



SPHL2216

Speech Acoustics

Session 2, Special circumstance 2020

Department of Linguistics

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Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff

Unit convenor

Michael Proctor

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AHH 3.525

Administrative Convenor

Margaret Wood

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Credit points

10

Prerequisites

LING217 or LING2217

Corequisites

Co-badged status

Unit description

Human speech makes use of the special acoustic properties of the vocal tract to generate the sounds of each language and to communicate them with an unlimited range of expression. In this unit, we explore the acoustic properties of speech which make this possible, and acoustic theories of speech production which describe its linguistic use. Topics include: general acoustics, source-filter theory, acoustics of vowels and consonants, acoustic description of Australian English and sounds in other languages, voice quality, speech variation, coarticulation, and prosody. Practical exercises include analysis of your own vowel space.

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:

ULO1: Explain how speech can be represented acoustically.

ULO2: Illustrate concepts pertinent to the acoustic theory of speech production.

ULO3: Analyse the acoustic features of consonants and vowels using standard

methodologies.

ULO4: Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.

ULO5: Describe the acoustic characteristics of different speech source types and voice qualities.

ULO6: Demonstrate the ability to deconstruct coarticulated acoustic representations.

ULO7: Analyse and describe the acoustic correlates of prosody.

ULO8: Engage in a research-rich environment.

General Assessment Information

It is a requirement of this unit that students make a serious attempt to complete all assessment tasks. Failure to complete all assessment tasks may result in failure in the unit even if the marks for the completed tasks total more than 50%. Each task is required to satisfy the learning objectives of the unit. If the learning objectives have not been met then a pass grade cannot be awarded.

Lateness

- Late submissions without an extension will receive a penalty of 3% of the total mark available for the assessment task per day including weekend days (i.e. this is 3% of the total marks possible for the task – NOT 3% of the marks the student received. For example, if the assessment task is worth 100 marks and the student is two days late their mark for the task is reduced by 6 marks)
- Late submission of an assessment task without an extension will not be accepted at all after the date on which marked assessment tasks have been released to the rest of the class. Any student with unsubmitted work at this date will receive a mark of 0 for the assessment task.
- Extensions will only be given in special circumstances, and can be requested by completing the Special Consideration request at ask.mq.edu.au and providing the requisite supporting documentation.
- Extensions that will result in submissions after the assessment task has been returned to the class will require a separate assessment task to be completed at the unit convenor's discretion.
- For more information on Special Consideration, see the university website <https://students.mq.edu.au/study/my-study-program/special-consideration>
- If a student fails the unit due to non-submission of an assignment or non-attendance at an exam, an FA grade will be applied in accordance with the University's Assessment Policy.

- Unit convenors have the discretion to determine whether or not students should fail a unit on the basis of lateness penalties alone if other learning outcomes of the unit have been met.

Assessment Tasks

Name	Weighting	Hurdle	Due
Vowel Analysis	30%	No	Week 7
Consonant Analysis	30%	No	Week 11
Final Exam	35%	No	Exam Period
Research Participation	5%	No	End of Semester

Vowel Analysis

Assessment Type ¹: Report

Indicative Time on Task ²: 30 hours

Due: **Week 7**

Weighting: **30%**

The aim of this assignment is to examine the acoustic phonetic properties of the vowels of a single speaker. Using the tools and techniques for spectrographic analysis developed in workshops, students will plot their own vowel space, and present a report describing the phonetic properties of their vowels in comparison with published vowel data. Indicative report length: 1500 words.

On successful completion you will be able to:

- Explain how speech can be represented acoustically.
- Illustrate concepts pertinent to the acoustic theory of speech production.
- Analyse the acoustic features of consonants and vowels using standard methodologies.
- Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.
- Demonstrate the ability to deconstruct coarticulated acoustic representations.
- Engage in a research-rich environment.

Consonant Analysis

Assessment Type ¹: Report

Indicative Time on Task ²: 30 hours

Due: **Week 11**

Weighting: **30%**

The aim of this assignment is to examine the acoustic phonetic properties of English consonants in connected speech. Using the tools and techniques for spectrographic analysis developed in workshops, students will segment and quantify the consonants in speech recordings, and analyze and describe the allophonic and coarticulatory processes involved. Indicative report length: 1500 words.

On successful completion you will be able to:

- Explain how speech can be represented acoustically.
- Illustrate concepts pertinent to the acoustic theory of speech production.
- Analyse the acoustic features of consonants and vowels using standard methodologies.
- Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.
- Describe the acoustic characteristics of different speech source types and voice qualities.
- Demonstrate the ability to deconstruct coarticulated acoustic representations.
- Analyse and describe the acoustic correlates of prosody.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 1.5 hours

Due: **Exam Period**

Weighting: **35%**

Knowledge and understanding of the topics covered in the unit will be assessed in a 90 minute examination, requiring written responses to a range of questions and problems.

On successful completion you will be able to:

- Explain how speech can be represented acoustically.
- Illustrate concepts pertinent to the acoustic theory of speech production.
- Analyse the acoustic features of consonants and vowels using standard methodologies.
- Differentiate the acoustic characteristics of segmental and voice quality aspects of

speech.

- Describe the acoustic characteristics of different speech source types and voice qualities.
- Demonstrate the ability to deconstruct coarticulated acoustic representations.
- Analyse and describe the acoustic correlates of prosody.

Research Participation

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 1 hours

Due: **End of Semester**

Weighting: **5%**

Students will participate in a study to learn more about current research directions in speech and language, and to gain first-hand experience in the research process. Research participation typically involves one hour of your time. You will be able to choose from a short list of studies being conducted by researchers in Linguistics, Psychology, and Cognitive Science. If you do not wish to participate in any of the available studies, you will be given the option of completing an alternative assessment task to satisfy this component of the unit.

On successful completion you will be able to:

- Engage in a research-rich environment.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

This unit is designed to foster a detailed understanding of speech acoustics, its relevance to phonetics and phonology, and methods used to study the acoustic properties of speech. These concepts will be studied through an extensive set of readings and multimedia resources, and will be consolidated in a series of companion lectures, workshops and assessment tasks. The unit provides students with essential theoretical and practical skills that are fundamental to further study of speech and which assist clinicians in keeping abreast of current research findings in speech and hearing.

Topics to be covered include: general acoustic theory; sound waves; spectrograms; resonance; turbulence; source-filter theory; formants; acoustic properties of vowels; acoustic properties of consonants; coarticulation; prosody; and digital representation of speech.

Students are required to engage seriously with all learning materials following the unit schedule provided on iLearn. Announcements and discussion forums should be consulted regularly, and recorded teaching materials must be reviewed in a timely manner to ensure that all participants in the unit are up-to-date with communications and aware of unit requirements.

In workshops and assessment tasks, you will be presented with different types of speech data, and record your own speech for analysis, to consolidate your understanding of acoustic phonetics. These materials are designed to help you explore how speakers of different languages manipulate the acoustic properties of speech to generate phonological contrast, to signal linguistic information, and to communicate information about who we are.

Preparation for and attendance at all classes is expected. Classes are designed to consolidate concepts introduced in readings, through explanation and presentation of examples, engagement with different types of data, questions, discussion, and seminar-type exercises. Learning the concepts necessary to gain a solid understanding of speech acoustics and speech analysis techniques requires dedication, practice, and engagement. We are here to support your learning and we can only do this successfully through structured contact to guide you through the materials and techniques. It is your responsibility to actively engage in the learning process with your teachers and peers.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(http](#)

[s://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@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 help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

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

If you are a Global MBA student contact globalmba.support@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.