FOR APPROVAL　　　　　　**PUBLIC**　　　　　　**OPEN SESSION**

TO:	UTSC Academic Affairs Committee
SPONSOR: **CONTACT INFO:**	Prof. William A. Gough, Vice-Principal Academic and Dean 416-208-7027, vpdean.utsc@utoronto.ca
PRESENTER: **CONTACT INFO:**	Prof. Katherine Larson: Vice-Dean Teaching, Learning & Undergraduate Programs (416) 208-2978, vdundergrad.utsc@utoronto.ca
DATE:	March 15 for March 22, 2023
AGENDA ITEM:	3

ITEM IDENTIFICATION:

Major Modification: Specialist/Specialist (Co-op) in Psycholinguistics, UTSC

JURISDICTIONAL INFORMATION:

University of Toronto Scarborough Academic Affairs Committee (AAC) "is concerned with matters affecting the teaching, learning and research functions of the Campus (AAC Terms of Reference, 2021, Section 4)." Under section 5.6 of its terms of reference, the Committee is responsible for approval of "Major and minor modifications to existing degree programs." The AAC has responsibility for the approval of Major and Minor modifications to existing programs as defined by the University of Toronto Quality Assurance Process (UTQAP, Section 3.1).

GOVERNANCE PATH:

1. **UTSC Academic Affairs Committee [For Approval] (March 22, 2023)**

PREVIOUS ACTION TAKEN:

No previous action in governance has been taken on this item.

HIGHLIGHTS:

The Department of Language Studies (DLS) proposes major modifications to the current Specialist and Specialist (Co-op) in Psycholinguistics, to change the degree designation for the program as leading to an HBSc (Science program) instead of the HBA (Arts program). This change is proposed to: 1) align the existing content and training of the more correctly with the science degree pathway, 2) align the UTSC program with other Canadian and international

undergraduate programs in Psycholinguistics, and 3) better fit the degree pathway with the graduate programs and careers pursued by Psycholinguistics graduates, which include clinical and research careers in speech language pathology and communication disorders, and graduate programs in psychology, linguistics, cognitive science, audiology, neuroscience, and medicine.

Psycholinguistics is the study of how the human mind/brain acquires, represents, processes, and produces language. As a field, Psycholinguistics is interdisciplinary and combines insights and methodologies from linguistic theory, psychology, cognitive neuroscience, physics, speech-language pathology, and computer science. The Psycholinguistics program trains students in quantitative reasoning, modeling of linguistic patterns, scientific hypothesis formulation and employs technical skills such as programming, quantitative data analysis and visualization. Students in Psycholinguistics programs gain knowledge and skills inherent to all areas of scientific inquiry, such as hypothesis testing, deductive and inductive reasoning, operationalization of methods, experimental design and sampling methods.

The Psycholinguistics programs were first established at UTSC in 2001-2, within the previous Division of Humanities. At the time, it was argued that offering an HBSc program within a Division of Humanities would be perceived as anomalous, and Psycholinguistics was ultimately aligned within the HBA degree pathway. However, the HBSc degree is supported by the curriculum's focus on scientific theory and methods. The current Psycholinguistics curriculum is comparable in scope and requirements to similar programs at the University of Ottawa, University of British Columbia, University of Victoria, and University College London, all of which offer a BSc in linguistics with a specialization in psycholinguistics.

This change will also better facilitate connections to career opportunities and the graduate admissions process for students. The Specialist/Specialist Co-op programs in Psycholinguistics are the preferred linguistics programs for students interested in pursuing careers in areas influenced by scientific thinking, including speech language pathology and communication disorders, as well as careers in audiology, psychology, computer science, and neuroscience. For example, speech language pathology graduate admissions require students to take courses in psycholinguistics, statistics and quantitative methods, physiology, and phonetics, all of which are offered or required by the UTSC Psycholinguistics programs.

The Specialist/Specialist Co-op programs in Psycholinguistics currently require students to complete a total of 12.5 credits, including:

1. 5.0 credits in introductory courses in: linguistics and applications to linguistics; biological and cognitive psychology; clinical, developmental, personality and social psychology; quantitative methods in linguistics; first language acquisition; and psycholinguistics;
2. 1.5 credits in foundational courses in: morphology; sociolinguistics; phonology; syntax; and semantics;
3. 2.5 credits in foundational and advanced courses in: American sign language; phonetic analysis; second language acquisition; psycholinguistics of reading; acquisition of mental lexicon; speech perception; and language and aging;

4. 1.5 credits in foundational and advanced courses in: human biology and physiology; computers in linguistics; speech physiology and speech disorders; language and the brain; language disorders in children; developmental psychology; perception or cognitive psychology; and adulthood and aging;
5. 2.0 additional credits in linguistics or psycholinguistics, which in practice often include supervised research projects available in the second through the fourth years of study.

Of the 12.5 credits required for the programs, students must complete at least 8.0 credits in courses that are designated as Natural Science, Quantitative Reasoning, or Social & Behavioural Sciences, but depending on the electives they choose, may complete at least 11.0 credits in science-focused courses.

Although no changes are needed to the program to bring it into alignment with other science-focused offerings, the Department is leveraging the opportunity provided by this curriculum change to incorporate minor changes to the curriculum that will keep the program at the leading edge of the field of psycholinguistics. These changes are the addition of an advanced quantitative methods course in linguistics, and increasing the number of credits required in components 2, 3, and 4 of the program, and reducing the number of credits required in component 5 for a net increase in total credits to 13.5 from 12.5. These changes better reflect our students' program completion profiles, the recent direction of our faculty complement, and current directions of the discipline.

Current students who are already in the program will be counted as HBA students until the effective date of the change from HBA to HBSc (September 1, 2024). No new students will be admitted to the HBA once the HBSc is available. Students interested in completing the HBSc instead of the HBA, and who are already enrolled in the program, will be offered the opportunity to transfer to the HBSc program.

The proposed change has been discussed extensively within the Department of Language Studies, and at UTSC with Arts & Science Co-op and the Department of Psychology, who have expressed support for the changes. The UTSC Registrar has offered support for the proposal and recommendations about the implementation timeline for September 1, 2024, to support admissions processes.

No additional resources are required to support the proposed changes. The proposed change is expected to positively support planned faculty hiring processes in 2023, by allowing the Department to expand the program's relationship to the sciences.

FINANCIAL IMPLICATIONS:

There are no significant financial implications to the campus operating budget.

RECOMMENDATION:

Be It Resolved,

THAT the proposed modifications to the Specialist and Specialist (Co-op) in Psycholinguistics, be approved, effective September 1, 2024.

DOCUMENTATION PROVIDED:

Major Modification Proposal to the Specialist and Specialist (Co-op) in Psycholinguistics

University of Toronto
Major Modification Proposal:

Significant Modifications to Existing Graduate and Undergraduate Programs

This template should be used to bring forward all proposals for major modifications to existing graduate and undergraduate programs for governance approval under the *University of Toronto Quality Assurance Process* (UTQAP).

This template (last updated by the Office of the Vice-Provost, Academic Programs on November 9, 2020) is for all proposals for significant modifications to existing graduate and undergraduate programs. It aligns with UTQAP requirements and will help to ensure that all evaluation criteria established by the Quality Council are addressed in bringing forward a proposal. Separate templates have been developed for other types of proposals.

Program being modified: **Please specify exactly what program and which components of that are being modified; e.g., BA…specialist, major and minor components.**	• Specialist in Psycholinguistics (HBA) • Specialist Co-op in Psycholinguistics (HBA)
Proposed major modification:	1. Change degree designation from HBA to HBSc for both programs 2. Changes to program requirements in line with most recent developments in psycholinguistics
Department/unit (if applicable):	Department of Language Studies
Faculty/academic division:	University of Toronto Scarborough
Dean's Office contact:	Suzanne Sicchia, Associate Dean, Undergraduate Programs and Curriculum, adundergrad.utsc@utoronto.ca Martha Harris, Academic Programs Officer, martha.harris@utoronto.ca

Proponent:	Juvenal Ndayiragije, Chair, Department of Language Studies, juvenal.ndayiragije@utoronto.ca Philip J. Monahan, Associate Chair, Department of Language Studies, philip.monahan@utoronto.ca
Version date: **Please change as you edit this proposal.**	**February 27, 2023**

Summary

Please provide a brief summary of the change(s) being proposed as it relates to the current structure of the program.

> **Changing the degree designation from HBA to HBSc**
>
> The Department of Language Studies at the University of Toronto Scarborough (UTSC) currently offers five undergraduate programs in Linguistics, and two undergraduate programs in Psycholinguistics. All Specialist and Major programs lead to an Honours Bachelor of Arts (HBA) degree:
>
> - Specialist/Specialist Co-op in Linguistics
> - Major/Major Co-op in Linguistics
> - Minor in Linguistics
> - Specialist/Specialist Co-op in Psycholinguistics
>
> Linguistics is the scientific study of human language. It encompasses theories of linguistic structure in all domains: speech sounds, words, sentences, meaning, and discourse. Psycholinguistics is the study of how the human mind/brain acquires, represents, processes, and produces language. As a field, Psycholinguistics is fundamentally interdisciplinary. It combines insights and methodologies from linguistic theory, psychology (cognitive, computational, developmental), cognitive neuroscience (neuropsychology, brain imaging), physics (acoustics), speech-language pathology, and computer science.
>
> This major modification proposes to change the degree designation of the Specialist/Specialist Co-op programs in Psycholinguistics as leading to the HBSc rather than the HBA degree. This

change is appropriate because the HBSc designation more correctly aligns with the content and training of the programs, and because UTSC programs in Psycholinguistics more closely align with undergraduate programs in psycholinguistics that culminate in a BSc degree offered at other Canadian and international universities (see section 7). Moreover, no changes to the program requirements are necessary to align the current programs in Psycholinguistics with other science-focused programs.

Although no changes are needed to the program to bring it into alignment with other science-focused offerings, the Department is leveraging the opportunity provided by this major modification to make changes to the curriculum that will keep the program at the leading edge of the field of psycholinguistics. These changes (i) better reflect our students' program completion profiles, and (ii) given that a substantial proportion of our recent graduates already meet these new criteria, indicate that our students have all along been completing program requirements that reflect the HBSc degree.

Effective Date

September 1, 2024

Academic Rationale

What are the academic reasons for the change proposed, and how do they fit with the unit's and division's academic plans?

The change in degree designation is proposed for three key reasons. First, the Specialist/Specialist Co-op programs in Psycholinguistics at UTSC are now, and have always been, science-focused programs; and no substantive changes to the program requirements are needed to support the change from HBA to HBSc. The historical designation of programs as leading to an Honours Bachelor of Arts (HBA) degree is incongruous with the actual content and training of the programs, which are far more closely aligned with other Honours Bachelor of Science (HBSc) programs at UTSC (e.g., Psychology, Mental Health Studies, Neuroscience, Computer Science, and Evolutionary Anthropology) than they are with programs leading to an HBA degree (e.g., English, History, Philosophy, Socio-Cultural Anthropology, Political Science, and Sociology).

Second, the UTSC Specialist/Specialist Co-op programs in Psycholinguistics closely align with undergraduate programs in psycholinguistics that culminate in a BSc degree offered at other Canadian and international universities, for example: University of Victoria, Carleton University, and University College London (see section below for a more complete discussion of Psycholinguistics at Other Universities).

Third, correcting the degree designation to the HBSc better aligns the UTSC Psycholinguistics programs with the graduate programs and careers that UTSC students are seeking to pursue. While it is true that current graduates of the Psycholinguistic programs (who receive an HBA degree) do go on to clinical and research careers in speech language pathology and communication disorders, and graduate programs in psychology, linguistics, cognitive science, audiology, neuroscience, and medicine, nevertheless, their academic preparation for such programs would be made more transparent if they received an HBSc degree, particularly in cases where students apply for science-based programs overseas.

UTSC Psycholinguistics Programs are Science-Focused

Historical Context

UTSC offered its first courses in Linguistics in the 1970-71 academic year through the Division of Humanities. The first program in Linguistics was introduced in the 1975-76 academic year, also through the Division of Humanities. The program was structured to have a common core providing students with basic training in linguistic theory and linguistic analysis. The program offered students a choice of two distinct streams/sub-programs of specialization: Psycholinguistics and Sociolinguistics. It is worth noting how the program was described in the Academic Calendar of that year:

> Linguistics is the science of language. For the linguist, language is a phenomenon of the human mind and of human society. Not all linguists are exclusively concerned with the description of languages…or the tracing of the history and development of languages…Linguists draw on the findings of Philosophy, Psychology, Sociology and Biology to create new frontiers of research. This new science is reflected in [linguistics courses].

The Specialist/Specialist Co-op programs in Psycholinguistics were first introduced by the Division of the Humanities at UTSC in 2001-02 alongside the major and minor programs in Linguistics. At this time, in addition to Linguistics, the Division of Humanities also supported programs and courses in Classics, English, French, History, Humanities, Philosophy, Spanish, Visual and Performing Arts, and Women's and Gender Studies; these programs all led to the Bachelor of Arts/Honours Bachelor of Arts degrees. Throughout the development of the Psycholinguistics programs, the Linguistics faculty group at UTSC contended that these Psycholinguistics programs should lead to an HBSc degree because of the curriculum's focus on scientific theory and methods, including: the use of experimental methods to measure language processes and representations through behavioural and neuroimaging techniques; quantitative training in the analysis and interpretation of language data; and complementary training in computational modeling. Many of the methodologies utilized in the curriculum, as well as the skills acquired by students, overlapped with those in developmental and cognitive psychology, cognitive neuroscience and computer science; however, the Humanities Programs

and Curriculum Committee argued that programs leading to an HBSc degree would be perceived as anomalous within a Humanities Division, where programs typically led to the HBA degree. Ultimately, notwithstanding their strong science-focus, the decision of the Division of Humanities academic leadership was to align the Psycholinguistics programs with the HBA degree.

Psycholinguistics Programs Today

There are nine Linguistics faculty who teach in the Department of Language Studies at UTSC, all of whom generally support the Psycholinguistics programs. Of these faculty, six are core to the Psycholinguistics programs (Armstrong, Bhattasali, Helms-Park, Kang, Kush, & Monahan). These faculty specialize in laboratory-based research that involves psychophysical and perceptual measurements, acoustic analysis, behavioural methods including eye-tracking, advanced brain-based technologies (e.g., electroencephalography (EEG), transcranial Cortical Stimulation (tCS), magnetoencephalography (MEG)), computational and neural network models and a variety of experimental tools for assessing language development. This supports the first reason for degree redesignation outlined above.

The Psycholinguistics programs train students in quantitative reasoning (LINB29H3, PLIC55H3, PLIC75H3, PLID50H3), formal (mathematical) modeling of linguistic patterns (LINB04H3, LINB06H3, LINB10H3, LINB35H3, LINC11H3, LINC12H3), scientific hypothesis formulation and a range of technical skills (e.g., programming, quantitative data analysis and visualization, statistics; LINB19H3, LINB29H3, LINB35H3, PLID50H3) with an emphasis on how the human mind acquires, represents, processes and produces human language (PLIC24H3, PLIC25H3, PLIC55H3, PLIC75H3, PLID34H3, PLID44H3, PLID50H3), and how language performance is modulated by speech physiology and different disorders and diseases (PLIC54H3, PLIC75H3, PLID56H3, PLID74H3). In addition to providing the requisite skills for linguistic analysis and theory construction, students in these programs gain knowledge and skills inherent to all areas of scientific inquiry; for example, hypothesis testing, deductive and inductive reasoning, operationalization of methods, experimental design, sampling methods (e.g., LINB19H3, LINB29H3, PLIC55H3, PLIC75H3, PLID50H3), as well as more focused skills for the behavioural sciences; for example, mitigating participant biases and preconceptions about an experiment's purpose, and minimizing confounds with other cognitive skills that may relate to language abilities (PLIC55H3, PLID50H3).

In program courses, students gain first-hand experience in scientific hypothesis testing, experimental design, programming, quantitative data visualization and analysis, statistics, and research ethics, in addition to learning about core linguistic theory. For example, in PLIC55H3 Psycholinguistics, PLIC75H3 Language and the Brain and PLID50H3 Speech Perception, students conduct quantitative experiments in the classroom. They learn to analyze and visualize quantitative data, adjudicate between competing hypotheses, and formulate, conduct, and design experiments. In LINB19H3 Computers in Linguistics, LINB29H3 Quantitative Methods in Linguistics, and LINB35H3 Introduction to Computational Linguistics,

students learn to program, work with large data sets, and perform statistical analysis. In PLIC75H3 Language and the Brain, students also work directly with neurophysiological data and learn how to perform an EEG experiment as a fundamental component of the course. Overall, program courses expose students to strong laboratory-based components (e.g., LINB19H3, PLIC24H3, PLIC55H3, PLIC75H3, PLID50H3, LINB09H3, LIND09H3), expose students to current scientific literature in psycholinguistics (PLIC24H3, PLIC25H3, PLIC55H3, PLIC75H3, PLID34H3, PLID44H3, PLID50H3, PLID74H3), provide plentiful experiential learning opportunities through additional in-class demonstrations and experiments (e.g. PLIC24H3, PLID34H3, PLIC55H3, PLIC75H3, PLID50H3), as well as opportunities to become involved in active research projects from an early stage of their undergraduate education (e.g., LINB98H3: Introductory Supervised Research in Linguistics/Psycholinguistics; PLID01H3, PLID02H3, PLID03H3, PLID07H3: Supervised Study in Psycholinguistics). Several of the Supervised Research projects in Psycholinguistics are conducted in the Oral Dynamics Lab in the Temerty Faculty of Medicine's Speech-Language Pathology program, an unquestionably scientific laboratory and program that awards an MHSc degree.

Program Objectives/Learning Outcomes:

At the A-level, students will:
a. Be introduced to basic concepts of linguistics, psychology, and mental grammar.
b. Learn about various sub-areas of linguistics including psycholinguistics, sociolinguistics, typology, etc.
c. Be introduced to how linguistics research advances through the study of data from languages other than English.
d. Develop an understanding of the basic mechanisms that are common across languages.

At the B-level, students will:
a. Develop their knowledge of the different components of mental grammar (phonetics, phonology, morphology, syntax and semantics).
b. Learn how to design experiments and collect and analyze data (ideally in a lab setting).
c. Learn to interpret data quantitatively/qualitatively (with an emphasis on the role of computational methods and other related technologies in linguistics)
d. Learn how to analyze both English and non-English data in phonetics, phonology, morphology, and syntax
e. Gain knowledge and skills needed to contrast the structure of different languages in phonetics, phonology, morphology, syntax, etc.
f. Gain a deeper understanding of how the brain processes language
g. Develop and implement effective strategies for written work and oral presentations (e.g., in terms of scope, planning, and style)

At the C-level, students will:
a. Gain enough knowledge of the contemporary issues in linguistic and psycholinguist theory to learn how to argue and marshal evidence for/against specific theories
b. Gain knowledge of classic and contemporary psycholinguistic models of lexical and sentence processing
c. Design and conduct behavioural experiments in a psycholinguistics/computer lab
d. Understand the principles and processes of first language (L1), second language (L2) acquisition, and simultaneous bilingualism
e. Learn to analyze and interpret L1 and L2 data.

At the D-level, students will:
a. Use distinct research methodologies to design actual experiments
b. Analyze phonetic data using software, e.g., PRAAT, Audacity
c. Learn how human speech is perceived including its underlying mechanisms, how it is encoded in the brain, how sound categories are established and how humans adapt to variation in auditory signal
d. Understand how the L1 (first language) and L2 (second language) lexicons interact during second language acquisition; consider the role of declarative memory, as well as linguistic and non-linguistic input and interaction in the acquisition of the L2 lexicon.
e. Acquire an in-depth understanding of how language changes with age in healthy and impaired older adults, and how these changes align with extra-linguistic cognitive changes
f. Adjudicate between distinct theories of models of sentence parsing using various forms of evidence.

The following equity, diversity, and inclusion-related program learning outcomes may overlap with some of those outlined above, but they are reiterated here for coherence. To understand and respect the complexity of sociocultural and international diversity, students are encouraged to:

a. Examine the sociocultural and international contexts that influence individual differences (e.g., in language backgrounds, bilingualism and multilingualism) and explain how research findings may apply (or not) to diverse groups (e.g., based on the similarities, or not, between different languages that individuals may know)
b. Recognize the systematic influences of sociocultural, theoretical, and personal biases on the research enterprise and evaluate the implications of such influences on past work and for future work (e.g., to address Anglocentrism and Eurocentrism)
c. Evaluate the generalizability of specific findings based on the research design, including possible limitations due to sociocultural influences (e.g., for studies that have focused on white, educated, industrialized, rich, and developed (WEIRD) populations)
d. Recognize that bilinguals and multilinguals are not "double monolinguals" since languages interact in the brain; furthermore, recognize that evaluating language skills

and disorders in bilinguals/multilinguals needs test instruments and procedures specific to these populations

e. Practice sensitivity and respect for people with diverse abilities, backgrounds, and cultural perspectives, and acknowledge sensitivity to issues of power, privilege, and discrimination.

f. Seek out sources of learning from diverse sources to understand and apply different ways of knowing in the advancement of psycholinguistic research

g. Recognize that approaches to psycholinguistics are influenced by sociocultural, theoretical, and contextual forces, including historically privileged frameworks that are often related as the "default" or as "neutral" views.

Psycholinguistics at Other Universities

The Department of Language Studies at UTSC is the only academic unit at the University of Toronto, and within the Greater Toronto Area more broadly, that offers an undergraduate degree program specifically in Psycholinguistics.

Only a few universities offer comparable science-focused undergraduate programs, that is, programs that include statistics, cognitive psychology, computer science, developmental psychology, and cognitive neuroscience in the context of language and linguistics:

I. The Dept. of Linguistics at the University of Victoria (Canada) offers a 4-year BSc in linguistics, with a specialization in psycholinguistics.

II. The Dept. of Linguistics at Carleton University (Canada) also offers a 4-year BSc in linguistics, with a specialization in psycholinguistics and communication disorders.

III. The Dept. of Psychology and Language Sciences at University College London (United Kingdom) offers a 3-year BSc in Psychology and Language Sciences with a track for specialization in Psycholinguistics.

The strong alignment between the UTSC HBA programs and the BSc programs at other universities underscores the contention in this proposal that the UTSC programs are appropriately understood as leading to the HBSc degree.

The current curricula of the UTSC programs are like the three BSc programs. UTSC students who specialize in psycholinguistics must complete a minimum of 12.5 credits, or 25 courses, in linguistics, psycholinguistics and psychology. These courses come from required courses and pre-approved upper-level electives. Students at the University of Victoria and Carleton must also complete the equivalent of 25 courses in these topic areas. At UCL, students must complete the equivalent of 20 courses.

The curricula of all four programs are extremely similar in breadth and depth of content. There is near-uniformity across all four programs in required courses and high overlap in content areas for upper-level specialization. Table 1 compares content areas and courses in the UTSC

psycholinguistics curriculum to the BSc programs in these other universities. Color-coding is used to highlight similarities and differences. Mandatory courses are coded in green. Pre-approved upper-level electives are coded in blue. If a university does not offer a course equivalent to a UTSC course or has not approved such a course for the psycholinguistics BSc, the cell is coded in red.

Table 1 makes clear that UTSC has comparable–if not more strenuous–requirements for introductory analysis in comparison to the other programs. It also makes clear that nearly all electives offered at UTSC have approved counterparts in the established BSc programs.

As points of comparison, the University of Ottawa (UOttawa) offers a joint BA program in Psychology and Linguistics, while the University of British Columbia (UBC) offers an HBA in Speech Sciences. We have reviewed the UOttawa curriculum; its degree requirements involve completing the equivalent of an additional 2.0 FCE in humanities-focused courses (e.g., English, Philosophy, Interdisciplinary Studies in the Arts). In the case of UBC, their program does require similar science-focused courses as at UTSC; however, we should note that it is entirely possible that both UBC and UOttawa could favour labelling degrees that UTSC would confer as a BSc degree as BAs. We based this assertion on how these institutions have classified other degrees that appear to be sciences at UTSC. For example, the Psychology programs at both UBC and UOttawa, which involve similar curricula to those offered at UTSC, confer BA degrees. Historically, psychology has also been treated as being at the intersection of the sciences and the humanities. This was also the case at UTSC. For a period, both a BA and a BSc degree in Psychology were offered (e.g., see the 1990-1991 UTSC academic Calendar, p. 162). The only difference between the two was that the BSc degree required the completion of an additional 1.0 FCE at the B-level or above in any science, including Psychology. Since then, UTSC Psychology has decided to only offer a BSc degree and maintain the higher science requirements from the past. This history speaks to the interdisciplinary nature of psychology as well, and how it has gradually been viewed more as a modern science than as a classic field from the humanities, as has been reflected, for instance, at UTSC, which has eliminated its BA in Psychology and only retains its BSc. Essentially, we are proposing to make a similar update to the Psycholinguistics program.

Table 1: Side-by-side Comparison of Required Courses and Approved Electives between UTSC Psycholinguistics Program and 3 Universities that Offer a BSc in Psycholinguistics: Green cells denote required courses in the respective program; Blue cells denote courses that are offered but optional within a program; Red cells denote for which there is not a corresponding counterpart in each program.

	UTSC	UVic	Carleton	UCL
Basic Linguistic Analysis				
Intro to Linguistics	1 Semester	1 Semester	1 Semester	1 Semester
Phonetics and Phonology	2 Semesters	2 Semesters	1 Semester	1 Semester
Syntax	2 Semesters	2 Semesters	1 Semester	

Lang Acquisition	1 Semester	1 Semester	1 Semester	
Psycholinguistics	1 Semester	1 Semester	1 Semester	1 Semester
Basic Quantitative Analysis				
Quantitative Methods	1 Semester[1]	1 Semester	1 Semester	2 semesters
Required Psychology Coursework				
Intro to Clinical, Developmental, Social Psych	1 Semester		1 Semester	1 Semester
Intro to Bio and Cognitive Psychology	1 Semester		1 Semester	
Pre-approved Upper-Level Coursework in Linguistic Analysis				
Morphology				
Sociolinguistics				
Advanced Phonology				
Advanced Syntax				
Semantics				
Pre-approved Upper-Level Coursework in Psycholinguistics				
Phonetic Analysis				
2nd Language/Multilingualism				
Speech Perception				
Language and the Brain/Neurolinguistics				
Language Disorders				
Psycholinguistics of Reading				
Language and Aging				
Acquisition of Mental Lexicon				
Structure of Sign Language				
Computers in Linguistics				
Pre-approved Upper-Level Coursework in Psychology				
Intro to Dev. Psych				
Intro to Perception				1 Semester
Intro to Cog Psych				
Human Brain and Behavior				
Adulthood and Aging				
Biology				
Human Biology			2 Semesters	
Human Physiology			1 Semester	

The curricula only diverge with respect to the inclusion of natural science and supplementary mathematics courses beyond the quantitative analysis courses taught in-house. The University

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[1] Currently one semester, but a course in Advanced Quantitative Analysis is slated to be added to the curriculum.

of Victoria and Carleton require students to take some mixture of external math courses (e.g., calculus) and natural science courses (e.g., physics, chemistry) as part of the degree program.

Supplemental natural science and mathematics courses should not be interpreted as necessary conditions for a BSc (in Psycholinguistics) for multiple reasons. The first reason is uniformity across psycholinguistics programs: different BSc programs do not agree on what should be mandatory; for example, UCL does not require any natural science or extra math courses for its psycholinguistics degree. Second, the actual difference in quantitative reasoning and natural science coursework across programs may be smaller than they first appear. UTSC students must fulfill general breadth requirements in quantitative reasoning and natural science. The specific courses the students choose to complete may not be included in the program requirements at UTSC the way they are at the University of Victoria or Carleton; however, in practice, the number of quantitative reasoning and natural science courses taken are similar.

3. **Aligning UTSC Psycholinguistics with the Graduate Education and Careers Students are Seeking**

The Specialist/Specialist Co-op programs in Psycholinguistics are the preferred programs for students interested in pursuing careers in areas influenced by scientific thinking, including speech language pathology and communication disorders. Students also pursue careers in audiology, linguistics, psychology, computer science, and neuroscience. For example, speech language pathology graduate admissions require students to take courses in psycholinguistics, statistics and quantitative methods, physiology, and phonetics, all of which are offered or required by the UTSC Psycholinguistics programs. While it is true that graduates of the Psycholinguistic programs, with an HBA degree, do already go on to clinical and research careers in speech language pathology and communication disorders, and graduate programs in psychology, linguistics, cognitive science, audiology, neuroscience, and medicine, nevertheless, correcting the program degree designation to an HBSc better aligns with the graduate programs and careers that UTSC students are seeking to pursue and should facilitate the graduate admissions process for students.

Changes to the Program Requirements to Keep the Psycholinguistics Programs at the Leading-edge of the Field of Psycholinguistics

See the next section for both a detailed description of the changes to the program requirements, and their rationale for each change.

Description of the Proposed Major Modification(s)

Please describe in detail what changes are being proposed. Major modifications include changes to the program requirements that will significantly change what students will know and be able to do when they complete the program.

Other major modifications that may be included are significant changes to admission requirements, significant changes to faculty engaged in program; and a change to mode of delivery, change to the language of the program and offering the program at another location or institution.

Please be explicit about how the learning outcomes have changed and include both previous and proposed learning outcomes or one version of the current learning outcomes with the new learning outcome in track changes. You may wish to use Appendices A and B.

Describe how the modification reflects <u>universal design principles</u> and/or how the potential need to provide mental or physical health accommodations has been considered in the development of this modification.

Describe how the program structure and delivery methods promote student well-being and resiliency in the learning and teaching environment.

Describe any elements that support a sense of community in the program.

Please provide calendar copy in track changes or changes highlighted in Appendix C.

The Current Curriculum

The Specialist/Specialist Co-op programs in Psycholinguistics currently require students to complete a total of 12.5 credits, including:

- 5.0 credits in introductory courses in: linguistics and applications to linguistics; biological and cognitive psychology; clinical, developmental, personality and social psychology; quantitative methods in linguistics; first language acquisition; and psycholinguistics;
- 1.5 credits in foundational courses in: morphology; sociolinguistics; phonology; syntax; and semantics;
- 2.5 credits in foundational and advanced courses in: American sign language; phonetic analysis; second language acquisition; psycholinguistics of reading; acquisition of mental lexicon; speech perception; and language and aging;
- 1.5 credits in foundational and advanced courses in: human biology and physiology; computers in linguistics; speech physiology and speech disorders; language and the

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brain; language disorders in children; developmental psychology; perception or cognitive psychology; and adulthood and aging;
- 2.0 additional credits in linguistics or psycholinguistics, which in practice often include supervised research projects available in the second through the fourth years of study.

Of the 12.5 credits required for the programs, students must complete at least 8.0 credits in courses that are designated as Natural Science (NS), Quantitative Reasoning (QR), or Social & Behavioural Sciences (SBS), but depending on the electives they choose, may complete up to 11.0 credits in science-focused courses.

For a complete breakdown of the current program, please see Appendix A.

Changes to Program Requirements

As previously stated, the training and skills that students achieve in the Psycholinguistics programs are already aligned with the HBSc degree, and no changes are needed to make the program science focused; however, this proposal to change the degree designation of the programs affords the Department an opportunity to make changes to the program requirements, effective for the 2024-25 academic year, that will serve to keep the programs at the leading-edge of the field of psycholinguistics. These changes support the program's existing learning outcomes, which are not changing.

The specific changes are:

1. In Component 1 of the PLI Specialist program, an advanced quantitative methods course in linguistics (LINC**H3) will be added as a requirement, increasing the total number of credits in this Component to 5.5 FCEs. This is being proposed to provide students with the requisite statistical knowledge to interpret, design, and conduct experiments in subsequent coursework. Specifically, this modification supports existing learning outcomes at the C and D-levels in which students will:
- Design and conduct behavioural experiments in a psycholinguistics/computer lab
- Learn to analyze and interpret L1 and L2 data.
- Use distinct research methodologies to design actual experiments

2. In Component 2 of the PLI Specialist program, students will now be required to take 1.0 credits (up from 0.5 credits) designated as Social & Behavioural Sciences or Natural Science. Students will select two of LINB10H3, LINB20H3 and LINC20H3—all designated as Social and Behavioural Sciences—and one of LINC11H3 and LINC12H3. Between 2017 and 2021, 91% of Psycholinguistics specialist graduates completed 1.0 SBS and NS credits from Component 2. This change, then, is expected to have little impact on students, instead formalizing what is already regular practice. This modification supports existing learning outcomes at the B- and C-levels in which students will:

- Develop their knowledge of the different components of mental grammar (phonetics, phonology, morphology, syntax, and semantics).
- Learn how to analyze both English and non-English data in phonetics, phonology, morphology, and syntax
- Gain knowledge and skills needed to compare the structure of different languages in phonetics, phonology, morphology, syntax, etc.
- Gain enough knowledge of the contemporary issues in linguistic and psycholinguistic theory to learn how to argue and marshal evidence for/against specific theories
- Develop and implement effective strategies for written work and oral presentations (e.g., in terms of scope, planning, and style)

3. In Component 3 of the PLI Specialist program, students will now be required to take 3.0 credits, an increase of 0.5 credits from the current program). PLID53H3 Sentence Processing will be added as an option. The reason for these changes is to provide students with the training and expertise in sentence level phenomena. The current program provides students with training in speech- and word-level experimental training, and as such, PLID53H3 provides students with the requisite training in sentence-level phenomena, filling out their psycholinguistic training. This modification supports existing learning outcomes for this requirement, in which students will:
- Gain knowledge and skills needed to contrast the structure of different languages in phonetics, phonology, morphology, syntax, etc.
- Use distinct research methodologies to design actual experiments
- Learn to analyze and interpret L1 and L2 data.
- Design and conduct behavioural experiments in a psycholinguistics/computer lab
- Adjudicate between distinct theories of models of sentence parsing using various forms of evidence.
- Gain enough knowledge of the contemporary issues in linguistic and psycholinguistic theory to learn how to argue and marshal evidence for/against specific theories
- Gain knowledge of classic and contemporary psycholinguistic models of lexical and sentence processing
- Learn to interpret data quantitatively/qualitatively (with an emphasis on the role of computational methods and other related technologies in linguistics)
- Learn how to analyze both English and non-English data in phonetics, phonology, morphology, and syntax
- Gain knowledge and skills needed to contrast the structure of different languages in phonetics, phonology, morphology, syntax, etc.
- Develop and implement effective strategies for written work and oral presentations (e.g., in terms of scope, planning, and style)

4. In Component 4 of the PLI Specialist program, students will be required to take 3.0 credits, rather than 1.5 credits, selected from a bin. LINB35H3 Introduction to Computational Linguistics will be added as an option. All options are already designated as Social & Behavioural Sciences or Natural Science. Between 2017 and 2021, 30% of Psycholinguistics

specialist graduates took 3.0 credits from Component 4. As such, a substantial minority of our students are already taking the additional science courses. This supports the current program learning outcomes and strengthens the current learning outcomes:

- Gain a deeper understanding of how the brain processes language
- Learn how to design experiments and collect and analyze data (ideally in a lab setting)
- Learn to interpret data quantitatively/qualitatively (with an emphasis on the role of computational methods and other related technologies in linguistics)
- Design and conduct behavioural experiments in a psycholinguistics/computer lab
- Acquire an in-depth understanding of how language changes with age in healthy and impaired older adults, and how these changes align with extra-linguistic cognitive changes
- Learn how to analyze both English and non-English data in phonetics, phonology, morphology, and syntax
- Develop and implement effective strategies for written work and oral presentations (e.g., in terms of scope, planning, and style)
- Understand the principles and processes of first language (L1), second language (L2) acquisition, and simultaneous bilingualism
- Learn to analyze and interpret L1 and L2 data.
- Use distinct research methodologies to design actual experiments
- Analyze phonetic data using software, e.g., PRAAT, Audacity
- Learn how human speech is perceived including its underlying mechanisms, how it is encoded in the brain, how sound categories are established and how humans adapt to variation in auditory signal
- Understand how the L1 (first language) and L2 (second language) lexicons interact during second language acquisition; consider the role of declarative memory, as well as linguistic and non-linguistic input and interaction in the acquisition of the L2 lexicon.

5. Component 5 will now be reduced from 2.0 credits to 0.5 credits.

The total number of credits to complete the programs will increase from 12.5 to 13.5, while the total number of science credits remains at 11.0 FCE. This overall increase comes due to the increase in number of required credits in Component 3 and Component 4, which now provide students with training in both sentence processing and computational linguistics. These changes reflect the recent direction of our faculty complement and keeps our program on pace to meet the changing nature of the discipline.

Enrolment Requirements

Currently, there are no enrolment requirements associated with the Specialist in Psycholinguistics. The enrolment requirements associated with the Specialist Co-op in Psycholinguistics are: 4.0 credits, including LINA01H3 and LINA02H3, plus a cumulative GPA of at least 2.5. These enrolment requirements will remain in place following the approval of this proposal. The Department of Language Studies will monitor the programs to determine if any

changes to the enrolment requirements, particularly for the non-Co-op Specialist program, are warranted.

The Department will monitor this over the next 5 years to determine if new enrolment requirements or recommended preparation will help support students in completing the program goals. It is expected that this would only be considered if enrolment pressures become a factor for the program.

Impact of the Change on Students

Outline the expected impact on continuing students, if any, and how they will be accommodated.

Please detail any consultation with students.

UTSC is the only university in the Greater Toronto Area that offers an undergraduate program specialization in Psycholinguistics. Identifying the programs as leading to an HBSc degree not only accurately reflects the training that students achieve but also increases the attractiveness of the programs to the many students who are fundamentally interested in language sciences and want an HBSc degree as well. Currently, linguistically oriented students who wish to pursue an HBSc must pursue a double major in Linguistics and a separate HBSc degree program: typically, either Psychology or Computer Science. While the double major option allows students to pursue inter-disciplinary studies, offering a Specialist leading to the HBSc would allow Linguistics and Psycholinguistics students a more direct path to a science degree.

During the 2020-2021 academic year, 71 students enrolled in the Specialist programs in Psycholinguistics. Enrollment increased to 78 students in the 2021-2022 academic year and 76 students in 2022-2023 academic year. Changing the Specialist programs in Psycholinguistics to the HBSc degree is expected to result in an increase in program enrolments, which we anticipate will largely come from students who would otherwise have completed a double major in Linguistics and Psychology or Linguistics and Computer Science. We anticipate this increase in part due to the relative uniqueness of the UTSC Psycholinguistics programs in comparison to other programs offered in the Greater Toronto Area and in other parts of Canada, as well as the intrinsic interest in language fostered by UTSC's multicultural and multilinguistic community. There may also be an increase in enrolments due to this change to an HBSc. Current and past students have reported that their main rationale for a second major in Psychology or Computer Science has been their desire to graduate with the BSc degree, which they perceive as enhancing their future career and graduate/professional school opportunities. Without undermining the core value of an HBA degree, this argument has merit in contexts where students are seeking futures in graduate programs or careers in the core sciences, where fundamental knowledge of the scientific method is essential. The Specialist/Specialist Co-op programs in Psycholinguistics offer such training. Because we view the main impact of these changes as redistributing enrolments across existing programs and

academic units rather than increasing overall enrolments at UTSC, this change is also consistent with UTSC Planning and Budget's aims of no overall increase in enrolments at UTSC.

Current students, who are already in the program, will be counted as HBA students until the effective date of the change from HBA to HBSc (September 1, 2024). No new students will be admitted to the HBA once the HBSc is available.

Students interested in completing the HBSc instead of the HBA and who are already enrolled in the program will be offered the opportunity to transfer to the HBSc program. Students who have already completed the HBA program and have graduated will not have retroactive changes applied to their degree. The Department will work with the Registrar's Office to establish a deadline by which students must decide whether to be conferred with HBA or the HBSc. It is anticipated that the majority of students will elect to graduate with the HBSc option.

Students who have selected the Specialist/Specialist (Co-op) in Psycholinguistics prior to September 1, 2024 may choose to select an HBA upon completion of the requirements of the program, if they choose; it is expected that most students will prefer the HBSc. Individual students who are pursuing a double major in Psychology and Linguistics, but who are not enrolled in the Psycholinguistics program specifically, will be able to apply for entry to the Psycholinguistic program through the regular application procedure.

Consultation

Describe the impact of the major modification on other programs and any consultation undertaken with the Dean and chair/director of relevant academic units.

Consultation Within the Department of Language Studies at UTSC

This change has been discussed and approved within the Department of Language Studies, including especially extensive discussion with faculty whose teaching and research interests are particularly focused on psycholinguistics (Dr. Blair C. Armstrong, Dr. Shohini Bhattasali, Dr. Rena Helms-Park, Dr. Yoonjung Kang, Dr. Dave Kush, and Dr. Philip J. Monahan).

Broad Consultation at UTSC

The Arts and Science Co-Op Office at UTSC has been consulted; they have confirmed that there are no concerns on their end with their ability to offer co-op placements due to the proposed degree designation change.

> The Department of Psychology has also been consulted with respect to whether the proposed designation change might impact their enrolment numbers, as several of the PLI BSc requirements can be satisfied by completing courses offered by Psychology. The curriculum committee in the Department of Psychology at UTSC has indicated that this should not be an issue.
>
> The proposal has been reviewed by the UTSC Registrar, who recommended the proposed approval timeline for September 2024, to support admissions processes. The Office of the Vice Principal Academic and Dean will continue to work with the UTSC Registrar on implementation of the changes and support for students.

Resources

Describe any resource implications of the change(s) including, but not limited to, faculty complement, space, libraries, and enrolment/admissions.
Describe any resources that enhance the learning and teaching environment, including resources to promote student well-being and resiliency in the learning and teaching environment. *You may also wish to highlight specific aspects of the following resources and supports as appropriate for the proposed program:*
- ▸ Library
- ▸ Co-operative Education
- ▸ Academic Advising (including international student advising)
- ▸ Teaching and Learning Office
- ▸ Technology Support for Teaching and Learning
- ▸ Distance/Online Learning
- ▸ Peer Learning Support
- ▸ Disabilities/Accessibility Services
- ▸ Student Academic Support Services
- ▸ Academic Computing Services
- ▸ Other unit- or program-specific supports/services

Please be specific where this may impact significant enrolment agreements with the Faculty/Provost's Office.
Indicate if the major modification will affect any existing agreements with other institutions or will require the creation of a new agreement to facilitate the major modification (e.g., Memorandum of Understanding, Memorandum of Agreement, etc). Please consult with the Provost's Office (vp.academicprograms@utoronto.ca) regarding any implications to existing or new agreements.

Faculty and Teaching Resources

No new faculty resources are required. Moreover, no changes to faculty commitments are needed to support the re-designation from the HBA degree to the HBSc degree for the Specialist/Specialist Co-op programs in Psycholinguistics. The Department of Language Studies is currently searching for a growth position in Psycholinguistics-relevant Computational Linguistics (i.e., computational models of language that relate to the cognitive representations and processes used by humans to process language). The appointed candidate will begin July 2023. In line with the growth in Psycholinguistics at UTSC, several more hires related to Psycholinguistics are identified in Departmental long-range complement plans. A tenure stream Psycholinguistics hire was completed in January 2021, resulting in Dr. Dave Kush joining the department as Assistant Professor. In July 2022, Dr. Shohini Bhattasali also joined the department as an Assistant Professor, specializing in computational linguistics. Another faculty search in computational linguistics is currently in progress. Future hiring decisions will continue to deepen and broaden the program's relationship to the sciences.

Research Interests of Core Psycholinguistics Faculty

The research interests of current faculty in the program are primarily disseminated at conferences that focus on experimental approaches to the study of language, including: Society for Neuroscience, Cognitive Science Society, the Psychonomic Society, Society for the Neurobiology of Language, the Canadian Society for Brain, Behaviour, and Cognitive Sciences, Acoustical Society of America, Cognitive Neuroscience Society, and the Conference on Human Sentence Processing, among others. Their main publication outlets focus on experimental work and include: *Journal of Neuroscience*; *Cognitive Science*; *Neuropsychologia*; *Psychological Bulletin*; *Brain and Language*; *Journal of Cognitive Neuroscience*; *Human Brain Mapping*; *eLife*; *Neurocomputing*; *NeuroImage*; *Cognition*; *Quarterly Journal of Experimental Psychology*; *Journal of Early Childhood Literacy*; *Journal of the Acoustical Society of America*; *Behavior Research Methods*; *Scientific Reports*; *Journal of Experimental Psychology: General*; *Journal of Experimental Psychology: Learning, Memory and Cognition*; *Philosophical Transactions of the Royal Society of London: Biological Sciences*; *Trends in Cognitive Sciences*; *Language, Cognition, and Neuroscience*; *Journal of Memory and Language*; *Current Directions in Psychological Science*; *Language and Cognitive Processes*; *Speech Communication*; *Language Acquisition*; *Second Language Acquisition*; *Studies in Second Language Acquisition*; *Applied Psycholinguistics*; *American Journal of Speech-Language Pathology*; *Frontiers in Human Neuroscience*; *Memory & Cognition*; *Frontiers in Human Neuroscience*; among others. This focuses their research in scholarly communities that align with the science degree designation.

Table 2 UTSC Psycholinguistics Faculty

Faculty Member	Appointment	Research Areas
Blair Armstrong	1.0 FTE in Psychology	Neural network simulations of how language is learned, represented, and generalized, using

Assistant Professor	Graduate Appointment: Department of Psychology	domain-general mechanisms, computational/corpus analysis of word meaning, neuroimaging studies of language learning and processing.
Shohini Bhattasali Assistant Professor	1.0 FTE in Linguistics Graduate Appointment: Department of Linguistics	Computational Linguistics, Neuroimaging, Cognitive Neuroscience, Memory, Argument Structure, Syntax
Rena Helms-Park Associate Professor	1.0 FTE in Linguistics Graduate Appointment: Department of Speech Language Pathology	Primary and non-primary language acquisition; the science of reading; the multilingual mental lexicon; evaluation of language and reading difficulties and disorders in multilingual children
Yoonjung Kang Professor	1.0 FTE in Linguistics Graduate Appointment: Department Linguistics	Phonetics-phonology interface, acoustics phonetics, articulation, speech perception, phonology, sociolinguistics, psycholinguistics
Dave Kush Assistant Professor	1.0 FTE in Linguistics Graduate Appointment: Department of Linguistics	Sentence processing, memory, eye tracking, computational modeling, interplay of grammar and processing, linguistic variation
Philip J. Monahan Associate Professor	1.0 FTE in Linguistics Graduate Appointment: Department of Linguistics	Speech perception, cognitive neuroscience of language, neurophysiology, phonetics, phonology. Certificate from the University of Maryland in Neuroscience and Cognitive Science.

Blair Armstrong's primary research interests focus on the neurocomputational basis of word processing, and how these processes relate to fundamental cognitive abilities such as vision and decision making. His primary research interests relate to the cognitive and neural representations, processes, and learning mechanisms underlying word comprehension and semantic memory. This work largely concerns developing theories of how ambiguous words are comprehended, the source of the similarities and differences between written and spoken word comprehension, how learning mechanisms lead to the emergence of cross-linguistic differences in lexical processing, and how newly learned words are integrated into the lexical system. During his PhD studies in Psychology at Carnegie Mellon University, he implemented biologically inspired

neural network models of how individuals comprehend ambiguous words. As part of his postdoctoral training, he expanded this neural network approach to studying other issues such as modeling cross-linguistic differences in how the neural systems that support vision become differentially specialized depending on the language an individual learns, as well as in EEG studies of the brain's electrical activity during word comprehension. He currently holds a full-time appointment in Psychology and teaches courses in the Psycholinguistics program in the Department of Language Studies and in the Cognitive Neuroscience program in Psychology. His research at UofT has been funded by both NSERC and SSHRC and his work has been featured in a range of scientific journals including *Cognition*; *Scientific Reports*; *Neuropsychologia*; *Philosophic Transactions of the Royal Society: Biological Sciences*; *Language, Cognition, and Neuroscience*; *Neurocomputing*; and *Trends in Cognitive Sciences*. His work has also been featured in popular press outlets such as CNBC, Scientific American, and New Scientist.

Shohini Bhattasali's research interests center around the neurocomputational basis of language processing. Using contemporary computational models and data from fMRI, MEG, and EEG, she investigates how we can gain further insight into language comprehension at the word, sentence, and discourse level. This interdisciplinary research program brings together computational linguistics and neurolinguistics, involving interfaces among cognitive neuroscience, psycholinguistics, and natural language processing (NLP). The primary question she has been investigating is how human comprehenders use different sources of contextual knowledge to predict upcoming words in a sentence or sounds in a word. Utilizing computational models like LSTMs, Transformers, and LDA topic models, she has shown how we can adapt these state-of-the-art NLP tools to embody contextual knowledge, operationalize various cognitive hypotheses, and test it against different neuroimaging datasets. She currently holds a full-time appointment in the Department of Language Studies at UTSC, along with a graduate appointment in the Department of Linguistics at UTSG. During her postdoctoral training at the University of Maryland, she held appointments across the Institute of Advanced Computing Studies (UMIACS), Neuroscience and Cognitive Science (NACS), and Linguistics. She received her PhD in Linguistics at Cornell University with a graduate minor in Cognitive Science. She has also been actively involved in science outreach programs such as the North American Computational Linguistics Olympiad (NACLO). She has presented her work at and been an ad-hoc reviewer for top-tier computer science and neuroscience venues such as *Association for Computational Linguistics*; *Conference on Computational Natural Language Learning*; *Empirical Methods in Natural Language Processing*; *Cognitive Modeling and Computational Linguistics*; *Language Resources and Evaluation Conference*; *Nature*; *Language, Cognition, and Neuroscience*; *Brain & Language*; *Journal of Neuroscience*; *Society for Neuroscience*; *Society for the Neurobiology of Language.* Her research has been supported by the Data Sciences Institute at UofT and prior to UofT, it has been supported by the US National Science Foundation and US Office of Naval Research.

Rena Helms-Park's interests encompass developmental psycholinguistics, the multilingual lexicon, and the psycholinguistics of reading. Her research in psycholinguistics and applied linguistics uses quantitative methods, and her publications have appeared in journals that favour statistical methods of data analysis (e.g., *Studies in Second Language Acquisition*, *Language*

Testing, *Applied Psycholinguistics*, and *The American Journal of Speech Language Pathology)*. Her doctoral dissertation used a cross-sectional design to determine how differences in the acquisition of English causatives by Hindi-Urdu and Vietnamese speakers corresponded with differences in the lexico-semantic properties of verbs in the two languages. Her subsequent research has examined non-primary lexical acquisition and lexical testing, covering languages such as Italian, French, Romanian, and Ukrainian. Dr. Helms-Park has supervised several individual research projects involving senior UTSC undergraduates and Master's level SLP students in conjunction with the Department of Speech-Language Pathology (SLP) at the University of Toronto. One long-term project co-authored by her and two UTSC supervisees, among others, recently received the *American Journal of Speech Language Pathology* Editor's Award for its impact and high standard of quality. (The article has been downloaded over 16,000 times since publication in March 2021.) A secondary area of interest of hers is primary and non-primary reading acquisition; this has resulted in a co-edited and co-written book, *Reading in a Second Language* (2016). Her current research includes a SSHRC-funded project on the psycholinguistic and cognitive contributors to reading success or difficulty among bilingual and multilingual children.

Yoonjung Kang obtained her Ph.D. in Linguistics from the Massachusetts Institute of Technology. Her research interests concern multiple subfields of linguistics and their interfaces. Specific topics she has published in include phonological theories, loan word phonology, phonology-phonetics interface, experimental phonology, acoustic and articulatory phonetics, sound change and variation, dialect variation, heritage language, second language acquisition, speech perception, and corpus linguistics. A central theme that underlies her research endeavours is the question of variation and learnability. Her research combines traditional sources of linguistic data—elicited speech, written material from the past, and dictionary data—with newer methodologies such as speech production and perception experiments and corpus research using computational tools. She regularly publishes in scientifically oriented venues, such as *Phonetics and Speech Sciences*; *Proceedings of the International Congress of Phonetic Sciences*; *Journal of Phonetics*; and *Laboratory Phonology*.

Dave Kush's research focuses on sentence comprehension, cross-linguistic variation in processing, and first- and second-language acquisition. The research uses a variety of experimental methodologies including eye-tracking, self-paced reading, and behavioral judgment studies, often complemented by insights from models of memory from psychology or acquisition models from computational linguistics. The overarching question that his research has sought to address is how humans build complex sentence structure word-by-word in real time and how language-specific knowledge interacts with domain-general cognitive systems like memory. Dr. Kush obtained his PhD in Linguistics from the University of Maryland, where he also received a Certificate in Neuroscience and Cognitive Science. After leaving the University of Maryland, Dr. Kush completed a postdoctoral fellowship at Haskins Laboratories. This postdoctoral research, which was funded by a National Research Service grant from the US National Institutes of Health, investigated how individual differences in memory affected language processing ability. After his postdoctoral research, Dr. Kush took an Assistant Professor position at the Norwegian University of Science and Technology for four years before joining

UTSC with a full-time appointment in the Department of Language Studies in 2021. Since coming to UTSC, Dr. Kush has established the Eyelands lab, where he conducts SSHRC-funded research. His research has appeared in a range of scientific journals including *Journal of Memory & Language*; *Journal of Experimental Psychology: Learning, Memory & Cognition*; *Language, Cognition & Neuroscience*; *Memory & Cognition*; *Language Acquisition*; *Second Language Research*; *Glossa Psycholinguistics*; and *Frontiers in Psychology*.

Philip J. Monahan's research investigates the cognitive and neurophysiological bases of speech sound and lexical representations using methodologies from experimental psychology and cognitive neuroscience, i.e., electroencephalography (EEG), magnetoencephalography (MEG), auditory psychophysics, to ask linguistically informed questions. Specifically, his research combines linguistics, experimental psychology, and cognitive neuroscience to understand how the brain encodes phonetic information, how phonological structure is employed predictively to interpret the incoming speech signal, and the time-course of access to morphological structure. Dr. Monahan received his PhD in Linguistics from the University of Maryland, where he also completed the Certificate in Neuroscience and Cognitive Science. He carried out his Marie-Curie funded post-doctoral work at the Basque Center for Cognition, Brain and Language. Specifically, he is interested in 1) the cognitive and cortical representation of speech sounds and how we use these representations to make predictions about what we are about to hear next during language processing, 2) the structure of words in the mental lexicon and finally, 3) the integration and use of low-level acoustic cues to inform us about the speaker. He currently holds a full-time appointment in the Department of Language Studies (UTSC) and a non-budgetary cross-appointment in the Department of Psychology (UTSC). His research at UofT has been funded by both NSERC and SSHRC and has appeared in a range of scientific journals including *Journal of Cognitive Neuroscience*; *Cognition*; *Quarterly Journal of Experimental Psychology*; *NeuroImage*; *Speech Communication*; *Journal of Experimental Psychology: Learning, Memory and Cognition*; *Current Directions in Psychological Science*; *Journal of the Acoustical Society of America*; *Journal of Speech, Language and Hearing Research*; *Language and Cognitive Processes*; *Brain and Language*; and *Frontiers in Human Neuroscience*. He is also an Associate Editor at *Language and Speech*.

Space and Other Infrastructure

No additional space requests are being made in conjunction with this proposed change. The Department of Language Studies currently has two research laboratories and a third is currently being set up. There is adequate office space for the existing faculty complement.

If program enrolments grow, this will increase the demand on our ability to provide laboratory-based hands-on research training within our current capacity and laboratory facilities. Such hands-on training in research methods is one of the major strengths of our offering. If, contrary to all expectations, enrolment does not increase because of this change to an HBSc, we have sufficient resources to continue offering students the same research opportunities that we are currently providing. A continued increase in faculty complement would entail additional space for our new hires, and this increase could accommodate the added demand should enrolments

increase. If space restrictions present an issue in the longer term, we will consider introducing admission requirements to keep demand at an acceptable level; however, we expect additional space allocations to be provided as part of the normal start-up packages for the additional hires.

The department has reviewed the allocation of TA hours for lab-based courses in Psycholinguistics to ensure that they are consistent with comparable lab-based courses in other units. The Dean's Office is supportive of this proposed adjustment.

UTQAP Process

The UTQAP pathway is summarized in the table below.

Steps	Approvals
Development/consultation within unit	**December 5, 2022**
Consultation with Dean's Office (and VPAP)	**February 10, 2023**
Sign-off from VPAP	**February 24, 2023**
Department of Language Studies	**December 5, 2022**
UTSC Academic Affairs Committee	**March 22, 2023**
Submission to Provost's Office	
Reported to the Provost and included in annual report to AP&P	
Ontario Quality Council — reported annually	

Appendix A: Breakdown of the Current Psycholinguistics Programs (Taken From the 2022-23 Calendar)

As described in Table 3 below, the vast majority of the psycholinguistics courses and courses identified as requirements or options for the Specialist in Psycholinguistics programs identify Natural Sciences (NS), Quantitative Reasoning (QR) or Social and Behavioural Sciences (SBS) as the breadth requirement category in the UTSC Calendar (https://utsc.calendar.utoronto.ca/search-courses).

Table 3: Required and Optional Courses in the Specialist/Specialist (Co-operative) programs in Psycholinguistics [From the 2022-23 UTSC Undergraduate Academic Calendar]

Course Code	Course Title	Breadth Requirement Category	Required or Option
Students must complete a total of 12.5 credits			
• Students **must** complete a minimum of 8.0 credits in courses designated as Natural Sciences, Quantitative Reasoning, or Social & Behavioural Sciences; however, depending on the electives they select, they can complete up to 11.0 credits in science-designated courses			
Component 1: Students must complete 5.0 credits as follows			
• Students must complete a minimum of 3.5 credits in courses designated as Natural Sciences, Quantitative Reasoning, or Social & Behavioural Sciences			
LINA01H3	*Introduction to Linguistics*	Arts, Literature & Language	Required
LINA02H3	*Applications of Linguistics*	Arts, Literature & Language	Required
PSYA01H3	*Introduction to Biological and Cognitive Psychology*	Natural Sciences	Required

PSYA02H3	*Introduction to Clinical, Developmental, Personality and Social Psychology*	Natural Sciences	Required
LINB04H3	*Phonology I*	Social & Behavioural Sciences	Required
LINB06H3	*Syntax I*	History, Philosophy & Cultural Studies	Required
LINB09H3	*Phonetics: The Study of Speech Sounds*	Natural Sciences	Required
LINB29H3	*Quantitative Methods in Linguistics*	Quantitative Reasoning	Required
PLIC24H3	*First Language Acquisition*	Natural Sciences	Required
PLIC55H3	*Psycholinguistics*	Natural Sciences	Required
Component 2: Students must select 1.5 credits from the following			
• Students must complete a minimum of 0.5 credit in courses designated as Social & Behavioural Sciences; however, depending on the electives they select, they can complete up to 1.5 credits in courses designated as Social & Behavioural Sciences			
LINB10H3	*Morphology*	Social & Behavioural Sciences	Option
LINB20H3	*Sociolinguistics*	Social & Behavioural Sciences	Option
LINC02H3	*Phonology II*	Social & Behavioural Sciences	Option
LINC11H3	*Syntax II*	History, Philosophy & Cultural Studies	Option
LINC12H3	*Semantics: The Study of Meaning*	History, Philosophy & Cultural Studies	Option
Component 3: Students must select 2.5 credits from the following			
• Students must complete all 2.5 credits in courses designated as Natural Sciences, or Social & Behavioural Sciences			
LINB62H3	*Structure of American Sign Language*	Social & Behavioural Sciences	Option
LIND09H3	*Phonetic Analysis*	Natural Sciences	Option
PLIC25H3	*Second Language Acquisition*	Natural Sciences	Option

PLID34H3	*Psycholinguistics of Reading*	Natural Sciences	Option
PLID44H3	*Acquisition of the Mental Lexicon*	Natural Sciences	Option
PLID50H3	*Speech Perception*	Social & Behavioural Sciences	Option
PLID74H3	*Language and Aging*	Natural Sciences	Option
Component 4: Students must select 1.5 credits from the following			
• Students must complete all 1.5 credits in courses designated as Natural Sciences, Quantitative Reasoning, or Social & Behavioural Sciences • *Students can take PSYB51H3 OR PSYB57H3 in completion of this requirement (but not both)			
BIOA11H3	*Introduction to the Biology of Humans*	Natural Sciences	Option
BIOB35H3	*Essentials of Human Physiology*	Natural Sciences	Option
LINB19H3	*Computers in Linguistics*	Quantitative Reasoning	Option
PLIC54H3	*Speech Physiology and Speech Disorders in Children and Adults*	Natural Sciences	Option
PLIC75H3	*Language and the Brain*	Social & Behavioural Sciences	Option
PLID56H3	*Special Topics in Language Disorders in Children*	Natural Sciences	Option
PSYB20H3	*Introduction to Developmental Psychology*	Social & Behavioural Sciences	Option
PSYB51H3*	*Introduction to Perception*	Natural Sciences	Option
PSYB57H3*	*Introduction to Cognitive Psychology*	Natural Science	Option
PSYC21H3	*Adulthood and Aging*	Social & Behavioural Sciences	Option
Component 5: Students must complete 2.0 further credits in any LIN and/or PLI courses			
• 13 LIN courses (6.5 credits) are designated as Arts, Literature & Language, or History, Philosophy & Cultural Studies; therefore, it is possible for students to complete the full 2.0 credits in this requirement using these courses			

- Except for Independent Study courses, all PLI courses identify either a Natural Sciences or Social & Behavioural Sciences breadth requirement category; therefore, **it is also possible** for students to complete the full 2.0 credits in this requirement using courses that are designated as either Natural Science or Social & Behavioural Science

The Specialist Co-op program in Psycholinguistics requires students to complete the above requirements for the Specialist in Psycholinguistics and in addition, students must successfully complete the additive Arts & Science Co-op Work Term Preparation courses and a minimum of two Co-op work terms.

Appendix B: Current Calendar Copy with Changes Tracked or Highlighted

SPECIALIST PROGRAM IN PSYCHOLINGUISTICS (ARTS)

Program Requirements
Students must complete 13.5 ~~12.5~~ credits, including 4.0 credits at the C- and D-levels of which 1.0 credit must be at the D-level as follows:

1. ~~5.0~~ 5.5 credits as follows:
LINA01H3 Introduction to Linguistics
LINA02H3 Applications of Linguistics
PSYA01H3 Introduction to Biological and Cognitive Psychology
PSYA02H3 Introduction to Clinical, Developmental, Personality and Social Psychology
LINB04H3 Phonology I
LINB06H3 Syntax I
LINB09H3 Phonetics: The Study of Speech Sounds
LINB29H3 Quantitative Methods in Linguistics
LINC29H3 Advanced Quantitative Methods in Linguistics
PLIC24H3 First Language Acquisition
PLIC55H3 Psycholinguistics

2. 1.5 credits from the following (Students will select two of LINB10H3, LINB20H3 and LINC02H3 and one of LINC11H3 and LINC12H3):
LINB10H3 Morphology
LINB20H3 Sociolinguistics
LINC02H3 Phonology II
LINC11H3 Syntax II
LINC12H3 Semantics: The Study of Meaning

3. 3.0 ~~2.5~~ credits from the following:
LINB62H3 Structure of American Sign Language
LIND09H3 Phonetic Analysis
PLIC25H3 Second Language Acquisition
PLID34H3 Psycholinguistics of Reading
PLID44H3 Acquisition of the Mental Lexicon
PLID50H3 Speech Perception
PLID53H3 Sentence Processing
PLID74H3 Language and Aging

4. 3.0 credits ~~1.5 credits~~ from the following:
BIOA11H3 Introduction to the Biology of Humans
BIOB35H3 Essentials of Human Physiology
LINB19H3 Computers in Linguistics
LINB35H3 Introduction to Computational Linguistics
PLIC54H3 Speech Physiology and Speech Disorders in Children and Adults
PLIC75H3 Language and the Brain
PLID56H3 Special Topics in Language Disorders in Children
PSYB20H3 Introduction to Developmental Psychology

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[PSYB51H3 Introduction to Perception *or* PSYB57H3 Introduction to Cognitive Psychology]
(PSYB65H3) Human Brain and Behaviour
PSYC21H3 Adulthood and Aging

5. ~~2.0~~ 0.5 further credit in LIN and/or PLI

Note: students interested in pursuing Speech Language Pathology as an option for graduate studies should complete BIOA11H3 and BIOB35H3 (of component 4 of the program requirements) in order to satisfy a portion of the physiology requirement necessary for admissions.

SPECIALIST (CO-OPERATIVE) PROGRAM IN PSYCHOLINGUISTICS (ARTS)

Co-op Contact: askcoop@utoronto.ca

The Specialist (Co-op) Program in Psycholinguistics is a Work Integrated Learning (WIL) program that combines academic studies with paid work terms in the public, private, and/or non-profit sectors. The program provides students with the opportunity to develop the academic and professional skills required to pursue employment in these areas, or to continue on to graduate training in an academic field related to Psycholinguistics upon graduation.
In addition to their academic course requirements, students must successfully complete the additive Arts & Science Co-op Work Term Preparation courses and a minimum of two Co-op work terms.

Enrolment Requirements
The minimum qualifications for entry are 4.0 credits, including LINA01H3 and LINA02H3, plus a cumulative GPA of at least 2.5.

Current Co-op Students:
Students admitted to a Co-op Degree POSt in their first year of study must request a Co-op Subject POSt on ACORN upon completion of 4.0 credits and must meet the minimum qualifications for entry as noted above.

Prospective Co-op Students:
Prospective Co-op students (i.e., those not yet admitted to a Co-op Degree POSt) must submit a program request on ACORN, and meet the minimum qualifications noted above. Deadlines follow the Limited Enrolment Program Application Deadlines set by the Office of the Registrar each year. Failure to submit the program request on ACORN will result in that student's application not being considered.

Program Requirements
Students must complete the program requirements as described in the Specialist Program in Psycholinguistics.

Co-op Work Term Requirements
Students must satisfactorily complete two Co-op work terms, each of four-months duration. To be eligible for their first work term, students must be enrolled in the Specialist (Co-op) Program in Psycholinguistics and have completed at least 7.0 credits, including LINB06H3 and LINB09H3.
In addition to their academic program requirements, Co-op students complete up to four Co-op specific courses. These courses are designed to prepare students for their job search and work term experience, and to maximize the benefits of their Co-op work terms. They cover a variety of topics intended to assist students in developing the skills and tools required to secure work terms that are appropriate to their program of study, and to perform professionally in the workplace. These courses must be completed in sequence, and are taken in addition to a full course load.

They are recorded on transcripts as credit/no credit (CR/NCR) and are considered to be additive credit to the 20.0 required degree credits. No additional course fee is assessed as registration is included in the Co-op Program fee.

Co-op Preparation Course Requirements:

1. COPB50H3/(COPD01H3) – Foundations for Success in Arts & Science Co-op
- Students entering Co-op from outside of UTSC (high school or other postsecondary) will complete this course in Fall or Winter of their first year at UTSC. Enrolment in each section is based on admission category: Typically, students in Computer Science, Mathematics and Statistics enroll in the Fall semester while all other Arts & Science Co-op admission categories enroll in the Winter semester however this may vary year to year.
- Current UTSC students entering Co-op in April/May will complete this course in the Summer semester.
- Current UTSC students entering Co-op in July/August will complete this course in the Fall semester.

2. COPB51H3/(COPD03H3) – Preparing to Compete for your Co-op Work Term
- This course will be completed eight months in advance of the first scheduled work term.

3. COPB52H3/(COPD11H3) – Managing your Work Term Search & Transition to Work
- This course will be completed four months in advance of the first work scheduled work term.

4. COPC98H3/(COPD12H3) – Integrating Your Work Term Experience Part I
- This course will be completed four months in advance of the second scheduled work term.

5. COPC99H3/(COPD13H3) – Integrating Your Work Term Experience Part II
- This course will be completed four months in advance of the third scheduled work term (for programs that require the completion of 3 work terms and/or four months in advance of any additional work terms that have been approved by the Arts and Science Co-op Office.

Students must be available for work terms in each of the Fall, Winter and Summer semesters and must complete at least one of their required work terms in either a Fall or Winter semester. This, in turn, requires that students take courses during at least one Summer semester.

For information on fees, status in Co-op programs, and certification of completion of Co-op programs, see the 6B.5 Co-operative Programs section or the Arts and Science Co-op section in the UTSC *Calendar*.