, and education. Language is immensely important to humans, but this exacerbates fragmentation, as it is studied in such diverse fields, typically siloed in different departments.

**Why is Language Science a suitable theme?** Language science as an integrated field is an emerging idea, and UMD is seen as the international leader in developing and institutionalizing the field.

The main organizational challenge for language science is to show scientific common purpose, i.e., that individual sub-fields genuinely benefit from collaboration. The main scientific challenge is to understand in detail why humans, with their limited memory, slower processors, and limited 'training data', outperform the best language technology on all but routine tasks. Two key human advantages are the constraints built into human biology and humans' ability to flexibly integrate different types of information, using context. The most pressing societal and technological challenges surround inequality, risks, and lost opportunity caused by limited or non-existent language technology, by gaps in health or education opportunities, or by outright communication breakdown.

**Why is UMD competitive?** Our competitiveness benefits from substantial pilot work over 5-10 years, and from occupying a part of the STEM landscape where few teams can mount a comparable effort. There are no current STCs with a base in NSF's SBE directorate, and UMD Language Science is uniquely prepared to mount an STC-scale effort in those fields.

Our approach follows a successful strategy in graduate education. In 2002 we were not competitive for an NSF training grant; 5 years of groundwork led us in 2008 to win UMD's first \$3M NSF IGERT award, and then in 2015 to become the first team in the nation to follow this with a \$3M NSF NRT award. Our group is now a recognized leader in graduate training. We have trained 80 PhDs from 10 departments, many of whom are now successful independent scientists. Building on this success, in 2013 we worked with the VPR, Provost and Deans to create

the Maryland Language Science Center, with the aim of broadening our impact in research, education, and partnerships, and being a model for a new field. We have built infrastructure for broad research initiatives, locally and internationally. We have expanded our interdisciplinary research training to undergraduates through our PULSAR program, and we are involved in multiple efforts to engage K-12 students and the wider public. We have built diverse participation and developed initiatives that support increasing diversity, ranging from partnerships with local majority-minority school districts to our Guatemala Field Station to citizen science to ethical AI. We have greatly increased external engagement, ranging from government, industry, NGOs and policy contacts to our role in shaping *Planet Word*, a new language museum due to open in central DC in late 2019.

**Research Themes.** To address language-based inequality, we must prioritize science and technology created by, for, and about the people and languages that are currently underrepresented and underserved. In the past, scientists have drawn scientific generalizations from populations of convenience (mostly white, upper/middle class, typically-developing speakers of mainstream American English) in ideal situations (e.g. not hungry or anxious or tired, in a quiet place with no distractions). Similarly, engineers have built technology dependent on data of convenience (billions of words of written English that can be scraped from the internet). As a consequence, scientific and technological developments do not extend easily to other populations or languages.

What would it take to build language technology for, say, Kaqchikel (one of the Mayan languages studied at our Guatemala Field Station)? It's not just a question of focus and resources: cutting-edge technologies that work for English fail catastrophically for low-resource languages. To succeed with Kaqchikel, we would need to leverage everything we know about language structure and diversity, plus how human children learn language from a limited amount of spoken input, often in noisy environments. And we would need to partner with speakers of Kaqchikel and local community leaders to understand not only the language itself, but new uses of technology that address local needs. This strategy--combining the strengths of humans and machines and partnering with diverse communities--will drive progress in many different research areas. Examples include:

Human-machine teaming: combining their strengths to solve problems using language-based technology;

Multi-level learning: simultaneous integration of information from multiple levels (e.g., words & sounds);

Language diversity and learning: developing statistically informed models of inference in learners that account for diverse languages and contexts;

Typology and technology: leveraging high-resource languages to improve technology for related languages;

Bias in AI: addressing the impact of biased/limited training data, and its impact on decision-making;

'Inverted' cross-language information retrieval: improving access to information in English via minority languages;

Understanding in adverse settings: dealing with cochlear implants, noise, scanning and information overload;

'Pedagogical input': understanding what language experience gives learners the best bang for their buck.

Our ability to pursue these themes in depth, in ways that benefit underserved groups, is enhanced by the breadth of expertise of collaborating faculty (from domains as widespread as public health, engineering, and education) and by the research venues that we have laid groundwork for. Locally we have partnerships with school districts, including many urban schools in Baltimore. We have established a research field station and numerous partnerships in the Mayan highlands of Guatemala, and we are developing related partnerships in the Republic of Georgia. We can draw upon enviable research resources at UMD, including the Maryland Neuroimaging Center, which we had a big hand in establishing. And through our *Langscape* digital portal we aim to engage diverse participants in creating the first flexible, open-source mapping of global language use, a tool that holds great value for applications such as humanitarian aid, global literacy, and flexible language technologies.

**Educational innovation.** Our educational efforts closely follow the research challenges. The key needs are training in (i) what humans and machines do well; (ii) complementing disciplinary expertise with training in technology and human science; (iii) connecting science to societal challenges; (iv) communicating about science across disciplines, and more broadly to policy-makers and the public. The guiding principles that we bring from our past experiences are: student 'ownership', vertical integration from K-12 to faculty, getting outside one's comfort zone, and training students to connect specific questions to broader challenges and societal needs.

At the graduate level we will build upon our Language Science Fellows program that has used 10 years of NSF support to bring about dramatic changes in cross-disciplinary training, student leadership, and preparation for diverse careers. The program is easily adapted to STC goals.



For undergraduates we propose a Living-Learning Community on Language Science and Global Inequality. It will link interests in CS/Engineering with social sciences, and serve existing majors and a new interdisciplinary minor, building on our 4-year-old PULSAR program for training undergraduates in research and public engagement.

At the K-12 level we will develop high school summer programs that build interest in language science in humans and computers. This will open students' eyes to fields that span traditional divisions in the HS curriculum and will broaden participation in our field(s). Additionally our STC will support a national effort to institutionalize language science HS education by creating an AP curriculum. We are currently involved in early stages of this effort.

For faculty we will sponsor individualized training that has them learning new skills alongside their students.

**Broadening Participation.** Underrepresentation in science affects our component fields in different ways. For example, women are severely underrepresented in computer science, while American racial minorities are underrepresented in linguistics. Our strategy for broadening participation has three components.

First, we aim to increase motivation to participate in language science through our focus on research themes with a social justice angle or direct relevance to students' home communities (including communities of origin for migrants). In addition, our communications will aim to raise the prestige of language science careers. Second, we aim to remove barriers through targeted funding, structured mentorship programs, and research venues that fit participants' life constraints. We will prepare students for diverse career pathways, reducing the perceived risk of entering the field. Third, we will promote diverse contributions by targeting not only traditional academic participation, but also scientifically engaged professionals, citizen scientists, and crowd-sourcing methods. All of these broaden the base of participation in science.

Through our past NSF support for graduate training and our pilot work for the STC we have had made progress in broadening participation in a number of ways: we have unusually high participation of women in computational research; we have developed research initiatives and partnerships that support work on social justice themes (e.g., Toggle Talk project in Baltimore schools); we have helped at-risk students achieve a high graduation rate; and our students have turned their analytical skills to researching gender bias in language science.

**Knowledge Transfer.** With our focus on challenges affecting diverse populations worldwide, knowledge transfer is an integral part of our research and efforts to broaden participation. Importantly, it's a two-way transfer: we do not want to simply disseminate our wisdom to diverse 'audiences'. We want to collaborate with diverse 'partners', understanding how science is relevant to their needs, and developing resources that they can actually use.

In addition to community partnerships (both local and international), we aim to build partnerships in K-12 education, policy (local to national), government and national security, industry, and health care. These different sectors share some key challenges: public understanding of language is limited, and its role in causing or addressing diverse societal challenges is undervalued. We have laid the groundwork for successful partnerships in various ways: close involvement with *Planet Word*, the first significant US museum devoted to language; coordinating roundtables on language science for government agencies; *Langscape*, a widely-viewed public portal for language diversity; a growing network of K-12 school connections; policy internships for graduate students.

To build the field of language science, it is also essential that we partner with academic institutions who can adopt our approach. Almost all institutions have some elements of language science, but not with the breadth or infrastructure that UMD has built. They need practical steps for getting started. We already serve as a role model in this area, by sharing resources and giving presentations on building academic initiatives in language science, and co-leading the national *Language Science for Everyone* network. We also designed an international network of language science groups, integrated with UMD's role in the *Universitas21* alliance.

Two new initiatives that our STC targets are: (i) an online portal that curates language science research news in a format suitable for a diverse audience, including lay summaries of new results; (ii) an initiative that hosts visiting fellows from diverse sectors and develops white papers linking science to policy. These would be strengthened by partners with professional and government organizations based in the DC area, plus the visibility and venues available via our relationship with the *Planet Word* museum.

*Note on the name: we do propose a center with a new name from the one already created. Rationale: we can more readily adapt and scale the existing unit than create a new unit that would suffocate the existing one.*

## Team & Partners

*Due to the short turnaround time for the internal call, and the lack of an actual NSF RFP, the list of team and partners is preliminary. Our focus was on discussions that identified cross-cutting themes and scientific challenges that connect a broad community. All partners reflect serious connections that we have worked with on projects, proposals, or other activities that fall under the proposed STC.*

PI: Colin Phillips. Professor & Distinguished Scholar Teacher, Linguistics; Director, Maryland Language Science Center; Associate Director, Neuroscience & Cognitive Science.

### *Faculty who participated in development of this proposal:*

DJ Bolger (Education - HDQM), Jordan Boyd-Graber (CS, iSchool, UMIACS), Thomas Connors (CASL/ARLIS), Rebecca Damari (NFLC), Jan Edwards (HESP), Naomi Feldman (Ling., UMIACS), Kira Gor (SLLC), Yi Ting Huang (HESP), Bill Idsardi (Ling.), Michael Israel (English), Shevaun Lewis (LSC), Jeff Lidz (Ling.), Rochelle Newman (HESP), Jared Novick (HESP), Maria Polinsky (Ling.), Omer Preminger (Ling.), Nan Ratner (HESP), Philip Resnik (Ling., UMIACS), Anton Rytting (CASL, UMIACS), Ebony Terrell Shockley (Education - TLPL), Bob Slevc (Psych.), Tess Wood (LSC).

### *Selected faculty whose research is reflected in the proposal and are already involved in developing our center:*

Cynthia Baur (SPH - HCHL), Marine Carpuat (CS, UMIACS), Hal Daumé (CS, UMIACS), Carol Espy-Wilson (ECE), Matt Goupell (HESP), Valentine Hacquard (Ling.), Ellen Lau (Ling.), Doug Oard (iSchool, UMIACS), Ana Taboada Barber (Education - CHSE), Alexander Williams (Ling., Philosophy).

### *Abbreviations:*

CASL - Center for Advanced Study of Language, CHSE - Counseling, Higher Education, & Special Education, CS - Computer Science, ECE - Electrical and Computer Engineering, HCHL - Horwitz Center for Health Literacy, HDQM - Human Development and Quantitative Methodology, HESP - Hearing & Speech Sciences, LSC - Maryland Language Science Center, NFLC - National Foreign Language Center, SLLC - School of Languages, Literatures, and Cultures, SPH - School of Public Health, TLPL - Teaching, Learning, Policy, & Leadership, UMIACS - UM Institute for Advanced Computer Studies

ACADEMIC PARTNERS. *We can draw on an extensive network of academic partners (inter)nationally.*

University of Maryland - Center for Geospatial Information Systems [*Language mapping*]

University of Maryland (CP/Baltimore/Med Center) - Maryland Cochlear Implant Center of Excellence (MCICE)

Iliia State University, Tbilisi, Georgia [*Georgia/Caucasus research initiative partner*]

Universidad del Valle de Guatemala, Antigua [*Guatemala Field Station partner*]

Universitas 21 - global network of research universities, including Amsterdam, Auckland, British Columbia, Connecticut, UC Davis, Delhi, Edinburgh, Lund, Melbourne, NU Singapore, Waseda, Zurich. Includes many with strong language science groups. We have developed a partnership plan with the network, stalled by higher-level administrative changes.

SELECTED NON-ACADEMIC PARTNERS: *All of these are involved in elements of our proposed STC*

Public Engagement - Planet Word Museum [*opens late 2019, Franklin Sq., Washington DC*]

Industry - Amazon [*tech for social good*], Microsoft [*natural language processing*]

Education - Baltimore City PS, PG County PS, Washington DC PS, MSI Inc. [*global literacy*]

Health & Humanitarian - Translators without Borders [*mapping*], World Health Organization [*mapping*], Wuqu'

Kawoq Maya Health Alliance

Professional Societies - Linguistic Society of America, American Speech-Language-Hearing Association

**NSF Science & Technology Center in Language Science**  
**Budget Summary**

*Budget is organized into main categories as requested in NSF STC RFP. More detailed budget spreadsheet available on request.*

	Annual	Year 1
<b>Management</b>	<b>\$300,000</b>	<b>\$300,000</b>
25% effort PI & Director		
Assistant Director for Research (100%)		
Administrative and Financial Support (100%)		
<b>Research</b>	<b>\$1,992,000</b>	<b>\$1,762,000</b>
20 - 25 months, TTK Research Faculty (including benefits)		
4 full-time PTK Faculty/Postdocs (including benefits)		
10 Graduate Research Assistants (including benefits and tuition)		
10 Undergraduate Research Assistants (hourly)		
Support for field sites (Guatemala, Republic of Georgia, Baltimore/DC Public Schools)		
Subawards/Partnerships		
Equipment, Supplies, Computing, and Development		
<b>Education</b>	<b>\$475,000</b>	<b>\$325,000</b>
Graduate Student Training and Support		
Undergraduate Interdisciplinary Minor		
Undergraduate Living-Learning Community		
High School Pre-College Research Training Program		
<b>Knowledge Transfer</b>	<b>\$147,000</b>	<b>\$105,000</b>
Communications/Development Personnel		
Online Portal, Website, Supplies		
Course / Workshop Development & Publishing Support		
<b>Broadening Participation</b>	<b>\$350,000</b>	<b>\$125,000</b>
Outreach (partnership w/ Planet Word, community outreach)		
Langscape Engagement (citizen science)		
Events and Meetings		
Advisory Board		
<b>Estimated Direct Costs</b>	<b>\$15,673,000</b>	
<b>Estimated F&amp;A (54.5%)</b>	<b>\$8,323,785</b>	
<b>Total Estimated Request</b>	<b>\$23,996,785</b>	

This request totals approximately \$4 million in Year 1, and \$5 million in the subsequent four years. Tuition not included in MTDC.

## Colin Phillips - PI

### A. Professional Preparation

Oxford University	Modern Languages	BA, 1990
MIT	Linguistics	PhD, 1996
MIT	Cognitive Neuroscience	Postdoc, 1996

### B. Appointments

1997-2000	Assistant Professor, Linguistics, University of Delaware
2000-	Assistant-Associate-Full Professor, Linguistics, University of Maryland
2009-	Associate Director, Neuroscience & Cognitive Science (NACS) Program
2011-	Distinguished Scholar-Teacher, University of Maryland
2013-	Director, Maryland Language Science Center

### C. Publications & Products (selected from 118 publications):

#### 5 recent products related to the current proposal:

1. Kazanina, N., Phillips, C., & Idsardi, W. (2006). The influence of meaning on the perception of speech sound contrasts. *Proceedings of the National Academy of Sciences*, 103, 11381-11386.
2. Lau, E., Phillips, C., & Poeppel, D. (2008). A cortical network for semantics: (de)composing the N400. *Nature Reviews Neuroscience*, 9, 920-933.
3. Sprouse, J., Wagers, M., & Phillips, C. (2012). A test of the relation between working memory capacity and syntactic island effects. *Language*, 88, 82-123.
4. Parker, D. & Phillips, C. (2016). Negative polarity illusions and the format of hierarchical encodings in memory. *Cognition*, 157, 321-339.
5. Momma, S.. & Phillips, C. (2018). The relation between parsing and generation. *Annual Review of Linguistics*, 4, 233-254.

#### 5 additional publications:

1. Kazanina, N. & Phillips, C. (2007). A developmental perspective on the imperfective paradox. *Cognition*, 105, 65-102.
2. Conroy, A., Takahashi, E., Lidz, J., & Phillips, C. (2009). Equal treatment for all antecedents: how children succeed with Principle B. *Linguistic Inquiry*, 40, 446-486.
3. Chow, W.-Y. & Phillips. (2013). No semantic illusions in the "semantic P600" phenomenon: electrophysiological evidence from Mandarin Chinese. *Brain Research*, 1506, 76-93.
4. Omaki, A., Davidson White, I., Goro, T., Lidz, J., & Phillips, C. (2014). No fear of commitment: children's incremental interpretation in English and Japanese wh-questions. *Lang. Learn. & Devt.*, 10, 206-233.
5. Phillips, C. & Ehrenhofer, L. (2015). The role of language processing in language acquisition. *Linguistic Approaches to Bilingualism*, 5, 409-453. [target article with 17 commentaries,]

### D. Synergistic Activities

1. Interdisciplinary student training. Since 2000 I have led efforts to build interdisciplinary training in language science at the U of Maryland. The first step involved curricular changes and teaching innovations, supported by an NSF CAREER award (2000-2005). This enabled linguistics students to combine diverse skills in the service of questions at the intersection of traditional fields. The second step was an NSF IGERT training program (*Biological and Computational Foundations of Language Diversity*, 2008-2015), which focused on preparing students to be successful interdisciplinary scientists. The program trained 50 PhD students from 10 departments. Students served as 'research ambassadors', and learned to be effective leaders through their ownership of the program. The third step is a current NSF NRT training program (*Flexibility in Language Processes and Technology: Human- and Global-Scale*, 2015-2020). This program builds upon the earlier program to foster team-based approaches to grand challenges, and to develop the broad skills needed for diverse career paths, e.g., communication, collaboration, planning. Our team is the first, in any field, to receive both of these NSF awards, and in May 2016 I

led an NSF-supported national meeting on the future of graduate STEM training: [futurestemleaders.com](http://futurestemleaders.com). In 2014 our interdisciplinary training efforts were extended to the undergraduate level via the PULSAR program, led by my colleagues Rochelle Newman and Tess Wood. [ter.ps/pulsar](http://ter.ps/pulsar)

My own PhD students have helped to develop this training model, and they have gone on to successful careers, mostly as faculty members in research universities (e.g., Johns Hopkins, Chicago, Northwestern, UMass, UC Santa Cruz, Maryland, Bristol), but also in government and policy (e.g., Senior Program Officer, National Academies; language training leadership for Dept of Defense). [colinphillips.net](http://colinphillips.net)

2. Language Science Center. The success of our NSF-supported programs led to the creation in 2013 of the Maryland Language Science Center (LSC), which I direct. LSC is the home of a university-level initiative in language science, serving around 200 language scientists across 17 academic units, ranging from special education to electrical engineering. It provides infrastructure to support education, research, and partnerships, connecting fundamental science of language (from philosophy to neuroscience) to applications in education, technology, and health. It is supported by investments in faculty, staff, and space from the Provost, the VP for Research, and multiple colleges. [languagescience.umd.edu](http://languagescience.umd.edu).

3. Landscape. Landscape is a portal for language diversity. It combines mapping of 6400 languages throughout the world with aggregation of resources, including language descriptions, audio, and text materials. The goal is to serve diverse audiences, including researchers in multiple fields, organizations that depend on rapid access to information about understudied languages (e.g., government and NGOs), plus public and K-12 students. The initial public release was in late 2014. It has achieved broad visibility, through online media outlets around the world. Following the retreat of a key missionary-based global language map, we have oriented our efforts to building new open-source maps that more accurately reflect the diversity of language use in most locations worldwide. We currently partner with the humanitarian organization *Translators without Borders* among others. [landscape.umd.edu](http://landscape.umd.edu)

4. International Science. Nowadays everybody wants to be global, but ideas differ on what that means. For example, study abroad, researcher collaborations, and institutional partnerships are typically developed independently. I led efforts to align the internationalization interests of students, researchers, and institutions, using language science as a test case. I planned the Global Research Alliance in Language (GRAIL) under the auspices of the Universitas 21 network of 25 research universities from 6 continents. GRAIL aimed to involve students as research ambassadors, to develop linked training activities, public-facing initiatives, and collaborative research. This builds upon earlier international experience through my own research on language diversity, and through individual institutional partnerships that I helped to develop (Tel Aviv U., Tübingen, Edinburgh, Hiroshima). An April 2016 workshop that I co-organized in Edinburgh (Language Science and Global Mobility) focused on building the initiative and developing a public-facing initiative on language and human migration. This effort was stalled by shifting priorities in higher administration and funding gaps. [go.umd.edu/grail](http://go.umd.edu/grail)

5. Public Engagement. We started an outreach program with a local majority-minority high school as part of our NSF-IGERT program, and then quickly learned that the activities benefited the researchers as much as the K-12 students who we were reaching out to. We learned to communicate better, we worked together across disciplines, and we fed off the enthusiasm of the students who we met. These activities expanded to include diverse activities with schools. Since 2014 we have partnered with language scientists at other institutions (e.g., Ohio State, Arizona, UMass) on the *Language Science for Everyone* alliance, which collaborates on reaching broader audiences, developing more engaging activities, and helping other researchers to get involved in outreach activities, e.g., via symposia and demos at professional meetings, and via booths at the AAAS Family Science Days. I have worked to increase participation in public engagement through various roles in the board of the Linguistic Society of America. And I am a member of the advisory board and helped to shape the vision for *Planet Word*, a museum of language in central Washington DC, spearheaded by Ann Friedman, opening late 2019.

## **Landscape: Creating a global, open-use language map**

### **Purpose**

To create a freely available global language map to address needs in humanitarian, research, education, and government applications.

### **Problem**

Point to any spot on the globe. What languages are spoken there? By whom? In what contexts? Such information is often surprisingly hard to find. But language information is essential for diplomacy, international development, business, education, and research. The need can be extremely urgent in humanitarian emergencies and security crises, in order to deliver appropriate resources on the ground.

A freely accessible dataset providing location and use information for the world's languages would be extremely valuable for all of these applications, but there is currently nothing close to such a resource available. Existing maps and country-level language data are patchy, tend to focus on large languages to the exclusion of others, often under-represent multilingualism, lack standardization in their characterization of languages, and do not reflect differences in language status (e.g. official languages, lingua francas) or language use (e.g. languages used in the marketplace and in primary education vs. languages used in government, courts, or business contexts). The World Language Mapping System (WLMS) is the main existing global language map layer. It is owned by SIL International and available under license - but it is expensive and under-represents the richness of language use scenarios in many areas, and the data sources on which it is based are not easily identifiable.

### **Background**

Landscape is a developing online resource for mapping, integrating and making discoverable a range of information about the world's languages, and for raising public awareness of language diversity. Landscape currently provides basic language location information for over 6,000 languages worldwide via an interactive map. Additional data for almost half of those languages is available through the map interface, including word lists, texts, recordings, sound inventories, and references. New information will continue to be integrated. Landscape has been online since mid-2014 and has been accessed by over 60,000 users from 184 countries.

### **Aims of the Project**

Landscape, a project of the University of Maryland Language Science Center, is intended to be a broad, encyclopedic resource that serves multiple applications and user communities: researchers, language teachers and learners, K-12 education (across multiple curriculum areas), government, humanitarian responders and the general public. To serve these diverse applications, it is crucial to develop worldwide language mapping resources that are:

- Integratable with additional types of language information (including via Landscape's interactive website);
- Freely available for download, use and adaptation by other organizations;
- Sufficiently detailed to support a range of applications in research, education, business and diplomacy as well as humanitarian crises and international development work;
- Easily updatable as situations and demographics change; and
- Transparent about the data sources reflected in the maps.

### **Gathering Language Data**

Creating a dataset that can serve the needs outlined above will require multiple mechanisms for gathering, curating and integrating information. Data may come from a variety of sources, each of which is valuable - yet none of which alone would be sufficient to create the kind of flexible resources envisioned. For example:

- Existing freely available basic language maps (e.g. CIA-produced ethnolinguistic maps);
- Data-mining: social media and other online interaction;
- Country census data and aggregated collections of census data (e.g. from UNdata, data.un.org);
- Information from published academic references on the distribution of linguistic and ethnic groups in various countries and regions;
- Linguists, anthropologists, and human geographers with regional expertise;
- Translators, language teachers and international professionals with language expertise connected with aid and development activities or with other organizations working in the regions of interest; and

- General public via crowd-sourcing and similar methods.

Aggregating currently available resources is valuable. However, crowd-sourcing information from language experts (translators, teachers, linguists), community members and the general public is a potentially transformative method for building worldwide coverage and compiling detailed and accurate data for linguistically complex regions. Crowd-sourcing and citizen science have been effectively used in a number of fields but are currently under-exploited for gathering language data. Knowledge about languages and language use across the globe is challenging to gather because it is so widely distributed - among linguists, community members in local areas, translators with specific expertise. Crowdsourcing language information will require building tools and resources that many people can effectively contribute to and *want* to contribute to.

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### **Pilot Project: Crowd-sourced Mapping for Humanitarian Uses (May - December 2018)**

Our goal is to pilot a crowd-sourcing tool to develop language mapping for several countries which are of high priority for humanitarian work (Nigeria, Ethiopia, Bangladesh and Syria). Humanitarian organizations design their operations to respond quickly wherever a crisis strikes. The rapid nature of this work necessitates having access to open and accurate datasets prior to crises occurring. The [lack of available data](#) related to language and communication preferences makes it difficult for organizations to design effective communication strategies. Reception centers rarely have the right interpreters available because they often do not know what language refugees speak before they arrive. Radio messaging during disease outbreaks is often only available in national or international languages. Posters and pamphlets preparing communities for cyclone season primarily reach educated men who can read particular languages, proving ineffective at targeting populations of women, children, or disabled people who are especially vulnerable. Still, there is a growing consortium of organizations interested in improving communication before, during, and after a crisis. Humanitarian responders and institutional donors have committed to a [participation revolution](#) that promotes greater transparency and ensures the voices of affected communities are heard. Having access to open and accurate data about language and communication will help to make this commitment achievable.

### **Proposed methods**

These countries pose some specific challenges for language mapping. High language density, multilingualism, complex language use contexts, and rapidly changing population distributions have all contributed to a lack of accurate language use and location data. Variable literacy rates and access to technology mean that data-mining methods would have severe limitations. Crowd-sourcing - or rather “niche-sourcing” by targeting specific communities of individuals with relevant knowledge - has the potential to fill this information gap.

Langscape and Translators without Borders aim to jointly develop a crowd-sourcing tool which will survey contributors about the languages used in specific contexts in a local area - for example, languages used in primary education, on the radio, in official documents, in the marketplace. The tool will be designed to enable both language experts (linguists, translators, language teachers) and others (e.g. health or development workers, community leaders and community members) to contribute their knowledge. The tool will be localized and translated into multiple languages to ensure non-English speakers can fully contribute to it.

By niche-sourcing data from a wide range of people with relevant local knowledge and completing some basic checks on data reliability, we will be able to create an initial map from the aggregated data which can be used immediately. The data will then be revised and refined with expert input from linguists, human geographers, and language documentation experts.

A prototype version of the tool for gathering crowd-sourced data is currently being designed in collaboration with a team of Human-Computer Interaction students at Carnegie Mellon University, and will be developed and refined over the next several months.

### **1. Niche-sourcing**

Language mapping will initially be done at the level of local administrative areas. This allows us to use existing polygons already available in an open data set (from [Natural Earth](#)) rather than having to draw completely new polygons to represent language distribution. Contributors will be able to:



- (a) Create an optional login account via Langscape's website, providing an email address;
- (b) Select a country from a high-priority list and view a country map broken down into administrative areas;
- (c) Select an area (or several adjacent administrative areas) for which they wish to provide information;
- (d) Enter languages that are spoken within the selected area(s) for which they will provide information (contributors may enter as many languages as they would like);
- (e) Select check boxes to indicate the ways they believe the language is used in that area (e.g. spoken in the home by a majority of the population; used in primary education classrooms; used in radio broadcasts);
- (f) Add optional additional information about language use or speaker populations in the area;
- (g) Continue to add data about more languages, areas, or countries if they wish.

In this way, users will be able to provide information about as little as a single language spoken in one administrative area. Contributors will have the option to contribute anonymously (simply identified as a unique contributor by IP address). Alternatively, they can identify themselves and provide additional information that may be relevant - e.g. about their language expertise, experience in the country they are providing information about, organizational affiliation, or professional website. This will help the Langscape team and/or expert curators to verify the information provided and to acknowledge and cite our data sources.

A key component of this stage is an effective communications strategy to recruit and motivate contributors with relevant expertise. Jointly, Langscape and Translators without Borders have broad networks and strong credibility among academic linguists, professional translators, professional organizations of language teachers, and humanitarian agencies. In addition, the project will require robust communications efforts through social media advertising targeted at people in specific linguistic and geographic areas.

## **2. Data curation and aggregation**

The next step will be data review by Langscape's team (including student researchers and volunteers as well as faculty working on the project). At this stage, the main goals are to ensure that the data passes some basic consistency checks - e.g. the language in question is plausibly found in the areas it is placed - and that we can correctly match the entered language name to a standard ISO 639-3 language code. (The tool will attempt automatic matching to Langscape's database but languages with multiple dialects and alternate names may require manual verification). Published data from censuses, UNdata, and scholarly articles can be used as resources to verify plausibility. Once data from multiple contributors has been collected for a region, input can be aggregated and confidence scores calculated for the presence of particular languages based on the level of agreement among contributors.

Once this basic curation is completed, a usable visualization of language distribution in the countries of interest can be created (from the aggregate of contributions with appropriate cut-off for confidence scores - e.g. displaying all languages in a specific area which >50% of contributors marked as present).

## **3. Expert review and refinement**

Once we have a map of a region with data on multiple languages from multiple contributors, the material is ready for review by regional language experts (e.g. linguists with significant expertise in the languages of a particular area). Langscape and the Language Science Center already have connections to many linguists who may be able to provide such review, but we will also issue calls for volunteer expertise in particular areas of the world. Individuals who are able to provide this type of assistance will function as "area editors". This kind of expert-volunteer strategy has been successful for larger citizen science projects such as Encyclopedia of Life, as well as for language-specific projects like BasaBali. Essential to this strategy is (a) that the goal of the project is seen by experts to be valuable; and (b) that it is not excessively burdensome for them to provide their expertise (i.e. the interaction is relatively easy but makes good use of their specialist knowledge, e.g. reviewing and making decisions about contributed data).

High priority for review will be areas of inconsistency in the aggregated data, as well as identifying omitted languages or (potentially) filling in areas for which no data has yet been contributed. Future steps for data refinement can include creation of language-specific polygons where language distribution does not align well with administrative areas. For example, if a particular language is spoken in only one city/town within an administrative area, it should ultimately be represented by a smaller and more accurate polygon.

#### **4. Applying maps to humanitarian response efforts**

In order to evaluate and demonstrate the value of the data collected, the final stage of the pilot project will involve application to current humanitarian response efforts. This will include the development of various crisis maps, language resources, and the integration of the language dataset with other spatial datasets commonly used by humanitarian organizations (e.g. IOM DTM data, ongoing assessment data, earthquake assessment maps). The pilot project will conclude with an end-term evaluation in one of the four countries to measure the impact of language mapping as a tool to influence more effective communication strategies in humanitarian responses. This will include a series of ground-truthing surveys to measure the accuracy of the niche-sourced data in an environment that is experiencing volatile population movements, as well as a key informant interviews and focus groups with humanitarian responders to understand the effectiveness of these tools and resources.

#### **Timeline**

This pilot project will span approximately 8 months, from May-December 2018. For efficiency, we will begin by recruiting experts and collecting data for a single country (June-July 2018). This will allow us to resolve any problems in data collection early, and then proceed to assess and integrate those data while gathering data for the remaining three countries (August-October 2018). The final stage of testing applications to humanitarian use scenarios will take place from October-December 2018.

#### **Budget Summary**

Direct Costs	\$160,519
Indirect Costs (10% TWB, UMD 15% adjusted to foundation cap)	\$21,002
<b>Total Requested</b>	<b>\$181,521</b>
Matching Contributions	\$39,164



## LANGUAGE SCIENCE FELLOWS

**Language Science Fellows (LSF)** are a community of engaged graduate students training to become innovative, adaptable leaders in language science. They come from different departments, and have a range of research and career goals. What they have in common is an interest in research that integrates theory or methods from multiple disciplines, and a desire to have a broader impact on their community—whether scientific, educational, social, or political.

Fellows develop an integrated research and training plan, incorporating coursework and research collaborations outside their home department, as well as professional development that suits their long-term goals. They participate regularly in cross-departmental language science events and activities, and often take leadership roles in organizing them.

Applications to the Language Science Fellows program are generally accepted in March. Students who are interested in LSF but not yet ready to apply may join the **Apprentice Program**. Apprentices can spend up to a year mapping out their goals and building connections in the language science community before applying to join the full program.

For more information, visit [languagescience.umd.edu/lsf](http://languagescience.umd.edu/lsf)

RESEARCH

COMMUNICATION

IMPACT



## FUNDING

- All Fellows and Apprentices may apply throughout the year for funds to support research-related expenses such as travel, supplies, or participant payments.
- Fellows may apply for Language Science Summer Research Fellowships to support 3 months of summer research.
- A limited amount of funding is available to support academic year stipends; these are awarded based on both need and merit.



## NRT PROGRAM

The Language Science Center was awarded a \$3M training grant through the **NSF Research Traineeship (NRT)** program. Most Language Science Fellows choose to join the NRT Program to access additional travel, research, and (in some cases) stipend support. NRT trainees fulfill a few additional requirements: research that addresses the theme of “multi-scale data”, participation in research teams, and a science policy experience.

## CONTACT US



[languagescience.umd.edu](http://languagescience.umd.edu)



# LANGUAGE SCIENCE GRADUATE PROGRAMS

The **University of Maryland** has the largest language science community in North America, involving over 200 people across 17 departments and centers. There are many ways for graduate students to participate and make the most of this valuable resource.





# GET INVOLVED



## LANGUAGE SCIENCE LUNCH TALKS

Join us at the Language Science Center **every Thursday at 12:30pm** to hear about ongoing research from students and faculty from different departments. Or take the leap and present your own work! You may be surprised by both the challenge and the benefits of communicating to a multidisciplinary audience.

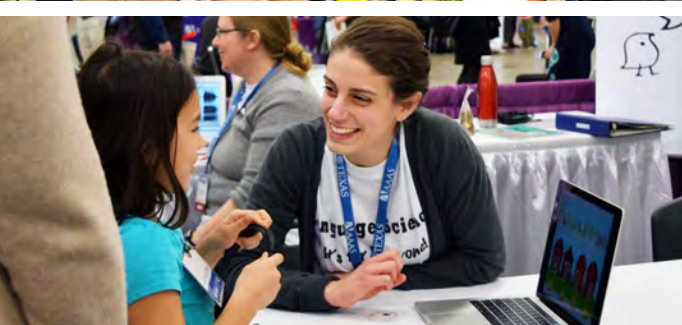
For more information, visit [languagescience.umd.edu/lslt](http://languagescience.umd.edu/lslt)



## LANGUAGE SCIENCE DAY

Since 2010, we've brought the language science community together every fall to exchange ideas, showcase exciting projects, and celebrate our accomplishments. Join 150+ language scientists from across the university: you may meet a new friend or future collaborator.

For more information, visit [languagescience.umd.edu/lstd](http://languagescience.umd.edu/lstd)



## OUTREACH: LANGUAGE SCIENCE FOR EVERYONE

Engaging with people outside the university reflects a core value of the Language Science Center. It helps **build public understanding and support for language science** (and social science more generally), and potentially diversify the pool of future language scientists. Participating students and faculty also benefit by developing the skills to **communicate across boundaries**, which is useful for any kind of scientific career.

The **student-led outreach committee** organizes a variety of activities on and off campus, including campus visits for local high school students, STEM career fairs, science fairs at local elementary schools, and a tent at Maryland Day. We also participate in national events such as AAAS Family Science Days and the USA Science and Engineering Festival.

For more information, visit [languagescience.umd.edu/outreach](http://languagescience.umd.edu/outreach)

## WINTER STORM

Winter Storm is a **free, student-led workshop** in late January that brings together students and faculty from different fields for training, collaboration, and interdisciplinary innovation. Activities vary from year to year, but commonly include methods workshops, faculty lunch talks, research interest groups, communication and professional development workshops, and social events.

For more information, visit [languagescience.umd.edu/winter-storm](http://languagescience.umd.edu/winter-storm)

## YOU DECIDE!

Student leadership is the glue that holds our community together. Graduate students lead the organization of most language science events and activities, and design new activities throughout the year to meet the needs of students. Get in touch with the student committees to pitch your ideas, or go all-in and join one!

For more information, visit [languagescience.umd.edu/student-leadership](http://languagescience.umd.edu/student-leadership)

## RESEARCH

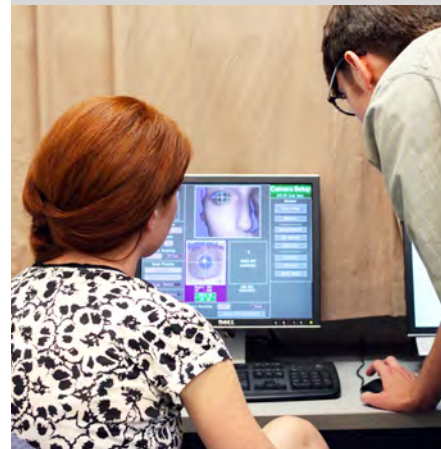
Collaborate across disciplines. The University of Maryland is home to top researchers in many fields of language science:

linguistics, psycholinguistics, first and second language acquisition, philosophy of language, bilingualism, applied linguistics, language pedagogy, speech and hearing, language and communication disorders, cognitive neuroscience, literacy development, education, natural language processing, automatic speech recognition, machine translation, and more!



## TRAINING

Learn the skills you need to advance your research and professional development.



## COMMUNITY

Build a diverse network of language science students and faculty throughout the university. Many students have co-mentors within or across departments.



## BEYOND THE UNIVERSITY

Reach outside the ivory tower to connect with the general public and decision makers in government, education, health, and technology.



## LEADERSHIP

Develop as a future innovator in language science, through opportunities to lead language science research teams and community initiatives.