

INTRODUCTION TO SPEECH PATHOLOGY PRACTICE

FOUNDATIONAL CONCEPTS FOR AUSTRALIAN FIRST YEAR STUDENTS



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Introduction to Speech Pathology Practice: Foundational Concepts for Australian First-year Students

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REFERENCE LIST

Acknowledgement of Country

At James Cook University we acknowledge with respect the Aboriginal and Torres Strait Islander peoples as the first peoples, educators and innovators of this country. We acknowledge that Country was never ceded, and value the accumulation of knowledge and traditions that reflect the wisdom of ancestral lines going back some 60,000 years, and recognise the significance of this in the ways that Aboriginal and Torres Strait Islander peoples are custodians of Country. As a University, we will continue to learn ways to care for and be responsible for Country, and we will collectively seek to build a future that is based on truth-telling, mutual understanding, hope, empowerment, and self-determination.



Kassandra Savage (JCU Alumni), 'Coming Together and Respecting Difference', acrylic on canvas, 2014, 90cm x 90cm. © Kassandra Savage, reproduced with permission of the artist

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1.1		
1.2		

Preface

This ebook is designed specifically for aspiring speech pathologists embarking on their professional journey. This book provides an overview of the speech pathology profession, beginning with a clear explanation of the role and responsibilities of speech pathologists. The text then explores the diverse areas of practice relating to communication and swallowing. The anatomy involved in communication and swallowing is explored, offering insights into how the structures of the human body support these crucial functions. Linguistics is another key area covered, offering insights into the structure and function of language, including syntax, pragmatics, semantics, morphology, phonology, and phonetics. The book also delves into the core aspects of communication development, covering the typical progression of speech, language and literacy skills from infancy through adulthood. It offers students a framework for understanding both typicality and diversity in development. These are concepts which are essential for effective assessment and intervention. The book advocates for culturally responsive practice, outlining strategies for delivering effective and sensitive care to clients from diverse backgrounds. Additionally, the book emphasises the professional foundations of speech pathology, covering ethical principles, evidence-based practice, and the importance of advocacy and lifelong learning.

This ebook was developed with support from a [James Cook University Textbook Affordability Project](#) Grant. Our primary aim for the development of this ebook is to have an open-access single resource for students that covers multiple content areas, and that also incorporates scaffolded and interactive learning. We hope that this single source will also enable students to see connections between subjects, instead of the subjects potentially being seen as separate entities. We have co-created this ebook in collaboration with first-year speech pathology students to ensure the resource meets their learning needs and styles.

Some of the material in this book has been adapted with gratitude from the open textbook [Essentials of Linguistics \(2nd ed\)](#). We have adapted parts of the book to reflect the James Cook University and Australian speech pathology contexts.

We acknowledge and extend our gratitude to Jaimee Hamilton for generously volunteering to peer review this ebook.

CHAPTER 1: THE SPEECH PATHOLOGY ROLE AND PROFESSIONAL FOUNDATIONS

This chapter provides an overview of the speech pathology profession, beginning with its historical evolution and development in Australia. It outlines the current Australian speech pathology landscape, highlighting the roles and scopes of practice for speech pathologists, including their contributions to diverse populations and various settings. The chapter emphasises the importance of professional and ethical practice, detailing the standards and frameworks that guide speech pathologists in their work. It introduces the International Classification of Functioning, Disability, and Health (ICF) as a crucial tool for understanding and describing health and well-being, facilitating a holistic approach to client care. Evidence-based practice is underscored as a fundamental principle in the profession, ensuring that interventions are grounded in the best available research. The discussion on culturally responsive practice highlights the need for speech pathologists to consider cultural factors in service. Reflective practice and lifelong learning are presented as essential components for professional growth and adaptation to evolving practices. The chapter concludes with an exploration of clinical reasoning, highlighting its role in decision-making and tailoring services to meet individual client needs. Overall, this chapter serves as a foundational guide for understanding the multifaceted nature of speech pathology, encouraging ongoing learning and ethical practice within the field.

1.1 History of the speech pathology profession

Globally, the speech pathology profession provides services and support to people who experience communication and swallowing challenges. There has been a strengthening of the view that communication is a human right, globally and within the speech therapy / speech pathology community – see, for example, “Communication Rights and the United Nations’ 70th Anniversary of the Universal Declaration of Human Rights” (McLeod, 2018).

However, this wasn’t always the case. The initial focus was primarily on speech, in particular, speech correction. It appears that the origins of the speech pathology profession emerged during the nineteenth and early twentieth centuries in response to the “demand for docile efficient, and thus productive speech” (St. Pierre & St. Pierre, 2018, p. 151) as the ability to speak effectively became a necessity in the increasingly industrial and democratic modern societies, and is seen as a feature of White British and Euro-American colonisation. The ability to ‘speak well’ was viewed as a key commodity for capital production (St. Pierre & St. Pierre, 2018). An example of the importance for individuals in positions of power to be able to ‘speak well’, was King George VI, who experienced a stutter or ‘stammer’ as he described it. As portrayed in the movie, [The King’s Speech](#), Australian speech therapist [Lionel Logue](#) worked with King George VI to improve his speaking fluency. Around the time of World War One, the profession expanded beyond ‘speech correction’ focus to include broader communication remediation for soldiers who had experienced head injuries.

A further example to highlight this ‘speaking well’ focus was the establishment of the The American Academy of Speech Correction in 1925 by a group of individuals working in the areas of theatre, debate and persuasive speaking. This Academy later became the American Speech-Language-Hearing Association (ASHA) in 1978. Speech and language therapy in the United Kingdom became organised under a single professional body in 1945 as the College of Speech Therapists, now called the Royal College of Speech and Language Therapists (RCSLT). In Australia, the first speech therapy clinic opened in Sydney in 1931. In 1949, the Australian College of Speech Therapists was founded. In 1975, the title of the national body was changed to the “Australian Association of Speech and Hearing (AASH)” and the undergraduate professional education program was expanded from three to four years. In 1996 the Speech Pathology Association of Australia was established with a public name of Speech Pathology Australia (SPA).

The notion of ‘socially acceptable’ speech and communication as contributing to economic production “gave critical legitimacy to speech and language therapy as a discipline because it focused on the remediation of “pathology” inherent in disabled individuals” (Nair et al., 2023, p. 781). The term *pathology* in *speech pathology* originates from the Greek roots *pathos*, meaning “suffering” or “disease,” and *logos*, meaning “study” or “science.” In the speech pathology context, *pathology* refers to the diagnostic process used in the discipline to study the cause, development and effects of communication and swallowing difficulties.

Around the 1930s, speech pathologists started to work in the area of oral feeding and swallowing, initially with children who experienced oral motor disorders due to cerebral palsy (Miller & Groher, 1993). Prior to the 1970s, speech pathologists primarily worked in public school and ambulatory care settings. During the 1970s and 1980s, speech pathologists started working in acute and chronic care clinical environments where many of the patients had experienced neurological injury. Many of these patients often had coexisting communication and swallowing difficulties (dysphagia). As the assessment, diagnostic processes, and potential rehabilitation

approaches overlapped, speech pathologists started to practice in the area of dysphagia (Miller & Groher, 1993).

To find out more about the history of the speech pathology profession in Australia, please refer to this resource: [Speech Pathology Australia celebrates 60 years](#)

Speech pathologists now have a broad scope of practice and work in diverse practice settings. There are more than 230 000 people working as speech pathologists across the world (International Association of Communication Sciences and Disorders [IALP], 2023), but the name of the profession differs between countries.

1.2 The Australian speech pathology landscape

[Speech Pathology Australia](#) (SPA) is the professional body representing speech pathologists in Australia. Speech pathology is a self-regulating profession in Australia and a member of the National Alliance of Self-Regulating Health Professions (NASRHP).

Speech Pathology Australia (SPA) membership categories and commonly used acronyms

These are some of the membership categories and commonly used acronyms for speech pathologists in Australia:

- **Certified Practising Speech Pathologist (CPSP).** This membership category is for suitably qualified speech pathologists engaged in activities of speech pathology practice who meet the [Certification requirements](#) for Certified Practising Speech Pathologist (CPSP) status. CPSP status entitles speech pathologists to provide rebateable services for government-funded schemes such as the National Disability Insurance Scheme (NDIS) and Medicare.
- **Member, Speech Pathology Australia (MSPA).** Speech pathologists who are members of Speech Pathology Australia can use this acronym.

In 2024, SPA had more than 13,000 members. This number has grown considerably in recent years. In 2015, there were 6044 Certified Practising Speech Pathologist (CPSP) members. Despite the growth in graduates and membership, speech pathology services are not meeting the level of need and demand across Australia. Speech pathologists are inequitably distributed across Australia with rural and remote areas having less access to speech pathology services, yet many of these locations have the highest need (SPA, 2023).

Speech pathologists work in diverse practice settings with the majority working in education settings or private practice. Early intervention, disability service providers, hospitals and health services, and residential aged care are other commonly identified practice settings. The SPA member in this video outlines her practice contexts.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=21#oembed-1>

[Tanya Ramadan – Member Profile](#) by Speech Pathology Australia

Interestingly, a considerable number of Australian speech pathologists have lived experiences of diverse

perspectives that reflect the scope of speech pathologists' practice. These include cultural and linguistic diversity, experiences of living in rural and remote areas, experience of a communication, swallowing and/or learning difficulties, experience caring for family members and friends with disabilities, including communication challenges (Nancarrow et al., 2023).

Approximately 96% of SPA members are female and the majority speak English only. Approximately 0.2% of Australian speech pathologists identify as Aboriginal and/or Torres Strait Islander.

There are a range of demand drivers, or factors that influence demand for services, related to speech pathology. These include (NSW Ministry of Health, 2018):

- Improvement in survival rates (e.g. birth, cancer, stroke)
- Population demographic changes and increased complexities (e.g. ageing population, migration, cultural and linguistic diversity, chronic disease, cancer, geographical distribution)
- Government funding, research and policy (e.g. NDIS, MBS, university training)
- Awareness of the profession (e.g. advocacy, multi-disciplinary teams, client expectations)
- Scope of practice (e.g. growing and changing scope due to demands, evidence-based etc)
- Service coverage and accessibility (e.g. greater demand for services has led to greater geographical access to services; telepractice)

"Australia is known for its international collaboration in research, advocacy, leadership in practice (clinical) education and training of the workforce, innovations in technology for service delivery, and global partnerships" (McLeod et al., 2023, p. 793). Examples of international collaboration, global advocacy, and world-leading research centres include:

- World Health Organization's World Report on Disability (McAllister et al., 2013)
- Communication rights and the United Nations' 70th Anniversary of the Universal Declaration of Human Rights (McLeod, 2018)
- The United Nations' Sustainable Development Goals (McLeod & Marshall, 2023)
- [Australian Stuttering Research Centre](#) (ASRC)
- [The Centre for Research Excellence in Aphasia Rehabilitation and Recovery](#) (Aphasia CRE)

SPA hosts a national conference annually and produces two journals: International Journal of Speech-Language Pathology and Journal of Clinical Practice in Speech-Language Pathology. SPA have committed to cultural responsiveness and privileging the voices of Aboriginal and Torres Strait Islander Peoples and Communities, the First Peoples of Australia, and have developed the [Aboriginal and Torres Strait Islander culturally responsive capability framework](#). SPA supports the development of speech-language pathology in the Asia-Pacific region including Vietnam and Cambodia.

Activity

Explore the diverse careers available to you as a speech pathologist.

- Conduct an internet search for speech pathology jobs by using employment websites such as [Seek](#) and [Indeed](#). What jobs did you find?

- Conduct an internet search for speech pathology services in your local area. What services are available?

1.3 Role and scope of practice

[The Professional Standards for Speech Pathologists in Australia](#) (SPA, 2020a) (Professional Standards) details the knowledge, skills and attributes a speech pathologist practising in Australia must demonstrate and apply, at any point in their career, as relevant to their speech pathology role and work context. It also contextualizes the knowledge, skills and attributes a graduating speech pathology student must demonstrate and be able to apply by the time they complete their entry-level degree.

1.3.1 WHAT IS PRACTICE?

The [Speech Pathology Scope of Practice in Australia \(SPA, 2022, p. 3\) document](#) provides the following definition of 'practice': "The SPA Board of Directors defines 'practice' as encompassing roles in which a speech pathologist uses their knowledge, skills, professional attributes and ethical judgement to contribute to culturally responsive, lawful, safe and effective delivery of evidence-based speech pathology services. Practice in speech pathology is not restricted to direct services to individuals and is inclusive of all activities related to the provision of services to individuals, communities and populations with communication and swallowing needs".

1.3.2 SCOPE OF PRACTICE

Speech pathology practice is grounded in evidence, drawing on scientific and technological advancements as well as contextual and cultural considerations. Innovations, feedback from clients, and research inform both practice and the ongoing assessment of professional scope. The scope of speech pathology may exceed initial entry-level expectations, with terms like advanced and extended practice reflecting the profession's development. A speech pathologist's specific scope of practice is shaped by their work environment, individual skills, and commitment to professional growth. Practitioners must participate in relevant, evidence-based education and quality supervision when expanding or modifying their scope of practice. Speech pathologists' roles are diverse and may include a range of different roles (e.g. practitioner, consultant, advocate, manager, academic, practice educator, researcher, policy developer) that result in evidence-based speech pathology service provision

Certified practicing speech pathologists (CPSP) engage in continuing professional education and fulfill required practice hours to ensure their work is based on up-to-date knowledge and evidence, thereby maintaining a relevant scope of practice. According to the [Code of Ethics](#) (SPA, 2020b), speech pathologists must be aware of their competencies (based on their education, training, and experience) and refrain from practicing beyond those limits and scope of practice.

Central to speech pathology practice is a focus on communication and swallowing needs of individuals across the lifespan, and building knowledge, skills and professional services in partnership with others, to support every individual's right to optimal communication and swallowing. Speech pathology scope of practice can also be described as encompassing the areas of language, speech, hearing, voice, fluency and cognition.

1.3.3 PARAMETERS OF PRACTICE

The [Parameters of Practice](#) (SPA, 2016) provides a guide for clinical practice and information about delegation, collaboration and teamwork. This document recognises that speech pathologists are the professionals with the expert knowledge and skills in the areas of communication and swallowing. At times, it may be reasonable to delegate appropriate tasks or activities to support workers or other professionals in order to facilitate effective and evidence-based services.

The Parameters of Practice (SPA, 2016) provides specific definitions and guidance regarding areas of clinical practice core to speech pathologists, which are not suitable for delegation, and which areas of practice with appropriate education, training, competency development and supervision may be delegated.

Speech Pathology Australia recommends that **the following are the exclusive responsibilities of a speech pathologist:**

- Informing clients and families about the type, frequency, and duration of services;
- Representing the speech pathology team in all collaborative, interprofessional and interagency meetings, correspondence and reports;
- Making all clinical decisions, including determining client selection for inclusion/ exclusion in caseload, and discharging clients from treatment;
- Communicating with clients, parents and family members about diagnosis, prognosis and treatment plan, unless these are done with explicit instructions from the speech pathologist;
- Conducting diagnostic assessments, evaluations or appraisals and interpreting obtained data in reports;
- Preparing individualised treatment plans and making modifications prior to or during implementation;
- Signing all formal reports.

Tasks **not** to be undertaken by a support worker:

- select clients for assessment or intervention;
- perform definitive assessment procedures;
- change any treatment;
- independently alter a plan of care or treatment goals;
- independently draft reports;
- discharge clients from treatment;
- knowingly withhold information important for the speech pathologist to make an informed decision about client care.

1.3.4 WORKING AS AN ALLIED HEALTH ASSISTANT (AHA)

Allied health assistants (**AHA**) may also be called rehabilitation assistants, therapy assistants, therapy aides and support workers, depending on the work context or location. However, it is important to note that a 'support worker' or 'disability support worker' have different roles to AHAs. Support workers provide assistance to individuals and families that are generally focused on activities of daily living (ADLs) such as showering, eating, dressing, cooking, cleaning, and community access. Unlike AHAs, support workers do not perform therapy tasks unless directed and supported by a speech pathologist or other health professional.

Generally, AHAs have obtained a formal allied health assistant qualification through a TAFE or Registered Training Organisation (e.g. [Certificate IV Allied Health Assistance](#)), however this is not a requirement in all work settings. AHAs work under the direction and supervision of health professionals, including speech pathologists, to deliver services.

Many speech pathology students are employed as AHAs. It is important to note that when undertaking clinical education or placement activities as part of their speech pathology qualification, speech pathology students may undertake some activities (e.g. administration of assessment; interpretation of data and goal setting; intervention planning; modification of plans) that are not appropriate for students to undertake in an AHA role. AHAs, including those who are speech pathology students, must follow a therapy program set by a qualified speech pathologist and receive regular supervision.

For further information about Allied Health Assistants, including working as an AHA while studying speech pathology, please refer to the [Working with Allied Health Assistants \(AHA\) document](#) (SPA, 2021) and the [Allied Health Assistants SPA webpage](#).



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=24#h5p-1>

1.4 Professional and ethical practice

The [Professional Standards for Speech Pathologists in Australia](#) (SPA, 2020a) detail the knowledge, skills and attributes a speech pathologist practising in Australia must demonstrate and apply (including graduate speech pathology students in order to enter the profession). The Speech Pathology Australia (SPA) [Code of Ethics](#) (SPA, 2020b) informs speech pathologists' everyday professional practice. When undertaking this work, we do so with an awareness of the broader context of human rights of the individual.

1.4.1 PROFESSIONAL STANDARDS FOR SPEECH PATHOLOGISTS IN AUSTRALIA

The [Professional Standards for Speech Pathologists in Australia](#) (**Professional Standards**) detail:

- the knowledge, skills and attributes a speech pathologist practising in Australia must demonstrate and apply, at any point in their career (from entry to the profession and throughout their career), across the spectrum of activities as relevant to their speech pathology role and work context;
- the knowledge, skills and attributes a graduating speech pathology student must demonstrate and be able to apply by the time they complete their entry-level degree.

Speech pathologists must use their knowledge, skills and attributes to practise lawfully, safely and effectively and in a way that meets the Professional Standards.

The Professional Standards includes three Domains, with associated standards and elements:

1. Professional conduct.
2. Reflective practice and life-long learning
3. Speech pathology practice

This video provides an introduction and outline to the Professional Standards.



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[Professional Standards – Introduction](#) by Speech Pathology Australia



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[Professional Standards – Working with Aboriginal and Torres Strait Islander Peoples](#) by Speech Pathology Australia

1.4.2 NATIONAL CODE OF CONDUCT

The [National Code of Conduct](#) for Health Care Workers (the Code) is a minimum set of standards of conduct for all health service providers who are not regulated by the Australian Health Practitioner Regulation Agency (AHPRA). Speech pathologists are included in this group of health professionals. SPA is a full member of the National Alliance of Self-Regulating Health Professions (NASRHP). Other health providers the Code will apply to include dietitians, social workers, audiologists, allied health assistants and personal care workers. The Code sets national standards against which disciplinary action can be taken. In serious cases registration and right to practice can be withdrawn.

SPA ensures that its independently set standards align with NASRHP's framework. NASRHP's framework is closely modelled on the National Registration and Accreditation Scheme (NRAS), the regulatory framework administered by the Australian Health Practitioner Regulation Agency (AHPRA). A Certified Practising Speech Pathologist (CPSP) is a speech pathologist who has demonstrated they meet specific standards of practice in the field of speech pathology, as specified by SPA. This includes meeting the [SPA Continuing Professional Development](#) (CPD) Requirements.

The National Code of Conduct states that practitioners must (Queensland Government, 2022):

- provide services in a safe and ethical manner
- obtain consent from their clients
- display appropriate conduct when giving treatment advice
- report concerns about treatment or care provided by other health care workers
- take appropriate action in response to adverse events
- adopt standard precautions for infection control
- practice safely if diagnosed with infectious medical conditions
- not make claims to cure certain serious illnesses
- not misinform their clients
- not practice under the influence of alcohol or drugs
- modify or stop practicing if they have certain mental or physical impairments
- not financially exploit clients
- not engage in sexual misconduct

- comply with relevant privacy laws
- keep appropriate records
- be covered by appropriate insurance
- display information about this code and how to make a complaint.

1.4.3 CODE OF ETHICS

“Ethical conduct is a hallmark of professional practice, essential for safe and quality clinical care and upholding the reputation of healthcare professions” (Kenny et al., 2023, p. 60). It is essential that speech pathologists observe the highest standards of ethical practice. The [Speech Pathology Australia Code of Ethics](#) (SPA, 2020b) guides and informs our everyday professional practice and should be used by [Speech Pathology Australia Members](#) proactively. The Speech Pathology Australia Code of Ethics (SPA, 2020b) must be considered along with relevant legislation, policies and procedures (e.g. [The Privacy Act 1988](#), [SPA National Code of Conduct](#)).

“A code of ethics is not, however, designed as an instruction manual for SLPs to manage specific ethical issues that occur within their workplaces. Nor will a code address ethically complex professional scenarios where there may not be a sole ‘right’ response or when no options are perceived ideal. When ethical dilemmas occur, ethics education resources provide an essential bridge between an aspirational code and professional practice” (Kenny et al., 2023, p. 60).

This video provides an introduction and overview of the Code of Ethics.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=81#oembed-3>

[Overview of the 2020 Code of Ethics](#) by Speech Pathology Australia

The model of speech pathology ethical practice (figure 1) outlines how three underpinning elements (values, principles and standards of ethical practice) guide how speech pathologists practice and make ethical decisions. Practice and decision-making is also informed by culturally responsive practice and person-centredness.

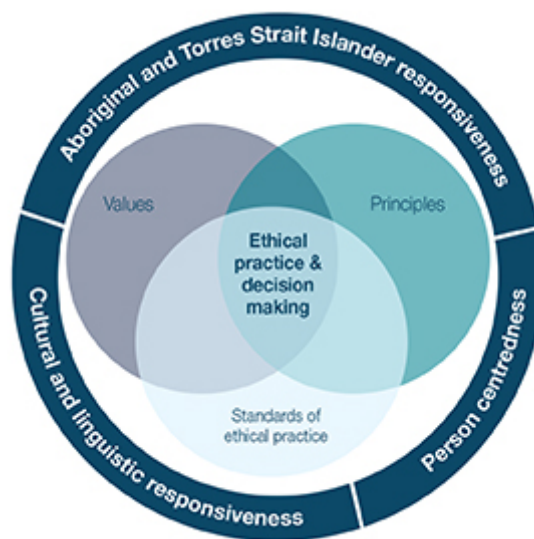


Figure 1. Model of Speech Pathology Ethical Practice by Speech Pathology Australia is used with permission of the copyright holder, Speech Pathology Australia, All Rights Reserved

Ethical Values (SPA, 2020b)

Ethical values underpin speech pathologists' interactions. These values drive and inform how speech pathologists behave.

Respect and dignity: We promote a professional culture which embodies kindness through taking time to value, listen, and show compassion to others. In our professional work, we provide person- and relationship-centred care through respecting the worth of all people. We recognise and respect diversity, including the range of characteristics that make each person and community unique.

Responsiveness: We collaborate, engage, advocate and partner with individuals, families, colleagues, other professionals, and the community to respond to their needs. We promote accessible communities.

Quality and safety: We provide quality and competent professional services which follow evidence-based practice principles. We work within quality improvement and safety frameworks. We are responsible for managing our personal health and wellbeing to effectively fulfil our professional responsibilities.

Professionalism and integrity: We uphold the reputation of our profession in all our activities and communications. We act in an objective manner, and are transparent, accountable and keep our commitments.

Ethical Principles (SPA, 2020b)

We apply these principles to guide speech pathologists when making decisions in their everyday practice. These principles are inter-related and are of equal value.

Autonomy: We respect the rights of others to self-determination, and to make free and informed decisions. We support client autonomy in the way that we gain and share information.

Beneficence: We seek to benefit others through our activities.

Non-maleficence: We act to prevent harm, and do not knowingly cause harm.

Truth and veracity: We act honestly and demonstrate respect.

Justice and fairness: Our professional decision-making is fair and equitable. We consider the context and the needs of the person and the wider community.

SPEECH PATHOLOGY AUSTRALIA ETHICS EDUCATION RESOURCES

Speech Pathology Australia (SPA) have developed a range of online resources and education packages to support Speech Pathology Australia members (including speech pathology students who are student members of SPA). You are encouraged to explore and familiarise yourself with these resources [note: you will only be able to access these online education packages if you are a SPA member]:

1. Ethics Education Package (EEP)

- This is a self-directed education resource that guides members to reflect upon their ethical practice and apply a deductive decision-making model to identify, analyse, and manage ethical issues presented in authentic case scenarios.

2. Ethics in Professional and Clinical Practice

- This is the first of two SPA online ethics learning modules. This module focused on developing knowledge about the application of ethics in the workplace.

3. Enhancing Ethical Practice, Avoiding Snakes and Building Ladders

- This is the second module in SPA's online ethics learning resources and presented as an extension module. This module introduces alternative approaches to ethical reasoning, including narrative and ethics of care approaches.

(Kenny et al., 2023, p. 61)



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=81#h5p-2>

1.5 Human rights and communication

The [United Nations](#) (UN) is a diplomatic and political organisation that is made up of 193 member states (as at November 2024). The purpose of the UN is to maintain international peace and security through fostering relations and cooperation among nations.

1.5.1 COMMUNICATION AS A HUMAN RIGHT

Communication is a basic human right and is an integral part of our well-being. Communication rights are specifically referred to in a number of United Nations articles including, for example:

- Article 19 of the [Universal Declaration of Human Rights](#)
 - *Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.*
- Article 21 of the [Convention of the Rights of Persons with Disabilities](#)
 - *Freedom of expression and opinion, and access to information*
- Articles 12 and 13 of the [Convention on the Rights of the Child](#)
 - States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child (Article 12);
 - The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice (Article 13).

For some people, communication difficulties can lead to significant barriers as well as negative effects on a person's emotional and social well-being. Everyone has the right to communicate in ways that suit the person and in ways that may overcome these barriers. A useful framework to consider is the [Communication Bill of Rights \(3rd ed.\)](#) published by the USA National Joint Committee for the Communication Needs of Persons with Severe Disabilities (NJC) (NJC, 2024). These communication rights promote full participation across the lifespan. Scope Victoria have developed a useful [poster](#) that outlines these 12 rights.

Recently, there has been an international call for *SDG 18: Communication for All*. "This call has advocated for the importance of communication to overcome communication barriers, disinformation, and inequalities and support sustainability, inclusion, gender equality, development, social change, and peace in policy, the media, social media, literacy, information, activism, and civil society" (McLeod & Marshall, 2023, p.1).

You are encouraged to explore this special issue as the papers included demonstrate that communication is essential for the achievement of all 17 SDGs and advocates for SDG 18: Communication for All

- [Special issue of the *International Journal of Speech-Language Pathology* \(IJSLP, vol. 25, no. 1\)](#)

Our role as speech pathologists, and speech pathology students, is to **advocate** for communication rights. Advocacy means building public support for a particular cause. To advocate means standing up for your rights, standing up for someone else, or an issue you see within the broader community (SPA, 2023).

1.5.2 SUSTAINABLE DEVELOPMENT GOALS (SDG)

In 2015, the UN presented **17 Sustainable Development Goals (SDGs)** as a “shared blueprint for peace and prosperity for people and the planet, now and into the future” (United Nations, 2015), with the aim of these being achieved by 2030. The [17 SDGs](#) address poverty, hunger, health, education, gender, innovation, climate, cities, land, oceans, justice, and partnerships to achieve the goals and are underpinned by five principles, or 5Ps: “people, planet, prosperity, peace, partnership” (Sustainable Capacity International Institute, 2015-2020).

This video provides an overview of the 17 UN Sustainable Development Goals.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=239#oembed-1>

[The Sustainable Development Goals](#) by United Nations

Without effective individual and global communication, achievement of the 17 SDGs will be impacted (McLeod, 2018; McLeod & Marshall, 2023). Everybody, including speech pathologists, people with communication and/or swallowing difficulties, their families and communities, have a role in contributing to the achievement of all 17 SDGs.

Activity

Think about your role as a communication advocate.

- What might be some instances where you may need to advocate for the communication rights of a client or patient?
- How might you go about this?

1.6 Frameworks for understanding and describing health

1.6.1 INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF)

The World Health Organization (WHO) has systematically developed a model of disability that considers the ongoing interaction between an individual's health and contextual factors. This model acknowledges that disability is a universal human experience, is aetiologically neutral, and lies on a *continuum* from no disability to complete disability. The [International Classification of Functioning, Disability and Health](#), also commonly known as the **ICF**, is a classification of health and health-related domains and considers the dynamic interactions between a person's health condition and contextual aspects of a person's life including personal and environmental factors. The **ICF** is the international standard for framing, describing, recording and measuring functioning and disability (WHO, 2001).

The aims of the ICF (WHO, 20015) are to:

- provide a scientific basis for understanding and studying health and health-related states, outcomes, determinants, and changes in health status and functioning;
- establish a common language for describing health and health-related states in order to improve communication between different users, such as health care workers, researchers, policy-makers and the public, including people with disabilities;
- permit comparison of data across countries, health care disciplines, services and time; and
- provide a systematic coding scheme for health information systems.

When using the ICF in practice, health professionals may use both the ICF Categories and ICF Qualifiers to describe a person's health. **ICF Categories** include:

- body functions
- activities and participation
- environment factors
- body structures

ICF Qualifiers describe aspects of whether the health condition is a barrier or facilitator, the nature of the change in body structure, the extent to which a person's capacity may be affected, and the extent or magnitude of the impairment and associated performance.

For this stage of your stage of learning, we will just focus on the **ICF Categories** within the framework (Figure 2). We can describe a person's health in terms of these domains, specifically: body structures and body functions/impairments; activities/activity limitations; participation/participation restrictions. Environmental

and personal factors can be described as barriers or facilitators and may highlight how we might need to support people to achieve their rights, goals and maximum levels of functioning. The framework diagram below highlights the interaction between each of the domains. We can't view a single domain without consideration for the other domains. Speech pathologists must explore and integrate consideration for all ICF domains when providing services to individuals, families and communities.

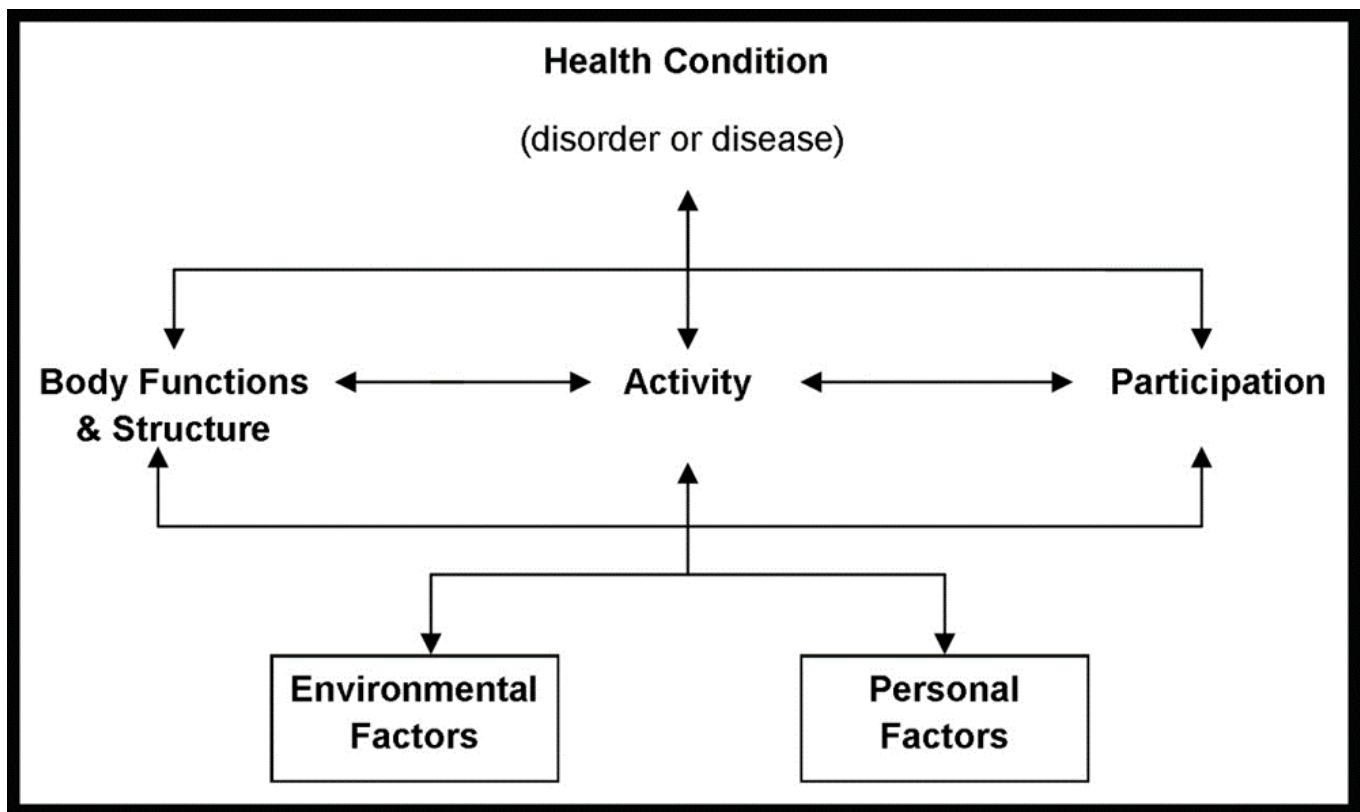


Figure 2. [Interactions between the components of ICF](#) by the World Health Organization is licensed under [CC BY 4.0](#)

Let's explore each of these ICF categories:

ICF Category	Description
Health Condition	This is an umbrella term for any disease, disorder, injury or trauma. The health condition may also include other circumstances such as ageing, mental health conditions, etiology or pathogeneses related to the condition.
Body Functions and Structures	Body functions are the physiological functions of body systems (e.g. mental functions, voice and speech, sensory functions, pain, cardiovascular functions, neuromuscular functions). Body structures are the anatomical body parts (e.g. limbs, bones, organs, nervous system structure).
Activity	The execution of a task or action by a person (e.g. self-care, eating, driving, talking).
Participation	The involvement of a person in everyday situations and in society (e.g. conversation with others, employment, study, relationships).
Environmental Factors	These are the physical, social and attitudinal environment aspects of a person's life. These factors are external to the person, but may have positive or negative influences on a person's functioning.
Personal Factors	These are related directly to the person that are not part of the primary health condition. These include factors such as age, cultural and linguistic background, social background, gender orientation, lifestyle and habits. These factors may also have positive or negative influences on a person's functioning.

There are many resources and publications available for you to explore that further relate and apply the ICF to aspects of speech pathology practice:

- **Voice disorders**

Ma, E. P., Yiu, E. M. & Abbott, K. V. (2007). Application of the ICF in Voice Disorders. *Seminars in Speech and Language*, 28(4), 343-350.

- **Cognitive-communication disorders**

Larkins, B. (2007). The Application of the ICF in Cognitive-Communication Disorders Following Traumatic Brain Injury. *Seminars in Speech and Language*, 28(4), 334-342.

- **Aphasia**

American Speech-Language-Hearing Association [ASHA]. (n.d.). *Person-centred focus on function: Aphasia*. https://www.asha.org/siteassets/uploadedfiles/icf-aphasia.pdf?srsId=AfmBOor2WhuonjB0YJbF82L-5Aowt8Mgf-kWcgdG_lys1mm2gji7waoG

- **Developmental language disorders**

Kwok, E. Y. L., Rosenbaum, P., & Cunningham, B. J. (2022). Speech-language pathologists' treatment goals for preschool language disorders: An ICF analysis. *International Journal of Speech-Language Pathology*, 25(6), 885–892. <https://doi.org/10.1080/17549507.2022.2142665>

Let's have a look at a further example of the application of the ICF related to *childhood apraxia of speech* (CAS) [note, just the speech difficulties associated with CAS are represented in the example below]:

ICF Category	CAS application
Health Condition	Childhood apraxia of speech (CAS).
Body Functions and Structures	Speech and articulation functions impacted by nervous system functioning. Reduced speech intelligibility due to organisation and production difficulties affecting articulation at the segmental (consonants and vowels) and suprasegmental (intonation, stress, speech rate) levels.
Activity	Communication including talking.
Participation	Participating in conversations with others especially unfamiliar communication partners; engaging in play with others; accessing the school curriculum.
Environmental Factors	Home and school support; access to funding to support communication skills; attitudes of others.
Personal Factors	Age, cultural and linguistic background, coping skills, confidence.

Activity

We recommend you extend your learning by engaging with the WHO ICF e-learning modules.

- Go to icf-elearning.com
- Select 'English' language
- As an introduction, complete chapters 1 and 4 either individually or in small groups/pairs, including the end of chapter quizzes

1.7 Evidence-based practice

A critical element of our work as speech pathologists, and the provision of quality services, is **evidence-based practice (EBP)**. The first standard (standard 1.1) in the Professional Standards for Speech Pathologists in Australia (SPA, 2020) is: *Provide ethical and evidence-based practice*. The purpose of EBP is to assist health professionals with clinical decision making. To make appropriate and informed clinical decisions, we need to integrate information from a number of different sources.

This video provides an overview of EBP.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=118#oembed-1>

[EPB – The basics](#) by Speech Pathology Australia

EBP in speech pathology has been defined as “an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values, into the process of making clinical decisions” (ASHA, 2005, p. 1). There are two common models used to further describe and outline EBP. The two models are similar but conceptualise evidence relating to the ‘practice context’ differently.

The first is referred to as the E³BP model conceptualised by Dollaghan (2007). In this model, three (3) types of equally-relevant evidence should be integrated into decision-making:

1. **Research-based evidence** (the best available evidence from systematic research with high internal validity that applies to a given clinical question);
2. **Practice-based evidence** (evidence which is collected in a clinical setting and which can have greater real-life application; includes clinical expertise);
3. **Informed by patient or client preferences** (how clinicians develop a shared understanding of preferences, values and goals of clients and their families/communities so the most appropriate service response is provided).

An enhancement to this model was proposed by Hoffman, Bennett, and Delmar (2013) who suggest it is necessary for health professionals to also consider the changing and diverse characteristics of the practice context in which you are working and interacting with clients. The practice context includes potential service characteristics and constraints, the resources that may or may not be available in your practice context, as well as the broader policies and procedures associated with the practice context. Therefore, the E³BP has been expanded to a four (4) component model (Figure 3):

1. **Research-based evidence;**
2. **Information from the practice context;**
3. **Patient values, circumstances etc;**
4. **Clinical expertise.**

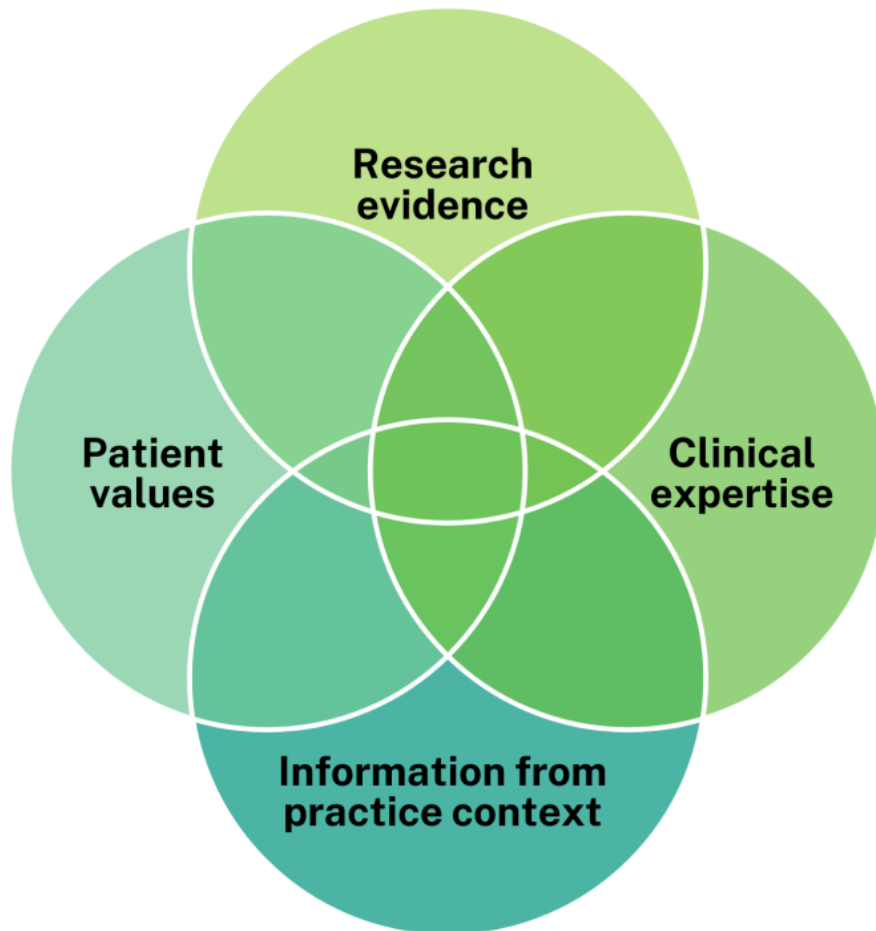


Figure 3. A model of evidence based practice by James Cook University, adapted from [Hoffman et al.](#), is licensed under [CC BY 4.0](#)

There are a range of useful resources that will assist with your learning, understanding and application of EBP. These include:

- [Evidence-based practice for speech pathology in Australia](#)
- [Speechbite](#)
- [ASHA Evidence-based practice](#)
- [ASHA Evidence Maps](#)
- [ASHA Practice Portal](#)
- [JCU InfoSkills Toolkit](#)
- [The DECIDE Framework](#)

Activity

Extend your knowledge of the application of EBP by completing these short activities:

- Access the [Living Clinical Guidelines for Stroke Management](#). Scroll down to Chapter 5 (Rehabilitation) and click onto 'Communication difficulties'. Then scroll to 'Aphasia'. In this section, you will see there are a number of practice points and statements. Some of these statements indicate 'strong recommendations', others are 'weak recommendations'. The strength of these recommendations is related to the quality of research evidence. Browse these sections and explore the research evidence included in the different statements.
- Access the [ASHA Evidence Maps](#). In the search section on the landing page, enter a term you are interested in exploring (e.g. stroke, dysphagia, cerebral palsy, speech sound, hearing loss, autism). Browse the research evidence available for your topic. Note you can refine your search by different types of evidence (i.e. external scientific evidence; clinical expertise; client perspectives).
- Access [Speechbite](#). In the search section on the landing page, enter a term you are interested in exploring (e.g. stroke, dysphagia, cerebral palsy, speech sound, hearing loss, autism). Browse the research evidence available for your topic. Some will be open access. This will be a useful resource for your future practice. If there are articles accessible only via a Paywall, please contact the university library to see if these are able to be accessed.

1.8 Clinical reasoning

In the previous chapters you learned about the ICF and importance of evidence-based practice (EBP), and how we need to integrate consideration for all components of the ICF and a range of evidence-related factors in our decision making. But how do we actually make these decisions? **Clinical reasoning** is about how clinicians go about making the decisions they do and involves the integration of information from the four components of EBP. Clinical reasoning is a logical, systematic and cyclical process that guides our decision making.

Clinical reasoning, or problem solving, is a complex concept involving cognitive processes and has been described as “the often intangible, rarely explicated thought processes that lead to the clinical decisions” that clinicians make on a daily basis when providing services to individuals, families and communities in specific practice contexts (McAllister & Rose, 2000, p. 205). Effective and robust clinical reasoning is associated with improved client care and outcomes (Ginsberg Friberg & Visconti, 2016). Clinical reasoning comprises two interactive elements: 1) *Diagnostic reasoning* (i.e. collecting and analysing information); and 2) *Therapeutic reasoning* (consideration for the client’s circumstances, values and goals).

The video below provides a useful overview of clinical reasoning, and how critical thinking applies to the clinical reasoning process.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=124#oembed-1>

[Critical thinking vs Clinical reasoning](#) by American Council of Academic Physical Therapy

As a student speech pathologist you will not have, at your stage of learning and expertise, the same skills in clinical reasoning that an experienced clinician possesses. Your clinical reasoning skills and knowledge will be developed over time through a combination of formal education, case-based learning, learning activities, application of skills and knowledge in a range of clinical settings, and clinical reflection.

As outlined above, clinical reasoning is a logical, systematic and cyclical process. As such, to support development of your clinical reasoning skills, it is useful to use clinical reasoning models for guidance in the clinical reasoning process. There are a number of theoretical models and processes that help to describe and explain various clinical reasoning approaches. For example, Yazdani, Hosseinzadeh and Hosseini (2017) outline several models of clinical reasoning associated with medicine in their critical review paper. Some of the models outlined include [hypothetic-deductive](#) and [pattern recognition](#).

For our purposes, we will use the clinical reasoning cycle below in Figure 4 (Levett-Jones et al., 2010). This

evidence-based theoretical model of clinical reasoning is used extensively in nursing, medicine and allied health professions globally. As depicted in Figure 4, clinical reasoning is described across eight phases:

1. Consider the patient situation.
2. Collect cues and information.
3. Process information.
4. Identify problems/issues.
5. Establish goal(s).
6. Take action.
7. Evaluate outcomes
8. Reflect on process and new learning.

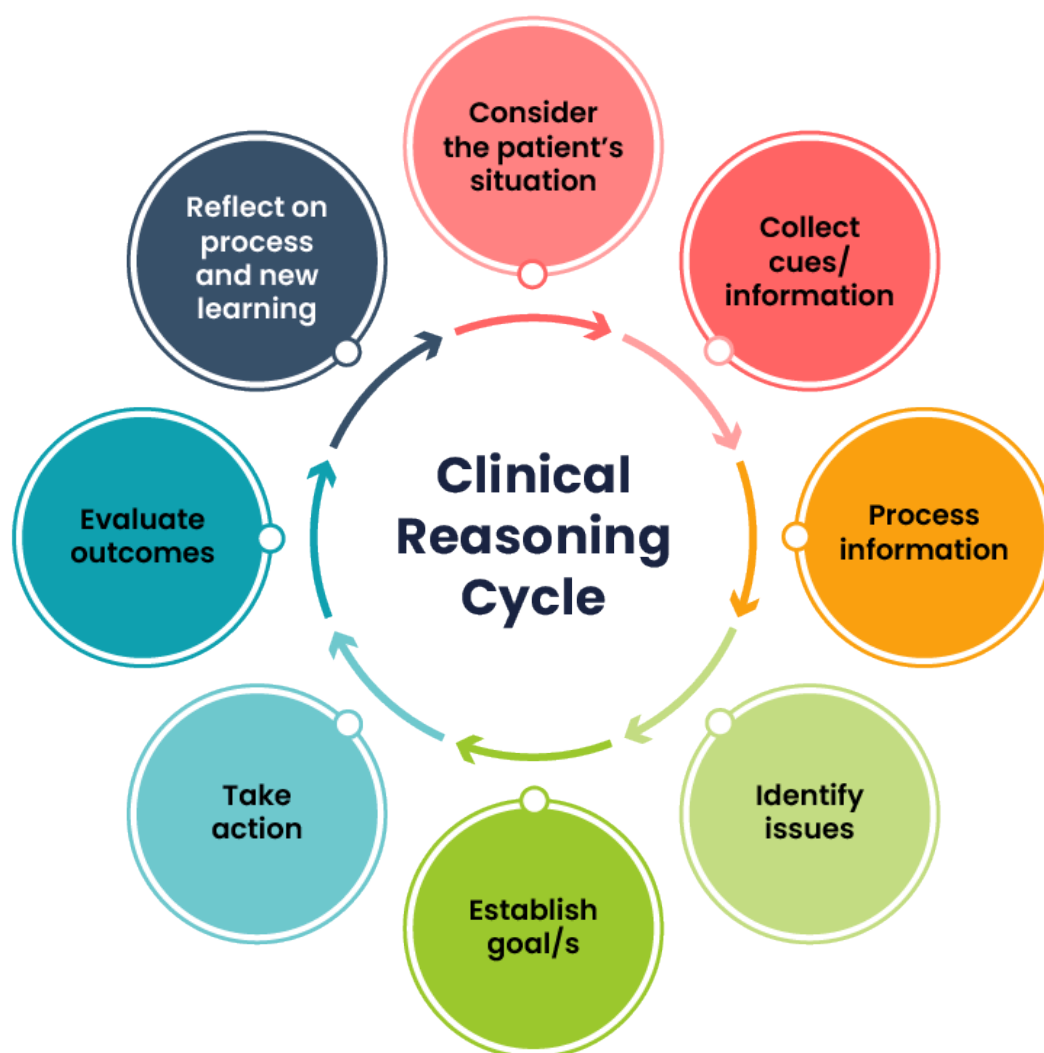


Figure 4. The Clinical Reasoning Cycle by Coogan et al., adapted from [Levett-Jones et al.](#), is licensed under [CC BY-NC 4.0](#)

Below are examples of the application of the clinical reasoning cycle to speech pathology contexts:

Clinical reasoning cycle phase	Description	Example: Speech and swallowing difficulties following stroke
Consider the patient situation	Engage the person, their family/carers to learn about their situation and describe or list facts, context, objects or people. Check and reflect on your assumptions or preconceptions.	65 yo man is in the acute stroke unit because he had a left hemisphere MCA ischaemic cortical stroke 2 days ago.
Collect cues/information	Review current information (e.g. handover reports, patient history, patient charts, results of investigations, previous assessments, patient/carer reports, reports from others etc)	He has a history of hypertension. He takes beta blockers. He is on a soft and bite-sized and slightly fluids. He has a right-sided mild paresis of all limbs. He can follow simple directions and is talking in grammatically correct sentences. Nurses reports his speech is difficult to understand.
	Gather new information (e.g. undertake patient assessment, patient/carer interview)	An OME, patient interview and communication screener (WAB Bedside) was undertaken. Overall unilateral (right sided) weakness and reduced ROM of articulators (particularly tongue, face and lips). Imprecise articulation; slow speech rate; speech intelligibility approx. 60%; anterior spillage of bolus; increased oral transit time of bolus; mild oral pocketing of bolus in buccal cavity on right side. Language appears intact. Likely dysarthria and dysphagia
	Recall knowledge (e.g. physiology, anatomy, neuroanatomy, epidemiology, therapeutics, context of care, ethics, law etc)	Upper motor neuron (UMN) involvement – motor speech, voice, swallowing..... Acute hospital setting Consider nutrition/hydration needs; immediate communication needs.
Process information	Interpret: analyse data to come to an understanding of signs or symptoms. Compare typical vs not typical	His presentation is consistent with UMN damage. Moderate severity. Not consistent with pre-morbid function.
	Discriminate: distinguish relevant from irrelevant information; recognize inconsistencies, narrow down the information to what is most important and recognise gaps in cues collected	He's on a modified diet/fluids but food intake chart & dietitian indicates his intake is meeting nutritional needs – patient reported modified diet/fluids is preferable at present. His speech is quite unintelligible (approx. 60% intelligibility) and he is having difficulty participating in his healthcare due to his communication difficulties. He is also very frustrated at his inability to communicate.
	Relate: discover new relationships or patterns; cluster cues together to identify relationships between them	Speech impairment clusters/patterns (imprecise articulation, tongue/lip/face hypotonia, slow speech rate, fatigue) could be indicators of unilateral upper motor neuron dysarthria. These clusters and links to anatomical function likely contributing to dysphagia.
	Infer: make deductions or form opinions that follow logically by interpreting subjective and objective cues; consider alternatives and consequences	Speech impairment/dysphagia clusters & patterns indicate common cranial nerve involvement (VII, XII)
	Match current situation to past situations or current patient to past patients (usually an expert thought process)	L-MCA cortical strokes often result in varying severities of dysarthria and dysphagia
	Predict an outcome (usually an expert thought process)	Education and treatment may improve function.
Identify problem/issue	Synthesise facts and inferences to make a definitive diagnosis of the patient's problem	XX presents with moderate UUMN dysarthria and moderate oral phase dysphagia characterized by reduced speech intelligibility, slow speech rate, anterior spillage of bolus, increased oral transit time of bolus, and mild oral pocketing of bolus in buccal cavity on right side. Presentation consistent with right-sided lip, tongue and facial weakness.
Establish goals	Describe what the person, their family/carers/supporters/stakeholders want to happen, and a desired outcome, a timeframe	Ensure adequate nutrition and swallow safety. Reduce communicative frustration and facilitate active healthcare participation. Improve speech intelligibility. Improve swallowing function to return to normal diet and fluids.

Clinical reasoning cycle phase	Description	Example: Speech and swallowing difficulties following stroke
Take action	Select a course of action between different alternatives available	Develop communication board in collaboration with patient. Provide communication partner training. Provide safe swallowing strategies. Daily speech and swallow rehabilitation.
Evaluate	Evaluate the effectiveness of outcomes and actions. Ask: "has the situation improved?"	Monitor patient chart notes Review baseline in one week. Ask patient/others for feedback on progress.
Reflect on process and new learning	Contemplate what you have learnt from this process and what you could have done differently. Engage and reflect with the person , their family/carers/stakeholders to see what they've learnt, what they'd have liked to be different and what else they need to know.	What worked well/didn't work well? Next time I would..... I should have..... If I had..... I now understand.....



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=124#h5p-3>

1.9 Numeracy concepts for speech pathology

1.9.1 HOW DO SPEECH PATHOLOGISTS USE NUMERACY SKILLS IN PRACTICE?

As speech pathologists, we need to be able to apply basic numeracy skills in our practice, including interpreting numerical data we use in speech pathology. These numeracy skills are underpinned in the Professional Standards for Speech Pathologists in Australia (SPA, 2020).

EXAMPLE 1

Let's explore **standard 3.2 (Assessment communication and swallowing needs)** and the associated elements:

b. We use each contact with the individual and/or community to contribute to ongoing *individual assessment* or community *needs assessment*.

c. We *assess* and consider the *communication and swallowing goals* and needs of the individual and/or community with respect to:

- body structures and functions, and/or
- performance and capacity in activities and participation
- opportunities for prevention and promotion strategies and initiatives
- facilitators and barriers in the social and physical environment.

In these examples, we see a common theme of assessment and goals. These aspects require some form of data acquisition (i.e. numbers) to use as a baseline, for monitoring, and for collaborative development of measurable goals.

EXAMPLE 2

Let's explore **standard 3.3 (Interpret, diagnose and report on assessments)** and the associated elements:

- a. We use clinical reasoning to *synthesise assessment findings* and *formulate* a diagnosis or description.
- b. We use *evidence* to inform our understanding of why a need exists and to identify factors that may contribute to possible outcomes.

In these examples, we see a common mathematical terms. We use measurement of individuals' skills and relate these to typical performance or development. Evidence may be in the form of the data we acquire and data reported in scholarly literature. This helps us to describe and discuss the nature, severity and prognosis of the area/s of concern.

EXAMPLE 3

Let's explore **standard 3.4 (Plan speech pathology intervention or service response)** and the associated elements:

- a. We *identify* communication and/or swallowing intervention or service response options *relevant to the identified goals*.
- b. We *design* an intervention or service response plan *informed by a range of options*.
- c. We identify how intervention or service response *outcomes will be measured*.
- d. We *adjust plans* over time *informed by assessments, changing goals, current needs and outcomes* of interventions or service responses.

In these examples, we see numerical data is related to all elements of service planning.

EXAMPLE 4

Let's explore **standard 3.5 (Implement and evaluate intervention or service response)** and the associated elements:

- a. We *implement* the agreed intervention or service response that is responsive to the *capability and progress* of the individual or community.
- b. We *collect, record, analyse and share data* to evaluate:
 - the fidelity of the intervention or service response

- the appropriateness of the goals, plans and approaches being used
- the progress towards and acquisition of individual and community goals
- the timing of and engagement with other services and supports as needed
- when the intervention or service response will be complete.

c. We continually refine goals and modify the implementation of the intervention or service response to meet the needs of the individual or community.

In these examples, we see numerical data is related to most elements of implementing and evaluating our service response.

The examples above highlight that speech pathologists use numeracy skills in a variety of ways to support their work, particularly when providing assessment and intervention services to individuals, families and communities. While speech pathologists' primary focus is communication and swallowing disorders, numeracy skills play an important role in both diagnostic and therapeutic contexts.

Here are some further ways speech pathologists may use numeracy skills in their practice:

Practice area	Relationship to speech pathology practice	Numeracy skills and application examples
Assessing communication skills using standardised assessment	Many standardised assessment used by speech pathologists incorporate numerical scores to quantify an individual's skills. Speech pathologists need numeracy skills to accurately interpret these scores and make sense of assessment results.	• Scoring scales (e.g., rating a child's language development on a 1-5 scale). • Percentile ranks and standard deviations to interpret the severity of communication difficulties in comparison to typical populations. • Age-equivalent scores or other age-based comparisons to understand how a client's skills are developing.
Tracking progress over time	Speech pathologists often track patient progress using numerical data.	• Quantifying frequency of behaviors, such as the number of words spoken or understood, or the number of correct articulation attempts. • Measuring improvement in areas like speech fluency, articulation accuracy, or language comprehension over multiple sessions. • Graphing or charting progress, using numerical data to visualise trends and communicate progress to patients and families.
Intervention planning and goal setting	Measurable goals help to guide selection of intervention approaches and monitoring to ensure the effectiveness and efficacy of the approaches.	• Establish measurable outcomes for improvement (e.g., achieving a certain percentage of correct sounds in speech production or a target number of new vocabulary words within a set period). • Break down goals into small, measurable steps. For example, a goal might be to increase word retrieval accuracy from 70% to 85% over six weeks.
Time management and scheduling	Speech pathologists often work with tight schedules, managing multiple clients, therapy sessions, and documentation requirements.	• Track session durations to ensure they are providing an appropriate amount of time for each individual. • Calculate treatment frequency (e.g., how many sessions per week or month). • Plan therapy activities and allocate resources efficiently, especially when managing multiple clients with varying needs.
Data collection for research or clinical trials	In clinical or research settings, speech pathologists collect data to evaluate the effectiveness of treatment strategies.	• Statistical analysis of data, such as comparing the effectiveness of two different therapies by analyzing pre- and post-treatment scores. • Understanding research findings through statistical terms like means, medians, percentages, or p-values, which inform evidence-based practice.
Swallowing and feeding assessment	For speech pathologists working with patients who have swallowing difficulties (dysphagia), numeracy is crucial for analysing the consistency and viscosity of foods and fluids, identifying safe swallow approaches, and analysing technology approaches.	• Speech pathologists may use numerical measures to assess the volume of food or liquid a patient can safely swallow. • Quantifying the duration of swallowing tasks or the number of swallows in a given period. • Using tools like modified barium swallow studies to analyse the safety and efficiency of swallowing.
Interpreting audiological data	Speech pathologists working with patients who have hearing impairments must understand audiological data.	• Interpreting audiograms, which include numerical values representing hearing thresholds. • Using dB (decibels) and Hz (hertz) measurements to assess hearing ability and understand the audiological profile of a patient.
Speech production and articulation	Some treatment techniques for speech disorders, particularly in children, involve exercises related to counting, syllables, or phonological patterns.	• Counting the number of syllables in words for children working on speech sound production. • Using numbers to guide structured speech drills, such as focusing on producing a sound in a set number of trials (e.g., 10 repetitions of a sound).
Financial management in practice settings	Speech pathologists in private practice or running clinics also apply numeracy skills in the business side of their work.	• Billing and coding for insurance claims. • Budgeting for therapy supplies, office costs, and other practice-related expenses. • Managing client payments and scheduling regular payments for therapy sessions.

Practice area	Relationship to speech pathology practice	Numeracy skills and application examples
Analysing client behaviour in cognitive-communication therapy	In cases of brain injury or cognitive-communication disorders, speech pathologists may need numeracy skills to assess memory, attention, and problem-solving abilities.	• Time-based tasks, such as measuring how long it takes a client to complete certain cognitive tasks. • Quantitative measures to track the number of errors or correct responses in memory and problem-solving tasks.

1.9.2 EXAMPLES OF THE APPLICATION OF NUMERACY SKILLS TO SPEECH PATHOLOGY PRACTICE

The following are examples of the application of numeracy skills to various aspects of speech pathology practice. This is not an exhaustive list, however provides you with examples of numeracy skills that will be the foundation of your future learning and practice.

THE NORMAL DISTRIBUTION CURVE

The **normal distribution curve**, also known as the **Gaussian distribution** or **bell curve**, is a statistical concept that represents the distribution of a set of data where most of the observations cluster around the mean (average), with fewer observations occurring as you move further away from the mean. It is symmetrical and bell-shaped, meaning the data is evenly distributed on either side of the mean.

For most common norm-referenced, standardised tests, the number of people tested is so large that the scores of the people taking it form a bell-shaped or “normal” curve when plotted on a graph. This fact allows us to measure a client’s performance against clients of the same age by taking the raw scores and translating them into standard or scaled scores and percentiles.

This video provides a good overview of the normative curve in relation to standardised assessments.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=305#oembed-1>

[Standard Scores](#) by Southeast Psych is licensed under [CC BY 4.0](#)

Key characteristics of the normal distribution curve include:

1. Symmetry

- The normal distribution curve is **symmetrical** around the mean, meaning the left and right halves are mirror images of each other. The mean, median, and mode all coincide at the centre of the curve.

2. Bell-Shaped

- The curve rises gradually to a peak at the mean and then tapers off on both sides. It’s highest at the mean and decreases as you move away from the mean in either direction.

3. The Mean, Median, and Mode Are Equal

- In a perfectly normal distribution, the **mean**, **median**, and **mode** are all the same and located at the centre of the distribution. This central point is where the peak of the curve occurs.

4. Standard Deviation and Spread

- The **spread** or **width** of the normal distribution is determined by the **standard deviation** (SD). The larger the standard deviation, the wider and flatter the bell curve becomes. The smaller the standard deviation, the narrower and steeper the curve.

5. 68-95-99.7 Rule (Empirical Rule)

- In a normal distribution:
 - **68%** of the data falls within **one standard deviation** (± 1 SD) of the mean.
 - **95%** falls within **two standard deviations** (± 2 SD).
 - **99.7%** falls within **three standard deviations** (± 3 SD). This rule is useful for understanding the spread of data and predicting the likelihood of observing certain values.

6. Asymptotic Nature

- The tails of the normal distribution curve extend infinitely in both directions, but they never actually touch the horizontal axis. This means that extreme values (far from the mean) are always theoretically possible, though the likelihood of such extreme values diminishes as you move further from the centre.

Figure 5 below shows a 'perfect' normal distribution. The peak of the curve represents Mean (or average) performance of the population from which data has been gathered. However, not every data point is the same as the mean, therefore we have data on the left (i.e. lower) and right (i.e. higher) of the mean. In the diagram below σ represents Standard Deviation, so 1σ equals one deviation and -1σ is the region of one standard deviation below the mean and 1σ is the region of one standard deviation above the mean. In a perfect normal distribution this means that approximately 70% (i.e. 68.2%) of population will fall within the 1 standard deviation range (i.e. $34.1 + 34.1$) and approximately 95% (i.e. 95.2%) will fall within the 2 standard deviation range of the mean.

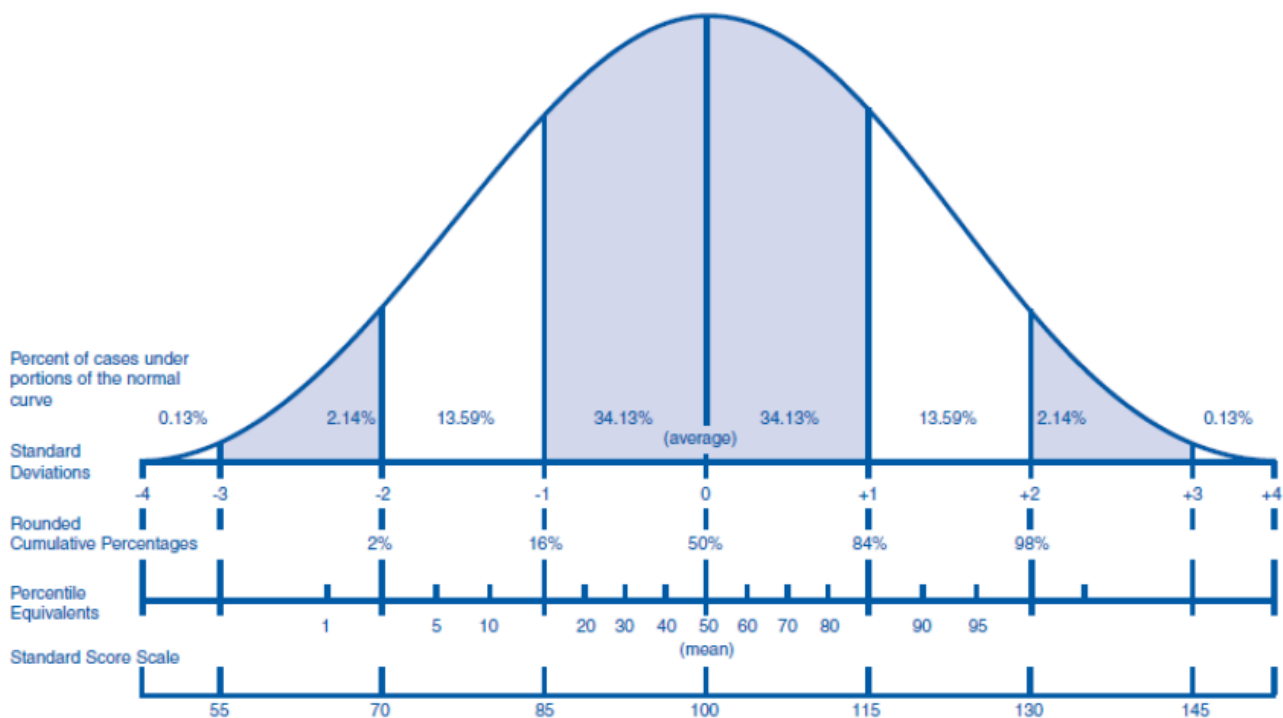


Figure 5. Normative Distribution by Linguisticsystems. All Rights Reserved

STANDARD SCORES AND PERCENTILES

Standard scores and **percentile equivalents** are two ways of interpreting where an individual's score or measurement falls in relation to a normative distribution, often represented by the **normative distribution curve**. They provide a way to understand an individual's performance relative to the general population or a group of peers.

Standard scores are a type of z-score which expresses an individual's performance in terms of how many standard deviations their score is above or below the mean of the distribution. Standard scores are useful because they standardise data across different tests or measurement scales, making it easier to compare individuals or groups. In some tests or assessments, raw scores are converted into **standard scores** using a different metric, such as the **T-score** (where the mean is typically 50, and the standard deviation is 10) or **Stanine score** (on a scale of 1 to 9). These are all derived from the same underlying concept of z-scores but with different scales or units.

A **percentile** indicates the percentage of scores that fall below a given score in a normative distribution. It tells you the relative position of an individual's score compared to others. The **percentile rank** refers to where an individual's score stands in relation to others (e.g., the 85th percentile means the individual scored higher than 85% of the comparison group). The **percentile equivalent** is the actual score that corresponds to a given percentile rank.

Interpretation:

- **50th percentile** is the **median**, meaning the score is exactly in the middle of the distribution.
- **90th percentile** means the score is higher than 90% of the scores in the group.
- **10th percentile** means the score is higher than only 10% of the scores.

CALCULATING A CLIENT'S CHRONOLOGICAL AGE

What is chronological age?

Chronological age is how old someone is in actual calendar time. This refers to the amount of time that has passed since their birth, measured in years, months, and days.

Why is calculating chronological age important?

Chronological age is a critical factor in helping speech pathologists assess, diagnose, and treat communication and swallowing disorders in ways that are developmentally and contextually appropriate for the individual.

Developmental Milestones: A person's chronological age provides context for understanding developmental milestones in speech and language acquisition. For example, children typically reach certain speech and language milestones by specific ages (e.g., saying their first word at around 12 months, forming two-word phrases by 2 years, etc.). Knowing a child's chronological age helps the speech pathologist assess whether their speech and language skills are on track for their developmental stage.

Assessment of Communication Disorders: Age-based norms are used to assess whether a person's speech and language abilities are typical or delayed. If a child has difficulty with communication, their chronological age helps the speech pathologist compare their performance to standardised age-related norms in order to identify any delays or disorders. Additionally, for many standardised assessments, chronological age influences the item number of where you might start the assessment.

Treatment Planning: Chronological age is used to guide treatment approaches. For instance, younger children might benefit from play-based interventions, while older children or adults may require more structured techniques. Age can also inform a speech pathologist about what kind of communication skills are expected at a given stage, which in turn helps determine the most appropriate intervention strategies.

Differentiating Between Age-Related Challenges and Pathological Issues: As people age, certain speech and language changes are typical (e.g., some older adults may experience slight declines in memory or word-finding ability). Knowing a person's chronological age helps distinguish between natural age-related changes and potential underlying disorders that might require therapy, such as speech or language problems due to neurological conditions.

Predicting Outcomes: Early intervention is often most effective when addressing speech and language disorders. By knowing a child's chronological age, a speech pathologist can estimate the likelihood of success with different interventions, as younger individuals tend to show more rapid and significant improvement with appropriate therapy.

Cultural and Linguistic Considerations: The speech pathologist may also consider the chronological age in the context of cultural or linguistic backgrounds, as communication expectations can vary widely across different societies and languages. This ensures that the assessment and treatment plan are appropriate for the individual's specific age and environment.

How do I calculate chronological age?

EXAMPLE 1

Simple calculations where the date, month and year of testing is more than the client's birth date:

- 1. Write down the year, month and day of assessment testing and the client's birth date.
- 2. Subtract the client's birth date from the testing date (begin with the day, then the month, then the year).
- 3. There is generally no need to report the client's age in days, unless the client is very young (e.g. a newborn baby) where days since birth is important to record.

In this example, the client's age is 3 years and 3 months (or 3;03).

	Year	Month	Day
Test Date	2024	03	19
Birth Date	2021	01	03
Age	3	2	(16)

More complex calculations where the date and/or month of testing is less than the client's birth date (when the testing date and/or month is less than the client's date and/or month of testing, borrowing of values is required).

EXAMPLE 2

The month of testing is less than the client's birth month:

In this case, you need to borrow 1 year (12 months) from the year of the test and add this to the month in which the test occurred.

In this example, 1 year is subtracted from the year of the test and the associated 12 months is added to the month of the test. The value of the test date in months now increases from 3 months to 15 months (i.e. 12 months added to the original 3 months). This now makes the calculation of chronological age more straightforward.

The client's age is 2 years and 7 months (or 2;07).

	Year	Month	Day
Test Date	2024 2023	03 15	19
Birth Date	2021	08	03
Age	2	7	

EXAMPLE 3

The day of testing is less than the client's day of birth.

In this case, you need to borrow one month (always use 30 days, regardless of the actual number of days in the month) from the month of the test and add this to the day of the test.

In this example, 1 month is subtracted from the test month and the associated 30 days is added to the test date day. The value of the test date day now increases from 10 days to 40 days (i.e. 30 days added to the original 10 days). This now makes the calculation of chronological age more straightforward.

This client's recorded age is 3 years and 1 month (or 3;01).

	Year	Month	Day
Test Date	2024	~~10~~ 9	~~10~~ 40
Birth Date	2021	08	20
Age	3	1	

EXAMPLE 4:

The month and day of testing are both less than the client's birth month and day.

In this case, you need to borrow 1 month (30 days) from the month of testing and add this to the day of testing. Then subtract 1 year (12 months) from the year of the test and add this to the month of the test and borrow. Deal with the day column first.

In this example, 1 month* (30 days) must be subtracted from the test date month (by changing the number of months from 3 to 2), and added to the test date (changing the number of days from 19

to 49). Next, 1 year must be borrowed from the test date year and added to the test date month (changing the number of months from 2 to 14).

**When borrowing 1 month, add 30 days to the first number in the day column.*

This now makes the calculation of chronological age more straightforward.

The client's age is 2 years and 6 months (or 2;06).

	Year	Month	Day
Test Date	2024 2023	03 02 14	19 49
Birth Date	2021	08	30
Age	2	6	

MONITORING PROGRESS

A great way to visually represent data to monitor a client's progress is by using charts, tables or graphs. These can show a visual representation of data over time showing the client's progress in different areas. These approaches help to clearly illustrate to both the clinician and the client, trends in a client's progress and makes it easier to communicate findings to others.

Below is an example of progress monitoring for the percentage of correct responses over multiple sessions using *table* format.

Session	/s/ words attempted	/s/ correctly produced	% correct
Week 1:	49	26	53% (53.1)
Week 2:	54	35	65% (64.8)
Week 3:	61	36	59% (59)
Week 4:	68	44	65% (64.7)
Week 5:	63	47	75% (74.6)

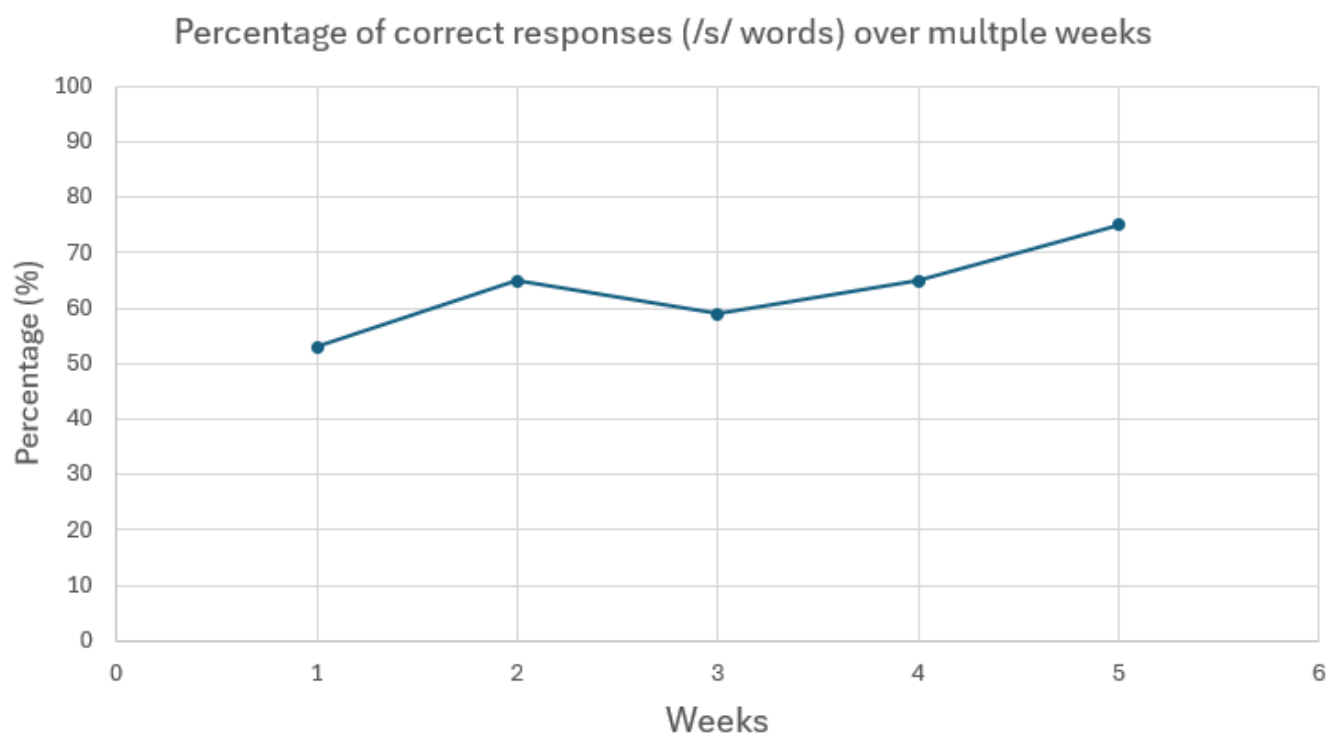


Figure 6. Percentage of correct responses (/s/ words) over multiple weeks by Frances Cochrane is licensed under [CC BY 4.0](#)

Figure 6 is an example of the same data using a *graph* format. Note how the graph provides a good visual representation of the data. Percent correct is on the y (vertical) axis; week is on the x (horizontal) axis.

1.10 Culturally responsive practice

1.10.1 CULTURAL RESPONSIVENESS

The Professional Standards for Speech Pathologists in Australia (SPA, 2020) “define approaches to professional practice that acknowledge past and current wrongs. They highlight the need to listen to, respect, learn from and collaborate with Aboriginal and Torres Strait Islander peoples to achieve equitable health, well-being, language and educational outcomes for individuals, families and communities” (SPA, 2020, p. 3). In 2023, the SPA [Aboriginal and Torres Strait Islander culturally responsive capability framework](#) was published.

In this video, SPA Reconciliation Action Plan officer, Pauline Weldon-Bowen, discusses the importance of the journey to reconciliation.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=120#oembed-1>

[National Reconciliation Week – Pauline Weldon-Brown](#) by Speech Pathology Australia

Cultural responsiveness ‘describes the capacity to respond to the healthcare issues of diverse communities’ (Victorian Department of Health, 2009, pg. 4). The term cultural responsiveness is not specific to Aboriginal and Torres Strait Islander peoples, rather, the term applies to the responsiveness of health professionals to individuals’ and communities’ health beliefs and practices, and cultural and linguistic diversity. Cultural responsiveness is advocated by Indigenous Allied Health Australia (IAHA) through its [Cultural Responsiveness in Action Framework](#) (IAHA, 2019). As outlined by IAHA (2019, p. 5), “cultural responsiveness is what is needed to transform systems; how individual health practitioners work to deliver and maintain culturally safe and effective care”.

Culturally responsive healthcare practice is a strengths-based and action-oriented approach that focuses on the provision of person-centred services that acknowledge and respects cultural difference, and the social and cultural factors that may impact a person’s health (Gill & Babacan, 2012; Hyter & Salas-Provence, 2019; IAHA, 2019).

The operationalisation and actions of culturally responsive practice must occur at the individual and institutional level so patients feel culturally safe when accessing and participating in healthcare services (Gill & Babacan, 2012). In the Australian context, cultural responsiveness is a priority tenet in professional SLP practice documents including the code of ethics (Speech Pathology Australia, 2020a), and professional standards (Speech Pathology Australia, 2020b). Additionally, the Aboriginal and Torres Strait Islander culturally

responsive capability framework (SPA, 2023) provides guidance and support for SLPs and organisations in ways to facilitate culturally responsive practice. Cultural responsiveness is a lifelong professional development practice and generally draws on concepts including cultural awareness (Coffin, 2007).

To be genuinely culturally responsive, you need to develop skills, knowledge, capabilities and competencies in relation to cultural awareness so that your services are culturally safe and secure as determined by the users of your services. There are numerous terms (e.g. cultural safety, cultural awareness, cultural security, cultural competence, cultural awareness, cultural capabilities) that are associated with and are the foundations for 'cultural responsiveness'. An outline of some of these terms are provided below. You will find that these terms may be used interchangeably in various contexts but there are key distinctions between the terms.

A useful *cultural security model* has been outlined by Juli Coffin (2007). In this model (Figure 7), Juli highlights the concepts of cultural awareness, cultural safety, and cultural security, and aligns the model with speech pathology practice examples. In the model, you can see the interconnectedness between these concepts, however there are key differences between these terms.



Figure 7. Coffin Cultural Security Model by Juli Coffin is reproduced with permission from the author. All Rights Reserved

1.10.2 CULTURAL AWARENESS

One of the first steps to practicing cultural responsiveness, and ultimately achieving cultural safety as determined by Aboriginal and Torres Strait Islander peoples receiving the health service, is **cultural awareness** (Coffin, 2007; Taylor & Guerin, 2014). Cultural awareness involves demonstrating an awareness of, and sensitivities to, difference and diversity, and therefore, different care is required for different peoples (Taylor & Guerin, 2014). Cultural awareness also involves awareness of one's own culture and influences upon behaviours, judgements and beliefs (Taylor & Guerin, 2014). However, cultural awareness does not necessarily

lead to action. It is only when action is implemented as an outcome of cultural awareness, that cultural responsiveness, and facilitation of cultural safety, occur (Coffin, 2007).

Cultural awareness example

An example of cultural awareness for a speech pathologist might be understanding that bilingualism or multilingualism may influence how a child communicates and interprets that in context. For example, in some cultures, it may be common to use multiple languages or dialects in different social settings, and a speech pathologist must consider this when assessing language skills. This example highlights that a speech pathologist may be aware of these differences and cultural influences, however there is no specific action taken here.

1.10.3 CULTURAL SAFETY

Cultural safety has its foundations in Aotearoa New Zealand in the area of nursing and midwifery (Papps & Ramsden 1996). Cultural safety is the experience of the recipient of care, it is not defined by the caregiver or health provider (Mohamed et al., 2024). 'cultural safety is not something that the practitioner, system, organisation or program can claim to provide, but rather it is something that is experienced by the consumer/client' (Walker et al., 2014, p.201).

Working toward cultural safety is a lifelong journey and the key focus areas of cultural safety include analysis of power racism, ongoing effects of colonisation and white privilege (Mohamed et al., 2024). Cultural safety will only be experienced if the system is changed, adapted and/or challenged to incorporate respect for 'Aboriginal and Torres Strait Islander ways of knowing, being and doing' (IAHA, 2019). Aboriginal and/or Torres Strait Islander people will determine if their cultural identity and meanings are being respected, they are not being subjected to racism, and they feel valued, safe, and trusted.

Cultural safety example

Building on the example provided above in cultural awareness, an example of cultural safety awareness for a speech pathologist might be where the speech pathologist asked the child's family how they would like to be involved in the therapy process and respecting their wishes. This may mean communicating with the extended family or community members who are important to the client and being sensitive to cultural norms around caregiving and decision-making.

1.10.4 CULTURAL SECURITY

The term **cultural security** is more likely to be used in the Northern Territory and Western Australia. Cultural security shifts the focus from individual practitioners or staff to the health and human services systems in which they operate, and the decisions and actions of government and non-Indigenous parties. It relates to how systems ensure that the rights of Aboriginal and Torres Strait Islander peoples to access and receive high quality services are met through the consideration and incorporation of culture in policy and practice (Australian Human Rights Commission 2011; Coffin 2007; Mohamed et al., 2024). Cultural security directly links understandings and actions, and government/workplace policies create processes that are automatically applied (Coffin, 2007).

Cultural security example

Building on the examples provided above, an example of cultural security for a speech pathologist might be making sure that systemic barriers such as language, access to interpreters, or past experiences with healthcare systems do not prevent the client from receiving the care they need. Cultural security ensures that the client's right to access services is protected, and that any cultural or language differences are actively supported rather than ignored. The speech pathologist's workplace has clear policies and procedures for ensuring that all clients have access to interpreter services and these are provided free of charge.

Activity

Access the SPA [Aboriginal and Torres Strait Islander culturally responsive capability framework](#) and complete the following quiz:



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=120#h5p-4>

Review the 'capabilities in action' and 'outcomes' for each of the five culturally responsive capabilities. How might you enact these on an individual or personal level?

1.11 Reflective practice

In previous chapters you have learned about foundational concepts that underpin your learning and speech pathology practice. These have included aspects such as professional and ethical practice, evidence-based practice, clinical reasoning, and culturally responsive practice. In learning about the Professional Standards for Speech Pathologists in Australia (SPA, 2020), you will have noted that the second domain of the standards is related to **Reflective practice and lifelong learning**. As outlined in the Professional Standards, this domain includes professional and personal elements such as demonstrating self-awareness, critical reflection to guide your development and practice, planning personal development goals, engaging in learning, contributing to the evidence base, and using information from a range of sources. Each of these elements requires you to reflect on your learning and practice, in order to identify strengths and weaknesses, and opportunities for growth or enhanced practice.

1.11.1 WHAT IS REFLECTIVE PRACTICE?

Reflective practice means engaging in a conscious continuous cycle of self-awareness, self-reflection, self-observation and self-evaluation in order to better understand your actions and reactions (Boud, 1985). Reflective practice is generally captured or articulated in some way such as through discussion with others (e.g. discussions with peers, supervisors, mentors or critical friends) or writing (e.g. reflective journals, logs, written summaries, reflective essays, reflective templates). The goal of reflective practice is not necessarily to address a specific problem or question, but to reflect on and refine practice more broadly on an ongoing basis. As outlined, reflective practice is a continuous cycle and as such, contributes to lifelong learning. Reflective practice underpins the development of new skills and knowledge, as well as helping to develop your responsive capacity that contributes to building relationships, managing your emotions and coping abilities, and making decisions.

The video below provides an overview of reflective practice for health professionals.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=122#oembed-1>

[Reflective Practice](#) by Clinical Excellence Commission

1.11.2 THEORIES AND MODELS OF REFLECTIVE PRACTICE

Various theories and models inform and underpin reflective practice. It doesn't particularly matter which theory or approach you adopt in your reflective practice, the most important factor is that you engage in reflective practice. Use a model that you feel meets your personal and professional needs for a specific context. During your undergraduate training, you will have the opportunity to engage with different models and approaches of reflective practice.

Some of the more common theories and models used in healthcare include the following:

THE SCHÖN REFLECTIVE MODEL

Schön's (1991) *Reflection in action/Reflection on action* provides a model for reflective during an event or experience (hence the term 'reflection *in* action'), or directly after an event of experience (hence the term 'reflection *on* action'). Schön emphasized the importance of these two types of reflection in professional development, suggesting that learning is enhanced when professionals engage in both reflective processes. Reflection-in-action allows for immediate problem-solving, while reflection-on-action helps refine practice over time.

- **Reflection-in-Action (as it happens):** This type of reflection occurs during the action itself. Professionals think on their feet, adjusting their approach in real time as new situations arise. It involves tacit knowledge and intuition, where the practitioner is actively reflecting and making decisions while performing a task, often without fully articulating their reasoning.
- **Reflection-on-Action (afterwards):** This type of reflection happens after the action has been completed. It involves looking back on the experience to evaluate what went well, what didn't, and why. It is a more deliberate, analytical process where the practitioner reflects on past actions to improve future performance.

EXPERIENTIAL LEARNING THEORY

Kolb's **Experiential Learning Theory** (1984) is based on the idea that learning is a process of cyclical reflection and subsequent action. He proposed that individuals learn best when they actively engage in the learning process through a four-stage cycle. The stages of the cycle (Figure 8) are:

1. **Concrete Experience (CE):** This is the stage where learners have a direct experience. It could be a hands-on task, an activity, or an event where new information is encountered.
2. **Reflective Observation (RO):** After experiencing something, learners reflect on their experiences. They consider what happened, what worked, what didn't, and how they felt about it. This stage involves thinking critically about the experience.
3. **Abstract Conceptualization (AC):** In this stage, learners develop theories or generalizations based on their reflections. They make sense of the experience by linking it to existing knowledge or creating new ideas and concepts.
4. **Active Experimentation (AE):** Learners apply their new concepts or ideas to the world to see how they work in practice. This stage involves testing theories and making adjustments based on results.

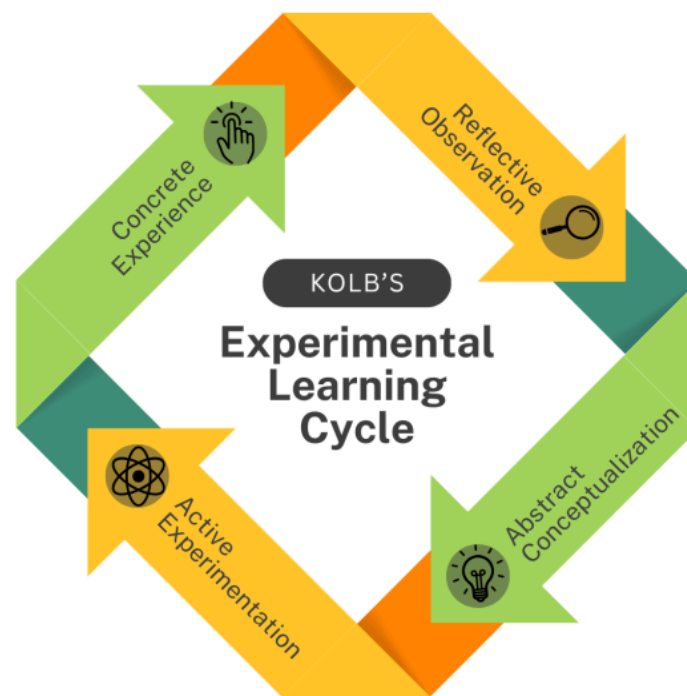


Figure 8. Kolb's Experimental Learning Cycle by James Cook University, adapted from [Boud et al.](#), is licensed under [CC BY 4.0](#)

REFLECTIVE LEARNING THEORY

Boud, Keogh, and Walker's **Reflective Learning Theory** (1985) emphasizes the importance of reflection in the learning process. Their model focuses on how individuals actively process and make sense of their experiences to develop deeper understanding and learning, contributing to personal and professional growth. The theory consists of three key stages:

1. **Return to Experience:** This initial stage involves revisiting the experience that the learner has gone through. It requires a thoughtful recall or re-examination of the event, action, or situation, considering what happened and how it unfolded.
2. **Attending to Feelings:** In this stage, learners focus on their emotional responses to the experience. Recognizing and processing feelings—whether positive or negative—helps learners understand their emotional involvement and how it may have influenced their actions and outcomes.
3. **Re-evaluating the Experience:** Finally, learners critically analyze the experience in light of new perspectives and insights. This stage involves making sense of the experience, identifying what can be learned from it, and how it can inform future actions or understanding.

The model is conceptualised in Figure 9 below. The first circle refers to the experience you have (e.g. your placement, learning experience, place of work, classroom). The second circle outlines the **reflective process**. The smaller four circles are the actions taken based on your reflections.

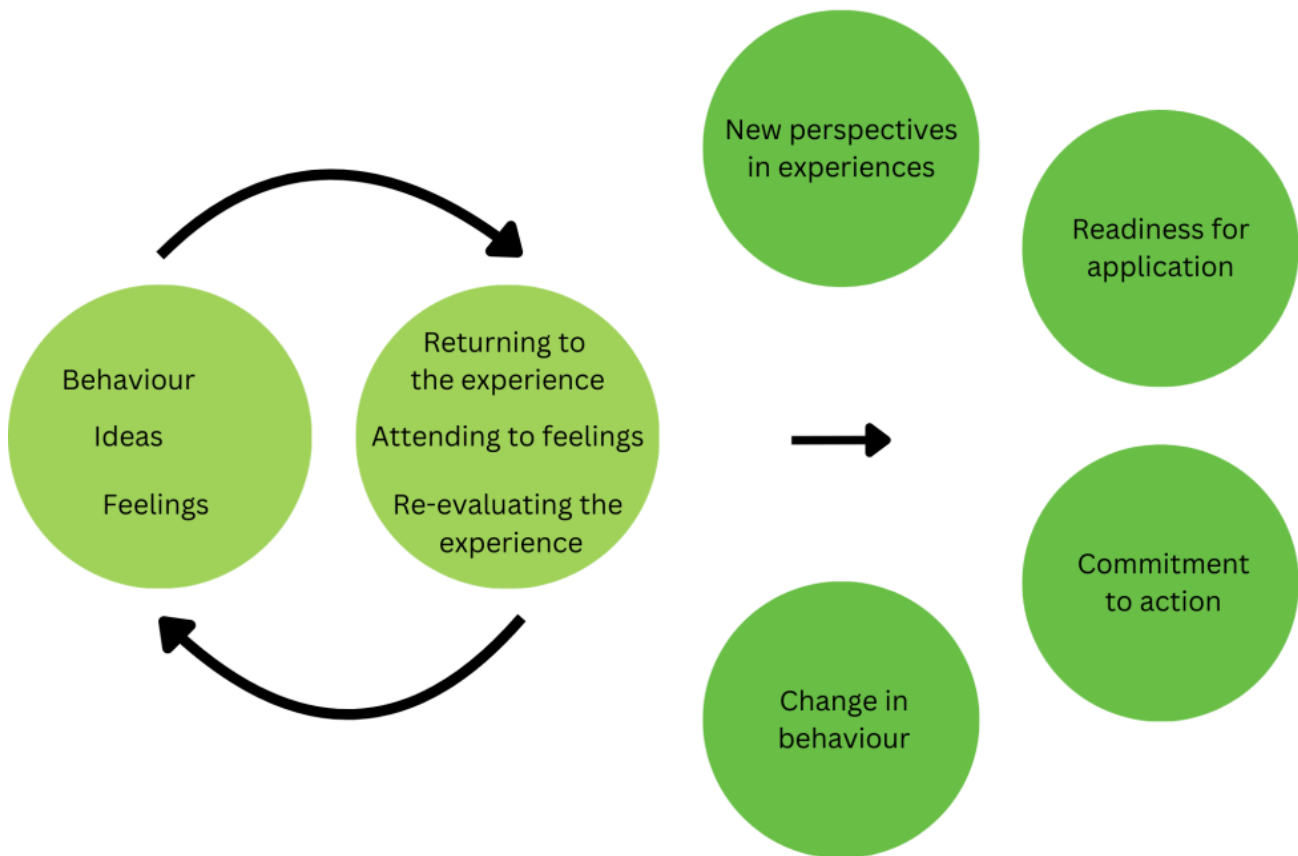


Figure 9. Reflective Learning Theory by James Cook University, adapted from [Boud et al.](#), is licensed under [CC BY 4.0](#)

WHAT? SO WHAT? NOW WHAT?

The “What-So What-Now What” model of critical reflection (Rolfe et al., 2001) is a simplistic and practical model that aims to support health professionals to reflect on their experiences, feelings, and actions, and enhancing aspects of personal and professional practice accordingly. The model consists of three key questions:

1. **What?** (describe what happened)
2. **So what?** (analyse and make sense of what happened)
3. **Now what?** (take effective next steps)

Stage	Focus area	Possible questions to reflect upon
What?	Past: Identify and describe the event and what happened	• What happened, focusing on the actual facts only? (report objectively without judgement or interpretation) • When did it happen? • Where did it happen? • How did it happen? • What was your experience? • What did you particularly notice? • What worked well and what didn't? • Who else was involved? • What did you do? • What was the related data or information?
So What?	Present: Analyse, make sense, and understand the event and what happened	• What did you learn? • What difference did the event make? • How is your experience different from what you expected? • What did you like/dislike about the experience and why? • How did you feel when it happened? • What were your emotions in response to it? • What might have been behind your response? • Was this event part of a broader pattern? • What caused this event? • Why might have other people acted the way they did? • What connections can you make between this experience and other aspects of your prior experiences, work or study life? • Are there any implications for me personally or professionally? • What other insights or hypotheses might be drawn from the experience and data?
Now what?	Future: Plan and outline the effective next steps you will take	• What lessons can you take forward in similar and other contexts? • How can you apply this learning in the future? • How might you prevent negative outcomes or problems in a similar situation? • How might I move forward positively? • Are there any necessary actions or changes I need to make? • What would you do differently if a similar situation arose? • How might you better prepare and resource yourself for a similar situation? • How might you test out your understanding or hypotheses? • What are the actionable takeaways? • What learning goals have you set for yourself? • What supports might you need?

The video below provides a useful overview of the What? So what? Now What? model of critical reflection.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=122#oembed-2>

[What is critical reflection?: Introducing the What? So What? Now What? model](#) by the University of Guelph McLaughlin Library is licensed under [CC BY 4.0](#)

Choose one of the models above and:

1. Think about an event that has occurred recently. This could be, for example, a learning activity, a workplace event, placement, or group assignment.
2. Have a go at reflecting on the event using the model you have chosen.
3. Compare different models and see which one you connect with.

CHAPTER 2: FOUNDATIONS OF LINGUISTICS

This chapter introduces students to key foundational linguistic concepts including phonetics, phonology, morphology, semantics, syntax and pragmatics.

Chapter Attribution

This chapter has been adapted in parts from:

[Essentials of Linguistics \(2nd edition\)](#) by Anderson et al. (2022). Licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](#).

2.1 Form, content and use

In communication, **form**, **content** and **use** are key components that shape how communication messages are conveyed and understood. A simple diagram to highlight these interactions is provided in Figure 10 below.

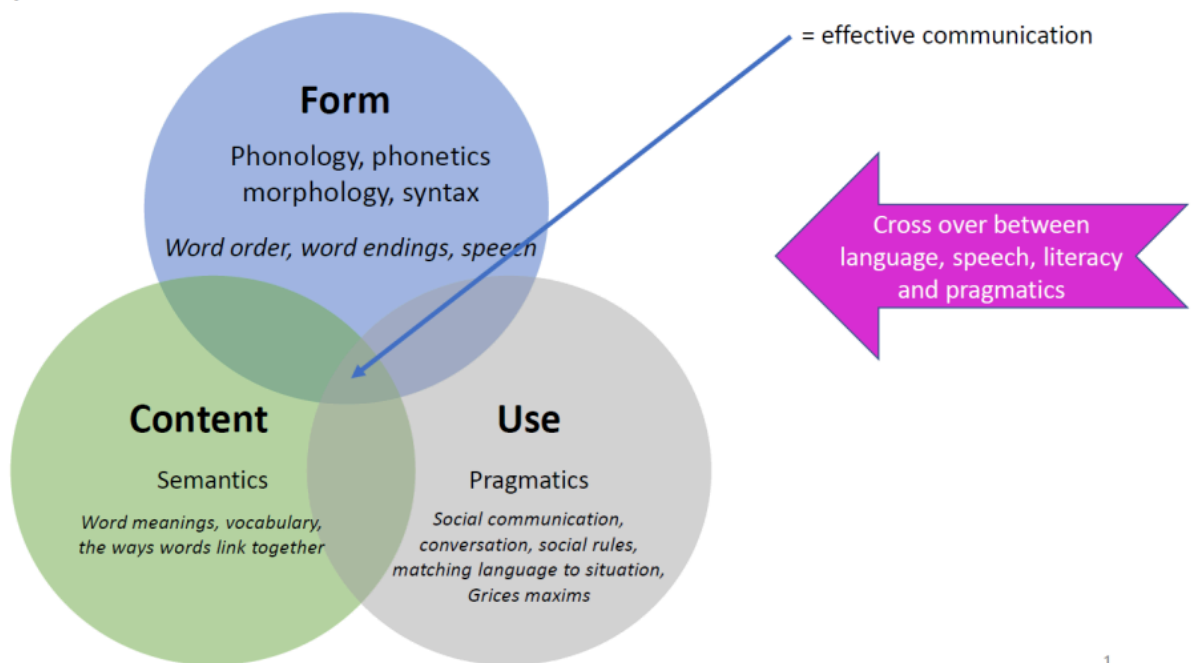


Figure 10. Diagrammatic Representation of the Components of Communication by Frances Cochrane is licensed under [CC BY 4.0](#)

Let's explore each of these components in more detail:

Form

Definition: Form refers to the structure, medium, and style in which a message is delivered. It encompasses the **how** of communication.

Key Aspects:

- **Medium:** The platform or channel used to deliver the message (e.g., face-to-face, written, digital, visual, or auditory).
- **Structure:** The organization of the message—its grammatical structure, coherence, and clarity.
- **Tone:** The emotional tone or style, such as formal, informal, professional, or casual.
- **Language and Symbols:** The words, gestures, or visuals chosen to represent the message.

Purpose: Form impacts how the audience perceives and interprets the message. The right form ensures the message is accessible, effective, and suitable for the audience and context.

Linguistic components:

- **Phonetics:** study of production of speech sounds. The smallest unit of speech is called a *phoneme* (e.g. the “c” sound in the word “cat”).
- **Phonology:** study of the organisation, function and pattern speech sounds (including prosody) as part of grammar in a language.
- **Morphology:** internal organization of words. The smallest grammatical or meaning unit in a language is called a *morpheme* (e.g. in the word “cats” there are 2 morphemes: 1 = “cat” and 2 = “s” which indicates plurality).
- **Syntax:** The linguistic conventions of a language for organising word order at the sentence level.

Content

Definition: Content is the actual information, ideas, words (vocabulary) or message, and the meaning of the message being communicated—the **what** of communication.

Key Aspects:

- **Ideas or Information:** The core message being communicated, whether it’s factual, emotional, or persuasive.
- **Clarity and Relevance:** The quality and importance of the message. The content must be clear and directly related to the purpose of the communication.
- **Details:** The specifics, examples, or supporting data that explain or back up the message.

Purpose: Content provides the substance of communication. It ensures that the message contains valuable and relevant information for the audience to understand and act upon.

Linguistic components:

- **Semantics:** the linguistic representation of objects, ideas, feelings and events and the relations among these. In other words, the way words link together to help us express our ideas and understand concepts. Semantics is associated with *word meaning*.

Use

Definition: Use refers to the **purpose** or **function** of the communication—why and how the message is being sent.

Key Aspects:

- **Purpose:** Whether the communication aims to inform, persuade, entertain, request, or express emotions.
- **Context:** The situation or environment in which communication occurs, which influences the message’s tone, language, and content.
- **Audience:** Understanding the needs, preferences, and characteristics of the audience to ensure that the message is appropriate and resonates.

Purpose: Use shapes the intention behind the message, guiding the choice of content and form. It ensures that communication achieves its desired outcome, whether it’s to inform, influence, or entertain.

Linguistic components:

- **Pragmatics:** how we use language in everyday communication situations, in different communicative contexts and with different communicative partners, and is associated with the social communication rules of a language and culture.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=337#h5p-5>

2.2 Phonetics

2.2.1 MODALITY

THE MAJOR COMPONENTS OF COMMUNICATION

An act of communication between two people typically begins with one person constructing some intended message in their mind (step ❶ in Figure 11). This person can then give that message physical reality through various movements and configurations of their body parts, called **articulation** (step ❷). The resulting physical **linguistic signal** (step ❸) can come in various forms, such as sound waves (for spoken languages) or light waves (for signed languages). The linguistic signal is then received, sensed, and processed by another person's **perception** (step ❹), allowing them to reconstruct the intended message (step ❺). The entire chain of physical reality in steps ❷ through ❹, from articulation to perception, is called the **modality** of the language.

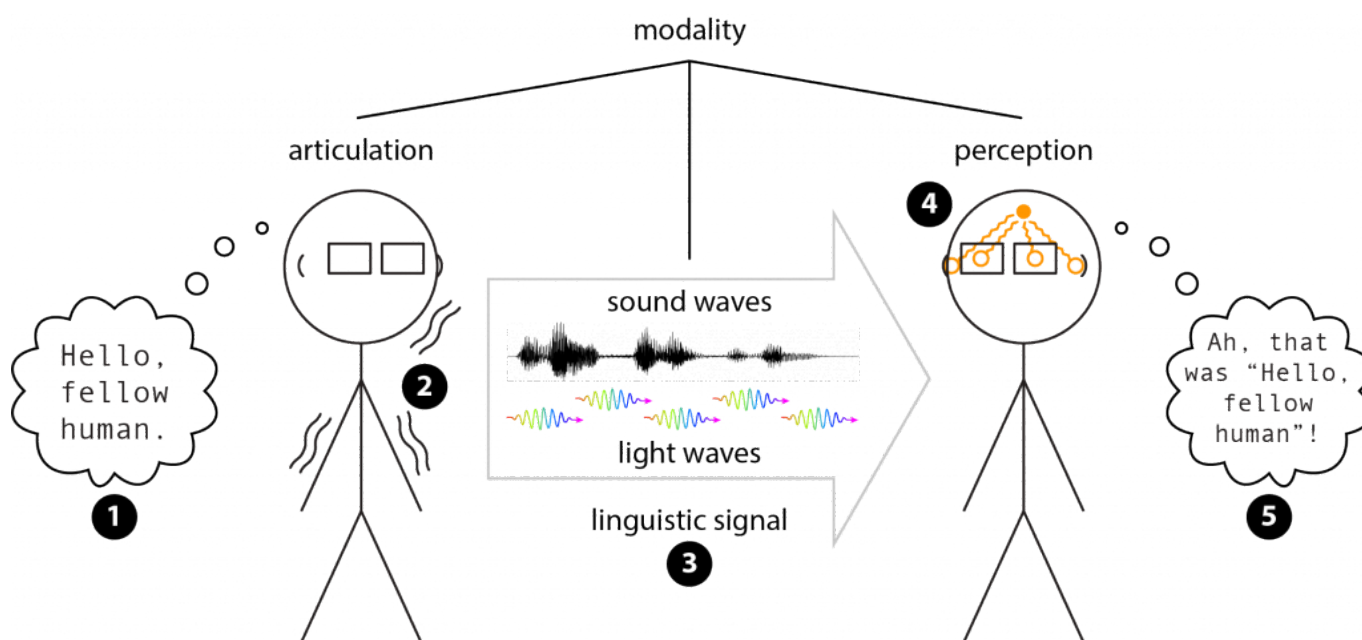


Figure 11. *Steps in the Transmission of a Linguistic Signal from One Person to Another* by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)

2.2.2 SPEECH ARTICULATORS

OVERVIEW OF THE VOCAL TRACT

Spoken language is articulated by manipulating parts of the body inside the **vocal tract**, such as the lips, tongue, and other parts of the mouth and throat. The vocal tract is often depicted in a **midsagittal diagram**, a special kind of diagram that represents the inside of the head as if it were split down the middle between

the eyes. Midsagittal diagrams are conventionally oriented as in Figure 12, with the nostrils and lips on the left and the back of the head on the right, so that we are viewing the inside of the human head from its left side. The main regions and individual articulators of the vocal tract labelled in Figure 12 are defined and described in more detail in the rest of this section and the following sections.

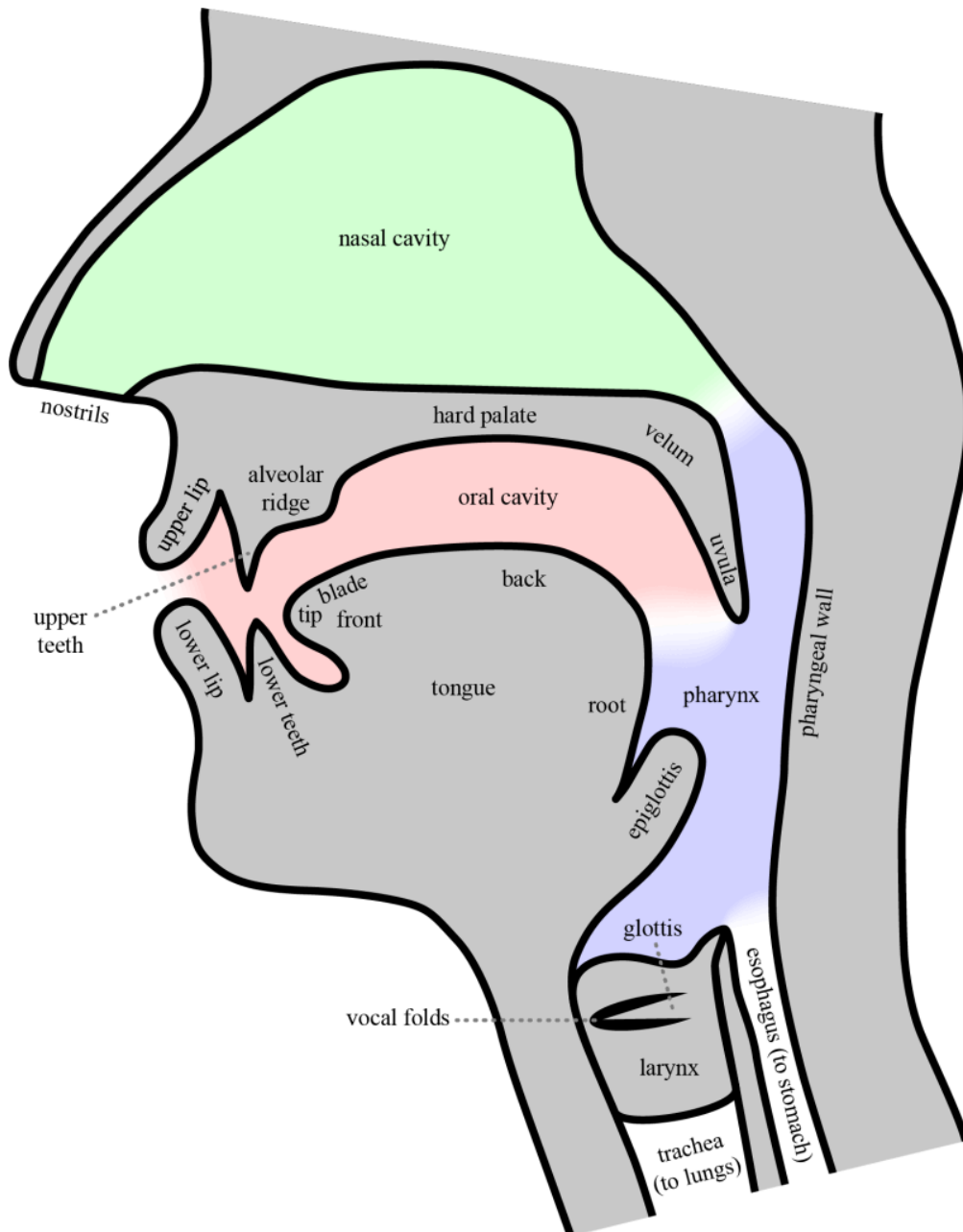


Figure 12. [Midsagittal Diagram of the Human Vocal Tract](#) by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)

This video provides a great visual of relating the movements and coordination of the anatomical components of the articulatory system to the production of various speech sounds.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=339#oembed-1>

[Simone articulation system](#) by Speech Graphics

OPEN SPACES IN THE VOCAL TRACT

There are three important open regions of the vocal tract, coloured in Figure 12. The **oral cavity** (red) is the main interior of the mouth, taking up space horizontally from the lips backward. The **pharynx** (blue) is behind the oral cavity and tongue, forming the upper part of what we normally think of as the throat. Finally, the **nasal cavity** (green) is the open interior of the head above the oral cavity and pharynx, from the nostrils backward and down to the pharynx. Note that the boundaries between these regions are not precisely defined.

The bottom of the pharynx splits into two tubes: the **trachea** (also known as the **windpipe**), which leads down to the lungs, and the **esophagus**, which leads down to the stomach. The esophagus is not normally relevant for phonetics, but the trachea is important, since the vast majority of spoken language is articulated with air coming from the lungs and there are ways we can manipulate that airflow when it passes from the trachea to the pharynx.

2.2.3 PHONEMES AND ALLOPHONES

PHONES (PHONEMES) AS A BASIC UNIT OF SPEECH

The pieces of the vocal tract can be articulated in various ways to create and manipulate a wide range of sounds. In the phonetics of spoken languages, we are primarily interested in studying units of speech called **phones (phonemes)** or **speech sounds**. A phoneme in a spoken language is a linguistically significant sound, which means that it can be used as part of an ordinary word in that language. For example, the ordinary English words *spill*, *slip*, *lisp*, and *lips* each contain four phonemes; in fact, these words have the same four phonemes, just in different orders (with some slight variation in how they are pronounced).

A **phoneme** is the smallest unit of sound in speech that can distinguish one word from another in a particular language. Phonemes don't carry meaning by themselves but are the building blocks of words. For example, changing one phoneme in a word can result in a completely different word, such as changing the /b/ sound in "bat" to /k/ to make the word "cat."

Each language has its own set of phonemes. In English, for example, there are about 44 phonemes, though the exact number can vary slightly depending on the dialect. One of the most fundamental distinctions between phonemes is whether they are **consonants** or **vowels**. Phonemes can be represented by the International Phonetic Alphabet (IPA) (more on this in section 2.1.4 below), which provides a standardised way to represent speech sounds. Here are a few examples to clarify your understanding of phonemes (these are represented using IPA symbols):

- The word "pat" consists of three phonemes: /p/, /æ/, and /t/.

- The word “bat” also consists of three phonemes: /b/, /æ/, and /t/. By changing just the first phoneme (/p/ to /b/), the word changes entirely.

ALLOPHONES

We learned above that each language has distinctive phonemes (or individual speech sounds). However, we don't always produce a phoneme in exactly the same way every time. **Allophones** are variants of a phoneme that are conditioned by phonetic context and are language dependent. What does this mean?

This means that when we say different speech sounds, they will be produced differently and perceived differently depending upon which other speech sounds (or phonemes) come before or after the sound in a language. The structure of the syllable and the rules of combining the sounds in a language also influences how the speech sound is produced.

For example, consider the phoneme /p/ in the following words – the “p” sound in each of these words sounds slightly different from each other – these are allophones of the phoneme /p/:

- Pan
- Nap
- Span
- Spring
- Naps
- Napkin

When we are thinking about allophones, this aligns with the area of phonology.

2.2.4 THE INTERNATIONAL PHONETIC ALPHABET (IPA)

SEGMENTATION

Note that we have been talking about phones as if it were obvious what they are, but this is not always the case. It is sometimes easy to find a clear separation between the phones in a given word, that is, to **segment** the word into its component phones, but sometimes, it can be very difficult. We can see this difference by looking at **waveforms**, which are special pictures that graphically represent the air vibrations of sound waves. The two waveforms in Figure 13 show a notable difference in how easy it is to segment the English words *nab* and *wool*. The waveform for *nab* contains abrupt transitions between three very different regions, corresponding to three phones. In comparison, the waveform for *wool* has smooth transitions from beginning to end, with no obvious divisions between phones.

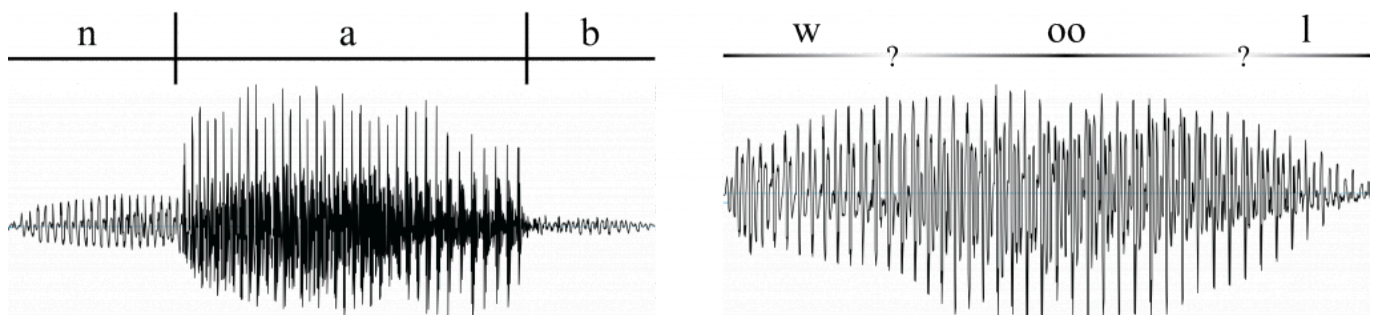


Figure 13. [Waveforms for the English Words Nab and Wool](#) by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)

TRANSCRIPTION

When we can identify the individual phones in a word, we want to have a suitable way to notate them that can be easily and consistently understood, so that the relevant information about the pronunciation can be conveyed in an unambiguous way to others. Such notation is called a **transcription**, which may be very **broad** (*phonemic transcription* – giving only the minimal information needed to contrast one word with another), or it may be very **narrow** (*phonetic transcription* – giving a large amount of fine-grained phonetic detail), or somewhere in between. For broad or phonemic transcription, we use the **slant symbols** /. For example, the consonant at the beginning of the English word *nab* could be transcribed as /n/, with the understanding that the symbol /n/ is intended to represent a voiced alveolar nasal stop.

For narrow or phonetic transcription, we use the **square brackets** [. For example, if we were to transcribe the English word *phonetics*, the phonetic transcription would look something like this: [fəˈne.tɪks]. Note there are additional symbols, or diacritics, that have been used in this transcription. These symbols indicate precisely how the phonemes were articulated. **Diacritics**, which are special marks like [ː] and [ʰ] that are placed above, below, through, or next to a symbol to give it a slightly different meaning.

As speech pathologists, you may be working with clients who do not share the same language as you. Therefore, we ideally want to use a transcription system that can be used for all possible phones in any spoken language. This means we cannot simply use one existing language's writing system, because it would be optimized for representing the phones of that language and would not have easy ways to represent phones from other languages.

In addition, many writing systems are filled with inconsistencies and irregularities that make them unsuitable for any kind of rigorous and unambiguous transcription, even for their associated spoken language. For example, the letter <a> in the English writing system is used to represent different phones, such as the low front unrounded vowel in *nab*, the low back unrounded vowel in *father*, the mid front tense unrounded vowel in *halo*, and the mid central unrounded vowel in *diva*. Conversely, the high front unrounded tense vowel in English can be represented by different letters and letter combinations: <i> in *diva*, <ee> in *meet*, <ea> in *meat*, <e> in *me*, and <y> in *mummy*. That is, then English writing system does not have a one-to-one relationship between phones and letters.

THE INTERNATIONAL PHONETIC ALPHABET

To avoid these problems, linguists have devised more suitable transcription systems for spoken languages, each with their own strengths and weaknesses. In this textbook, we will use a widespread standard transcription system called the **International Phonetic Alphabet** (abbreviated **IPA**). The IPA was created by the **International Phonetic Association** (unhelpfully also abbreviated IPA). The IPA organization was founded in 1886, and the first version of their transcription system was published shortly after. Since then, the IPA transcription system has undergone many revisions as our understanding of the world's spoken languages has evolved. The most recent symbol was added to the IPA in 2005: [ɗ] for the labiodental tap, a phone found in many languages of central Africa, such as Mono (a Central Banda language of the Ubangian family, spoken in the Democratic Republic of the Congo; Olson and Hajek 1999).

For reference, the full chart for the IPA is given in Figure 14. This chart is available under a Creative Commons Attribution-Sharealike 3.0 Unported License, by the International Phonetic Association. It is also available online at [IPA's homepage](#), and there are also some online versions that are accessible for screen readers, such as [the one created by Weston Ruter](#).

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2020)

CONSONANTS (PULMONIC)

© 2020 IPA

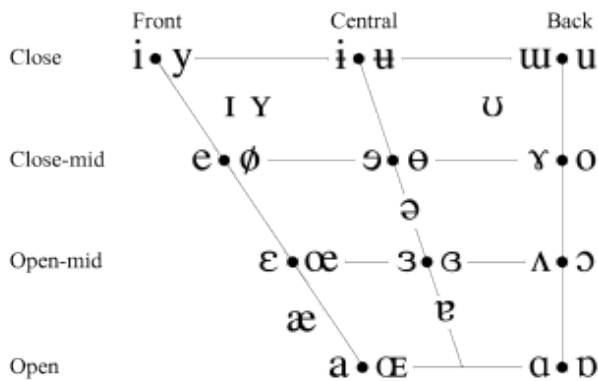
	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d			ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ	n			ɳ	ɲ	ŋ	ɴ		
Trill	ʙ		r						ʀ		
Tap or Flap		ⱱ	ɾ			ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative			ɬ ɮ								
Approximant		ʋ	ɹ			ɻ	j	ɰ			
Lateral approximant			l			ɭ	ʎ	ʟ			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
◌͡ Bilabial	͡ Bilabial	ʼ Examples:
͡ Dental	͡ Dental/alveolar	pʼ Bilabial
͡ (Post)alveolar	͡ Palatal	tʼ Dental/alveolar
͡ Palatoalveolar	͡ Velar	kʼ Velar
͡ Alveolar lateral	͡ Uvular	sʼ Alveolar fricative

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

OTHER SYMBOLS

ʌ Voiceless labial-velar fricative

Ç ʒ Alveolo-palatal fricatives

W Voiced labial-velar approximant

l Voiced alveolar lateral flap

U Voiced labial-palatal approximant

Simultaneous $\int$ and X

H Voiceless epiglottal fricative

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.

ʢ Voiced epiglottal fricative

ʔ Epiglottal plosive

DIACRITICS

◦ Voiceless	<u>n</u> <u>d</u>	.. Breathily voiced	<u>b</u> <u>a</u>	◌ _̪ Dental	<u>t</u> <u>d</u>
✓ Voiced	<u>s</u> <u>t</u>	~ Creaky voiced	<u>b̰</u> <u>a̰</u>	◌ _̺ Apical	<u>t̺</u> <u>d̺</u>
h Aspirated	<u>t</u> ^h <u>d</u> ^h	~ Linguolabial	<u>t̼</u> <u>d̼</u>	◌ _̹ Laminal	<u>t̹</u> <u>d̹</u>
◌ _̠ More rounded	◌ _̠	◌ ^w Labialized	<u>t</u> ^w <u>d</u> ^w	~ Nasalized	<u>ẽ</u>
◌ _̡ Less rounded	◌ _̡	j Palatalized	<u>t</u> ^j <u>d</u> ^j	n Nasal release	<u>d</u> ⁿ
+ Advanced	<u>u</u> ₊	Y Velarized	<u>t</u> ^Y <u>d</u> ^Y	l Lateral release	<u>d</u> ^l
– Retracted	<u>e</u> _–	◌ ^ɣ Pharyngealized	<u>t</u> ^ɣ <u>d</u> ^ɣ	◌ [̚] No audible release	<u>d</u> [̚]
¨ Centralized	<u>ë</u>	~ Velarized or pharyngealized	<u>ɫ</u>		
× Mid-centralized	<u>ẽ</u>	◌ _̥ Raised	<u>e</u> _̥ (◌ _̥ = voiced alveolar fricative)		
◌ _̜ Syllabic	<u>n</u> _̜	◌ _̟ Lowered	<u>e</u> _̟ (◌ _̟ = voiced bilabial approximant)		
◌ _̝ Non-syllabic	<u>e</u> _̝	◌ _̞ Advanced Tongue Root	<u>e</u> _̞		
◌ _{̠̞} Rhoticity	<u>ə̠̞</u> <u>a̠̞</u>	◌ _{̠̞} Retracted Tongue Root	<u>e</u> _{̠̞}		

Some diacritics may be placed above a symbol with a descender, e.g. $\overset{\circ}{n}$

SUPRASEGMENTALS

¹ Primary stress

Secondary stress

! Long

' Half-long

Extra-short

Minor (foot) group

|| Major (intonation) group

• Syllable break ɹi.ækt

Linking (absence of a break)

TONES AND WORD ACCENTS

LEVEL		CONTOUR	
ẽ or ʘ	Extra high	ẽ or ʘ	Rising
é	High	ê	Falling
ē	Mid	ẽ	High rising
è	Low	ẽ	Low rising
ẽ	Extra low	ẽ	Rising-falling
↓	Downstep	↗	Global rise
↑	Upstep	↘	Global fall

Figure 14. [Full Chart of All Symbols in the International Phonetic Alphabet](#) by Anderson et al. is licensed under [CC BY-SA 3.0](#)

Learning the IPA takes a lot of time, practice, and guidance, and it is not just about memorising symbols. The underlying structure and principles behind the organization of the table are what really matter. In this way, the IPA is like the periodic table of elements in chemistry. So, while it is helpful to know that Na is the chemical symbol for the element sodium with atomic number 11 and that [m] is the IPA symbol for a voiced bilabial nasal stop, it is much more important to know what these concepts are and what those terms mean. What is sodium? What does it mean for an element to have an atomic number of 11? What does it mean for a phone to be voiced? How is the vocal tract configured for a bilabial nasal stop?

This is why this book focuses on defining concepts, so that you can build a solid foundation in understanding *how* phones are articulated.

TRANSCRIBING ENGLISH WITH THE IPA

Since this textbook is presented in English, English is a good starting point to give you something concrete in which to ground your understanding of how to do transcription. However, there is much dialectal variation in English, so the transcriptions offered here are very general and may differ from the varieties of English you are familiar with.

You may find this resource useful in your learning and practice: [AusE IPA symbols in word version](#). This document provides you with the symbols for all of the consonant and vowel phonemes of Australian English, including a description of these (more on this below).

There are also a range of useful online resources you can access for free to help with your understanding of using the IPA and practice. These include:

- [Macquarie University: Australian English Pronunciation and Transcription pages](#)
- [Interactive IPA chart](#) (International Phonetic Association)
- [Seeing Speech](#)

2.2.5 DESCRIBING CONSONANTS

We describe consonants by the following three parameters:

1. Place of articulation.
2. Manner of articulation.
3. Voicing.

To be able to describe consonants, it is important that you have a good understanding of the vocal tract anatomy and the movement of the articulators to create constrictions in the vocal tract to form different speech sounds.

CONSONANTS AS CONSTRICTIONS

Consonants are phones that are created with relatively narrow constrictions somewhere in the vocal tract. These constrictions are usually made by moving at least one part of the vocal tract towards another, so that they are touching or very close together. The moving part is called the **active** or **lower articulator**, and its target is called the **passive** or **upper articulator**. Vowels have wider openings than consonants, so they

are not usually described with the terms used here; more appropriate terminology for vowel articulation is discussed in Section 2.1.6.

ACTIVE ARTICULATORS

The active articulators we find in phones across the world's spoken languages are listed below, in order from front to back. They are also labelled in the midsagittal diagram in Figure 15.

1. the **lower lip**, which is used for the consonants at the beginning of the English words *pin* and *fin*.
2. the **tongue tip** (the frontest part of the tongue; also called the **apex**), which is used for the consonants at the beginning of the English words *tin* and *sin*.
3. the **tongue blade** (the region just behind the tongue tip; also called the **lamina**), which is used for the consonants at the beginning of the English words *thin* and *chin*.
4. the **tongue front** (the tip and blade together as a unit, also called the **corona**); it is useful to have a unified term for the tip and blade together, since they are so small and so close, and languages, and even individual speakers of the same language, may vary in which articulator is used for similar phones.
5. the **tongue back** (the upper portion of the tongue, excluding the front; also called the **dorsum**), which is used for the consonants at the beginning of the English words *kin* and *gone*.
6. the **tongue root** (the lower portion of the tongue in the pharynx; also called the **radix**), which is not used for consonants in English but is used for consonants in some languages, such as Nuu-chah-nulth (a.k.a. Nootka, an endangered language of the Wakashan family, spoken in British Columbia; Kim 2003)
7. the **epiglottis** (the large flap at the bottom of the pharynx that can cover the trachea to block food from entering the lungs, forcing it to go into the esophagus instead), which is not used for consonants in English but is used in for consonants in some languages, such as Alutor (a Chukotkan language of the Chukotko-Kamchatkan, spoken in Russia; Sylak-Glassman 2014).

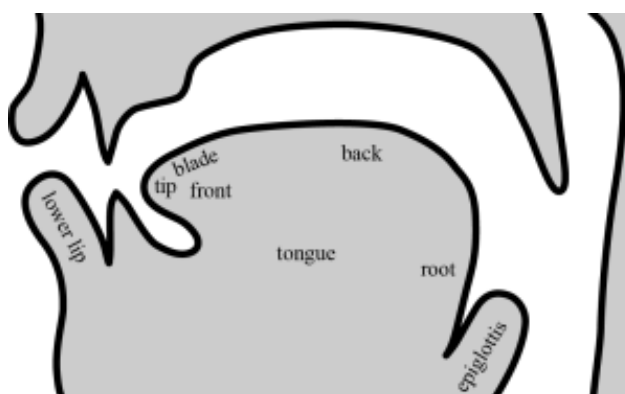


Figure 15. [Midsagittal View of the Active Articulators of the Vocal Tract](#) by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)

PASSIVE ARTICULATORS

The passive articulators we find in phones across the world's spoken languages are listed below, in order from front to back. They are also labelled in the midsagittal diagram in Figure 16.

1. the **upper lip**, which is used for the consonants at the beginning of the English words *pin* and *bin*
2. the **upper teeth**, which are used for the consonants at the beginning of the English words *fin* and *thin*
3. the **alveolar ridge** (the firm part of the gums that extends just behind the upper teeth, recognizable as the part of the mouth that often gets burned from eating hot food), which is used for the consonants at the beginning of the English words *tin* and *sin* (though some speakers may use the upper teeth instead or in addition)
4. the **postalveolar region** (the back wall of the alveolar ridge), which is used for the consonants at the beginning of the English words *shin* and *chin*
5. the **hard palate** (the hard part of the roof of the mouth; sometimes called the **palate** for short), which is used for the consonant at the beginning of the English word *yawn*
6. the **velum** (the softer part of the roof of the mouth; also called the **soft palate**), which is used for the consonants at the beginning of the English words *kin* and *gone*
7. the **uvula** (the fleshy blob that hangs down from the velum), which is not used for consonants in English but is used for consonants in some languages, such as Uspanteko (an endangered Greater Quichean language of the Mayan family, spoken in Guatemala; Bennett et al. 2022)
8. the **pharyngeal wall** (the back wall of the pharynx), which is not used for consonants in English but is used in languages that have consonants with the tongue root or epiglottis as an active articulator (such as Nuuchah-nulth and Archi mentioned earlier)

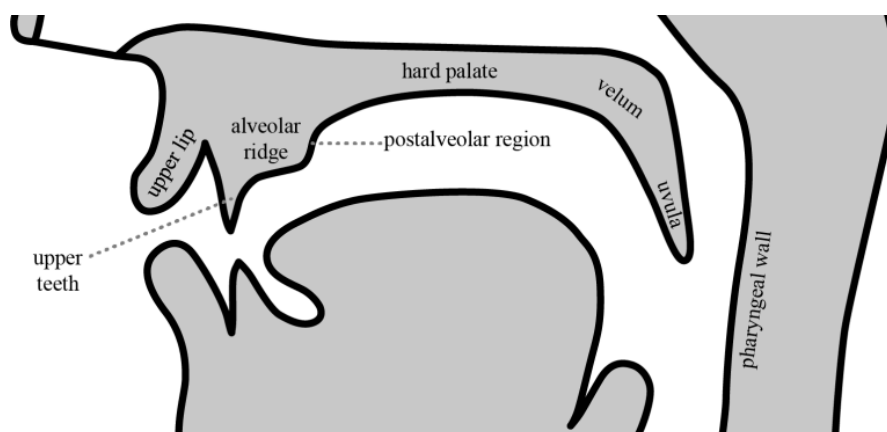


Figure 16. *Midsagittal Diagram of the Passive Articulators in the Vocal Tract* by Anderson et al. is licensed under [CC BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/)

Each of the passive articulators has a corresponding adjective to describe phones with that passive articulator. These adjectives are given in the list below, again from front to back:

1. **labial** (articulated at the upper lip)
2. **dental** (articulated at the upper teeth)
3. **alveolar** (articulated at the alveolar ridge)
4. **postalveolar** (articulated at the back wall of the alveolar ridge)
5. **palatal** (articulated at the palate)

6. **velar** (articulated at the velum)
7. **uvular** (articulated at the uvula)
8. **pharyngeal** (articulated at the pharyngeal wall)

Thus, we could say that the English words *tin* and *sin* begin with alveolar consonants, while *kin* and *gone* begin with velar consonants.

PLACE OF ARTICULATION

The overall combination of an active articulator and a passive articulator is called a consonant's **place of articulation**, or simply **place** for short. Places of articulation may be described with a compound adjective that refers to both articulators, with the adjective for the active articulator first (without the *-al* ending), then a linking *-o-*, followed by the adjective for the passive articulator. For example, the consonant at the beginning of the English word *fin* is a **labiodental** consonant, because it is articulated with the lower lip (*labi-*) at the upper teeth (*-dental*). However, some places of articulation may be described only by one articulator. For example, the consonant at the beginning of the English word *dog* is an **alveolar** consonant, because it is articulated by raising the tongue tip to touch the alveolar ridge briefly.

A full table of the places of articulation is provided in Figure 17, showing the usual shortened adjective, plus the active and passive articulators (with none given for glottal, since neither of the vocal folds has a privileged status over the other).

<i>place of articulation</i>	<i>active articulator</i>	<i>passive articulator</i>
bilabial	lower lip	upper lip
labiodental	lower lip	upper teeth
dental / interdental	tongue blade	upper teeth
alveolar	tongue tip	alveolar ridge
postalveolar	tongue blade	postalveolar region
retroflex	underside of the tongue tip	postalveolar region
palatal	tongue front and back	hard palate
velar	tongue back	velum
uvular	tongue back	uvula
pharyngeal	tongue root	pharyngeal wall
epiglottal	epiglottis	pharyngeal wall
glottal	—	—

Figure 17. [Places of articulation](#) by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)

MANNER OF ARTICULATION

Consonant phones can also be categorized by their **manner of articulation**, which is how air flows through the vocal tract, based on the size and shape of the constriction between the articulators.

Stops (includes both plosives and nasals)

The most basic manner of articulation is **stop**, in which the active articulator presses firmly against the passive articulator to make a complete closure, blocking all airflow at that point. The most common type of oral stops are **plosives**, which have airflow from the lungs that gets trapped behind the stop closure, until the air can be quickly released in an explosive burst. Bilabial oral stop closures are shown in the midsagittal diagrams in Figure 18. There are many kinds of stops across the world's spoken languages. One important distinction for stops is based on the position of the velum. The velum may be raised against the upper pharynx to block off access to the nasal cavity, as indicated by the dotted circle in the midsagittal diagram on the left in Figure 18. This forces all airflow (blue arrow) to go into the oral cavity only, as indicated by the arrow in Figure 18. Such a stop with a raised velum and oral airflow only is called an **oral stop**. The English words *pet* and *get* both begin and end with oral stops. If instead a stop is articulated with a lowered velum, as indicated by the dotted circle in the midsagittal diagram on the right in Figure 18, this allows air to flow into both the oral and nasal cavities.

Such a stop with a lowered velum and both oral and nasal airflow is called a **nasal stop**, or sometimes just a **nasal** for short. The English words *met* and *net* both begin with nasal stops.

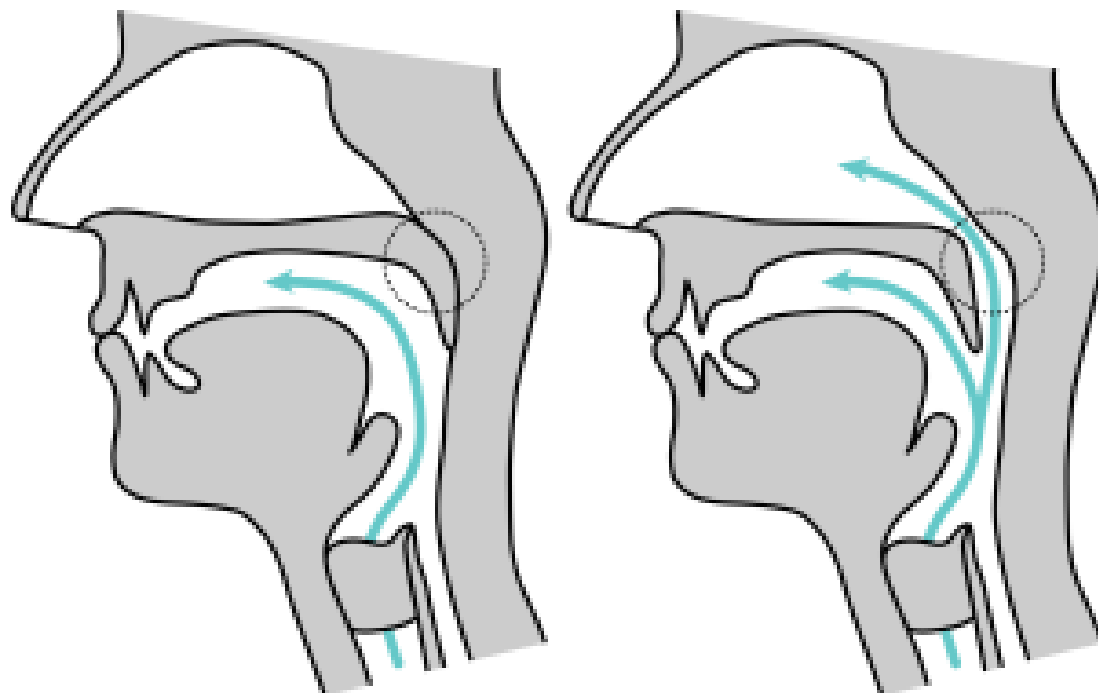


Figure 18. *Midsagittal Diagrams Showing a Raised Velum for a Bilabial Oral Stop (left) and a Lowered Velum for a Bilabial Nasal Stop (right). Airflow is shown as blue arrows* by Anderson et al., licensed under [CC BY-NC-SA 4.0](#)

Fricatives

If the active and passive articulators are very close but not touching, creating a narrow constriction, airflow through this constriction becomes very turbulent, resulting in highly random noisy airflow called **frication**, which sounds like hissing or buzzing. A phone articulated this way is called a **fricative**. The English words *set* and *vet* begin with fricatives.

Approximants

If the active and passive articulators are not touching and are spaced far enough apart to create little or no frication in the airflow, then the resulting phone is called an **approximant**. Most approximants have relatively unrestricted airflow through the middle of the oral cavity and are called **central approximants**. However, during the articulation of an approximant, part of the tongue may instead make full contact with an upper articulator, causing the airflow to be diverted along one or both sides of the tongue, but still without frication. Such an approximant is called a **lateral approximant**. The English words *yet* and *wet* begin with central approximants, while the English word *let* begins with a lateral approximant.

Affricates

Normally, the stop closure for a plosive is released relatively quickly, allowing the air to begin flowing almost immediately. However, it is also possible to release the closure slowly, so that a very brief fricative-like sound is created, causing the release of the plosive to have some frication, in which case, we say that it has a **fricated** release. A plosive with such a fricated release is often referred to as an **affricate**, which is a fifth kind of manner of articulation. The English word *jet* begins with an affricate /dʒ/.

Other manners of articulation

There are many other manners of articulation that are beyond the scope of this textbook. The two most notable ones are **taps** (also called **flaps**) and **trills**. Taps are like stops, except that the closure is so short that airflow is barely interrupted. The consonant in the middle of the English word *atom* is articulated as a tap for most North American speakers.

VOICING

In addition to acting as a place of articulation for some consonants in some languages, the vocal folds are also used to regulate airflow through the vocal tract for most consonants and vowels in all spoken languages. In particular, when the vocal folds are configured in the right way, airflow through the glottis will cause the vocal folds to vibrate.

You can feel this vibration by placing your fingers on the front of your throat where the larynx is, while making the sound of a bee buzzing, like the sound of the consonant at the end of the English word *buzz*. If instead you make the sound of a snake hissing, like the sound of the consonant at the end of the English word *bus*, you should feel that there is no vocal fold vibration. Switch between buzzing and hissing to feel the change in the presence versus absence of vibration: *zzzzz-sssss-zzzzz-sssss-zzzzz-sssss*.

Vocal fold vibration is often called **voicing**, and a phoneme with vocal fold vibration is called **voiced**, while a phone without it is called **voiceless** or **unvoiced**. When viewing the IPA chart, if a pair of IPA symbols is written at a place and/or manner of articulation, the symbol on the right indicates a voiced phoneme. For example, the phonemes /p/ and /b/ are both bilabial plosive consonants; /p/ is unvoiced, whilst /b/ is voiced.

2.2.6 DESCRIBING VOWELS

Many vowels of the world's spoken languages have a relatively stable pronunciation from beginning to end. These kinds of stable vowel phones are called **monophthongs**. However, just as there are dynamic consonant phones (affricates), vowel phones may also change their articulation from beginning to end. Most of these are **diphthongs**, which begin with one specific articulation and shift quickly into another, as with the vowel in the English word *toy*, which begins with a mid back round quality but ends high, front, and unrounded.

We describe vowels by the following four parameters:

1. Tongue (vowel) height.
2. Tongue fronting/backing.
3. Lip rounding.
4. Vowel length.

Tongue (vowel) height and tongue fronting/backing concepts are represented on the [vowel quadrilateral](#). Tongue height is represented by the terms *high*, *mid*, *low* on the left side of the diagram. Tongue fronting/backing is represented by the terms *front*, *central*, *back* at the top of the diagram.

TONGUE (VOWEL) HEIGHT

Vowels are articulated with a larger opening in the oral cavity than consonants are, requiring the tongue to move farther down than for approximants. This is typically facilitated by also moving the jaw down to allow the tongue to move even lower. The height of the tongue during the articulation of a vowel is called **vowel height**, or simply **height** for short.

A vowel with a very high tongue position, as in the English word *beat*, is called a **high** vowel. This may also be known as a **close** vowel. A vowel with a very low tongue position, as in the English word *bat*, is called a **low** vowel. This may also be known as an **open** vowel. Low vowels have the largest oral cavity opening of any phone, whether vowel or consonant.

A vowel with an intermediate tongue position between high and low, as in the English word *bet*, is called a **mid** vowel. The differences in vertical tongue position for these three categories of vowel height are shown in Figure 19, from highest on the left (as in *beat*) to lowest on the right (as in *bat*). Note how the jaw also lowers along with the tongue in these diagrams.

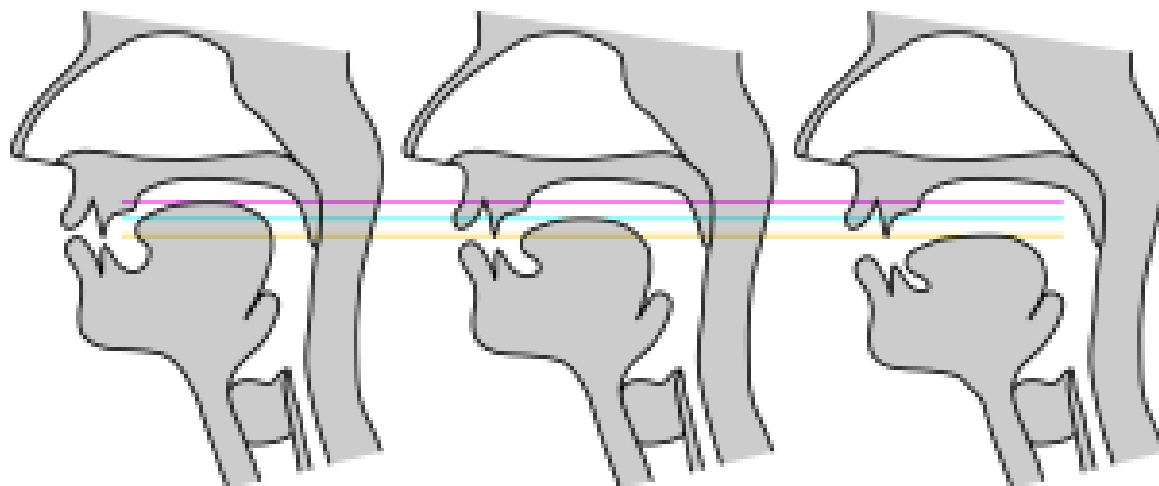


Figure 19. *Three categories of vowel height: high as in beat (left), mid as in bet (centre), and low as in bat (right). Each height is also represented with a line across all three diagrams for ease of comparison: high (magenta), mid (cyan), and low (orange)* by Anderson et al., licensed under [CC BY-NC-SA 4.0](#)

TONGUE FRONTING/BACKING

The horizontal position of the tongue, known as its **fronting** or **backing**, also affects vowel quality. If the tongue is positioned in the front of the oral cavity, so that the highest point of the tongue is under the front of the hard palate, as for the vowel in the English word *beat*, the vowel is called a **front** vowel. If the tongue is positioned farther back in the oral cavity, so that the highest point of the tongue is under the back part of the hard palate or under the velum, as in the English word *boot*, the vowel is called a **back** vowel.

If the tongue is positioned in the centre of the oral cavity, so that the highest point of the tongue is roughly under the centre of the hard palate, in between the positions for front and back vowels, as for the English word *but*, the vowel is called a **central** vowel. The differences in horizontal tongue position for these three categories of vowel backness are shown in Figure 20 from frontest on the left (as in *beat*) to backest on the right (as in *boot*).

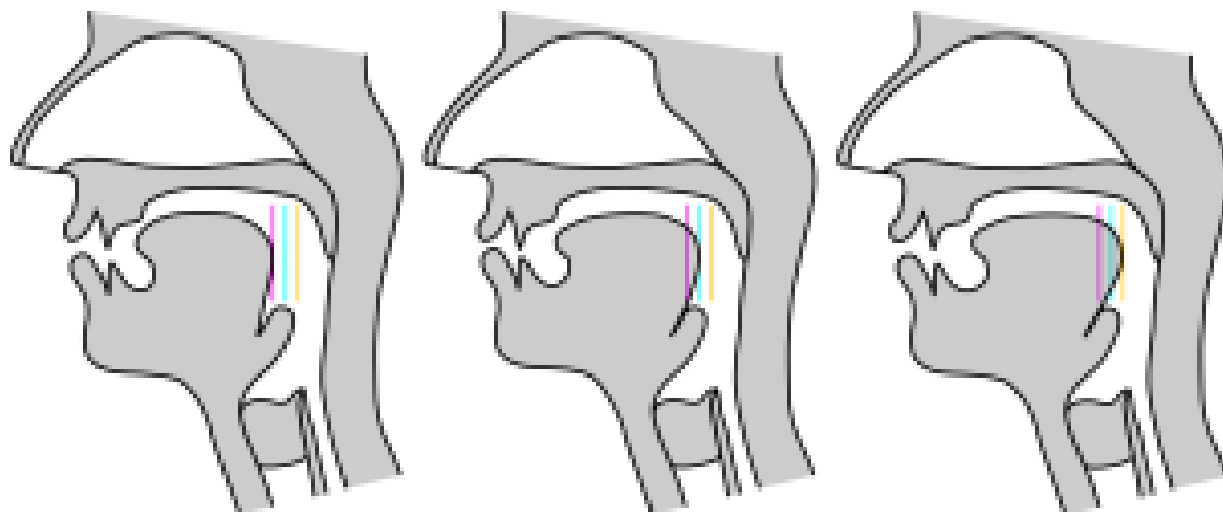


Figure 20. *Three categories of vowel backness: front as in beat (left), central as in but (centre), and back as in boot (right). Each backness is also represented with a line in the same position in all three diagrams for ease of comparison: front (magenta), central (cyan), and back (orange)* by Anderson et al., licensed under [CC BY-NC-SA 4.0](#)

LIP ROUNDING

Vowel quality also depends on the shape of the lips, generally referred to as the vowel's **rounding**. If the corners of the mouth are pulled together so that the lips are compressed and protruded to form a circular shape, as for the vowel in the English word *boot* in many dialects, the lips are said to be **rounded** and the corresponding vowel is called a **round** or **rounded** vowel. If the corners of the mouth are pulled apart and upward so that the lips are thinly stretched into a shape like a smile, as for the vowel in the English word *beat*, the lips are spread and therefore, an **unrounded** or **non-rounded** vowel.

The lips may also be in an intermediate configuration, neither rounded nor spread, as for the vowel in the English word *but*, in which case, the lips are said to be **neutral**. Spread and neutral vowels are collectively referred to as **unrounded** or **non-rounded** vowels, because the distinction between spread and neutral lips seems almost never to be needed in any spoken language, whereas the distinction between rounded and unrounded frequently is needed. The differences in lip shape for these three categories of vowel rounding are shown in Figure 21.

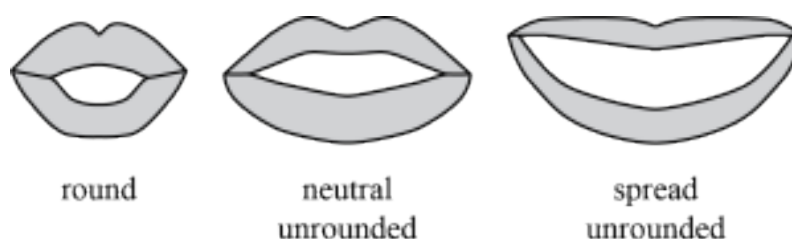


Figure 21. *Three categories of rounding: round as in boot (left), neutral as in but (centre), and spread as beat (right), where neutral and spread are also classified together as unrounded* by Anderson et al., licensed under [CC BY-NC-SA 4.0](#)

VOWEL LENGTH

In addition to differences in vowel quality, vowels may also differ from each other in **length**, which is a way of categorising them based on their duration. In most spoken languages where vowel length matters, there is just a two-way distinction between **long** vowels and **short** vowels, with long vowels having a longer duration

than their short counterparts. In some languages, vowel length is used to distinguish words with completely different meanings (e.g. Japanese). This does not occur as frequently in English. However, English vowels can still differ in vowel length in some circumstances. For example, English vowels are often pronounced a bit longer before voiced consonants than before voiceless consonants. Thus, the vowel in the English word *bead* is usually pronounced longer than the vowel in the word *beat*, even they both have the same vowel quality: high front unrounded.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=339#h5p-7>

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2.3 Phonology

2.3.1 PHONOTACTICS

While phonemes units may change their pronunciation in some environments, it is also possible that certain phonemes cannot be used in some environments at all. Each language has its own set of **phonotactics**, which are language-specific restrictions on what combinations of phonemes are allowed in which environments. For example, English has phonotactic restrictions that ban [tʃ] and [dʃ] in onsets, but this is not a universal restriction. Plenty of languages allow onsets with [tʃ] and [dʃ], such as Ngizim, which has words like [tʃà] ‘cow’ (Schuh 1977), and Hebrew, which has words like [dʃi] ‘bucket’ (Klein 2020). Further examples of other patterns in English phonotactics include: English allows up to three consonants in an onset, but when there are three, the first must always be [s], the second must be one of [p], [t], or [k], and the third must be one of [r], [l], [j], or [w].

Phonotactics refers to the set of rules governing the permissible arrangements of sounds in a particular language. It deals with the restrictions on the sequence and combination of phonemes (speech sounds) that can occur in words, syllables, and across different positions in a language. Phonotactic constraints differ from language to language, shaping how speech sounds can be ordered and combined.

2.3.2 PROSODY

While phonology typically focuses on the arrangement and distribution of individual sounds (phonemes), **prosody** looks at the *higher-level* patterns that organize these sounds across larger units of speech, such as syllables, words, phrases, or sentences. **Prosody** refers to the features of speech that involve *pitch*, *loudness*, *duration*, and *rhythm*. These elements are organised into patterns that are crucial for conveying meaning, emotion, and grammatical structures in speech. Prosody in phonology concerns the study of these larger speech patterns and their impact on language understanding.

KEY FEATURES OF PROSODY:

Pitch: The highness or lowness of the voice. It can convey different meanings, such as whether a sentence is a statement or a question.

Stress: Emphasis placed on certain syllables or words. Stressed syllables tend to be louder, longer, and more prominent than unstressed ones.

Intonation: The rise and fall of pitch across a sentence or phrase. Intonation patterns can indicate whether the speaker is asking a question, making a statement, or showing surprise, etc.

Rhythm: The pattern of stressed and unstressed syllables. It influences the overall flow of speech.

Duration: The length of time a sound or syllable is held. This can influence meaning in some languages, like how vowel length in **Japanese** can differentiate words.

2.3.3 SUPRASEGMENTALS

Suprasegmentals are elements of speech that exist above the level of individual phonemes (the basic speech sounds) and are concerned with the prosodic features that extend over multiple segments of speech (such as syllables, words, or phrases). They influence how sequences of sounds are grouped and understood within larger units.

KEY SUPRASEGMENTAL FEATURES:

Stress (which also ties into prosody): This can be applied to syllables, words, or phrases. It can change the meaning of a word or sentence depending on which syllable or word is emphasised.

EXAMPLE

In English, the word “record” can be stressed differently based on whether it is a noun or a verb:

- **Re**cord (noun) – The first syllable is stressed.
- re**cord** (verb) – The second syllable is stressed.

Intonation (which is part of prosody): The pattern of pitch variation across a sentence or phrase, which helps convey meaning like questioning, emphasis, or emotion.

EXAMPLE

In **English**, a rising pitch at the end of a sentence can signal a yes/no question:

- “You’re coming?” (rising intonation at the end indicates a question).
- “You’re coming.” (falling intonation at the end indicates a statement).

Tone: In tone languages, pitch or tone can change the meaning of a word. This is a type of suprasegmental feature, as tone applies across entire syllables or words.

EXAMPLE

In Mandarin Chinese, the word “ma” can have different meanings depending on the tone:

- **mā** (妈) with a high-level tone means “mother.”
- **mǎ** (马) with a rising tone means “horse.”
- **mà** (骂) with a falling tone means “scold.”

Syllable Timing and Rhythm: The timing between syllables can be stressed or unstressed, and this varies across languages.

- **Stress-Timed Languages** (like **English**): The rhythm is based on stressed syllables, and unstressed syllables are shorter in comparison.
- **Syllable-Timed Languages** (like **Spanish** or **French**): Each syllable is given roughly equal time, regardless of whether it is stressed or not.

Length and Duration: In some languages, the length of sounds, syllables, or words can be phonemic and can change the meaning of a word or phrase

EXAMPLE

In **Japanese**, vowel length is important:

- “biru” (ビル) with a short vowel means “building.”
- “biiru” (ビール) with a long vowel means “beer.”



An interactive H5P element has been excluded from this version of the text. You can view it online here:

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2.4 Morphology

In this section, we look at words and at the meaningful pieces that combine to create words. We will see that languages vary in how words are built, but that nonetheless we can find **structure** inside of words in all languages. In linguistics, the study of word forms is known as **morphology**. A **morpheme** is the smallest meaning unit in a language.

2.4.1 WHAT IS MORPHOLOGY?

In linguistics, **morphology** is the study of how words are put together. For example, the word *cats* is put together from two pieces: *cat*, which refers to a particular type of furry four-legged animal (🐱), and *-s*, which indicates that there's more than one such animal (🐱🐱🐱). Most words in English have only one or two pieces in them, but some technical words can have many more, like *non-renewability*, which has at least five (*non-*, *re-*, *new*, *-abil*, and *-ity*). In many languages, though, words are often made up of many parts, and a single word can express a meaning that would require a whole sentence in English. Not all combinations of pieces are possible, however. To go back to the simple example of *cat* and *-s*, in English we can't put those two pieces in the opposite order and still get the same meaning—*scat* is a word in English, but it doesn't mean "more than one cat", and it doesn't have the pieces *cat* and *-s* in it, instead it's an entirely different word.

WHAT IS A WORD?

If morphology is the investigation of how words are put together, we first need a working definition of what a **word** is.

In everyday life, in English we might think of a word as something that's written with spaces on either side. This is an **orthographic** (or spelling-based) definition of what a word is. But just as writing isn't necessarily a reliable guide to a language's phonetics or phonology, it doesn't always identify words in the sense that is relevant for linguistics. And not all languages are written with spaces in the way English is—not all languages have a standard written form at all. So we need a definition of "word" that doesn't rely on writing.

The definition of "word" is actually a hotly debated topic in linguistics! Linguists might distinguish **phonological words** (words for the purposes of sound patterns), **morphological words** (words for the purposes of morphology), and **syntactic words** (words for the purposes of sentence structure), and might sometimes disagree about the boundaries between some of these.

For the purposes of linguistic investigation of grammar we can say that a word is the **smallest separable unit in language**.

What this means is that a word is the smallest unit that can stand on its own in an utterance. For example, content words in English (**nouns**, **verbs**, **adjectives**, and **adverbs**) can stand by themselves as one-word answers to questions, as you can see in the mini-dialogues in (1).

(1)	a.	What do you like to eat?
		Answer: cake (noun)
	b.	What did you do last night?
		Answer: sleep (verb)
	c.	What colour is the sky today?
		Answer: orange (adjective)
	d.	How did you wake up this morning?
		Answer: slowly (adverb)

Words are also **syntactically independent**, which means they can appear in different positions in a sentence, changing their order with respect to other elements even while the order of elements inside each word stays the same. Even though words are the smallest *separable* units of language, that doesn't mean that words are the smallest unit of language overall. As we already saw earlier in this section, words themselves can have smaller pieces inside them, as in the simple cases of *cats* (*cat-s*) or *non-renewability* (*non-re-new-abil-ity*)—but these smaller pieces can't stand on their own.

To refer to these smaller pieces within words, we use the technical term **morpheme**. A **morpheme** is the smallest systematic pairing of both form (sign or sound) and meaning or grammatical function. (We say “meaning or grammatical function” instead of just “meaning” because while some morphemes have clear meanings in the context of lexical semantics, other morphemes express more abstract grammatical information.) In other words, a morpheme is the smallest meaning unit in a language. Words that contain more than one morpheme, like *cats* or *nonrenewability*, are **morphologically complex**. Words with only a single morpheme, like *cat* or *new*, are **morphologically simple**.

Our goal in morphology is to understand how words can be built out of morphemes in a given language. We will explore the shapes of different morphemes (and morphological processes); in later sections we will review different functions that morphology can have, looking at divisions between **derivational** morphology, **inflectional** morphology, and **compounding**.

2.4.2 ROOTS, BASES AND AFFIXES

AFFIXES VS ROOTS

Morphemes can be of different types, and can come in different shapes. Some morphemes are **affixes**: they can't stand on their own, and have to attach to something. The morphemes *-s* (in *cats*) and *inter-* and *-al* (in *international*) are all affixes.

The thing an affix attaches to is called a **base**. Just like whole words, some bases are morphologically simple, while others are morphologically complex.

For example, consider the word *librarian*. This word is formed by attaching the affix *-ian* to the base *library*. *Librarian* can then itself be the base for another affix: for example, the word *librarianship*, the state or role of being a librarian, is formed by attaching the affix *-ship* to the base *librarian*. There is a special name for simple bases: **root**. A root is the smallest possible base, which cannot be divided, what we might think of as the *core* of a word.

Turning back to affixes, an affix is any morpheme that needs to attach to a base. We use the term “affix” when we want to refer to all of these together, but we often specify what *type* of affix we're talking about.

A **prefix** is an affix that attaches **before** its base, like *inter-* in *international*.

A **suffix** is an affix that **follows** its base, like *-s* in *cats*.

A **circumfix** is an affix that attaches **around** its base.

An **infix** is an affix that attaches **inside** its base.

A **simultaneous affix** is an affix that takes place at the **same time as** its base.

Prefixes and suffixes are very common, not only in English but also in other languages. Circumfixes, infixes, and simultaneous affixes are less common, and we will not focus on these in this book.

FREE AND BOUND MORPHEMES

Another way to divide morphemes is by whether they are **free** or **bound**. A **free morpheme** is one that can occur as a word on its own. For example, *cat* is a free morpheme. A **bound** morpheme, by contrast, can only occur in words if it's accompanied by one or more other morphemes. For example, the *'ing'* on the end of the word *'reading'* is a bound morpheme. It cannot exist on its own in the English language – it needs to be attached to another morpheme (in this case a free morpheme) to have meaning.

Because affixes by definition need to attach to a base, only **roots** can be free. In English most roots are free, but we do have a few **bound morpheme** roots that can't occur on their own. For example, the root *-whelmed*, which occurs in *overwhelmed* and *underwhelmed*, can't occur on its own as **whelmed*.

In many other languages, though, all (or most) roots are **bound**, because they always have to occur with at least some morphology. This is the case for verbs in French and the other Romance languages, for example; it was also the case for Latin, which is why the roots *nat-* and *libr-* were shown with hyphens above.

We show that morphemes are bound by putting hyphens either before or after them, on the side that they attach to other morphemes. This applies to bound roots as well as to affixes.

MORPHOLOGY BEYOND AFFIXES

There are some morphological patterns that don't obviously involve affixes at all. In this section we discuss a few examples: **internal change**, **suppletion**, and **reduplication**.

Internal change

Internal change is one name for the type of change found in many **irregular** English noun plurals and verb past tenses.

For example, for many speakers of English the plural of *mouse* is *mice*, the plural of *goose* is *geese*, the past tense of *sit* is *sat*, and the past tense of *write* is *wrote*.

These are all relics of what used to be a regular pattern in English. By **regular** we mean that they were phonologically predictable based on the general pattern of the language, and automatically applied to new

words. For speakers of English today, changes like “*mouse* becomes *mice* when it’s plural” have to be memorized, and are therefore **irregular**.

Suppletion

Suppletion is an even more irregular pattern, where a particular morphological form involves entirely *replacing* the form of a morpheme. Suppletion is always irregular—you can never predict what the result of suppletion will be, it always has to be memorized. For example, the past tense of the verb *go* is *went*—there is no amount of affixation or internal change that will get you from one to the other. This type of total replacement is also found in English in the comparatives and superlatives *good ~ better ~ best* and *bad ~ worse ~ worst*, throughout the paradigm of the verb *to be*, and on some pronouns.

If a language has suppletion (and not all languages do!) it is commonly found on some of the most frequent words in the language, just as we see in English. The reason for this is that children acquiring a language tend to assume patterns are regular and predictable until the weight of the evidence convinces them otherwise—and they’re more likely to get enough evidence to reach the conclusion that something is suppletive if a word is incredibly common. Suppletion is a type of **allomorphy**, which we will learn more about in a section below.

Reduplication

Finally, **reduplication** involves repeating part or all of a word as part of a morphological pattern. English does have one pattern of reduplication, which can apply to phrases as well as words. This type of reduplication carries the meaning of something being a prototypical example of the type; it is often called *salad-salad* reduplication by linguists. For example, in my variety of English I can say: “Tuna salad is a salad, but it’s not a *salad-salad*.”—in other words, tuna salad isn’t a prototypical salad because it doesn’t involve lettuce or other leafy green vegetables.

2.4.3 ALLOMORPHY

Some morphemes have a consistent meaning, but appear in different forms depending on the environment where they occur. When a morpheme can be realized in more than one way, we refer to its different forms as **allomorphs** of the morpheme. In other words, **allomorphy**. In English, for example, the indefinite article shows up as *a* when it occurs before a consonant (*a book*), but as *an* when it occurs before a vowel (*an apple*). This is an example of allomorphy based on the *phonology* (sounds) that appear before or after the morpheme (the phonological environment). This is called **phonologically conditioned allomorphy**.

Another example of allomorphy can be found in the plural forms of English nouns. First, consider the pairs of singular and plural nouns in (1).

(1)		<i>singular</i>	<i>plural</i>
a.	[s]	book	books
		cat	cats
		nap	naps
b.	[z]	paper	papers
		dog	dogs
		mile	miles
c.	[ɪz] or [əz]	niece	niece
		horse	horses
		eyelash	eyelashes

The plural in all these words is spelled as “s” (or “es”), but it isn’t always pronounced the same way. If you pay attention, the plural adds the sound [s] in (1a), the sound [z] in (1b), and the sound [ɪz] or [əz] in (1c). Just like the alternation between *a* and *an*, this is predictable phonologically conditioned allomorphy, based on the last sound in the noun root.

Now look at the singular-plural pairs in (2). These examples show more allomorphs of the plural in English, but they are **not** predictable: the allomorph of the plural used with these roots has to be remembered as a list.

(2)		<i>singular</i>	<i>plural</i>
a.	-(r)en	child	children
		ox	oxen
b.	<i>internal change</i>	mouse	mice
		goose	geese
		woman	women
c.	no change (-Ø)	fish	fish
		sheep	sheep
		deer	deer

Allomorphy that is determined by the root, like in (2), is called **lexically conditioned allomorphy**.

2.4.4 LEXICAL CATEGORIES

DERIVATION VS INFLECTION AND LEXICAL CATEGORIES

Morphology is often divided into two types:

- **Derivational** morphology: Morphology that changes the meaning or category of its base
- **Inflectional** morphology: Morphology that expresses grammatical information appropriate to a word’s category

We can also distinguish **compounds**, which are words that contain multiple roots into a single word.

The definitions of derivation and inflection above both refer to the **category** of the base to which morphology applies. What do we mean by “category”? The category of a word is often referred to in traditional grammar as its **part of speech**. In the context of morphology we are often interested in the **lexical categories**, which is to say **nouns**, **verbs**, **adjectives**, and **adverbs**. The rest of this section gives an overview of what lexical categories are, and how we can identify them.

LEXICAL CATEGORIES (WORD CLASSES), AKA “PARTS OF SPEECH”

Determining the category of a word (or word class) is an important part of morphological and syntactic analysis. A category of words or morphemes is a group that behave the same way as one another, for grammatical purposes.

You might be familiar with traditional **semantic** definitions for the parts of speech—definitions that are based on a word’s meaning. If you ever learned that a noun is a “person, place or thing”, or that a verb is an “action word”, these are semantic tests. However, semantic tests don’t always identify the categories that are relevant for linguistic analysis. They can also be hard to apply in borderline cases, and sometimes yield inconsistent results; for example, surely *action* and *event* are “action” words, so according to the semantic definition we might think they’re verbs, but in fact these are both nouns!

We can define categories based on the grammatical contexts in which words or morphemes are used—their **distribution**. The distribution of different categories varies from language to language. We will explore below some of the main distributional tests for lexical categories (nouns, verbs, adjectives, and adverbs) in English. Many of these tests involve syntactic distribution—how each lexical category combines with other words in phrases and sentences.

Nouns (N)

Syntactic tests for nouns in English:

- Can follow a determiner, as in: *an event* or *the proposal*
- Can be modified by adjectives, as in: *a happy event* or *the new proposal*
- Can be the subject or object of a verb, as in: *Events occurred.* or *We made proposals.*
- Can be replaced by a pronoun, as in: *Events occurred.* → *They occurred.*
- Do not allow objects (without a preposition).

Morphological tests for nouns in English:

- Have singular and plural forms: e.g. *books*, *governments*, *happinesses*

Note: The plurals of some abstract nouns can seem odd! Think outside the box to find contexts where they might naturally occur.

Verbs (V)

Syntactic tests for verbs in English:

- Can combine with auxiliary verbs, as in: *can remain*, *will know*, *have thought*, *be kicking*.
- Can follow the infinitive marker *to*, as in: *to kick*, *to think*, *to remain*, *to know*.
- Can take an object (without a preposition), as in: *kick the ball*.

Morphological tests for verbs in English:

- Have a third person singular present tense form with *-s*, as in: (*she/he/it*) *kicks, goes, remains*.
- Have a regular past tense form, usually (but not always) with *-ed*, as in: (*she/he/it*) *kicked, went, remained*.
- Have a perfect/passive form, usually with *-ed* or *-en*, as in: (*she/he/it*) *has kicked, gone, remained*.
- Have a present progressive form with *-ing*, as in: *kicking, going, remaining*.

Adjectives (Adj)

Syntactic tests for adjectives in English:

- Modify nouns (occur between a determiner and a noun), as in: *a happy event* or *the new proposal*.
- Can be modified by *very* (but so can many adverbs!), as in: *very happy, very new*.
- Do not allow noun phrase objects. If objects are possible, they must be introduced in a prepositional phrase. There are a handful of exceptions to the generalization that adjectives only take prepositional phrase objects, depending on your variety of English.

Morphological tests for adjectives in English:

- Can often be suffixed by *-ish*
- May have comparative and superlative forms (e.g. *happier, happiest*)

Adverbs (Adv)

Syntactic tests for adverbs in English:

- Modify verbs, adjectives, and other adverbs (anything but nouns!).
- Cannot appear alone between a determiner and a noun.
- Can be modified by *very* (but so can adjectives!).

Morphological tests for adverbs in English:

- Many (but not all) adverbs end in *-ly*

USING DERIVATIONAL AFFIXES TO IDENTIFY CATEGORY

In addition to the morphological tests above, you can also use derivational affixes to help determine the category of a word. For example:

- Suffixes like *-ment* and *-ness* always create nouns; the base that *-ment* attaches to is always a verb (if it's a free form), and the base of *-ness* is usually an adjective.
- Suffixes like *-ify* and *-ize* always create verbs; their bases are nouns (if they're free forms).

The property of derivational affixes to not only create particular categories, but also to *attach* to specific categories, is called **selection**.

2.4.5 DERIVATIONAL MORPHOLOGY AND SELECTION

Derivational morphemes are typically choosy about the types of bases they combine with—another word for “choosy” is *selective*, and so we talk about how derivational affixes **select** the category of their base. For example, the suffix *-able* combines only with verbs, and always creates adjectives meaning “able to be verb-ed”: *readable*, *writable*, *playable*, *employable*, and *googleable* are all possible adjectives in English, even if they don’t appear in a dictionary—while the other words in this list probably do show up in most dictionaries, *googleable* might not, because *google* a relatively recent verb (adapted from the name of the company).

The list in (1) is a very incomplete sample of derivational suffixes in English, with the category they **select** on the left side of the arrow, and the category they **create** on the right side.

(1)	<i>-tion</i>	V	→	N
	<i>-able</i>	V	→	Adj
	<i>-en</i>	V	→	Adj
	<i>-ed</i>	V	→	Adj
	<i>-ing</i>	V	→	Adj or N
	<i>-ment</i>	V	→	N
	<i>-ness</i>	Adj	→	N
	<i>-ity</i>	Adj	→	N
	<i>-ous</i>	N	→	Adj
	<i>-hood</i>	N	→	N
	<i>-ize</i>	N	→	V
	<i>-ly</i>	Adj	→	Adj
	<i>-ish</i>	Adj	→	Adj

There are many more than this! You’ll see them inside many words if you start paying attention.

Prefixes in English never change the category of the base they attach to, but they express clear meanings, like negation, repetition, order (e.g. *pre-* and *post-*), etc. Examples of English derivational prefixes and the categories they select appear in (2):

(2)	<i>non-</i>	N	→	N	<i>non-issue</i>
		Adj	→	Adj	<i>non-distinct</i>
	<i>un-</i>	V	→	V	<i>undo</i>
		Adj	→	Adj	<i>unhappy</i>
	<i>re-</i>	V	→	V	<i>redo</i>

Derivational morphology can be even more selective, requiring not only a base that belongs to a certain category, but requiring *specific* roots or bases. A lot of derivational morphology in English was acquired from borrowing words from French and Latin; these “latinate” affixes often prefer to combine with each other, and sometimes only with roots that are also latinate. Such affixes are less productive than other affixes, which combine freely with most bases.

Some of the most productive derivational suffixes in English are *-ish*, which can attach to most adjectives, *-ness*, *-able*, and *-ing*.

-ing is particularly productive: it can attach to all verbs in English to form adjectives (traditionally called

“participles”) or nouns (traditionally called “gerunds”). It is very unusual for a derivational affix to be that productive; usually there are at least a few roots that don’t occur with a derivational affix, for whatever reason.

2.4.6 INFLECTIONAL MORPHOLOGY

Unlike derivational morphology, inflectional morphology never changes the category of its base. Instead it simply *suits* the category of its base, expressing grammatical information that’s required in a particular language.

In English we find a very limited system of inflectional morphology:

- **Nouns**
 - Number: singular vs. plural
 - Case (only on pronouns)
 - Nominative: I, we, you, he, she, it, they
 - Accusative: me, us, you, him, her, it, them
 - Possessive: my, our, your, his, her, its, their
- **Verbs**
 - Agreement: most verbs agree with third person singular subjects only in the present tense (-s), but the verb *to be* has more forms.
 - Tense: Past vs. Present
 - Perfect/Passive Participle: -ed or -en (Perfect after auxiliary have, Passive after auxiliary be)
 - Progressive -ing (after auxiliary be)
- **Adjectives**
 - Comparative -er, Superlative -est (Arguable! Some people might treat this as derivational)

One thing about inflectional morphology is that lots of it can be expressed **syntactically** instead of morphologically. So some languages have tense, but express it with a particle (a separate word) rather than with an affix on the verb. This is still tense, but it’s not part of inflectional morphology.

TYPES OF INFLECTIONAL DISTINCTIONS

There are many types of inflectional distinctions commonly made in the world’s languages, but we will focus on the following common types related to English: Number, Person, Case, Agreement, Tense and Aspect, and Negation.

Number

Most languages, if they have grammatical number, just distinguish singular (“one”) vs. plural (“more than one”), but number systems can be more complex as well. For example, many languages have **dual** in addition to singular and plural. Dual number is used for groups of exactly two things; we have a tiny bit of dual in English with determiners like *both*, which means “strictly two”. You have to replace *both* with *all* if a group has three or more things in it. But in English we don’t have any morphological marking of dual.

Person

Person distinctions are those between first person (*I, we*), second person (*you*), and third person (*he, she, it, they*). Some languages make a further distinction in the first person plural between a first person inclusive (me + you, and maybe some other people) and a first person exclusive (me + one or more other people, not you).

Case

Case refers to marking on nouns that reflects their grammatical role in the sentence. Most case systems have ways to distinguish the subject from the object of a sentence, as well as special marking for possessors and indirect objects. In modern English, case is only marked on pronouns. The case found on subject pronouns is called **nominative**, the case found on object pronouns (and in most other positions) is called **accusative**, and the case found on possessors is called **genitive** (or sometimes just “possessive”). It is also common to have a case found primarily on indirect objects, which is called **dative**. There is no morphological dative case in English.

Agreement

Agreement refers to any inflectional morphology that reflects the properties of a different word in a sentence, usually a noun. The most common type of agreement is verbs agreeing with their subject, though verbs in some languages might also agree with their object (or might sometimes agree with their object instead of their subject). Verbs usually agree with nouns for their number and person, but they can agree for other properties as well. Determiners, numerals, and adjectives often agree with the noun they modify, usually for some combination of number, case, and gender—assuming a language has some or all of these types of inflection in the first place!

Tense and Aspect

Tense refers to the contrast between present and past (or sometimes between future and non-future) and is typically marked on verbs. Aspect is a bit harder to define, but is usually characterized as the perspective we take on an event: do we describe it as complete, or as ongoing? In English we have progressive (marked with *be* + *-ing*) and perfect aspect (*have* + *-ed/-en*).

Negation

In English we have derivational negative morphology (as in the prefixes *in-* or *non-*), which negates the meaning of a base or root. Inflectional negation, by contrast, makes a whole sentence negative. In English we express inflectional negation syntactically, with either the word *not* (or its contracted clitic form *-n't*). In other languages, however, negation can be expressed by inflectional affixes.

2.4.7 COMPOUNDING: PUTTING ROOTS TOGETHER

The last main “type” of morphology is **compounding**. Compounds are words built from more than one root (though they can also be built from derived words): if you find a word that contains more than one root in it, you are definitely dealing with a compound. Compounding differs from both derivation and inflection in that it doesn't involve combinations of roots and affixes, but instead roots with roots.

English is a language that builds compounds very freely. For almost any two categories, you can find examples of compounds in English.

Noun-Noun compounds include:

- doghouse
- website
- basketball
- sunflower
- moonlight
- beekeeper
- heartburn
- spaceship

Adjective-Noun compounds include:

- greenhouse
- bluebird

Verb-Noun compounds include:

- breakwater
- baby-sit

Noun-Adjective compounds include:

- trustworthy
- watertight

Adjective-Adjective compounds include:

- purebred
- kind-hearted
- blue-green

Noun-Verb compounds include:

- browbeat
- manhandle
- sidestep

Adjective-Verb compounds include:

- blacklist

2.4.8 HOW TO DRAW MORPHOLOGICAL TREES

In previous sections we saw that the order in which we attach derivational affixes, or the order in which we build compound words, sometimes matters. So a word like “governmental”, isn’t just a string of the

root *govern* + the suffix *-ment* + the suffix *-al*. Instead, it's the result of first combining *govern* and *-ment*, and then combining the result of that with a further suffix *-al*.

We often represent this type of structure with a **tree diagram**. Trees are used to represent the **constituency** of language, the subgroupings of pieces within a larger word or phrase. One of the big insights of linguistics is that constituency is always relevant when describing how pieces combine together, whether we're looking at morphemes within a word or words within a sentence. (though different theories in linguistics often take different views of what range of hierarchical structures are possible in natural languages.) The morphological tree diagram for the word *government* is provided in Figure 22.

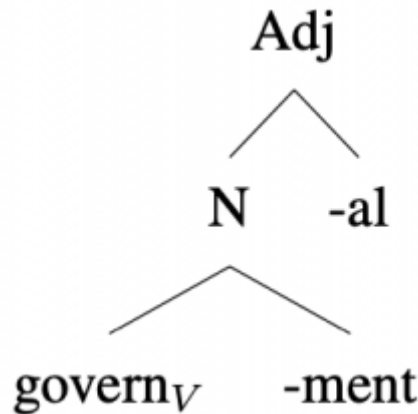


Figure 22. [Morphological tree diagram for governmental](#) by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)

When drawing a morphological tree, we can follow these steps:

1. Identify the root and any affixes
 - 1 root: non-compound word
 - 2 roots: compound word
1. Determine the category of the root
2. Determine the order in which affixes attach
3. Determine the category of any intervening bases, and of the whole word.

You might find that it makes sense to do these in different orders, or in different orders in different words. The best way to find out what works for you is to practice.

2.4.9 FUNCTIONAL CATEGORIES

We learned above about some words having lexical categories. These were nouns, verbs, adjectives and adverbs. As we will next be discussing syntax (phrases and sentences), not all words in a sentence belong to these four categories.

Consider the sentence in (1).

(1) The spaceship will arrive in orbit very soon.

Spaceship is a noun, and it is the head of the noun phrase [*the spaceship*] (we can tell because it could be

replaced by a pronoun like *it*). But what category is *the*? Similarly, *arrive* is a verb, *orbit* is a noun, and *soon* is an adverb, but what categories do *will*, *in*, and *very* belong to?

Words like *the*, *will*, *in*, and *very* belong to **functional** categories. Functional categories can be thought of as the grammatical glue that holds syntax together. While lexical categories mostly describe non-linguistic things, states, or events, functional categories often have purely grammatical meanings or uses. Some of the most important functional categories that we'll use in this book are described in this section.

Determiner

You may be familiar with the **definite article** *the* and **indefinite article** *a(n)*, as in *the book* or *a cat*.

(2)	a.	the book
	b.	a cat

In English, definite and indefinite articles occur in noun phrases before the head noun, as well as before any numbers or adjectives, as we see in the examples in (3):

(3)	a.	the three red books
	b.	a large angry cat

In fact, articles are usually the very first thing in a noun phrase, and you can only have one of them (unlike adjectives, which you can pile up). If you try to have more than one, the result is ungrammatical, as we can see in (4)—for me it's not grammatical to say **a the book* or **the a cat*.

(4)	a.	*a the book
	b.	*the a cat

This distribution doesn't apply only to the articles *the* and *a(n)*, though. There are a bunch of other elements that occur in exactly the same places, with exactly the same restrictions. These other things aren't articles in traditional grammar, so we use the label **determiners** for this larger functional category (usually abbreviated **Det**).

Some other determiners:

- **Demonstratives** (*this, that, these, those*)
- Some **quantifiers** (*every, some, each, most*, etc.)

Test for yourself that these occur in the same places in noun phrases as *the* and *a(n)* do—and that some other words expressing quantities (like *all* and *many*) and numbers do not.

Possessors in English expressed by possessive pronouns or by noun phrases marked with 's also appear in the same position as determiners, and are also in complementary distribution with them, as shown in (5).

(5)	a.	my book
	b.	[a friend from school]'s cat
	c.	*the [a friend from school]'s cat
	d.	*[a friend from school]'s the book

Notice that the marker 's attaches to the whole phrase, rather than to the head noun *friend*; this makes it a **clitic** rather than an affix, and makes it different from possessor marking typically found in languages that have genitive case.

Possession in English can also be marked with a prepositional phrase, which would come after the noun and not be in complementary distribution with determiners: *the cat [of my friend from school]*.

Not all languages have definite and indefinite articles, but most languages have some kind of determiners.

Pronouns

Pronouns are a special functional category that can replace a whole noun phrase. The set of pronouns in the variety of English most Australians speak is limited to the following, where each row lists the nominative, accusative, and possessive forms of the pronoun:

- First person singular: I / me / my
- First person plural: we / us / our
- Second person singular *or* plural: you / you / your
- Third person singular inanimate: it / it / its
- Third person singular feminine: she / her / her
- Third person singular masculine: he / him / his
- Third person animate singular *or* general plural: they / them / their

Auxiliaries

Auxiliaries (abbreviated **Aux**) are like verbs in that they can be present or past tense, and can show agreement, but they always occur alongside a lexical main verb. For this reason they're sometimes called "helping verbs".

For example, in the **progressive** in English we see the auxiliary *be*, alongside a main verb that ends in the inflectional suffix *-ing*, as in (6):

(6)	The bears are <i>dancing</i> .
-----	---------------------------------------

In English declarative sentences, auxiliaries occur after the subject and before the main verb.

If an English sentence is negative, at least one auxiliary will occur to the left of negative *not* / *n't*, as you see in (7):

(7) The bears **aren't** dancing.

In a Yes-No questions in English, at least one auxiliary appears at the front of the sentence, before the subject, as you see in (8):

(8) **Are** the bears dancing?

The auxiliaries in English are:

- *have* (followed by a past participle, in the perfect)
- *be* (followed by a past participle in the passive, and a present participle in the progressive)
- *do* (used in questions and negation when there's no other auxiliary)

Importantly, these can all also be used as main lexical verbs! They're auxiliaries only when there's also another verb in the clause that's acting as the lexical verb. If *have* expresses possession, or *be* is followed by a noun or adjective instead of a verb, they are occurring as main verbs.

In English there is also a class of **modal** auxiliaries. In modern English modals only occur as auxiliaries—they don't have uses as main verbs—and they are different from the other auxiliaries in that they don't agree with the subject. The modal auxiliaries are:

- will
- would
- can
- could
- may
- might
- shall (archaic for many people)
- should
- must

Prepositions

Prepositions (abbreviated **P**) express locations (temporal/spatial) or grammatical relations. They are almost always followed by noun phrases (though a few prepositions can occur by themselves)—in other words, they are almost always **transitive** and **select a noun phrase complement**. Prepositions can sometimes be modified by degree words like *very* or *way*. Those modifiers, the preposition, and the following noun phrase, all group together into a prepositional phrase constituent.

Some prepositions:

- on
- up
- beside
- through
- outside
- in

- above
- to
- of
- with
- for
- without



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=344#h5p-9>

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2.5 Syntax

In this section we look at how words are organized into **phrases** and **sentences**, which in linguistics is called **syntax**.

2.5.1 SYNTACTIC KNOWLEDGE AND GRAMMATICALITY JUDGEMENTS

In linguistics, **syntax** is the study of how words are organized into phrases and sentences. Just as the morphemes in a word are organized into structures, the words in a sentence are also best viewed not just as a string of words, but instead as having a **hierarchical structure**. And just as words contain a head morpheme, we'll see that every phrase has an element that is its **syntactic head**.

What kind of knowledge do we have about the syntax of a language we know? Let's start by considering the sentence in (1):

(1) All grypnos are tichek.

You might not know what a *grypno* is, or what it means to be *tichek* (because these are made-up words!), but you can tell that this sentence is still the right kind of "shape" for English. In other words, (1) is consistent with the way English speakers put words together into sentences.

Compare this with the sentence in (2):

(2) *Grypnos tichek all are.

Unlike (1), (2) isn't the right shape for a sentence in English. Even if you did know what a *grypno* was, or what it meant to be *tichek*, this still wouldn't be the way to put those words together into a sentence in English.

Something we can be pretty confident about is that you've never heard or read either of these sentences before encountering them above. So that means that your internal grammar of English must be able to generalize to new cases—this is the **generativity** of language. As someone who uses language—in the case of (1) and (2), as someone who speaks and reads English—you can identify sentences that do or do not fit the patterns required by your internal grammar. In syntax we describe sentences that do match those patterns as **grammatical** for a given language user, and sentences that do not match required patterns as **ungrammatical**.

GRAMMATICALITY JUDGEMENTS IN SYNTAX

In syntax when we say something is **ungrammatical** we don't mean that it's "bad grammar" in the sense that it doesn't follow the type of grammatical rules you might have learned in school or learned for your language. Instead, we call things ungrammatical when they are inconsistent with the grammatical system of language user.

The evaluation of a sentence by a language user is called a **grammaticality judgement**. Grammaticality judgements are a tool for investigating the linguistic system of an individual language user—there is no way to get a grammaticality judgement for “English” as a whole, only grammaticality judgements from individual English speakers. Despite that, sometimes you will see a sentence described as grammatical or ungrammatical “in English” or another language; technically this is a shorthand for saying that users of English (or another language) generally agree about whether it is grammatical or not. In many cases different users of a language disagree about the status of a particular example, and this tells us something about **syntactic variation** in that language!

2.5.2 WORD ORDER

If you think about hearing or seeing a sentence, or if you think about reading a sentence that’s been written down, a really obvious property is that words and morphemes come in a particular order. Indeed, the only difference between the grammatical and ungrammatical sentences we saw above, repeated below in (1), is that the words appear in different orders.

- | | | |
|-----|----|--------------------------|
| (1) | a. | All grypnos are tichek. |
| | b. | *Grypnos tichek all are. |

The English language has relatively **fixed word order**. Typically, English is **Subject-Verb-Object** (SVO) word order language. There isn’t much flexibility in English to change the order of words in a sentence, without either changing the meaning or making the sentence ungrammatical. Lots of other languages also have relatively fixed word order—among them French—but lots of other languages have much more flexible word order. Languages with relatively flexible word order include Latin, Russian, Greek, and AUSLAN, to name just a few. For users of these languages, the order of words in a sentence is often determined by style or by the topic or focus of the sentence.

What is the basic order of words in English sentences? A generalisation would be to say that the verb in an English sentence has to come after at least one **noun**, and that it *can* be followed by a second noun, but doesn’t have to be. We could write this generalization as a kind of formula or template: the grammatical sentences in (2) have the order **N V (N)** (the parentheses around the second “N” mean that it is optional).

Another way to describe word order involves talking not just about categories like nouns and verbs, but grammatical functions like **subject** and **object**. Word order in English doesn’t just require that *any* noun come before the verb, it has to be the noun that corresponds to the subject. Similarly, if the verb is a **transitive** verb with an object, the object noun must come after the verb. So even though *Chocolate ate Amal* is a grammatical sentence of English (though with a somewhat implausible meaning), it can’t express the same meaning as *Amal ate chocolate*.

2.5.3 KEY GRAMMATICAL TERMINOLOGY

This section reviews some key grammatical terminology that you might be familiar with from elsewhere (for example, from language classes). This vocabulary is important for describing the basic structure of phrases and sentences, and we’ll use it frequently throughout this book.

SENTENCE

A sentence is a string of words that expresses a complete statement, question, or command. For statements (as opposed to questions or commands), a sentence expresses a **proposition**, something that can be *true* or *false*. A sentence is a **clause** that stands on its own as an utterance.

CLAUSE

A clause is a constituent that includes a subject and a predicate. Some clauses occur *inside* other clauses (see **complex sentence** below), and so not all clauses are independent sentences.

PREDICATE

A predicate is the state, event, or activity that the sentence attributes to its **subject**. The word “predicate” is used in two ways. Sometimes it is used to refer to a single head or word (usually a verb or an adjective), but other times it is used to describe everything in the sentence other than the subject (for example, a whole **verb phrase**. In this chapter we use it in the first sense, to refer to a word that combines with a subject and (sometimes) one or more objects.

ARGUMENTS

Arguments are phrases that correspond to the participants or actors involved in a sentence’s predicate. They are typically **noun phrases**, but it’s possible to have arguments of other types (usually prepositional phrases or whole clauses).

In the sentences in (3) the arguments are in **bold** and the predicate is *italicized*.

- | | | |
|-----|----|---|
| (3) | a. | Vanja <i>loves</i> chocolate . |
| | b. | The children <i>gave</i> [the kitten] [a toy]. |
| | c. | Everyone <i>is excited</i> . |

CLASSIFYING PREDICATES

Predicates can be classified by their **transitivity**, which is the *number* of arguments they take. (This is also sometimes called the **valency** of a predicate.) The words for transitivity are based on the *number of objects* a predicate takes.

Intransitive

An intransitive predicate takes one argument (the subject); no object. Example 1: *she laughed*. The verb “laughed” is intransitive because it only requires a subject (“She”) and doesn’t need an object to complete the meaning. Example 2: *the baby cried*. The verb “cried” is intransitive because it only needs the subject “the baby” to form a complete thought.

Transitive

A transitive predicate takes two arguments (subject and direct object); one object. Example 1: *she kicked the ball*. The verb “kicked” is transitive because it takes both a subject (“She”) and a direct object (“the ball”). “The ball” is the entity that receives the action of the verb. Example 2: *Mia ate the chocolate*. The verb “ate” is transitive because it requires an object (“the sandwich”) in addition to the subject (“Mia”).

Ditransitive

A ditransitive predicate takes three arguments (subject, direct object, and indirect object); two objects. Example 1: *she gave him a present*. The verb “gave” is ditransitive because it requires a subject (“She”), a direct object (“a gift”), and an indirect object (“him”), the recipient of the gift. Example 2: *I sent her a photo*. The verb “sent”

is ditransitive because it involves a subject (“I”), a direct object (“a photo”), and an indirect object (“her”), the recipient of the letter.

CLASSIFYING ARGUMENTS

Arguments can be classified in at least two ways: their position in the sentence, and how they’re related to the predicate (are they the actor, the thing acted upon, etc). For now we’ll focus on the **position** of arguments, with diagnostics specific to English.

Subject

Subjects almost always appear *before* the predicate in English, and control agreement on the verb. If the subject is a pronoun, it is in nominative case (*I, we, you, he, she, it, they*).

Direct object

Objects usually appear *after* the verb in English. If the direct object is a pronoun, it is in accusative case (*me, us, you, him, her, it, them*).

Indirect object

With ditransitive verbs, the indirect object is often the recipient of the direct object. The indirect object is often (but not always) marked by “to” or another preposition; in English, if the indirect object is a pronoun, it is in accusative case (but in languages that have dative case, indirect objects are often in dative case).

CLASSIFYING SENTENCES

Now that we’ve looked at grammatical terminology relating to predicates and arguments within sentences, let’s talk about terminology for sentences and clauses as a whole. First, we can classify them according to their **function**—whether they are used to make a statement, ask a question, or give a command.

Declarative

Declarative clauses are statements, things that can be true or false. For example: *The sun sets in the west; The dog is barking.*

Interrogative

Interrogative clauses are questions. Questions come in two general types:

- Yes-No questions, like: *Did Romil watch a movie?*
and
- Content questions, like: *What did Romil watch? Where did Romil watch the movie? Why did Romil watch the movie?*

Imperative

Imperative clauses express requests or commands. For example: *Open the door (please)!; Stop talking!; Close the door.*

Alternatively, we can classify sentences according to their **structure**; that is, according to whether they contain one clause or more than one clause, and (if more than one clause) how the sub-clauses are related to one another.

Simple sentence

A sentence is **simple** if it contains only one clause. A clause requires a verb (and generally a subject). For example: *She sings*; *I love pizza*; *The horse jumped the fence*.

Compound sentence

A **compound** sentence has at least two clauses, linked by a conjunction like *and*, *or*, or *but*. For example: *[Mark laughed] and [Andy cried]*; *[I wanted to go for a walk], but [it started raining]*.

Complex sentence

A **complex** sentence is one that contains one independent clause and at least one independent (or subordinate) clause. Example 1: *I went to the store because I needed some milk*. The independent clause is “I went to the store,” and the dependent clause is “because I needed some milk,” introduced by the subordinating conjunction “because.” Example 2: *Although it was raining, we decided to go for a hike*. The independent clause is “we decided to go for a hike,” and the dependent clause is “Although it was raining,” introduced by “Although.”

2.5.4 STRUCTURE WITHIN THE SENTENCE: PHRASES, HEADS AND SELECTION

Beyond the order of words, all human languages appear to group words together into **constituents**. The generalisations about which sentences people find grammatical and which ones they find ungrammatical don't refer to purely linear properties like “fourth word in a sentence”, but instead to **phrases** in particular **structural positions**.

A **phrase** is a set of words that act together as a unit. Let's look at the example in (1) to see what this means:

(1) All kittens are very cute.

What other groups of words can appear in the same position as the words **all kittens** in this sentence?

- (2)
- | | |
|----|---|
| a. | Puppies are very cute. |
| b. | The ducklings that I saw earlier are very cute. |
| c. | These videos of a baby panda sneezing are very cute. |

...and so on. It turns out that lots of different groups of words can go in this position—but not all of them! What all these examples have in common is that we've replaced [all kittens] with another group of words that includes at least one **plural noun**: *puppies* or *ducklings* or *videos*. If we swap in a singular noun, the sentences would be ungrammatical, as we see in (3).

- (3)
- | | |
|----|---|
| a. | * The puppy are very cute. |
| b. | * The duckling that I saw earlier are very cute. |
| c. | * This video of a baby panda sneezing are very cute. |

...but if we change the plural verb *are* to the singular *is* they become good again (this is **subject agreement inflection**):

- | | | |
|-----|----|--|
| (4) | a. | The puppy is very cute. |
| | b. | The duckling that I saw earlier is very cute. |
| | c. | This video of a baby panda sneezing is very cute. |

It turns out that the groups of words that we can easily substitute here are all ones that have a **noun** in them. But it's not enough to just have *some* noun in the group of words at the front of the sentence, as the examples in (5) show. (5a) is ungrammatical even though the string of words at the beginning includes the pronoun *I*—and this sentence is ungrammatical whether we try the form *is* or *are* or even *am*. In (5b) the sentence is ungrammatical even though we have the compound noun *baby panda*, again no matter what form of the verb we try.

- | | | |
|-----|----|--|
| (5) | a. | * That I saw earlier {is / are / am} very cute. |
| | b. | * Of a baby panda {is / are} very cute. |

What distinguishes the grammatical sentences in (1), (2), and (4) from the ungrammatical sentences in (5) is that in (1), (2), and (4) the group of words at the beginning of these sentence are **noun phrases** (remember that the sentences in (3) were ungrammatical only because they had the wrong agreement inflection). Noun phrases are groups of words that not only contain a noun, but where the noun is the “most important” element in some sense.

By “most important” we mean that it's the noun that determines an important part of the meaning of the subject, but also that it's this noun that determines the category of the whole phrase, which determines where the phrase can go in relation to other phrases. The *noun* is the **head** of a *noun phrase*. The head of a phrase also determines what else can go in the phrase; in particular it determines whether the phrase contains an **object**.

2.5.5 TREE DIAGRAMS

In this section we begin to introduce the formal notation of **tree diagrams** to represent the structure of phrases and sentences in a way that makes it easier to analyse and test constituency elements about them. What constituents do we find inside sentences? Well, we know that a sentence consists of (at least) a subject and a predicate, that subjects are (usually) noun phrases, and predicates are often verb phrases. We might express this as a rule, known as a phrase structure rule.

$S \rightarrow NP VP$

This rule says that wherever you have an *S* (a sentence), it is possible for that *S* to be made up of an *NP* (noun phrase) followed by a *VP* (a verb phrase).

Another way to represent the same idea is with a **tree diagram**, as in Figure 23. Tree diagrams can express the same information as phrase structure rules, but can more efficiently express the output of multiple such rules; current syntactic theories are typically expressed in terms of constraints on possible trees, rather than in terms of constraints on phrase structure rules.

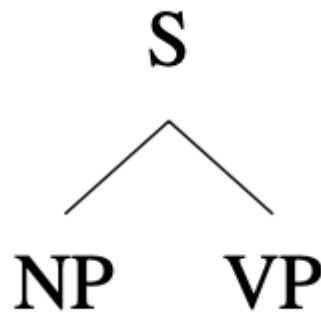


Figure 23. *Schematic tree for S containing an NP subject and VP predicate* by Anderson et al. is licensed under [CC BY-NC-SA 4.0](#)



An interactive H5P element has been excluded from this version of the text. You can view it online here:

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2.6 Semantics

This section is about linguistic meaning, particularly **semantics**: how the meaning of words combine to form the meaning of sentences.

2.6.1 LINGUISTIC MEANING AND SEMANTICS

We use the word “meaning” in various ways in our everyday lives. **Linguistic meaning** refers to the sorts of things we have to know as language users when we produce and comprehend meaning. **Semantics** is the study of linguistic meaning: how the meaning of words combine to form the meaning of sentences. In this chapter, we will analyse linguistic meaning from various perspectives. There are many different kinds of linguistic meaning. Each way of thinking about meaning gives us important insight into how we produce and understand meaning as language users.

Consider the following sentence.

- (1) The raccoon clothing store was doing a photo contest so I submitted a picture of a Toronto raccoon wearing a bright pink bandana with lime green polka dots on it.

This is likely a sentence you have never heard before in your life, but you are still able to comprehend it and understand what it means. The reason for this is because you have the meaning of each morpheme that appears in this sentence stored in your head, and by combining those meanings, you are able to get the meaning of the overall sentence. This is the principle of **compositionality**: the meaning of a complex linguistic unit results from the individual meanings of its subparts, and how these subparts were combined. This means that the meaning of a sentence is determined by the meaning of the words that it contains, and how these words were put together. It also means that the meaning of a multi-morphemic word is determined by the meaning of the morphemes it contains, and how they were put together. So for example, the meaning of the word *unhelpfulness* is the combination of the meaning of *un-*, *help*, *-ful*, and *-ness*, put together as [[un- [help -ful]] -ness]. Compositionality is not just a matter of *what* linguistic pieces you put together: it also matters *how* you put the pieces together, too.

2.6.2 ARGUMENTS AND THEMATIC ROLES

In previous sections, we classified predicates (verbs and verb phrases) in terms of their **transitivity**—that is, the number of arguments they combine with. Intransitive verbs take only a subject, while transitive verbs take both a subject and an object, and ditransitive verbs take a subject, an object, and an indirect object.

Importantly, “subject” and “object” are **structural** terms, not semantic ones. In English, a subject appears at the beginning of a declarative clause, has nominative case (if it’s a pronoun), and controls agreement on the tensed verb. An object in English occurs after the verb, and has accusative case (if it’s a pronoun).

As we are now exploring the area of semantics (the study of meaning), verbs can be thought of as describing **events** or **states**. The difference between events and situations, in semantics, is that events are often thought

of as dynamic (things are actively happening), whereas states are static (things that are simply true, without anything happening, like *being tall*). Both events and states involve some number of **participants**. The participants can play various **roles**, which we will call **thematic roles**.

Do subjects always play the same **role** in an event or state? If we look at the following examples, it looks like they don't:

(1)	a.	The children yelled.	(children did something on purpose)
	b.	The wind blew the tree down.	(wind did something, but not on purpose)
	c.	The tree burned.	(something happened to the tree)

Indeed, we sometimes see this even with a single verb, as with *sink* in (2).

(2)	a.	The pirate sank the ship.	(the pirate did something on purpose)
	b.	The ship sank.	(something happened to the ship)

In the sentences in (2), we see that the verb *sink* can be either transitive or intransitive. In (2a) [*the pirate*] is the subject and in (2b) [*the ship*] is the subject, but they play different roles in the event or state. Indeed, in (2a) [*the ship*] is the *object*, but plays the same role in the event as it does when it's the subject in (2b).

But for other verbs, we don't see this kind of "trading places":

(3)	a.	The author wrote the book.
	b.	The author wrote.

In (3) the subject stays the same in the transitive and intransitive uses of the verb *write*, and [*the author*] continues to play the same kind of role in the event.

To talk about the different roles associated with subjects and objects, we can define a number of thematic roles that are relevant in natural language. There are potentially many such roles, but in this section we'll focus on just a few.

AGENT

Agents are animate actors who do things on purpose.

- [The pirate] sank the ship. (subject = agent)

CAUSER

Causers are often inanimate (not alive); they cause things to happen but without acting on purpose.

- [The bilge pump malfunction] sank the ship. (subject = causer)

Not all animate subjects are agents: some animate subjects instead perceive something or experience a mental state.

EXPERIENCER

An experiencer is an animate participant that experiences a mental state. This includes perceiving something, as with the subjects of verbs like *see*, *hear*, etc.

- [Pirates] frighten **me**. (**me** = experiencer, [pirates] = causer)

- I fear [pirates]. / I like [pirates]. (I = experiencer, [pirates] = causer)
- **[The pirates]** saw an approaching storm. ([**the pirates**] = experiencer)

THEME

The theme is the participant to which something happens, and may be changed by the event.

- The pirate sank [the ship]. ([the ship] = theme, affected/changed by the event)
- The author read [a book]. ([a book] = theme, not affected by the event)

Some work on thematic roles distinguishes **themes** (undergo an event, but are not affected or changed) from **patients** (undergo an event, and are affected or changed as a result). The objects of verbs of consumption (like *eat*) or creation (like *build*) are prototypical patients; they either disappear or come into existence as a result of the verb's action. The distinction between themes and patients is not relevant for our discussion here, though, and so we won't worry about it.

INSTRUMENT

An instrument is the thing an agent uses to accomplish an action, often (but not necessarily) introduced in English by the preposition *with*.

- The pirate sank the ship [with a cannon]. (PP = instrument)

LOCATION

A location is the place where an eventuality occurs, often (but not necessarily) introduced by a locative preposition.

- The pirate sank the ship [at sea]. (PP = location)

GOAL

The goal is the location or person that receives the theme. In most ditransitives, the indirect object is the goal of the eventuality.

- The pirates sent [the ship] **a message**.
- The pirates sent **a message** to [the ship]. ([the ship] = goal; **a message** = theme)

Different verbs don't just select how *many* arguments they combine with, but also select what thematic roles those arguments take. At the same time, verbs aren't totally free to map thematic roles onto argument positions; for example, while we've seen that an experiencer can be either the subject or object of a verb, if a verb combines with both an agent and a theme, the agent is always the subject. Also, whenever a verb takes only a single argument, that argument will necessarily be the subject (at least in English, and in many other languages).



An interactive H5P element has been excluded from this version of the text. You can view it online here:

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2.7 Pragmatics

In this section, we look at sentential meaning from the perspective of how it is influenced by and how it influences the context. The study of how context affects meaning, and subsequently how we use language in everyday communication settings, is called **pragmatics**.

2.7.1 CROSS-COMMUNITY DIFFERENCES IN DISCOURSE

Imagine a time where you were in a conversation with someone with a cultural background different from yours. Have there been times where miscommunication happened? There are different conversational rules for different language communities. What counts as a 'friendly' interaction? What counts as 'polite'? When we study pragmatics, we need to be aware that there are cultures and conversational norms beyond your own. Encountering unfamiliar discourse rules in a language that you may not have encountered before may give rise to feelings of surprise, and that's OK — but we hope that you will use your linguist mind to prevent this surprise from turning into negative judgments about other cultures and languages. Remember, all forms of language are valid!

2.7.2 THE COOPERATIVE PRINCIPLE (GRICE'S MAXIMS)

In this section, we will discuss the conversational logic behind why certain **implicatures** arise in discourse. **Implicature** refers to information that is suggested or implied by a speaker, but not explicitly stated in the utterance. It goes beyond the literal meaning of the words and involves a kind of indirect communication, relying on context, shared knowledge, and conversational principles.

Let's start with the following example in (1).

- | | | |
|-----|------|---|
| (1) | Aya: | Did Raj feed the cat and clean the litterbox? |
| | Bo: | He fed the cat. |
| | Aya: | (Infers: 'He didn't clean the litterbox.') |

Terminologically, the *speaker/signer* creates an **implicature** or they **imply** that content. The *addressee* makes an **inference** or they **infer** that content.

A way of analysing how implicatures arise in discourse is called the **Cooperative Principle**, proposed by philosopher Paul Grice. He proposed that one way of explaining how we get implicatures in a conversation is to think that there are implicit conversational principles that discourse participants follow. According to the Cooperative Principle, the major underlying assumption that we make in a conversation is that all discourse participants are acting in a way to accomplish conversational goals. For example, let's say that the topic of discussion was "How much money should we spend on our cat's birthday party?". *If* everyone in the conversation agrees that the goal is to figure out a reasonable cost for the party, then all discourse participants assume that everyone in the conversation is acting in a reasonable way and uttering things in order to accomplish this goal. This is what is meant by "cooperation" in the Cooperative Principle. Specifically,

Grice described four **maxims** (or general rules of conduct) that might be the basis of many conversations: the *Maxim of Quality*, *Maxim of Quantity*, *Maxim of Relation*, and *Maxim of Manner*. The idea is that if these are the conversational rules that people follow (and if people assume that other people follow these rules too), then there is an explanation of why certain implicatures arise in discourse. When the maxims are violated, this is called **flouting**.

Let's take a look at the four maxims that Grice described.

THE MAXIM OF QUALITY

Grice observed that discourse participants seem to follow a conversational rule about being honest. He stated this rule as the **Maxim of Quality**: *in a conversation, you say what you believe to be true, and only say what you have sufficient evidence for*. For your convenience, our previous example is reproduced below as (2).

- | | | |
|-----|------|---|
| (2) | Aya: | Did Raj feed the cat and clean the litterbox? |
| | Bo: | He fed the cat. |
| | Aya: | (Infers: 'He didn't clean the litterbox.') |

This maxim says that the fundamental assumption that you make in discourse is that no one is lying in the conversation. Aya gets the inference from Bo's statement in (2) partially because she assumes he would only say true things. Their logic is that Bo must have not said *Raj cleaned the litterbox* because it would be false to say so.

If the Maxim of Quality is violated, someone would be overtly lying in the discourse. Imagine for example that the conversation in (2) took place, except that Raj never fed the cat (or clean the litterbox for that matter). Bo is being blatantly uncooperative in this conversation in this case. When a maxim is **violated** in a conversation, it gives rise to the intuition that something has gone wrong in the discourse. In this case, the objective in the conversation was to figure out if Raj fed the cat and if Raj cleaned the litterbox, but now Aya incorrectly thinks Raj did feed the cat. This does not help with the objective of the conversation, hence, something has gone wrong. Note that if Bo is a good liar, Aya might not realise that something has gone awry in the discourse during the conversation. But if it was revealed later that Raj didn't feed the cat, Aya would certainly feel that the conversation she previously had with Bo was not a cooperative one: a maxim was violated.

In English and many languages, failure to *try* is what is considered a maxim violation. That is, if you were not *trying* to follow Quality at all, knew the statement was false but uttered it anyway, that is what is considered a violation. Let's assume for a moment again that Raj actually didn't feed the cat. If Bo *truly* thought that Raj fed the cat, saying "He fed the cat" would technically not be a violation under the Cooperative Principle. English users likely wouldn't accuse Bo of lying because Bo truly had the belief that he was telling the truth (Carson, 2006). Bo said something false but didn't lie.

In summary, the Maxim of Quality is paraphrasable as "don't lie" and "make sure you have enough evidence for what you're saying", which is a maxim common to a lot of languages — but what counts as a lie (= a violation of the maxim) may vary from community to community.

THE MAXIM OF QUANTITY

Grice also observed that discourse participants seem to follow a conversational rule about how much information they should give when trying to meet conversational goals. He stated this as the **Maxim of Quantity**: *in a conversation, don't be more informative than is needed by the purpose of the conversation, and don't be less informative than is needed by the purpose of the conversation, either*. You need to be as informative as is required. **Informativity** is generally measured based on entailment relations. This definition of informativity is given below. Take *p* and *q* to be variables for sentences.

- (3) If p entails q (and p and q are not the same sentence), then p is more informative than q .

By this definition, *Panks is a Siberian Forest Cat* ($=p$) is more informative than *Panks is a cat* ($=q$), because p entails q and they are not the same sentence. Let's go back to our original example, reproduced below as (4).

- (4) Aya: Did Raj feed the cat and clean the litterbox?
 Bo: He fed the cat.
 Aya: (Infers: 'He didn't clean the litterbox.')

The relevant entailment relation is between *Raj fed the cat* and *Raj fed the cat and cleaned the litterbox*. The latter sentence entails the former; so, *Raj fed the cat and cleaned the litterbox* is more informative than *Raj fed the cat*.

To understand how this maxim works, imagine in (4) that Bo knew that Raj actually fed the cat AND cleaned the litterbox, and still said what he said ("He fed the cat."). This would be a violation of the Maxim of Quantity, because the statement *He fed the cat* is underinformative: the more informative thing to say in this situation would be *Raj fed the cat and cleaned the litterbox*. If Aya found out after the conversation in (4) that Raj actually cleaned the litterbox too, Aya would likely feel that Bo was being uncooperative in the conversation they had ("Why didn't you tell me he cleaned the litterbox too, if you knew?!"). Bo didn't make a false statement, but the true statement that he did make wasn't the most informative one.

The flip side of this is being OVERinformative. For this, imagine this version of the previous discourse:

- (5) Aya: Did Raj feed the cat and clean the litterbox?
 Bo: ?? Yes, he fed the cat, he cleaned the litterbox, he brushed the cat, he trimmed the cat's claws, he told the cat what a good boy he was, he pet the cat, he napped with the cat...

Assume that Raj actually did all of the things that Bo said he did. This means that Quality is not being violated. What IS being violated is Quantity. This time, he gave more information than what was requested by Aya's question. A simple "Yes (he fed the cat and cleaned the litterbox)" would've sufficed to meet the objective of the conversation.

THE MAXIM OF RELATION

Another one of Grice's observation was that discourse participants seem to expect each other to stay on topic during a conversation. He described this as the **Maxim of Relation**: *make your contributions to the conversation relevant to what is being discussed*. Consider the following conversation in (7).

- (7) Aya: I used to take piano lessons when I was little. What sorts of extracurricular activities did you do as a kid?
 Bo: Nice. When I was little, I used to go to weekly swimming classes.

This is a perfectly normal and cooperative conversation, because Aya brought up the topic of what things they did in their childhood. Bo responds with something that is related to this topic: what he did as a child, which in this case is *take swimming classes*. The Maxim of Relation is being followed.

Contrast this with Bo's reply in (8), which for some people is a slightly more surprising turn in the conversation.

- (8) Aya: I used to take piano lessons when I was little. What sorts of extracurricular activities did you do as a kid?
 Bo: ?? When I was little, my favourite food was chicken nuggets.

Assuming that Bo is not lying, Bo has said something truthful, thus Bo is following the Maxim of Quality. We don't get the sense that he is oversharing or undersharing, and he has at least said something about his childhood, which is to some extent informative — so Quantity doesn't seem like the main maxim being violated

either. The main reason that (7) might feel odd to some adult English users is because Bo is off topic. The topic under discussion is “what extracurricular activities did you do as a child”, so to stay on topic you would minimally name events, not stative properties like what your favourite food was. This in this context would be a violation of the Maxim of Relation.

If you find yourself thinking things like ‘Well, maybe Bo means that he took cooking classes, or that he didn’t do any extracurriculars at all?’, that is a valid inference you are trying to draw.

THE MAXIM OF MANNER

Grice’s fourth and final observation was that discourse participants seem to have an expectation about *how* they say things in a conversation too, not just *what* they say. He described this as the **Maxim of Manner**: *be as clear, brief, and as orderly as possible when you make your contributions in a conversation*. Consider the following conversation (Note: the hand-washing instructions are adapted from this [CDC guideline](#)).

(9) Aya: How do I properly wash my hands?

Bo: ?? Dry your hands using a clean towel or air dry them. Scrub your hands for at least 20 seconds. Lather the backs of your hands, between your fingers, and under your nails. Rinse your hands well under clean, running water. Lather your hands by rubbing them together with the soap. Wet your hands with clean, running water. Turn off the tap, and apply soap.

Bo’s instructions are truthful, in that each step he listed indeed are things you do when you wash your hands. His contribution is also appropriately informative, and relevant to the question that was asked by Aya. However, Bo said the instructions in a funny way: he didn’t list the steps in order. So the oddness of Bo’s utterance mainly comes from a violation of the Maxim of Manner. For Bo to conform to the Maxim of Manner, we would of course have to change the order in which he presented each step:

(10) Aya: How do I properly wash my hands?

Bo: Wet your hands with clean, running water. Turn off the tap, and apply soap. Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails. Scrub your hands for at least 20 seconds. Rinse your hands well under clean, running water. Dry your hands using a clean towel or air dry them.

The Maxim of Manner essentially says that the way that you present the information should not get in the way of transmitting the information. So under the scope of this maxim are things like the order in which you present information, whether your statement is ambiguous, which words you choose, how quickly you speak or sign, and how loud you speak (for spoken languages).



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=351#h5p-6>

2.7.3 SPEECH ACTS

A **Speech Act** is a unit of communication involving a speaker’s intention, the linguistic form of the message conveying the intention, and the listener’s interpretation of the message. In other words, the act of communication as not only conveying information but also performing actions (e.g. making requests, giving instructions, offering apologies, making promises). By making a **speech/sign act**, there are different actions that you make simultaneously: you make a **locutionary act**, an **illocutionary act**, and a **perlocutionary act**.

Understanding speech acts is necessary for effective communication as it helps us to understand not only the words or lexical items being conveyed, but also the intentions and actions behind them.

ILLOCUTIONARY MEANING

Illocutionary meaning is the sentential meaning in terms of what the speaker/signer means *in* making an utterance. The idea is that after we compositionally build up the literal meaning of a sentence, we *do* something with this sentence in a conversation. In other words, what's the point of saying something in a conversation?

To understand what this means, let's take a look at the conversation in (1).

(1) (Context: Aya and Bo are roommates, and are trying to decide what to make for dinner.)

Aya: Should we have spaghetti for dinner?

Bo: We have tomato sauce and ground beef in the fridge.

Aya: Yeah. Can we make pasta bolognese with those ingredients?

Bo: Yeah, I think so.

Aya: OK, cool. We'll do spaghetti then.

Let's focus on Bo's utterance, *We have tomato sauce and ground beef in the fridge*. The sense of this sentence is the lexical meaning of all the words it contains combined. But Bo is not saying this sentence in this conversation for the sake of expressing the sense of the sentence. He is saying this because he believes this sentence to be true, and he would like for the addressee, Aya, to agree with it. This layer of meaning is what we are referring to as **illocutionary meaning**, and what we mean by "what we mean in making an utterance." In this case, Bo has made an **assertion**. In contrast, if you look at Aya's first utterance in (1), she has posed a **question**: *Should we have spaghetti for dinner?*. Assertion vs. question is a way of classifying sentences based on their illocutionary meaning. There's more that you can do in a conversation than just assert things and ask questions. For example, you might exclaim things in an **exclamative** (e.g., *What a beautiful raccoon!*) or you might give orders with an **imperative** (e.g., *Look at the raccoon!*).

Locutionary Speech Act

The **locutionary act** of a speech/sign act is an expression of the **locutionary meaning** of the sentence, which is the literal meaning of the sentence. The locutionary meaning of *You're manspreading* is something like 'the addressee, presupposed to be male, is sitting with their legs wide apart.'

Illocutionary Speech Act

The **illocutionary act** of a speech/sign act is an expression of the **illocutionary meaning** of the sentence, which is what you "do" in making an utterance. Typically, in making an assertion, what the speaker "does" is commit herself to the truth of the utterance (the performative version would be something like 'I hereby publicly declare that I believe that you are manspreading'). In this particular case, she's also likely "doing"

something else too: making a request (for him to move his legs). Those are both illocutionary acts. Other than asserting and requesting, illocutionary acts can include: asking, resigning, promising, congratulating, and more.

Perlocutionary Speech Act

Finally, the **perlocutionary act** (or **perlocutionary effect**) of a speech/sign act is an expression of the **perlocutionary meaning** of the sentence, which is the actual effect of the utterance on the addressee. In this case, the perlocutionary effect of *You're manspreading* might be that the addressee moves his legs to make more room for the speaker.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

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2.8 Language variation and change

2.8.1 SOCIOLINGUISTICS

Variationist sociolinguistics is a methodological and analytical approach to understanding the relationship between language and its context of use. We call it sociolinguistics because both social and linguistic (e.g., grammatical, structural, articulatory) factors, are equally important; sociolinguistics, unlike many formal approaches to language, does not focus on an idealized grammar (sometimes called ‘competence’) but rather analyzes language in use (sometimes called ‘performance’). We call it *variationist sociolinguistics* because it’s concerned with the *variable* nature of language in use.

2.8.2 LANGUAGE VARIES

There is substantial variation in language: both within and across language varieties. We’ll see some examples of both of these kinds of variation and introduce one of the central concepts used in variationist sociolinguistics: *the linguistic variable*.

ALL LANGUAGES EXHIBIT VARIATION

Many linguistic approaches to the study of language are concerned with language variation. Theories about how language works rest on evidence that comes about by contrasting the way something is said or signed in two or more different languages, dialects, or varieties.

LANGUAGE, DIALECT AND VARIETY

Colloquially, the term **dialect** is used to refer to ways of speaking that people perceive to be substandard, low status, associated with working class, non-prestigious, geographically-isolated, or some derivation or aberration from a ‘standard’ version of the language. The linguistic fact though is that everyone has a dialect. Rather than think about languages and dialects in a hierarchical way, linguists think about dialects as subdivisions of a language. Sometimes, linguists might talk about the “standard dialect” but it’s important to emphasize that no dialect, not even what we might call the “standard dialect” is objectively (linguistically) superior to any other dialect of the language. Another term, **‘variety’** doesn’t have the same negative connotations that ‘dialect’ has, and so we’ll usually use that to refer to subdivisions of a language in this chapter.

What's a linguistic variable?

When we approach language from a variationist sociolinguistic perspective, we call the choices between a set of options that mean the same thing a **linguistic variable**. The individual options that people choose between in the course of language use, we call **variants**. Linguistic variables exist in all languages and varieties, in all modalities, and at all domains of language from the phonetic to the pragmatic. A linguistic variable is an abstract set; there's nothing out there in the world that we can point to and be like "hey, that's a linguistic variable!". We only ever see or hear the abstract variable as one of its concrete variants. Let's have a look at some examples of linguistic variables from different languages and different domains of language.

In Auslan, NZSL, and ASL, some signs that are prescriptively located at the forehead, like KNOW, THINK, and NAME, have variable location: at the forehead or lowered to near the cheek (Bayley et al., 2015). You can see these two variants in Auslan/NZSL in Figure 24 and watch a [video in ASL](#). This is an example of phonetic-phonological variation with variants differing with respect to an articulatory parameter (in this case, location).

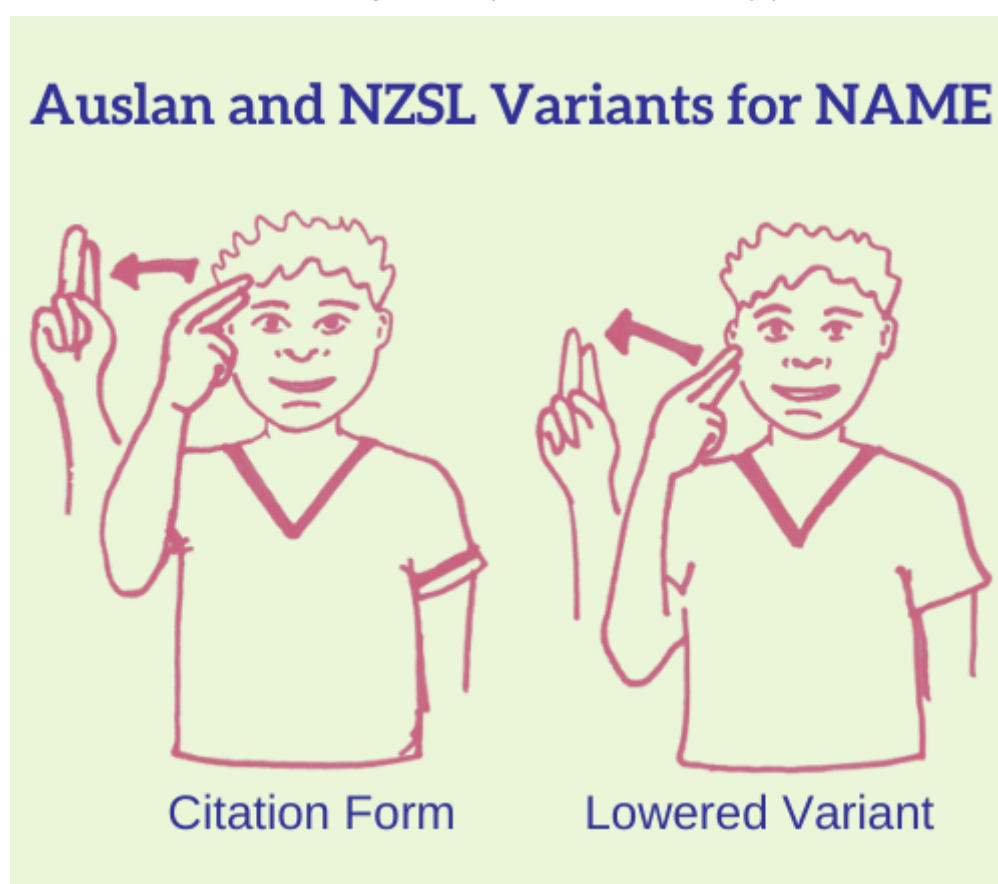


Figure 24. Auslan and NZSL variants for NAME by James Cook University, adapted from Bayley et al., is licensed under [CC BY 4.0](#)

We also find linguistic variables in the morphophonological domain of languages. Standardized English contains a categorical alternation with the indefinite article between *an* and *a* with *an* occurring prior to a vowel and *a* occurring elsewhere (cf. *an apple* vs. *a pineapple*). However, in contemporary London English, especially among immigrant youth of colour, the pre-vocalic context exhibits variation between *an* and *a*; both *an apple* [ənæpl] and *a apple* [əʔæpl] are possible (Gabrielatos, Torgersen, Hoffmann, and Fox 2010).

2.8.3 LANGUAGE CONVEYS MORE THAN SEMANTIC MEANING

All kinds of information about people are revealed through the ways they express themselves linguistically.

Much of that information goes beyond the semantic and even pragmatic meaning of the sentences they sign/speak. All kinds of social meanings are revealed through language! Some of this social meaning relates to how language functions in relation to social structures and power. For example, different **forms of address** – that is, labels we use to refer to our interlocutor – in many different languages reflect the social ranks of those involved in the interaction or the social circumstances of the interlocutor. For example, in Canadian English, referring to someone as *sir* or *buddy* reveals several sociological facts including how the speaker perceives the addressee's gender, how the speaker perceives the power dynamic between themselves and the addressee, and how the speaker perceives the formality of the interaction. In fact, language doesn't just reflect these things but also works to enact this kind of sociocultural significance. Imagine you're at a café and you witness a dispute between a male-presenting customer and a barista. At first, the barista refers to the customer as *sir* and says "*sir*, I know you're upset but generally we don't add steamed milk to iced coffees." But, after a few minutes of being yelled at and insulted by the unruly customer, the barista exclaims "listen *buddy*, it's time for you to leave!". This change in form of address, from *sir* to *buddy*, signals a change to the interactional context. The barista signals that they will no longer tolerate being treated poorly and along with that they abandon the general expectation of politeness and formality that comes along with the 'customer is always right' mandate of most service work.

Beyond forms of address, many languages encode information about social structure into pronominal reference. Many Indo-European languages make a distinction between familial/informal/lower rank and formal/polite/higher rank second person, singular pronouns. This is often referred to as a T/V distinction on the model of French's distinction between familial *tu* and formal *vous*. Romance languages like French, Slavic languages like Russian, and Germanic languages like German (and even Old and Middle English!) mark this distinction. If you do not know a language that marks this kind of distinction, its social significance may not seem particularly... significant! But for people who do use languages with such distinctions, the real life consequences of language as it relates to social power is clear.

Language can also tell us something about the cultural values of its users. For example, both what we discuss and with who is culturally-determined. What counts as a **taboo subject** (i.e., an inappropriate topic of discussion) differs by culture and context. In Euro-American culture, it is often considered taboo to talk about sexuality and death around children for example. Connected with this is how we interact: conversational styles (including the amount of interactional overlap, tolerance for interruptions, eye-contact expectations, etc.) are also culturally variable. It's critical for linguists and language-pathologists to be aware of the culturally-specific nature of interactional norms because too often English and Euro-American norms are interpreted as universals and thus, differences from those norms can be misinterpreted as deficiencies. For example, in their exploratory study of First Nations English, language-pathologists Jessica Ball and B. May Bernhardt (2008) note that where silence from a child is often interpreted as an indication of a lack of knowledge, rudeness, or shyness in Euro-American interactional norms, for many First Nations children, their silence is a sign of respect to elders.

Contextual information is another kind of social meaning that is revealed through language and linguistic variation. **Contextual style** is intimately connected with the formality of the interactional context. This formality relates to 1) the familiarity of two interlocutors with one another, 2) the social similarity/difference and power relations between them, and 3) the context of the interaction. Conversations between friends who share common experiences and identities are more likely to have a casual style whereas conversations between strangers of unequal social rank and who share little common ground are more likely to be formal. This varies on a continuum. But what do we mean by formal and casual language? There are several aspects of conversation that are linked with formality including the frequency of use of different variants of linguistic variables. Variants that are standardized tend to be more frequent in formal contexts and variants that are not standardized tend to be more frequent in casual contexts.

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2.9 Child speech and language acquisition

This section looks at how children develop the various components of mental grammar: phonetics, phonology, morphology, syntax and semantics. As we'll see, children's minds are equipped to acquire grammar very quickly as long as they have other language users to observe. Children's rapid language development can look quite magical from the outside, but it results from immense brain activity in response to the language environment, also known as the ambient language, the language used by the family members, caregivers, adults and older children that a child spends time with. The baby brain tracks the patterns in the language environment and uses them to build up the child's own mental grammar. If the language environment is English, the child develops a mental grammar for English. And obviously, children in a Tamil-speaking environment develop a mental grammar for Tamil, children in a Mandarin-speaking environment develop a mental grammar for Mandarin, and so on. If the ambient language is Auslan, then the child will develop a mental grammar for Auslan, regardless of whether they're deaf or hearing. If a child is in an environment where two or more languages are used, they'll develop mental grammars for both those languages.

2.9.1 WHEN DOES LANGUAGE LEARNING START?

Early exposure to language input is super-important because the mind starts building a mental grammar from a very young age. Just how early does language learning start? For hearing babies, it can start even before birth! If we measure the heart rate of a fetus in the uterus, we find that the heart rate increases in response to external sounds at about the seven-month point in pregnancy, so we know that a fetus can hear outside noises even while it's still inside the uterus. Not only can fetuses hear, but they're also remembering some of what they hear: by eight months of pregnancy, a fetus's heart rate increases more in response to their pregnant parent's voice than to a stranger's voice (Kisilevsky et al., 2003). This means they've stored some memory of what their parent's voice sounds like.

Ok, so by looking at fetal heart rates we can conclude that hearing babies have already stored some auditory memories by the time they're born. But that doesn't necessarily mean they have any mental grammar, does it? How can we tell what newborns know about their language? After birth, there are so many more interesting stimuli in their world that measuring heart rate isn't as informative, but they certainly can't tell us what they know. What can we observe that would tell us something about mental grammar?

OBSERVING SUCKING PATTERNS

Babies can't do much, but one thing they're very good at is sucking. Using an instrument called a pressure transducer, which is connected to a pacifier, we can measure how powerfully they suck. When a baby is interested in something, like a sound that she's hearing, she starts to suck harder. If

you keep playing that same sound, eventually she'll get bored and her sucking strength will decrease. When her sucking strength drops off, we say that the baby has **habituated** to the sound. But if you play a new sound, she gets interested again and starts sucking powerfully again. So we can observe if a baby notices the difference between two sounds by observing whether her sucking strength increases when you switch from one sound to the other.

Using this **high-amplitude sucking** habituation method, researchers have found that newborns whose parents speak French notice the difference between French and Russian sentences spoken by the same person (Mehler et al., 1988). The fact that these newborn infants are sensitive to this difference tells us that they must have some memory of the patterns of French, to be able to tell it apart from Russian. What could these babies with French parents have learned about French before they were born? A lot of the sound information they receive in the uterus is quite muffled, but what they do have access to is the **prosody**. The rhythmic pattern of French depends on syllables of similar length, while that of Russian depends on syllable stress. That prosodic rhythm is audible to a fetus in the uterus, so by the time they're born, babies can tell the difference between the rhythm they've heard before and an unfamiliar rhythm.

In fact, if the pregnant parent speaks more than one language, a newborn can even tell the difference between those two languages! In a high-amplitude sucking study in British Columbia, babies born to Thai-English bilingual parents noticed when the spoken language switched from English to Thai (Byers-Heinlein et al., 2010). This suggests that their minds are already starting to set up two different mental grammars for the two languages they'll be acquiring!

So even when they're just born, hearing babies have not only learned what their parent's voice sounds like, they've also already learned some of the **prosody** of the language (or languages!) spoken in their environment.

I also want us to remember, though, that language acquisition is not a race. In some cultures, parents like to believe that their child is "advanced" in some way: smarter or stronger than other babies. Even though this chapter talks about general patterns of acquisition, remember that there is huge variation across individual children, and learning something earlier isn't necessarily any advantage. The reason I mention that here is there's no evidence that a fetus that doesn't have access to speech sounds in utero, either because the fetus is deaf or the parent uses signed language, is disadvantaged in any way. As soon as they're exposed to language in a modality they can access, they start building their mental grammar.

2.9.2 PHONEMIC CONTRAST

There's another part of the mental grammar that hearing babies start to learn well before they can speak. Remember that the phonology of each language is specific to that language: the patterns of which features and segments contrast with each other and which are simply allophones is different in each language of the world. So, for example, we know from that in English, aspirated [p^h] and unaspirated [p] are both allophones of a single phoneme. But in Thai, these two segments contrast with each other and are two different phonemes. The phonetic difference is the same, but how that difference is organized in the mental grammar is different in the two languages. Phoneme contrasts are a classic example of unconscious linguistic knowledge: in all likelihood, nobody ever had to teach you that [k] and [b] are different sounds and that the words *cat* and *bat* refer to two different animals! But if no one ever taught it to you, how did you learn it? How did the phonology

of your first language come to be in your mental grammar? Researchers use a different habituation method for slightly older babies.

OBSERVING HEAD TURNS

This method works on the same kind of logic as the high-amplitude sucking method, but instead of measuring sucking strength, the researchers observe where the child looks. When the sound first starts to play from a speaker, the baby usually looks towards the speaker. Once they habituate to that sound, they get bored and look away. If the next sound that's played is the same as the first one, they stay habituated. But if the next sound is different and they notice the difference, they look back towards the speaker. So just like with the sucking method, if we observe that head-turn, we conclude that they noticed a difference between the two sounds.

Using this technique, linguists and psychologists have learned that babies are very good at noticing phonetic differences, and they can tell the difference between all kinds of different sounds from many different languages.

The research on babies acquiring signed language came later, but it showed exactly the same pattern (Baker Palmer et al., 2012). Babies younger than six months noticed the difference between phonemically contrastive American Sign Language (ASL) handshapes even without any exposure to ASL, just like the babies without Hindi experience noticed the Hindi spoken contrast. By age 14 months, ASL-acquiring babies had retained their ability to recognize phonemically contrastive handshapes, but the English-learning babies without ASL experience had lost that sensitivity.

So for either sign language or vocal language, a child's mind has built up phoneme categories in their mental grammar by about age one, according to the contrasts that they have experience with in their language environment. One thing to note here is that this doesn't mean that it's impossible to learn new phonemic contrasts in a new language, but that later learning will be shaped by the learning that has happened in the first year.

2.9.3 EARLY LANGUAGE PRODUCTION

We learned previously that babies are already learning a lot about their language even before they can talk. If they're learning so much so fast, why don't they talk right away? When babies are just born, their bodies just aren't ready yet. Newborns can certainly cry, which uses the lungs and the vocal tract. But a newborn's larynx is higher in the vocal tract than an adult's: it starts lowering around age six months. And newborns just aren't very good at controlling their bodies yet! It takes them a few months to begin to learn how to move their articulators. They begin to gain control of their fingers, hands and forearms first, and their ability to control their jaw, tongue and lips comes a bit later. So in those first few months after birth, their hand movements and vocal productions are kind of random: mostly wiggling and gurgling.

BABBLING

Once babies start to get their bodies organized, their productions tell us that their mental grammars are starting to get organized, too. Starting around age six months, the sounds babies make begin to have some

syllable structure. They start to produce reduplicated consonant-vowel syllables. Usually the vowel in these syllables is the low [a] made with the jaw fully open, and the consonants are usually voiced stops. Why voiced stops? They're still learning to control their vocal tract, so it's easier to alternate between fully open for vowels and fully obstructed for stops than to produce the consonants with partial obstruction like fricatives or approximants. Same thing for the voicing: if they just keep the vocal folds vibrating for vowels and voiced consonants, it's easier than alternating between voiced vowels and voiceless consonants. So the classic baby babbling sound, which linguists call **canonical babbling**, is [babababa] or [dadadada]. As they continue to grow and gain control of their muscles, they start to vary the vowels and consonants, and their babbles might sound more like [badibadi] or [gudaguda].

Vocal babbling starts at about age six months for both hearing and deaf babies, but deaf babies gradually produce less vocal babbling as they continue to grow. When the language environment is a signed language, babies start to babble using their hands. Both hearing and deaf babies who grow up with sign as an ambient language produce reduplicated syllables using handshapes from the language environment (Petitto et al., 2004; Petitto & Marentette, 1991). Sign-acquiring babies' first productions more often use the **proximal** articulators (the ones closer to the torso, like the elbows and wrists) than the **distal** ones (the articulators farther from the torso like fingers and knuckles) (Chen Pichler, 2012).

So we have some evidence that babbling isn't just random sounds: whether the language environment is vocal or sign, babies start to produce forms that are organized similarly to the language in the environment:

- Their babbles are made up of repeated patterns that have the structure of syllables.
- They alternate between handshape and path movement or between a closed and open vocal tract.
- Their babbles use a subset of the segments/handshapes that appear in the language environment.

So when you see or hear a baby babbling, it might look or sound like random nonsense, but what they're really doing is exercising their mental grammar!

FIRST WORDS

When babies babble, they're practicing making the forms, that is, the signs or sounds of the language they're acquiring. Remember that a word links a form with a meaning. So how can we tell if a child who produces a form has a meaning linked to that form? In other words, how can we tell if they're babbling or producing words? We have to look at the context. If an English-acquiring child says [baba] when they're reaching for their bottle or for a ball then they're probably using that form to refer, so it counts as a word even though it doesn't have the same form that the adult word [barel] or [bal] does. But if they're producing [baba] just for the fun of making the sounds, then their utterance is non-referential, – it doesn't have meaning, so it counts as babbling.

Babies acquiring sign languages often sign their first words at about age 0;8 or 0;9, while it's usually later than that for babies acquiring a spoken language, closer to age 1;0. This difference might be because babies develop muscle control of their hands and arms earlier than of their tongues and lips. It could also be because sign words more often have iconic forms than spoken words.

When children start to produce and understand words, the first words in their vocabulary are quite similar even when we compare across languages and modalities. Usually the first word meanings they acquire are for referring to things that are common and observable in the immediate environment, like names for their family members and pets, the word *baby*, and words for common objects like *milk*, *ball*, *shoe*. It's also common for their first words to include greetings like *hi* and *bye*, and other expressives like *uh-oh* and *no*. If there are verbs in their set of first words, the verbs are likely to refer to actions like *cry* or *eat*.

Of course, because one-year-olds don't have a lot of experience with the world yet, they often haven't got adult-like meanings in their mental grammar. For example, I know a toddler who saw a pumpkin for the first time

and declared, “Apple!”. If the child hasn’t yet got a mental representation for pumpkins, gourds and squashes, they might well **overextend** the meaning of *apple* to include many other roundish fruits. It’s also common for children’s word meanings to be **underextended**, so, for example, the word *elephant* might refer to a particular stuffed animal but not to any other elephants, real ones or toy ones. In short, children develop meanings for words based on their experience of encountering the word in their environment.

Landau and Gleitman (1985) provide some very interesting examples of how children’s word meanings are shaped by their experience of the environment, from their research comparing blind children to sighted children. You might guess that a blind child doesn’t really have a concept for the verb *look*, since they can’t see, but that’s not actually the case. In one experiment, the researchers asked children to “look up!”. Sighted kids tilted their heads to face the ceiling, even if they were wearing a blindfold. But when they asked a blind child, whom they called Kelli, to “look up”, she kept facing forward and put her hands up toward the ceiling! So does that mean that Kelli’s meaning for the verb *look* is the same as for the verb *touch*? In the next experiment, the researchers put an object in front of Kelli and said, “You can touch this but don’t look at it.” She tapped or stroked the object, and then once they told her, “Now you can look at it”, she ran her hands all over the object to explore it. So just like sighted children, Kelli’s mental grammar had two distinct meanings for the two verbs *look* and *touch*. It’s just that her meaning for the verb *look* was different from that of sighted children, since her experience of the world was different.

UNDERSTANDING WORD COMBINATIONS

We’ve seen that babies start to learn the phonology of their first language very early — as soon as they’re born and maybe even earlier than that! And they’re starting to learn some lexical semantics before their first birthday. What about syntax? What do babies and young children know about the syntax components of their grammar? And how can we tell? We know that children start to speak or sign their first word around twelve months, and they start to combine two or more words around eighteen to twenty-four months. But if you’ve ever spent any time with young children, you know that they can understand a lot more than they can say! Their comprehension is often much more advanced than their ability to produce spoken or signed words. But comprehension is much harder to observe. How can we tell what babies and toddlers understand about language?

OBSERVING PREFERENTIAL LOOKING

One simple technique is called preferential looking. In this kind of experiment, researchers use a large screen or television. The baby or toddler sits strapped into a booster seat, facing the screen. The screen is split so that two different pictures appear, one on each side of the screen. While the pictures or are on the screen, a recorded voice speaks a sentence, maybe something like, “Look! Can you find the bear?” The idea is that if the baby understands the word *bear*, they’re going to look at the picture of the bear, not the picture of the bus. The researchers keep track of the direction of the baby’s head-turn, or they use eye-tracking to measure the baby’s eye movements. This kind of experiment has shown that babies pretty reliably look at the named object by about ten months, and even as young as six months, they’re looking at the named object more often than chance would predict. So at the age of six months, babies are already beginning to link up word forms with their meanings.

There’s so much learning happening in that second year. Kids are learning new words very rapidly, and learning how words pattern in the morphological and syntactic behaviour. In fact, by the time they turn

two, kids are sensitive to verb **arguments** and **subcategories** too! In another split-screen experiment (Arunachalam & Waxman, 2010), when experimenters presented the novel verb *mooping* in a transitive frame, like “The lady is mooping my brother,” then two-year-olds looked more often to the scene where one participant is doing something to the other, like pushing. But when the novel verb appeared in an intransitive frame, like “The lady and my brother are mooping,” then the children looked more often to the scene where the two participants are doing the same activity together, like waving. This suggests that, by age two, children are sensitive not only to syntactic categories, but also to subcategories! So to go back to the question we started with, “What do kids know about syntax?” It turns out the answer is that, even before children start combining words to make phrases in their own speech or signing, they already know quite a lot about how words combine in the grammar.

SYNTAX IN EARLY UTTERANCES

Beginning at about age 1;6 to 2;0, most children start to **combine words** into **phrases of two or even three words**. At this early stage, their utterances are usually telegraphic, containing mostly content words like nouns and verbs, with few function words and few inflectional morphemes. It can be hard to figure out whether these short utterances have any syntactic structure to them. Let’s look at some of the evidence.

Corpus data (Stromswold, 1995) show that English-acquiring children start to ask questions not long after they begin combining words in their utterances. Simple questions like, “Where kitty?” and “Who crying?” are common in children’s speech, with the *wh*-word moved to the beginning of the sentence just like in adult English. *Why* questions show up a little later, but as any parent of a preschooler will tell you, the *why* stage feels like it lasts forever!

DEVELOPING WORD MEANINGS

We saw previously that children’s early meanings for nouns are often over- or under-extended. Their concepts become more adult-like as they get more experience of things and categories of things in the world. something something noun classes. There is a difference between **count nouns** like *pencils* and *cookies* and **mass nouns** like *rice* and *money* and different languages encode this meaning distinction using different morphosyntactic strategies. In English, singular count nouns must have a determiner, while plural count nouns can appear without one. Mass nouns, don’t really allow a plural form, but are grammatical without a determiner in their singular form.

These morphosyntactic properties are salient enough that English-acquiring children distinguish between count nouns and mass nouns very early in their productions. Researcher Peter Gordon looked at a corpus of speech from two English-acquiring children between ages 1;9 and 3;6 (Gordon, 1988). He found that even before age 2;0, these children rarely produce pluralized mass nouns. In other words, their speech included many pluralized count nouns like *dogs* and *balls*, but almost no ungrammatical mass plurals like *milks* or *sands*. They did, on the other hand, produce some singular count nouns without determiners (like “I want cookie”), because of the telegraphic nature of their speech. Their production of obligatory determiners for singular count nouns became reliable only after age 3;1. Children’s semantics for gradable adjectives (e.g. big, little) includes some measure of degree along a scale, and the scale they choose depends on the context in which the adjective is uttered.

2.9.4 MORPHEME DEVELOPMENT

During morphological development, morphemes are generally acquired in an invariable order. Despite individual variability, we generally see that Mean Length of Utterance (MLU) range is quite broader and typically developing children generally follow a similar path in terms of approximate age and order of

morpheme acquisition for a their language. As speech pathologists, we need to have knowledge about grammatical development and skills in being able to assess and analyse language to determine whether a child is developing typically (or not). This helps us in analysing potential difficulties the child might encounter, including diagnosing language difficulties.

A useful model to use for the English language is the Stages of Morphological Development proposed by Brown (1973). In this model, 14 English grammatical morphemes are generally acquired and mastered by children in a typical order (dependent on the syntactic and semantic complexity). The order of acquisition may be different for children who speak languages in addition to English, or those who are deaf or hard of hearing. The emergence of these grammatical morphemes generally starts to appear around 2 – 3 years of age when children start combining words and semantic relations.

[Brown's stages of language development](#)

2.9.5 SPEECH AND LANGUAGE MILESTONES

You will find an array of resources in your text books and online that provide summaries of the key speech and language milestones for children. Below are some great resources to use for your learning and future practice:

- [Speech Pathology Australia communication milestones](#)
- [Developmental norms for speech and language](#)
- [Speech sounds development chart](#)
- [Brown's Stages of Syntactic and Morphological Development](#)
- [Age-Appropriate Speech and Language Milestones](#)
- [Physical and cognitive developmental milestones](#)
- [Red Flags Early Identification Guide \(Birth to 5 years\) brochure \(QLD Health\)](#)
- [Developmental milestones \(Australian Government\)](#)

The video below also provides a good overview of some aspects of speech and language development.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=357#oembed-1>

[Speech-Language Pathology: Should I be concerned?](#) by Cincinnati Children's

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[Essentials of Linguistics \(2nd edition\)](#) by Anderson et al. (2022). Licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](#).

CHAPTER 3: AREAS OF SPEECH PATHOLOGY PRACTICE

This chapter introduces students to foundational areas of speech pathology practice including speech, language, voice, fluency, communication (multimodal, augmentative and alternative), and swallowing.

3.1 Speech

3.1.1 WHAT IS SPEECH?

Speech refers to the fluent and precise coordination of the tongue, teeth, lips, palate, jaw, voice and respiratory system to create the sounds of our language. Or more simply, it's the way that we make and use sounds to create words.

Speech is a highly complex process. To send a verbal message that another person can understand, we must first create a mental representation of the words we want to say. We do this by selecting the phonemes required and organising them into the correct sequence (e.g., /k/ /a/ /t/). The brain then creates a motor plan that is sent to the muscles required for speech production. Finally, the plan is executed by the articulators to produce the word (e.g. cat). A breakdown at any of these levels can result in speech sound errors which can make speech difficult to understand and cause frustration for the speaker (Bowen, 2023).

3.1.2 WHAT IS A SPEECH SOUND DISORDER?

Speech sound disorder is an umbrella term used to describe difficulties with either creating or correctly using sounds and syllables within words to produce clear speech (ASHA, 2025a). Speech sound disorders may result from known or unknown origins (Stringer et al., 2024). Speech sound disorders can be present from birth, as is the case with developmental speech sound disorders, or be acquired as a result of a sensory-perceptual difference (e.g., hearing loss), structural differences or origins (e.g., cleft lip), or neurological injury and/or illness (e.g., stroke, a traumatic brain injury, Parkinson's disease). Speech pathologists are the only professionals who can diagnose and treat speech sound disorders.

3.1.3 DEVELOPMENTAL SPEECH SOUND DISORDERS

Developmental speech sound disorders are speech difficulties that have no known cause and are present from birth. In this section, we will explore the 3 main types of developmental speech disorders:

1. **Articulation disorders (due to structural or non-structural origins)**
2. **Phonological disorders**
3. **Childhood Apraxia of Speech**

ARTICULATION DISORDERS

A person with an **articulation disorder** has difficulty physically producing individual speech sounds using the lips, teeth, tongue, palate, voice and respiration (Bowen, 2023). They may distort sounds, as is the case with a lisp, or they might replace sounds they cannot make with ones they can make (e.g., a person who can't say /r/

might say wabbit instead of rabbit). Articulation disorders are considered to occur at the phonetic level, as the difficulty is with coordinating the motor movement required to make the sound.

Some sounds are more difficult to make than others. When children are younger, they will often use easier sounds in place of more difficult sounds. As they gain more coordination over their articulators, they will begin to use the correct sounds. *Age of acquisition* refers to the ages at which children should be able to produce and use each sound correctly. If a child is unable to produce a sound correctly after the sound's age of acquisition, they are considered to have an articulation disorder.

The [Learning English Consonants chart](#) is a useful resource that summaries the age of acquisition for English consonants.

The video below is an example of a child with an articulation disorder.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#oembed-1>

PHONOLOGICAL DISORDERS

A **phonological disorder** is a condition where a person has difficulties using speech sounds where they need to in words, despite the fact that they know how to produce the sounds correctly (Bowen, 2023). It is a difficulty related to understanding the rules and sound patterns of their language.

Remember our discussion of place, manner and voice in [Chapter 2.2](#)? For some children, they have difficulty tuning in to these differences between sounds. For example, the sounds /b/ and /p/ are very similar. They have the same place (they are both made with the lips) and they have the same manner (they are both short, explosive sounds). The feature that makes them different is the voicing: when we say /b/ our voice is turned on, when we say /p/ our voice is turned off. If a child has not yet worked out that in English turning your voice on and off is meaningful (i.e. it can change the meaning of a word) they might consider /b/ and /p/ to be the same and use them interchangeably while talking. In fact, they might do this with lots of sound pairs that only differ in voicing (e.g. /t/ and /d/, /k/ and /g/, /f/ and /v/ etc). This is referred to as a *phonological error pattern* or *phonological process*. That is, the child can make physically make the sounds but does not use them when they should because they do not understand the meaningful sound contrasts in the English language (Bowen, 2023).

Phonological speech errors are a typical part of development. As children develop a clearer understanding of how sounds and words are organised and structured in English, these error patterns are expected to resolve. '*Age of elimination*' refers to the age by which each individual phonological error pattern should have naturally faded away (Bowen, 2023). If an error persists past this age, the child is considered to have a phonological speech sound delay. Some children present with unusual phonological speech patterns that are not a typical part of development. Children who exhibit these atypical phonological processes are considered to have a phonological speech sound disorder. Atypical patterns are highly unlikely to resolve without targeted speech pathology intervention.

Phonological Process	Description	Example	Age of Elimination
Assimilation	When one sound becomes the same or similar to another in a word.	elephant → efefant	3 years
Fronting	When a sound made at the back of the mouth is substituted with a sound made at the front of the mouth.	cup → tup	4 years
Stopping	When a fricative (long sound) or an affricate is substituted with a stop (short sound).	zoo → doo	/f/, /s/ – 3 years /z/, /v/ – 4 years /sh/, /ch/, /dz/, /th/ – 5 years
Gliding	When a glide (/r/ or /l/) is substituted with a liquid (/w/ or /j/).	rabbit → wabbit lick → yick	6-7 years
Deaffrication	When an affricate (/ch/ or /dz/) is substituted with a fricative (long sound).	cheep → sheep	4 years
Cluster Reduction	When a consonant cluster is reduced to a single consonant sound.	spider → pider flying → lying	with /s/ – 5 years without /s/ – 4 years
Weak Syllable Deletion	When an unstressed or weak syllable within a word is omitted.	tomato → mato	4 years
Final Consonant Deletion	When the final consonant in a word is omitted.	been → bee	3 years

Atypical Phonological Processes (ASHA, 2025b)

Phonological Process	Description	Example
Backing	When front sounds are substituted with back sounds.	tip → kip
Initial Consonant Deletion	When the first consonant in a word is omitted.	pool → ool
Medial Consonant Deletion	When consonants in the middle of words are omitted.	ladder → la_er
Sound Preference (aka. phoneme collapse)	When many speech sounds are substituted with a favoured sound.	spill → dill reef → deef lake → dake car → dar
Glottal Replacement	When a sound is substituted with a glottal stop.	sat → saʔ
Vowel Errors	When a vowel substituted for another vowel.	purple → parple

As phonological disorders are language-based speech sound disorders, children with this diagnosis have a higher risk of also experiencing language and literacy difficulties compared to their peers. Early intervention is therefore critical to ensure children have the strongest possible start to their schooling.

Below is a short video of a child with a phonological disorder. Can you work out which phonological processes he has?



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#oembed-2>

[Phonological Processes](#) by Blake Self

Consistent vs Inconsistent Phonological Disorders

Most children present with **consistent phonological disorders**, meaning that they will use the same errors patterns every time they say a word. For example, if a child with the phonological process voicing was asked to say 'pet' three times, they would say 'bet' each time. Children with **inconsistent phonological disorders**, however, will produce words with different errors each time they say them (Dodd et al., 2024). For example, if asked to say 'pet' three times they might say 'bet', 'get' and 'et.' Children with inconsistent phonological disorders are often much more difficult to understand during conversation and require specific intervention targeted at improving speech consistency prior to moving to more classic phonological approaches.

CHILDHOOD APRAXIA OF SPEECH

Childhood Apraxia of Speech (CAS) is a neurodevelopmental disorder that causes difficulties with the programming and planning of the motor movements required for clear speech. People with CAS know what they want to say, but when they go to speak their speech sounds are often jumbled and the way they say words inconsistent. CAS is less common than articulation or phonological speech sound disorders, affecting approximately 1 in 1000 children (McCabe et al., 2024). While many people with CAS do not know the reason for their speech disorders, approximately 33% of cases are due to an underlying genetic difference, such as chromosomal duplication or deletion (McCabe et al., 2024).

To be diagnosed with CAS, a child's speech must meet the following diagnostic criteria:

1. Inconsistent production of consonants and vowels when repeating syllables and words.
2. Lengthened and disrupted coarticulatory transitions between sounds and syllables
3. Inappropriate prosody, including use of unusual stress patterns across words and phrases.

CAS is a lifelong condition but with early intervention speech intelligibility can improve significantly.

Watch this video of child with CAS. Can you understand what she is saying?



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#oembed-3>

[Childhood apraxia of speech 3 year old girl](#) by UrbanKowboy



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#h5p-20>

3.1.4 ACQUIRED SPEECH DISORDERS

Previously in this section you have learned about the practice area of 'speech' including aspects related to developmental speech disorders. Now we will explore acquired speech disorders. **Acquired motor speech disorders** are speech impairments that a child or an adult may develop after birth, typically due to injury, illness, or disease.

Common causes of acquired motor speech disorders include:

1. **Brain injury:** Trauma to the brain (e.g. stroke; traumatic brain injury) can impact areas of the brain and nervous system responsible for motor planning and execution of speech.
2. **Neurological conditions:** Neurological conditions such as Parkinson's disease, multiple sclerosis, dementia or Motor Neuron Disease can affect speech.
3. **Infections:** Illnesses like meningitis or encephalitis that affect the brain may lead to speech issues.
4. **Tumors:** Head and/or neck tumors and cancer interfere with speech.
5. **Surgical trauma:** Surgery involving the head, neck, or brain may result in speech difficulties.

Two main types of acquired motor speech disorders include **acquired apraxia of speech** and **dysarthria**.

ACQUIRED APRAXIA OF SPEECH (AOS)

Acquired apraxia of speech (AOS) (also referred to as verbal apraxia or dyspraxia) is a motor speech disorder that occurs when there is damage to the areas of the brain responsible for *planning, sequencing, and coordinating the movements needed for speech*.

Key features of acquired apraxia of speech include:

- **Speech sound errors:** People with AOS may make different speech errors each time they try to say the same word (i.e. inconsistent speech sound errors) with speech errors commonly characterised by phoneme additions, omissions and/or distortions.
- **Slow rate of speech/segmented speech:** There may be noticeable difficulties initiating speech, as

well as pauses or disruptions in speech, including lengthened and equal stress of syllable segments, and slow rate of speech. (Duffy, 2020)

The video below provides a further summary about the key features of apraxia of speech.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#oembed-4>

[What is apraxia of speech?](#) by Expressable Speech Therapy

DYSARTHRIA

Dysarthria is a group of motor speech disorders that affects the muscles used for the *motor execution* aspects of speech production. This may be due to problems associated with the muscles required for speech movement related to the speech subsystems of respiration, phonation, articulation and resonance. These problems may include muscle weakness, reduced range and strength of movement, increased/decreased muscle tone, problems with coordination. This can affect the person's ability to articulate speech sounds and words clearly; and problems with voice quality, speech loudness, and speech rate. Unlike apraxia of speech, where the issue is with planning and sequencing movements, dysarthria is caused by problems with the muscles themselves or the neurological control of those muscles.

Speech characteristics associated with dysarthria can include:

- Slurred or mumbled speech
- Slow or rapid speech rate
- Weak voice or a breathy, harsh, or nasal tone
- Difficulty pronouncing words clearly

There are different types of dysarthria, depending on which part of the brain and nervous system is affected. Some people may present with mixed dysarthria which may be one or more of the dysarthria types outlined below. Examples of the different dysarthria types include:

Dysarthria type	Nervous system components affected and example aetiologies	Affects on muscle movement	Speech Characteristics
Spastic dysarthria	Bilateral damage to the upper motor neurons (UMNs) of the pyramidal (direct) and extrapyramidal (indirect) pathways (e.g. stroke).	Spasticity, weakness, reduced range of motion, and slow speech movements.	Strained-strangled voice quality, slow rate, imprecise articulation, monopitch, and reduced stress.
Flaccid dysarthria	Damage to the lower motor neurons (LMNs) , which include the cranial nerves (CNs) involved in speech production, the neuromuscular junction, or the muscles themselves (e.g. brain stem stroke; myasthenia gravis).	Weakness, hypotonia, reduced reflexes, and atrophy.	Breathy voice quality, hypernasality, and imprecise consonants.
Hypokinetic dysarthria	Damage to the basal ganglia control circuit , particularly affecting the substantia nigra and its dopamine pathways (e.g. Parkinson's Disease).	Rigidity, reduced range of motion, and difficulty initiating movements.	Vocal tremor, monopitch, reduced loudness, short rushes of speech, and imprecise articulation.
Hyperkinetic dysarthria	Damage to the basal ganglia control circuit , particularly dysfunction in the inhibitory pathways (e.g. Huntington's Disease).	Involuntary movements (hyperkinesia) that interfere with speech production. The movements can be slow (dystonia) or rapid (chorea, myoclonus, tremor, tics).	Irregular articulatory breakdowns, loudness variations, stress variations, voice stoppages or strained-strangled voice quality, intermittent hypernasality.
Ataxic dysarthria	Damage to the cerebellum or its connections (Friedreich's ataxia).	Incoordination, impaired timing, and reduced accuracy of speech movements.	Slurred and imprecise speech, irregular articulatory breakdowns, variable stress patterns, and slow speech rate.
Unilateral upper motor neuron dysarthria	Unilateral damage to the upper motor neurons (UMNs) affecting the corticobulbar pathways that control speech muscles. As most cranial nerves receive bilateral innervation (except for the lower face and tongue), speech deficits are usually milder compared to other dysarthrias (e.g. unilateral stroke).	Unilateral facial weakness.	Imprecise consonants (mild articulatory breakdowns), slow rate and mild harsh voice quality, reduced loudness and occasional hoarseness.

(Duffy, 2020)

The video below provides a good summary of dysarthria.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#oembed-5>



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=143#h5p-18>

3.2 Language

3.2.1 WHAT IS LANGUAGE?

The term **language** refers to a system of conventional (shared) symbols by means of which people, as members of social or cultural groups, use to communicate. Language can be expressed via different modes (American Speech Language Hearing Association, Language in Brief, n.d.):

- Spoken (using speech)
- Manual (e.g., sign languages)
- Written (e.g., text or braille)
- Other methods (e.g., picture symbols)

Receptive language (or *language comprehension*) refers to understanding of information, knowledge and ideas communicated by others.

Expressive language (or *language production*) refers to the ability to convey information, knowledge and ideas to others.

Components of language may be described using:

1. Bloom & Lahey model (Bloom & Lahey, 1978): Form, Content, and Use
2. Language domains (American Speech Language Hearing Association, Language in Brief, n.d.): Phonology, Morphology, Syntax, Semantics, and Pragmatics

Meta-language (or *meta-linguistic*) awareness is the ability to think about and reflect upon language and use this thinking for effective learning. Meta-language includes the awareness of phonological/phonemic, morphological, syntactic, semantic, and pragmatic “rules” of language .

Literacy is a term used to refer specifically to language in written form.

Biological, cognitive, social, and environmental factors influence how language is learned and used. A person with adequate language skills is able to comprehend and produce language to meet their social, cultural, and occupational needs. This includes abilities to across language domains, as well as an understanding of the human factors that influence language, such as motivation, cultural norms, and social roles.

3.2.2 LANGUAGE DISORDER

Language disorder a significant difficulty comprehending, producing, and learning spoken language. Language disorder may affect domains of morphology, syntax, semantics, and/or pragmatics. Difficulty may occur in one or multiple language domains and typically also affects written language comprehension and production (Bishop et. al. 2017). Some people with language disorders may require alternative or augmentative communication (AAC) to support their communication.

People with language disorder may experience difficulties with:

- Comprehending and following spoken and written instructions.
- Putting words into sentences when speaking or writing, for example, saying “He run” instead of “He is running”.
- Learning, comprehending, and understanding new words, for example, has a small “vocabulary” or uses words with incorrect meaning.
- Following conversations or understanding stories.
- Organising and sequencing information when telling or writing stories.
- Understanding social conventions or non-verbal language.

LANGUAGE DISORDER ASSOCIATED WITH BIOMEDICAL CONDITIONS

Language disorder may be associated with a biomedical or condition, for example, intellectual disability, Autism, acquired brain injury, or genetic conditions such as Down Syndrome. In these cases the term ‘language disorder associated with ‘biomedical condition’ is used.

DEVELOPMENTAL LANGUAGE DISORDER (DLD)

Developmental Language Disorder (DLD) is the term used to describe language difficulties that are not associated with another biomedical condition (Bishop et al., 2017; The DLD Project, n.d.)

Developmental Language Disorder is a learning disability that:

1. Is present from an early childhood (i.e., neurodevelopmental disorder).
2. Is persistent across the lifespan (i.e., is ongoing in nature).
3. Has a functional impact (i.e., impacts on a person’s ability to perform daily activities or participate in daily life, school, or work).
4. Is not attributed to another condition which is likely to impact on language development (e.g., intellectual disability or Autism).
5. Is not solely due to cultural and linguistic differences or lack of exposure to language (e.g., hearing loss).

DLD has historically been called by other terms such as specific language impairment (SLI), primary language impairment (PLI), speech-language impairment, or language delay. However, an international consensus study in 2017 adopted the term “Developmental Language Disorder (DLD)” as the internationally accepted term.

DLD may co-occur with impairments in other areas of learning or behaviour, for example, anxiety or depression, Attention Deficit Hyperactivity Disorder (ADHD), word-decoding difficulties/Dyslexia, or speech sound disorders.

Further information on DLD is provided on the Raising Awareness of Developmental Language Disorder Organisation Factsheet: [DLD-Fact-Sheet-V3_original-2023.pdf](#)

Below is a video about Developmental Language Disorder (DLD). This video is produced by the Raising Awareness of Developmental Language Disorder organisation.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=145#oembed-4>

[DLD 1-2-3](#) by RADLD

3.2.3 WORD ENCODING DIFFICULTIES (DYSLEXIA)

Word decoding difficulty is a term used to describe difficulty with word reading and spelling due to deficits within the phonological processing system (i.e., phonological and phonemic awareness difficulties). The term **dyslexia** is also often used to describe word decoding difficulties (Dyslexia SPELD Foundation, n.d.)

People with word decoding difficulty (dyslexia) have difficulties with phonological awareness, phonemic awareness, and sound-letter correspondence. This may result in difficulties reading and spelling single words and comprehending and producing written language.

Phonological awareness is a meta-language skills that involves the ability to recognise and manipulate parts of sentences and words. For example:

- Segmenting words into syllables, for example, identifying that the word “caterpillar” has 4 syllables.
- Identifying words that rhyme, for example, identifying that /brʌʃ/ rhymes with /krʌʃ/.

Phonemic awareness is a meta-language skill that involves the ability to recognise and manipulate individual phonemes (sounds) in words. For example:

- Identifying phonemes in words, for example, identifying that the word /brʌʃ/ ends in the phoneme /ʃ/.
- Blending phonemes to make words, for example, identifying that the single phonemes /b/ /r/ /ʌ/ /ʃ/ combine to make the word /brʌʃ/.
- Segmenting words into phonemes, for example, identifying that the word /brʌʃ/ has 4 phonemes.
- Manipulating phonemes in words, for example, identifying that swapping the phoneme /b/ to /k/ changes the word /brʌʃ/ to /krʌʃ/.

Sound-letter correspondence is the ability to link spoken sounds (phonemes) to written letters (graphemes). For example:

- Identifying that the letters “sh” spell phoneme /ʃ/.
- Identifying that the letter “c” can represent phonemes /k/ or /s/.

Word decoding difficulty (dyslexia) is a learning disability that:

1. Is present from an early (i.e., neurodevelopmental disorder).
2. Is persistent across the lifespan (i.e., is ongoing in nature).
3. Has a functional impact (i.e., impacts on a person’s ability to perform daily activities or participate in daily

life, school, or work).

4. Is not attributed to another conditions which may affect reading and spelling (e.g., hearing loss or low vision).

Word decoding difficulties (Dyslexia) may also co-occur with impairments in other areas of learning or behaviour, for example: anxiety or depression, Attention Deficit Hyperactivity Disorder (ADHD), speech sound impairments, or language disorder.

Below is a video about word decoding/dyslexia. This video is produced by the Dyslexia – SPELD Foundation.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=145#oembed-5>

[Understanding dyslexia](#) by DSF Literacy and Clinical Services

3.2.4 ACQUIRED LANGUAGE DISORDERS

In the sections above, you have learned about language processing and language disorders mainly from a developmental perspective. However, some people may experience neurological injury and damage to the language centres of the brain that results in acquired language disorders. The main acquired language disorder is *aphasia*.

APHASIA

Aphasia is an acquired language disorder caused by neurological injury to the language centres in the brain. This damage may be caused by stroke, head injury, brain tumor, or neurodegenerative disease (e.g. dementia). Aphasia may affects a person's ability to speak, understand language, read, and write (Papathanasiou & Coppens, 2022).

The video below provides a summary of aphasia.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=145#oembed-1>

[Aphasia – the disorder that makes you lose your words](#) by TED-ed

There are different presentations or types of aphasia. These presentations are generally classed as fluent (e.g. Broca's aphasia; global aphasia; transcortical motor aphasia) or non-fluent (Wernicke's aphasia transcortical

sensory aphasia; conduction aphasia; anomic), dependent on which language areas of the brain have been affected.

The video below provides an outline of the *fluent types of aphasia*.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=145#oembed-2>

[Fluent Aphasias made easy: How to distinguish and remember them!](#) by Med School Made Easy

The video below provides an outline of the *non-fluent types of aphasia*.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=145#oembed-3>

[Non-fluent Aphasias made easy: How to distinguish and remember them!](#) by Med School Made Easy



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=145#h5p-15>

3.3 Voice

3.3.1 WHAT IS VOICE?

Your voice is unique to you and is connected with your identity. Our voice expresses a lot of the meaning we want to say to others. We can convey our personality, emotions and general health via our voice and its quality. Everyone has a unique voice and difference voice quality. The quality of our voice is influenced by factors such as the shape and size of the vocal cords, the size of the resonatory space in the vocal tract, and the way the vocal cords vibrate. But how is voice produced? Essentially, voice is produced via the coordinated movement of body structures such as the respiratory system (e.g. lungs, diaphragm) and the phonatory system in the larynx (e.g. vocal cords).

The video below provides an overview of how we produce voice (or vocalisations) and speech.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=149#oembed-1>

[How does the human body produce voice and speech?](#) by National Institutes of Health

3.3.2 VOICE DISORDERS

A **voice disorder** (or **dysphonia**) can be described as where an individual's voice (i.e. pitch, loudness, resonance, or phonatory quality) differs significantly from that of persons of a similar age, gender, or cultural background (Colton et al., 2011).

Below are common terminologies used to describe different aspects voice quality or irregularities in voice production. Analysis of these features, and considering the person's case history, can often assist us with forming hypotheses regarding specific conditions or vocal habits that may be contributing to the voice disorder:

Voice quality terminologies

Pitch refers to how high (upper end of a scale) or low (bottom end of a scale) a sound is perceived by a listener. Pitch is determined by the frequency (measured in hertz – Hz) of the vibrations produced by the vocal cords. When the vocal cords vibrate faster, they produce a higher pitch (like a soprano voice), and when they vibrate

slower, the pitch is lower (like a bass voice). Pitch is the acoustic correlate that allows us to distinguish between a high note and a low note when singing or speaking.

Pitch breaks may when the voice unexpectedly changes pitch, usually during speaking or singing. Typically this happens when the vocal cords suddenly loosen or tighten, leading to an involuntary change in pitch. Examples of when pitch breaks may occur is during puberty or when people have vocal strain (i.e. excessive tightness in the vocal folds preventing smooth and even movement).

Loudness refers to the volume of the voice, or how soft or loud the sound is. Loudness is measured in decibels (dB). Loudness is influenced by the amount of air pushed through the vocal cords and how much tension is applied to them. Louder sounds come from greater airflow and increased tension in the vocal folds, whereas softer sounds come from less air and more relaxed vocal folds.

Resonance refers to the way the sound is amplified and modified by the vocal tract, including the throat, mouth, and nasal passages. These structures act like a resonating chamber, shaping and enriching the sound produced by the vocal cords. Resonance adds richness and depth to the voice. Some people may experience, for example, hypernasality or hyponasality when speaking. *Hypernasality* is when too much air escapes through the nasal passage during speech. *Hyponasality* occurs when there is insufficient airflow through the nose, making the voice sound stuffy or blocked. Changes in resonance also helps determine which speech sound a person is saying (such as 'ah' compared to 'oo')

Quality of voice encompasses several aspects. The following terms relating to the quality of a voice are often used interchangeably when people describe a dysphonic voice. Speech Pathologists typically use a more formal set of terms and definitions to describe voice quality. Here are some examples of these terms:

- **Breathiness** (or breathy voice quality) means there's excess air escaping through the vocal folds when a person is speaking or singing. This can happen if the vocal cords don't close fully during voice production (phonation), allowing air to escape between the vocal folds even though the vocal folds are still vibrating enough to create some voice. A breathy voice often sounds soft and weak.
- **Hoarseness** (or hoarse voice quality) means the voice sounds rough, raspy, or strained, often due to irritation or inflammation of the vocal cords.
- **Roughness** (or rough voice quality) means the voice sounds uneven or harsh, often with irregular vibrations of the vocal folds. This may be due to vocal fold pathology like swelling or nodules. Roughness is similar to hoarseness but may be more pronounced or consistent.
- **Harshness** (or a harsh voice quality) means the voice sounds like it has a sharp or grating quality. Harshness often occurs when the vocal folds are forced together with too much pressure or tension, leading to an aggressive, abrasive sound. For example, this may be caused by vocal strain.
- **Diplophonia** occurs when the vocal cords vibrate at two different speeds which results in the production of two distinct pitches simultaneously. This can give the voice a "double" sound.
- **Vocal fry** is when the voice drops to a low pitch and produces a creaky, crackling sound. It happens when the vocal cords are held loosely together and vibrate slowly, creating a low, gravelly sound. Fry is often used stylistically in speech and has become socially acceptable thanks to a number of social media influencers.
- **Tremor** in the voice is an involuntary, rhythmic variation in pitch or loudness. It can sound like a shaking or quivering voice. Tremor is often associated with neurological conditions (e.g., Parkinson's disease) but can also result from anxiety or fatigue.

(Colton et al., 2011; Gillam & Marquardt, 2016)

Causes of voice disorders

Voice disorders (or dysphonias) can occur across the lifespan due to a range of reasons. For example:

- people who experience neurological or spinal cord injury that affects the cranial nerves that innervate muscles for voice production (e.g. Vagus nerve [cranial nerve X]);
- people who experience head and/or neck cancer and who require surgery and/or chemoradiation;
- people who have a pathology or non-cancerous lesion (e.g. laryngitis, vocal nodules, vocal polyps) that affects vibration of the vocal folds;
- occupational voice users who may experience short or longer term voice difficulties due to voice overuse or misuse (e.g. teachers, vocal performers, media presenters, sports referees, athletes; children who frequently yell or scream).

Categories or classifications of voice disorders

When categorising or classifying voice disorders, this is typically done by exploring and analysing the aetiology (or cause) of the voice disorder. Below are examples of some of the common aetiology-based classifications of voice disorders:

Aetiology	Description and examples
Organic (non-neurological)	Benign or malignant growths or tumors on or near the vocal folds (e.g. papilloma ; granuloma). Ageing voice (presbyphonia) or disuse of vocal cords (e.g. a person who is unable to phonate).
Hyperfunctional	May or may not include vocal fold pathology. Examples of vocal fold pathology are vocal nodules and vocal polyps . Excessive tension in the vocal cords and/or vocal muscles that leads to a strained or harsh voice. May be mechanical and/or functional.
Hypofunctional	May or may not include vocal fold pathology. Reduced tension in the vocal cords and/or vocal muscles that leads to a weak, breathy, or soft voice. May be mechanical and/or functional.
Psychogenic	Conversion Voice Disorder is when the person loses their voice (aphonia) or experiences dysphonia but is unrelated to a physical or structural problem with the vocal cords or vocal tract. Primarily caused or influenced by psychological factors (e.g. stress, anxiety, psychological trauma). Mutational Falsetto is when an adult male, who would typically speak with a lower pitch, continues to use a higher-pitched voice, often as a result of psychological reasons like anxiety or identity challenges.
Neurological/neurogenic	Damage to the brain, cranial nerves and/or spinal cord may lead to dysfunction of the vocal cords and/or vocal musculature/vocal tract. For example, Parkinson's Disease, vocal cord paralysis as a result of stroke, spasmodic dysphonia .
Upper airway disorders	Some upper airway conditions can affect voice production. For example, Paradoxical vocal fold motion (PVFM) is a breathing disorder characterised by approximation rather than abduction/opening of the vocal folds during inspiration. This can result in upper-airway obstruction and stridor.



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3.4 Fluency

3.4.1 WHAT IS FLUENCY?

The term **fluency** refers to the smoothness, ease, and natural flow with which a person speaks.

Fluency or flow of speech generally involves several components including:

1. **Rate:** The speed at which speech occurs, which should neither be too fast nor too slow for effective communication.
2. **Rhythm:** The natural pattern of stressed and unstressed syllables in speech, contributing to the flow of speech.
3. **Pausing:** The ability to use pauses appropriately to separate thoughts or phrases, aiding clarity and comprehension.
4. **Articulation:** The clarity and precision with which speech sounds and words are articulated.
5. **Continuity:** The ability to maintain a steady, uninterrupted flow of speech, without excessive hesitations or fillers (like “um” or “uh”).
6. **Intonation:** The variation in pitch and tone that helps convey meaning and emotion.

A person with good speech fluency can speak clearly, confidently, and in a way that is easy for others to follow. The speech is generally effortless in nature, easy, rhythmical and evenly flowing (Gillam & Marquardt, 2016, p. 195). Conversely, speech difficulties, such as stuttering or frequent interruptions, may impact a person's fluency of speech. It is important to note that we all have normal dysfluencies in our speech from time to time. We do not speak in a perfectly fluent manner all of the time. We use, for example, false starts, hesitations, fillers, revisions and corrections, and repetitions of words and phrases. When interruptions to the flow of speech are consistent, this is when there may be an impairment of speech fluency.

Below is an example from the movie “The King’s Speech” of how interruptions to the flow of speech (e.g. stuttering) can impact speech fluency. For those who are unaware, this movie is about [King George VI](#).



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=151#oembed-1>

[The King’s Speech Trailer](#) by Transmission Films

3.4.2 WHAT IS FLUENCY DISORDER?

A **fluency disorder** is a communication disorder that *affects the flow of speech*. People with fluency disorders may experience disruptions in the normal smoothness or fluency of their speech, making it difficult to speak in a fluid and natural manner. Fluency disorders can be developmental (i.e. starting in childhood), or they may emerge later in life due to neurological (e.g. stroke, brain injury) or psychological factors (e.g. anxiety).

The most common type of fluency disorder is **stuttering**. Another type of fluency disorder is **cluttering**. Stuttering and cluttering differ in their nature and characteristics.

STUTTERING

Stuttering is the most common fluency disorder and involves frequent disruptions in the flow of speech (primary stuttering characteristics). Other physical behaviours (secondary stuttering characteristics) may also be observable. Often stuttering occurs on specific sounds, syllables or words, and it can affect a person's ability to communicate efficiently and effectively, especially in stressful or high-pressure situations.

Primary stuttering characteristics

- *Repetitions* of sounds, syllables, or words (e.g., "I-I-I want to go"; "dino dino dino dinosaur").
- *Prolongations* of sounds (e.g., "sssssssnake").
- *Blocks*, where the person has difficulty starting a word or sound, often leading to a long pauses (e.g. "My name is Lau.....ra")
- *Filler/interjections* to help get through blocks in speech (e.g. "um", "ah")
- *Circumlocutions* of words (e.g. "we went to the, uh the uh the place where there's a big bridge" [avoiding the name of the location])

Secondary stuttering characteristics or behaviours

- *Eye blinking or squinting* (e.g. Repeated blinking or squinting during moments of stuttering).
- *Facial grimacing* (e.g. Tensing the face or making a grimace, such as wrinkling the forehead).
- *Head jerking or nodding* (e.g. A sudden movement of the head, sometimes as a way to "get the words out").
- *Tension in the body* (e.g. Tensing or stiffening muscles, especially in the shoulders, neck, or chest).
- *Speech or physical avoidance* (e.g. Shifting away from eye contact, avoiding certain words or situations, or physically stepping back).
- *Hand movements or gestures* (e.g. Using the hands in exaggerated ways while speaking, sometimes in an attempt to force out the words).

In the video below, Australian music artist, Megan Washington, discusses her personal experiences of stuttering, as well as her interactions with speech pathologists. See if you can observe some of the primary and secondary stuttering characteristics outlined above.



One or more interactive elements has been excluded from this version of the text. You can view them online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=151#oembed-2>

[The thing is, I stutter: Megan Washington at TEDxSydney 2014](#) by TEDxTalks

Reflection

Reflect on how Megan described her experience of stuttering. What were some of the key points and challenges she identified?

Since the video above was recorded, Megan was interviewed as part of the television show, Australian Story. In [this episode](#), Megan outlines her role as Calypso in the animated children's series, Bluey, and how her personal experiences of stuttering have influenced her personally and professionally.

Australia is a global leader in the area of stuttering research. The [Australian Stuttering Research Centre](#) website contains valuable information about stuttering including the onset and impacts, as well as assessment and intervention approaches for children and adults.

CLUTTERING

Cluttering generally is when a person uses a rapid or disorganised speech pattern which is often characterised by unclear, imprecise, slurred or poorly structured speech. People who clutter often speech very quickly, omit syllables or words, or mix elements of words together which makes them sound jumbled. Typically, a person who clutters will not demonstrate physical behaviours associated with their speech (unlike in stuttering). A person who clutters may have difficulty organising their thoughts and they may be unaware of the nature of their disorganised speech pattern.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=151#h5p-13>

3.5 Multimodal Communication (MMC) and Augmentative and Alternative Communication (AAC)

3.5.1 WHAT IS MMC AND AAC?

Multimodal Communication (MMC) is a term for describing the use of different modes of communication (Iacono, 2019). Most people communicate through different modes of communication including speech, writing, facial expression, body language, gestures, hand signs, and symbols/pictures.

Augmentative and Alternative Communication (AAC) is the use of modes of communication that supplement, replace, or facilitate existing spoken language skills (Speech Pathology Australia, 2017). People with limited/no speech or literacy abilities are more reliant on modes of communication such as facial expression, body language, gestures, hand signs, and symbols/pictures.

Augmentative refers to modes of communication that supplement or facilitate spoken language (i.e., AAC is used in addition to spoken language). For example, someone with a speech sound disorder may use both spoken language and AAC to help others understand them, or may only use AAC in particular situations.

Alternative refers to modes of communication that replace spoken language (i.e., someone may always use AAC instead of spoken language).

The purpose of AAC is provide ways for a person to meet all of his/her varied communication requirements as intelligibly, specifically, efficiently, and independently as possible.

3.5.2 TYPES OF AAC

AAC may be described as unaided or aided.

Unaided AAC: Relies on body or hand movements and does not require additional materials/aids. For example, body language, facial expressions and hand/body signs.

Aided AAC: Requires the use of additional materials/aids. Aided AAC can either be high tech or low tech.

- *Low tech:* Uses non-electronic materials. For example, paper-based symbol boards, communication books, or pen/paper to write.
- *High tech:* Uses electronic systems. For example, voice output devices such as a communication system on an I-pad or text to speech functions on a computer.

The types of AAC that a person may use varies widely depending on the individual person's communication needs, abilities, and preferences. Many people use more than one type of AAC for efficient communication. For example, a person may use both signing (unaided) and a high tech voice output I Pad app (aided) in the same conversation. Some people may use different types of AAC depending on the situation or their communication

partner. For example, a child may choose to use a low-tech communication book to communicate with friends in the playground and a high tech text to speech device when speaking in front of the class.

The following video outlines the speech pathologists' role in working with people who require AAC systems to facilitate communication.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=153#oembed-1>

[Speech pathologists and assistive technology](#) by Speech Pathology Australia

3.5.3 WHO USES AAC

Anyone who is not able communicate all their needs effectively across all communicative situations may benefit from AAC.

AAC may be used long-term (e.g., by people with life-long conditions) or may be used temporarily (e.g., whilst someone is recovering from oral surgery).

AAC may be used by people with:

- *Complex Communication Needs (CCN)*. This term used to describe communication difficulties that occur alongside cognitive, physical, perceptual, and/or sensory impairments (Speech Pathology Australia, 2017). For example, people with Cerebral Palsy, Down Syndrome, and Autism often described as having CCN.
- Speech sound disorders.
- Craniofacial anomalies (e.g., cleft palate).
- Acquired brain injury (e.g., stroke or head trauma).
- Degenerative diseases (e.g, multiple sclerosis).
- Selective Mutism or social anxiety.

View the following videos for examples of people using AAC to communicate.

1. Ariel is a child with cerebral palsy who communicates using a voice output device (Dynavox) that she accesses using eye-gaze.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=153#oembed-2>

2. Key Word Sign (unaided AAC) being used to promote language development in babies and toddlers at risk of communication disorders.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=153#oembed-3>

3. Lee Ridley (aka “Lost Voice Guy”) is a non-speaking stand-up comedian who uses a voice out device. Lee’s comedy act won Britain’s Got talent in 2018.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=153#oembed-4>

4. Harper and Angela both use a low tech PODD (Pragmatic Organisation Design Display) book, facial expressions, and body language to communicate.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=153#oembed-5>

5. Bob has aphasia and uses a voice output device (Lingraphica). In this video he is giving a speech at his son’s wedding using AAC.



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3.6 Swallowing

3.6.1 THE SWALLOWING PROCESS: AN OVERVIEW

Swallowing, also commonly referred to as '*deglutition*', is a complex process that involves the coordinated movement of saliva, food or liquid from the mouth to the stomach (Logemann, 1998). It is essential for life, allowing for the intake of nutrients and fluids. This action involves the coordination of multiple muscles in the mouth, pharynx (throat), and oesophagus (food pipe) and is primarily controlled by the central nervous system.

The process of swallowing can be divided into **four main stages** (also referred to as '*phases*'), each with specific functions:

1. Oral preparatory;
2. Oral;
3. Pharyngeal; and
4. Oesophageal.

Each stage involves a combination of *voluntary* and *involuntary* actions that require coordination between various muscles, nerves, and anatomical structures. In the context of swallowing, the terms ***voluntary*** and ***involuntary*** refer to the conscious control of the different stages of the swallowing process.

Voluntary stages: The **oral preparatory** and **oral** stages of swallowing are both *voluntary*, where a person has conscious control over chewing and moving the bolus to the back of the mouth, and a person can stop this at any time.

Involuntary stages: The **pharyngeal** and **oesophageal** stages are both *involuntary*, where swallowing is controlled by automatic processes that do not require conscious input. Once the swallow is initiated and the pharyngeal stage commences, the swallow is no longer under voluntary control and cannot be stopped by the person.

3.6.2 STAGES OF SWALLOWING

1. **Oral preparatory stage:** This is the first phase of the swallowing process, responsible for preparing food or liquid in the mouth to be swallowed. This stage is *voluntary* and involves both sensory and motor functions to ensure that food or liquid is adequately prepared and made safe for the subsequent stages of swallowing. The primary functions of this stage are mastication (chewing) and the formation of a bolus (a ball of chewed food mixed with saliva), which will be moved to the back of the mouth during the oral stage.
2. **Oral stage:** This is a *voluntary* phase of swallowing, and follows on from the oral preparatory stage. Once food is chewed and mixed with saliva to form a bolus, the tongue then controls and pushes it

against the hard palate (roof of the mouth) to the back of the mouth, and once the swallow is triggered, the pharyngeal stage commences.

3. **Pharyngeal stage:** This is an *involuntary* phase where the bolus is propelled through the pharynx (throat) toward the oesophagus (food pipe). During this phase, breathing pauses while the airway is temporarily closed off by the vocal folds to prevent food from entering the trachea (windpipe), while the soft palate rises to prevent food from entering the nasal cavity. Muscle contractions in the pharynx then propel the bolus downwards, ready for the oesophageal stage.
4. **Oesophageal stage:** This is the final stage of swallowing, and is also *involuntary*. The bolus enters the oesophagus, where peristalsis (a wave-like muscle contraction) moves the food downward towards the stomach. The lower oesophageal sphincter (a ring-shaped muscle) relaxes to allow the food to enter the stomach.

The video below provides a descriptive animation of the swallowing processes including the 4 stages of swallowing.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#oembed-1>

[The 4 Stages of Swallowing: Biomechanics and Bolus Movement](#) by Fauquier ENT

3.6.3 DYSPHAGIA: DEFINITION, CAUSES, ASSESSMENT AND TREATMENT

Dysphagia refers to an impairment of the swallowing mechanism that may result in **penetration** or **aspiration** of saliva, food or fluid into the airway (McCarty & Chao, 2021).

- **Penetration** – this is where part or all of the bolus enters the airway to the level of the vocal folds, but not beyond.
- **Aspiration** – this is where part or all of the bolus enters the airway *below* the level of the vocal folds.

Ultimately, dysphagia can be a socially debilitating or even life-threatening disorder, and the person with dysphagia may experience emotions such as anxiety, isolation, frustration, and depression (Newman, 2012). Dysphagia can be caused by a range of conditions affecting the muscles, nerves, or structures involved in the swallowing process. This condition can present as difficulty initiating swallowing, a sensation of food 'sticking' in the throat or chest, coughing or choking while eating and drinking, excessive throat clearing after swallowing, or pain during swallowing. Dysphagia can be classified into two main types: *oropharyngeal dysphagia* (difficulty in the oral preparatory, oral, and pharyngeal stages) and *oesophageal dysphagia* (difficulty in the oesophageal stage). Speech pathologists are involved in the assessment and treatment of oropharyngeal dysphagia, but for someone with oesophageal dysphagia, care is usually transferred to another professional, such as a gastroenterologist.

CAUSES OF DYSPHAGIA

There are many causes of dysphagia, some of which can include the following:

- **Neurological disorders:** Conditions such as stroke, traumatic brain injury, Parkinson's disease, multiple sclerosis, and motor neuron disease (MND) which can impact the strength and accuracy of movement involved in swallowing.
- **Muscle disorders:** Diseases such as muscular dystrophy can affect muscle movement responsible for safe swallowing.
- **Structural abnormalities:** Conditions such as narrowing caused by tissue swelling or tumours can cause obstructions in the pharynx or oesophagus, making swallowing difficult.
- **Aging:** As people age, the muscles and nerves involved in swallowing may weaken or become less efficient, leading to age-related dysphagia.
- **Dementia:** This occurs as cognitive decline impacts the brain's ability to coordinate the complex processes involved in swallowing. As the disease progresses, it can impair a person's ability to recognise food, and also causes deterioration of oral control and the ability to initiate or complete the swallowing process, leading to an increased risk of choking, aspiration, and malnutrition.

Dysphagia can have significant impacts on the wellbeing, nutritional intake, hydration, and quality of life, not only for the person with dysphagia, but also their close social networks. The video below provides insights into what it is like to live with dysphagia.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#oembed-2>

[Swallow: A documentary – Dysphagia](#), by NFOSD Team

DIAGNOSIS OF DYSPHAGIA

To understand dysphagia, it is important to understand the *biomechanics* of normal swallowing. The **biomechanics of swallowing** refers to the study of the physical movements and forces involved in the process of swallowing, and includes the coordinated actions of muscles and tissues in the mouth, pharynx, and oesophagus, as well as the mechanics of bolus formation in the mouth, and bolus propulsion from the mouth to the stomach.

A diagnosis of dysphagia typically involves a detailed clinical evaluation, including a **medical history**, an **oromotor examination**, and sometimes imaging studies like a **videofluoroscopic swallow study (VFSS)**, or a **fibreoptic endoscopic evaluation of swallowing (FEES)**.

A swallowing study or a videofluoroscopic swallow study (VFSS) can help identify the exact stage at which swallowing dysfunction occurs. Treatment depends on the underlying cause and may include speech therapy to strengthen swallowing muscles, changes in diet or food texture, medications, or surgical interventions if there are structural causes.

- **Medical history:** a detailed record of a patient's past and present health, including information about previous illnesses, surgeries, medications, lifestyle factors, family health history, and any ongoing or recent symptoms. Obtaining a comprehensive history helps a SLP assess risk factors, diagnose conditions, and plan appropriate assessment, treatment or management strategies.

- **Oro-motor examination (OME):** a clinical assessment that evaluates the strength, coordination, and function of the muscles involved in movements of the mouth and face, including those used for chewing, swallowing, and speaking. Asking a person to move certain parts of the mouth and face can help to identify impairments that may affect swallowing and speech.
- **Oral trials:** the process of testing a patient's ability to swallow food or fluids safely during a bedside swallowing assessment. Oral trials involve offering the patient small amounts of food or drink, often in different textures or viscosities, to observe their swallowing ability, identify signs of aspiration or choking, and determine either further assessments, dietary modifications or other treatments needed to ensure safe swallowing.
- **Videofluoroscopic Swallowing Study (VFSS):** an imaging procedure that uses real-time x-ray technology to evaluate the process of swallowing. During a VFSS, the patient swallows food or liquid mixed with a contrast material (typically barium) to enable it to be visualised while x-ray images are taken, allowing speech pathologists to observe the movement of the bolus through the mouth, pharynx, and oesophagus to identify any swallowing dysfunction, and consider what treatment options are available.
- **Fibreoptic Endoscopic Evaluation of Swallowing (FEES):** a procedure where a flexible endoscope (a long, flexible tube with a light and camera at the end) is inserted through the nose to visualise the throat and larynx during swallowing. It provides real-time images of the swallow, helping to assess for aspiration or other swallowing difficulties.

The video below provides an example of an *oro-motor examination*.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#oembed-3>

[Clinical Examination for Dysphagia](#) by Medbridge

The video below provides an example of a *bedside swallow screen that includes and oro-motor examination and oral trials*.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#oembed-4>

[Bedside Swallow Screen](#), by Stanford Medicine 25

The video below provides an example of a *VFSS*.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#oembed-5>

[VFSS Swallowing Study: Videofluoroscopic Swallowing Study](#) by Mayo Clinic

The video below provides an example of a *FEES*.



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<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#oembed-6>

[FEES Swallowing Study: Fiberoptic Endoscopic Evaluation of Swallowing](#) by Mayo Clinic

TREATMENT OF DYSPHAGIA

Dysphagia can be treated in various ways depending on its cause, severity, and the specific stage of swallowing that is affected. Treatment typically involves a combination of strategies aimed at improving the ability to swallow safely and efficiently. Here are the common approaches to managing dysphagia:

Swallowing therapy

- *Swallowing exercises:* Speech pathologists may teach exercises to strengthen the muscles involved in swallowing, improve coordination, and reduce the risk of aspiration.
- *Swallowing techniques:* Speech pathologists may train patients in certain techniques which help improve swallowing safety and efficiency by modifying head position or breathing patterns.

Dietary modifications:

- *Bolus modification:* Foods and fluids can be altered to a safer consistency, such as pureeing solid foods to eliminate the need for chewing, or offering thickened liquids, proven to slow fluids down and make them easier and safer to swallow (Newman et al, 2016).
 - [International Dysphagia Diet Standardisation Initiative \(IDDSI\)](#). [IDDSI](#) is an international collaboration of professionals who developed a standardised framework for labelling texture-modified foods and thickened liquids.
 - The framework is designed to avoid the confusion created by variable terminology and definitions to describe modified diets around the world.
- *Dietary restrictions:* In some cases, certain foods may be restricted altogether, or a patient may be

instructed to avoid foods that are difficult to swallow or may pose a risk for aspiration.

Feeding support

- *Assistive devices*: Special tools or adaptive equipment, such as modified utensils, cups, or feeding devices, can help individuals manage dysphagia more easily.
- *Tube feeding*: In severe cases where swallowing is unsafe and eating and drinking orally would pose a risk to the patient, tube feeding may be recommended to ensure nutritional intake. This is usually a temporary solution until the swallowing function improves, but it also may be long-term for patients with chronic or progressive conditions.
 - Nasogastric Tube (NGT): a thin flexible tube that is inserted through the nose, down the oesophagus, and into the stomach. It is used to provide **short term** nutrition for patients who are unable to swallow food and fluids orally.
 - Percutaneous Endoscopic Gastrostomy (PEG): a medical procedure in which a feeding tube is inserted directly into the stomach through the abdominal wall. It is commonly used for **long-term** nutritional support in patients who are unable to swallow safely.

Addressing underlying conditions:

- *Neurological rehabilitation*: If dysphagia is due to neurological conditions (e.g., stroke, Parkinson's disease, or MND), treatment may focus on managing the underlying disorder and improving swallowing through targeted therapy.
- *Occupational therapy / physiotherapy*: In some cases, physiotherapy may be recommended to address posture or coordination issues that affect swallowing function.

Behavioural and compensatory strategies:

- *Postural adjustments*: Adjusting the patient's posture while eating, such as sitting upright or leaning slightly forward, can help facilitate safer swallowing and reduce the risk of aspiration.
- *Compensatory techniques*: These may include strategies to slow down the eating process, such as taking smaller bites or sips, chewing more thoroughly, or swallowing multiple times to clear food from the mouth and throat.

The treatment of dysphagia needs to be individualised, and based on the underlying cause, the specific difficulties a patient experiences, and their overall health. It often involves a multidisciplinary approach, including input from speech-language pathologists, dietitians, doctors, and other healthcare providers to ensure safe swallowing and adequate nutrition and hydration.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://jcu.pressbooks.pub/intro-speech-pathology-practice/?p=155#h5p-17>

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