

<b>Course Code</b>	HP4063
<b>Course Title</b>	Research Lab in Language in Perception and Thought
<b>Pre-requisites</b>	HP1000 Introduction to Psychology, HP1100 Fundamentals of Social Science Research and one of the following: HP2300 Developmental Psychology, HP2500 Personality and Individual Differences, HP2600 Cognitive Psychology
<b>No of AUs</b>	4

### Course Aims

Does the language we speak influence other aspects of cognition and perception? This class will introduce you to the Whorfian Hypothesis about the relationship between language and thought, and how to conduct experimental tests using the neo-Whorfian approach and techniques from psycholinguistics. In the first half of the class, you will take part in a number of quick-fire experiments, to build up an experimental 'tool kit' of techniques. We will review current evidence about the influence of different linguistic features on different domains of cognition and perception (e.g., categorization, spatial cognition, numerical cognition, colour perception, audition, and cross-modal perception). For each domain, we will investigate how the published literature relates to language in Singapore, and identify gaps in the existing literature. Interactions between language and the mind in extreme scenarios (e.g., language deprivation) will also be addressed. In the second half of the course, you will identify a research gap, formulate a detailed hypothesis, preregister a study, and conduct a data collection exercise for presentation in the class Symposium – a poster session held in the final week of term. The lab-based class provides an in-depth experience of the research cycle from identification of knowledge gaps to hypothesis formation, data collection and research presentation, with a focus on 21<sup>st</sup> century research skills such as power analysis & preregistration. This class will provide valuable insights for students with an interest in cross-cultural differences, psycholinguistics, education, or philosophy of mind. Students planning on conducting psychological research in the future will benefit from hands on experience of current best practice in the research cycle.

### Intended Learning Outcomes (ILO)

By the end of this course, you should be able to:

1. Describe Singapore's speech environment with reference to language contact, code-switching, loan words, diglossia, and different speech registers (e.g., formal & informal); and document features of language use in Singapore.
2. Explain the Whorfian hypothesis and the neo-Whorfian approach, with reference to contemporary evidence in the scientific literature.
3. Formulate a testable hypothesis about the relationship between a particular feature of a language, and some non-linguistic aspect of cognition/perception/thought.
4. Conduct a power analysis, and preregister a well-powered study, with a clear analysis plan (including corrections for multiple comparisons), and a detailed recruitment plan (including statistically justified target N, approach to exclusion, and Stop Rule).
5. Articulate the difference between hypothesis testing and exploratory analyses.

6. Apply knowledge of image rights/*visual plagiarism* when identifying/selecting visual materials for use in academic and other visual formats for different audiences.

7. Create and present a scientific poster including visual presentation of numerical data you have collected for this class.

### Course Content

#### Topic Domains

- What is language? Myths and Facts
- Linguistic Categories & Lexicon Structure
- Language and Numerical Cognition
- Language and Spatial Cognition
- Language and Time
- Language and Colour Perception
- Language and Cross-modal Perception
- Language Extremes (deprivation, aphasia)

#### Skills Development for Psychological & Language Science

- Collecting data about language use
- Formulating testable hypotheses
- Preregistering hypothesis tests
- Power to detect an effect
- Presenting data in a scientific poster session

### Assessment (includes both continuous and summative assessment)

Component	ILO Tested	Related Programme LO or Graduate Attributes	Weighting	Team/ Individual
1. Minor Project: Preregistration	1, 3, 4, 5	Creativity & Competence	30%	Individual
2. Major Project: Poster	2, 3, 6, 7	Communication, Creativity & Competence.	50%	Individual
3. Class Participation & Reflections	1, 2, 3, 4, 5,	Communication & Competence	20%	Individual
Total			100%	

### Formative feedback

You will receive formative feedback through written responses to your Reflections throughout the term. Peer evaluations will also constitute formative feedback for some tasks (e.g., summary of an article), along with verbal feedback from the instructor through in-class discussion.

You will receive **verbal feedback** about the Major Project (Poster) from the instructor during the Poster session, along with additional feedback from other members of the class during the sharing session. This feedback can be incorporated into the Pre-registration.

You will also receive summative feedback on the Major Project at the end of semester.

### Learning and Teaching approach

Approach	How does this approach support you in achieving the learning outcomes?
Mini Lectures	Each mini lecture will provide a summary overview of key findings within a domain of cognition that is known to be influenced by the language a person speaks. Each mini lecture is accompanied by a detailed reading list for 'deep dives' into the literature. You can use these overviews to ground your thinking about the relationship between language and cognition (Learning Objective 2), gain exposure to techniques that you can use in the research design of your Projects (Learning Objectives 3 & 7). For most mini-lectures, it is unclear whether similar results would be found if these relationships were tested in people who speak the local varieties of Singaporean languages. These research gaps are used as the jumping-off point for group discussions about language use in Singapore (Learning Objective 1).
Language documentation	In order to address research gaps in Singapore, we need to have a clear idea of what are the linguistic features used in local varieties, and how they might differ from other varieties of the languages spoken here (e.g., plurals; classifiers; tense marking). Following on from content presented in mini-lectures, you will work in a group to try to describe a particular linguistic feature in the Singaporean variety of the languages you speak (Learning Objective 1). The process of documenting language systems may form an essential part of your project design (Learning Objectives 3 and 7).
Experiments-to-Evidence	Each session of the class you will participate in simplified versions of Neo-Whorfian experiments, mostly implemented using low-tech data collection techniques. The responses of the class will be shared immediately following the experiment, using low-tech data visualization techniques. This approach allows you to build up a toolkit of experimental techniques that you can select from when designing your projects (Learning Objective 3). You will also gain exposure to a toolkit of data-visualization techniques for use in your poster (Learning Objective 7).
Workshop	In Workshops, you will receive detailed, hands-on training on technical aspects of the research cycle such as designing a testable hypothesis, conducting a power analysis, and preregistration (Learning Objectives 3, 4, 5). Workshops will be conducted as a 'challenge' for ad hoc groups to solve, using templates or digital tools. Discussions with the instructor during the workshop will help to shape the group's progress. Groups will share their solutions with the class, and verbal feedback from other groups as well as from the instructor will help you to apply these skills in your project (Learning Objective 7).

Learning Portfolio	<p>Throughout the term, you will be asked to submit short no-stakes <i>reflections</i> on topics discussed in class. This exercise acts as conceptual consolidation for topics and approaches introduced in class (using <b>Elaboration</b> to support Learning Outcomes 1 and 2), or application of learned techniques to the Singapore language environment (using <b>Concrete Examples</b> to support Learning Outcomes 1, 4 and 5).</p> <p>You are encouraged to write your reflections using an informal tone, and a personal voice, and to practice using technical terms introduced in class to describe your own experiences and knowledge. The reflections should document your learning journey throughout the semester. These regular reflections form a core part of the Learning Portfolio to be collated for submission at the end of semester.</p>
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### Reading and References

See Topic Specific Reading Lists

### Course Policies and Student Responsibilities

#### General Expectations

You are expected to...

- complete assigned class prep (listen to assigned podcasts; read assigned articles; prepare work for class discussions) **and print out/prepare presentation-ready work** for sharing sessions, when specified.
- complete scheduled class followups, as announced in class & posted on NTU-Learn (no-stakes reflections; resubmissions of revised work; methodology notes; etc)
- attend seminar classes punctually and participate in class activities & group-work
- take written notes during class (by hand or on devices). Note that this includes content discussed in class, and presented on whiteboards (some content is not included in lecture slides).
- complete scheduled assignments by the due dates
- present your work to the group during the class Conference

You are expected to take responsibility to follow up with your peers for class notes, assignments and course related announcements for seminar sessions you may miss.

#### Absenteeism

From the time you are enrolled in the class, you are allowed two 'free passes' from class, that can be taken at any time. The free passes do not require any documentation or explanation. However, please note that absences may impact your ability to do well in the assessable items, and/or your marks for class participation. It is advisable to 'save up' these free passes until you really need them. Absence from **more than 2 classes** without a valid reason will affect your overall course grade. Valid reasons include falling sick **supported by a medical certificate** and participation in NTU's approved activities **supported by an excuse letter** from the relevant bodies. The attendance policy is summarized in this cartoon by Lynda Barry:



The policy of 'two free passes' does not apply to the Class Conference (Week 13), where documentation must be provided if absence is unavoidable. In such a case, students should contact the instructor ahead of time to arrange for their poster to be displayed, if at all possible. Since class participation also makes up a proportion of the grade, multiple absences are best avoided. If you think that multiple valid absences may have impacted your participation grade, or your ability to perform the reflection exercises, please contact the instructor **before the first day of the exam period**.

### Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information.

*This class will provide explicit training about **image rights and visual/graphical plagiarism**.*

Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

### Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	What is language? Myths and Facts	1,2	Prep: Podcast Preview (TBC – changes each session) Activities: Catalogue of class languages Discussion of language myths/facts Followup: Readings on Languages & Dialects (var. Blogs & Magazine Articles) Readings on Weird Biases

			(var. Blogs & Magazine Articles) Reflection: What is Language?
2	Linguistic Categories & the Grammar of Things	1,2,3	Prep: Podcast Previews <ul style="list-style-type: none"> <li>• <i>Does language shape how we think? Linguistic relativity &amp; linguistic determinism</i> (3:15) by NativLang(2013)</li> <li>• 'Lost In Translation: The Power Of Language To Shape How We View The World' (35:25) <i>Hidden Brain: A Conversation about Life's Unseen Patterns</i>, NPR First broadcast: January 29, 2018</li> </ul>
			Activities: <b>Experiments-to-Evidence:</b> Lang Fingerprint & Words <b>Mini Lecture:</b> Lexicon Structure & Noun Grammar
			Followup: Reflection on one object (followup on class activities)
3	Language and Numerical Cognition	1,2,3	Prep: Create your Language Fingerprint Podcast Previews (Number) Plurals and Classifiers in SG (for class 1discussion)
			Activities: <b>Lang doc:</b> Noun grammar in SG English & Mandarin <b>Experiments-to-Evidence:</b> Numbers1 & Space <b>Mini Lecture:</b> Numerical cognition
			Followup: Reflections on grammar of number in SG (based on class discussion).
4	Language and Spatial Cognition	1,2,3	Prep: Podcast Previews (Space) Observations on pointing (for class discussion)
			Activities: <b>Experiments-to-Evidence:</b> Numbers2 & Time <b>Mini Lecture:</b> Spatial Language <b>Lang doc:</b> Spatial language in SG English
			Followup: Reflections on SG spatial language (based on class discussions).
5	Language and Time	1,2,3	Prep: Summarize one assigned article from 'Time' reading list
			Activities: <b>Experiments-to-Evidence:</b> Colour1 <b>Workshop</b> Pocket Checklist <b>Mini-Lecture:</b> Time <b>Lang doc:</b> Temporal sequence language in SG <b>Workshop:</b> Power analysis
			Followup: Revised Summary
6			Prep:

	Language and Colour	1,2,3,5	<p>Podcast Preview - Colour</p> <p>Power analysis attempt: Power to detect an effect</p> <p>Activities:</p> <p><b>Experiments-to-Evidence:</b> Colour2</p> <p><b>Workshop:</b></p> <ul style="list-style-type: none"> <li>• Random hypothesis formulation</li> <li>• Preregistration</li> </ul> <p><b>Mini Lecture:</b> Language of colour</p> <p><b>Lang doc:</b> Colour vocab in SG English</p> <p>Followup:</p> <p>Reflections on Power Analysis</p> <p>List of methods</p>
7	Research cycle skills: Formulating Hypotheses, Power & Preregistration	4,5	<p>Prep:</p> <p>Styles (2018) 'Coinflipping cowboys', in <i>The Psychologist Online</i>.</p> <p>Chambers (2017) 'Chapter 2 The Sin of Hidden Flexibility' in <i>The Seven Deadly Sins of Psychology</i>, Princeton University Press, pp.22-45.</p> <p>Activities:</p> <p><b>Experiments-to-Evidence:</b></p> <ul style="list-style-type: none"> <li>• Colour3</li> </ul> <p>Workshop: Power Analysis</p> <p>Followup:</p> <p>Reflections on Preregistration</p>
8	Language and Hearing  + Graphical Presentation	1,2,3	<p>Prep:</p> <p>List of graphical techniques (for class discussion)</p> <p>Activities:</p> <p><b>Lang Doc:</b> SG Phonology</p> <p><b>Experiments-to-Evidence:</b> Speech Sounds &amp; X-Modal</p> <p><b>Workshop:</b> Posters &amp; images</p> <p>Followup:</p> <p>Reflections on auditory plasticity</p>
9	Language and Cross-modal Perception	1,2,3	<p>Prep:</p> <p>Shang &amp; Styles (2017) Is a high tone pointy?</p> <p>Activities:</p> <p><b>Lang Doc:</b> Crossmodal</p> <p><b>Experiments-to-Evidence:</b> Synaesthesias</p> <p>Followup:</p> <p>Prepare for conference presentations</p>
10	Scientific Presentation:	6,7	<p>Prep:</p> <p>Prepare to give presentation</p> <p>Activities:</p> <p><b>Research Preview (Mini Conference)</b></p> <p>Followup:</p>
11	Research Workshop		<p>Prep:</p> <p>TBC (content arising)</p> <p>Class activities &amp; discussions to support Project work</p> <p>Group work on Conference Proceedings</p> <p>Followup:</p> <p>None (General Project Prep)</p>

12	Research Workshop + Language Extremes	1,2,3,7	Prep: Podcast Previews Bolte Taylor: Stroke of Insight
			Class activities & discussions to support Project work Group work on Conference Proceedings
			Followup: None (General Project Prep)
W13	Research Workshop & Sharing Session		<b><i>MAJOR PROJECTS DUE: Conference Proceedings</i></b> Students share their progress on the Creation of themed conference proceedings.
EXAM PERIOD			<b><i>Option B: Preregistration due</i></b>  <b><i>Portfolio of Reflections due</i></b>