



SPH 312

Auditory Physiology and Psychoacoustics

S1 Day 2016

Dept of Linguistics

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General Information

Unit convenor and teaching staff

Convenor

Kelly Miles

kelly.miles@mq.edu.au

Linguistics Administration Officer

Margaret Wood

margaret.wood@mq.edu.au

Convenor / Lecturer

Titia Benders

titia.benders@mq.edu.au

Contact via office hour (in person or phone: 02 9850 4154)

Hearing Hub 3.435

Wednesday, 4.15pm-5pm (not May 25)

Margaret Wood

margaret.wood@mq.edu.au

Credit points

3

Prerequisites

39cp including (6cp in LING units at 200 level including (LING210(P) or LING217(P)))

Corequisites

Co-badged status

Unit description

This unit is a detailed examination of human auditory anatomy and physiology, and also of psychoacoustics and speech perception. The structure of the outer, middle and inner ear, the auditory nerve, the auditory brainstem and the auditory cortex are examined, as are the mechanisms of hearing and the physiology of the auditory system. Another major focus of this unit is the psychoacoustics of hearing and speech perception, which are examined both in lectures and in practicals.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Demonstrate an advanced knowledge of the anatomy and physiology of the ear to the cortex

Demonstrate and communicate an understanding of neural anatomy and physiology as this relates to sound encoding

Analyse the processes involved in successful hearing, and evaluate what factors may lead to compromised audition

Analyse, interpret and report on audiometric data to engage with theoretical issues relating to clinical assessment techniques

Demonstrate understanding of psychoacoustic phenomena

Apply an advanced understanding of speech perception as a mapping of auditory information on linguistic representations

Evaluate, make informed decisions regarding, and report on the methods, data, and results from speech perception experiments

Communicate on methods, results, and theories of speech perception within typical and special populations

Assessment Tasks

Name	Weighting	Due
<u>OAE report</u>	20%	28/03/2016
<u>Categorical Perception report</u>	20%	16/05//2016
<u>Experiment proposal</u>	20%	13/06/2016
<u>Final examination</u>	40%	Examination period

OAE report

Due: **28/03/2016**

Weighting: **20%**

The measuring of otoacoustic emissions (OAEs) is important for detecting inner ear problems. This practicum will introduce you to this important audiological procedure. You will be asked to interpret the generated data and write a research report outlining your findings.

On successful completion you will be able to:

- Demonstrate an advanced knowledge of the anatomy and physiology of the ear to the cortex
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- Analyse, interpret and report on audiometric data to engage with theoretical issues relating to clinical assessment techniques

Categorical Perception report

Due: **16/05/2016**

Weighting: **20%**

Categorical Perception is a benchmark phenomenon in the study of phoneme perception. This practicum will introduce you to the experimental procedures involved in measuring Categorical Perception. You will be asked to interpret the data collected in the practicum and write a concise practicum outlining the findings.

On successful completion you will be able to:

- Apply an advanced understanding of speech perception as a mapping of auditory information on linguistic representations
- Evaluate, make informed decisions regarding, and report on the methods, data, and results from speech perception experiments
- Communicate on methods, results, and theories of speech perception within typical and special populations

Experiment proposal

Due: **13/06/2016**

Weighting: **20%**

Speech perception is tested in experimental paradigms that require a careful choice of the stimuli and appropriate method. This practicum will introduce you to the most important speech perception procedures. Your task in the assessment is to select one published speech perception experiment and propose a theoretically compelling modification thereof. In your proposal you will focus on the theoretical underpinnings of your proposed experiment, provide sample stimuli, and motivate the choice for the experimental paradigm.

On successful completion you will be able to:

- Apply an advanced understanding of speech perception as a mapping of auditory information on linguistic representations

- Evaluate, make informed decisions regarding, and report on the methods, data, and results from speech perception experiments
- Communicate on methods, results, and theories of speech perception within typical and special populations

Final examination

Due: **Examination period**

Weighting: **40%**

Short essay structure

On successful completion you will be able to:

- Demonstrate an advanced knowledge of the anatomy and physiology of the ear to the cortex
- Demonstrate and communicate an understanding of neural anatomy and physiology as this relates to sound encoding
- Analyse the processes involved in successful hearing, and evaluate what factors may lead to compromised audition
- Analyse, interpret and report on audiometric data to engage with theoretical issues relating to clinical assessment techniques
- Demonstrate understanding of psychoacoustic phenomena
- Apply an advanced understanding of speech perception as a mapping of auditory information on linguistic representations
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- Communicate on methods, results, and theories of speech perception within typical and special populations

Delivery and Resources

This unit has a presence on iLearn (ilearn.mq.edu.au)

Use of the Audiology lab and the Speech Perception lab for workshops

The unit requires a range of audiological technology that form part of the audiological teaching laboratories. The unit also utilises the AHH speech perception laboratory which is equipped with computers and computer based speech perception and psychoacoustics software, as well as equipment for the careful determination of sound levels presented to the students.

Unit Schedule

1. The Ear: An overview

2. Cochlear anatomy / physiology (with OAE practicum)
3. Cochlear transduction
4. Neural function
5. Brainstem nuclei and efferent pathways
6. Auditory cortex
7. Psychoacoustics
8. Perception of Segments and Words
9. Perception of Stress, Rhythm, Tone, and Intonation
10. Theories of Speech Perception
11. Early acquisition of speech perception
12. Speech perception by elderly listeners
13. Closing remarks

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Analyse, interpret and report on audiometric data to engage with theoretical issues relating to clinical assessment techniques
- Apply an advanced understanding of speech perception as a mapping of auditory information on linguistic representations
- Evaluate, make informed decisions regarding, and report on the methods, data, and results from speech perception experiments

Assessment tasks

- OAE report
- Experiment proposal

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Demonstrate an advanced knowledge of the anatomy and physiology of the ear to the cortex
- Demonstrate and communicate an understanding of neural anatomy and physiology as this relates to sound encoding
- Analyse the processes involved in successful hearing, and evaluate what factors may lead to compromised audition
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- Communicate on methods, results, and theories of speech perception within typical and

special populations

Assessment tasks

- OAE report
- Categorical Perception report
- Experiment proposal
- Final examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Demonstrate an advanced knowledge of the anatomy and physiology of the ear to the cortex
- Demonstrate and communicate an understanding of neural anatomy and physiology as this relates to sound encoding
- Analyse the processes involved in successful hearing, and evaluate what factors may lead to compromised audition
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Assessment tasks

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- Experiment proposal
- Final examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Demonstrate an advanced knowledge of the anatomy and physiology of the ear to the cortex
- Demonstrate and communicate an understanding of neural anatomy and physiology as this relates to sound encoding
- Analyse the processes involved in successful hearing, and evaluate what factors may lead to compromised audition
- Analyse, interpret and report on audiometric data to engage with theoretical issues relating to clinical assessment techniques
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Assessment tasks

- OAE report
- Categorical Perception report
- Experiment proposal
- Final examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Analyse, interpret and report on audiometric data to engage with theoretical issues relating to clinical assessment techniques
- Communicate on methods, results, and theories of speech perception within typical and special populations

Assessment tasks

- OAE report
- Categorical Perception report
- Experiment proposal
- Final examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcome

- Communicate on methods, results, and theories of speech perception within typical and special populations