

Ph.D in Speech-Language Pathology

UNIT 1

SPEECH – LANGUAGE PRODUCTION

Physiology of speech production

- . Physiology of speech – (a) Respiration: methods of respiratory analysis (b) Laryngeal function: Laryngeal movements, vocal resonance (c) Neuromotor mechanism of the articulatory, phonatory & respiratory systems, electrophysiology of the larynx.

Aerodynamics of speech production

- . Aerodynamics of speech production: Upper airway dynamics, lower airway dynamics, aerodynamics of vowels, aerodynamics of consonants: stops, fricatives, nasals.

Acoustics of speech and spectrography

- . Acoustics of speech: Acoustic phonetics: acoustics of vowels, Acoustics of consonants.
- . Spectrography – [a] spectrography in normal speech [b] place, manner, voicing and aspiration identification.
- . Infant cry analyses.

Suprasegmentals

- . Intonation – characteristics, development, tests of intonation.
- . Stress - types (syllable-timed, stress – timed, syllable, word), development, use of stress, physiology of stress, measurement of stress.
- . Rhythm - development, isochrony, measurement of rhythm, rhythm in various languages, tests of rhythm, rhythm in stuttering.

Acoustic correlates in clinical population and research

- . Spectrographic patterns in clinical population: Disorder of voice, phonology & fluency,
- . Applications of spectrography in basic & applied research
- . Suprasegmental features in different types of speech & language disorders – Multi-lingual & cultural variations

UNIT 2

NEUROBIOLOGY OF SPEECH – LANGUAGE, COGNITION AND BRAIN

Neurobiological correlates of speech, language and cognition

- . Neuroanatomical & neurophysiological correlates of speech & language including subcortical mechanisms in (a) Normals- children & adults (b) Persons with language disorders-children & adults
- . Language, cognition & Brain (a) Inter-relationships between language, cognition & brain: neurolinguistics & neural models (b) Cognitive models of language function (c) Neuroanatomical correlates of cognition and language

Influence of aging

- . Neurobiology of aging and its effect on speech & language.
- . Language & cognition – its relationship with aging.

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Cognitive processing

- . Cognitive psychology: Information processing & electrophysiological basis memory & attention processes & its implications for speech and language disorders.
- . Cognitive processes in the acquisition & disorders of language – (a) Role of attention (b) Memory (short-term, verbal, non-verbal) (c) Reasoning, judgement & metacognition.

Assessment

- . Investigative procedures for assessment of speech & language mechanisms (a) Neurological status (b) Biological status.
- . Assessment of cognitive processes with reference to language function.

Intervention

- . Team intervention for cognitive & communicative rehabilitation – (a) Effects of surgical, pharmacological & electrophysiological treatment on language & cognition (b) Cognitive/ metacognitive therapy with reference to language functions.

UNIT 3

SPEECH-LANGUAGE PROCESSING

Neural correlates of speech

- . Processing of prosodic features, hemispheric lateralization, types of dysprosody in various disorders
- . Neural basis of Suprasegmentals & dysprosody

Speech Processing

- . Basic issues in speech perception: (a) Linearity, segmentation, lack of invariance (b) Units of perceptual analysis: phoneme, syllable, word or beyond (c) Variability or perceptual constancy in speech (d) Perceptual organization of speech

Theoretical approaches to speech perception

- . Theoretical approaches to speech perception – (a) Invariant feature or cue-based approaches (b) Motor theory of speech perception (c) Direct-realistic approach to speech perception (d) TRACE

Spoken word recognition

- . Phonetic perception: perception of vowels, stop consonants, nasals, fricatives and other speech sounds.
- . Spoken word recognition – Methodology and issues
- . Visual word recognition – (a) Models & theories (b) Word & non- word naming (c) Acquired dyslexia (d) Role of phonology

Processing linguistic units

- . Perception of phonetic contrasts: native and foreign language contrasts, variable speech signal,
- . Cognitive attributes in infant speech perception
- . Processing prosodic cues
- . Processing of phonological, morphological, syntactic, semantic & pragmatic aspects of language.

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UNIT 4

MAXILLOFACIAL ANOMALIES AND PHONOLOGICAL DISORDERS

Phonology & Phonological processes

- . Phonology –phonological acquisition, phonological disability.
- . Phonological processes – different types, its analysis and phonological process pattern in various communication disorders

Phonological development and Coarticulation

- . Theories of phonological development
- . Metaphon theory
- . Metalinguistic abilities in phonological disorders
- . Coarticulation – Types (anticipatory, carry over), Models (feature based, syllabic and allophonic based, target based, phonologically based) – Physiological studies on coarticulation, effects of coarticulation (position and juncture effect, feature effect, transition effect, direction effect).

Assessment and management of phonological disorders

- . Application of phonological theories in evaluation & management of phonological disorders.
- . Application of metaphon theory to the rehabilitation of phonological disorders.
- . Clinical application of distinctive feature analysis principles, practice and clinical application of phonemic analysis.
- . Coarticulation in speech disorders – measurement of coarticulation and remediation.

Maxillofacial anomalies: Assessment and remediation

- . Maxillofacial anomalies
- . Anomalies related to various articulators & compensatory articulation
- . Acoustical, perceptual & physiological aspects of articulation in subjects with (a) cleft palate (b) glossectomy & mandibulectomy (c) hearing impaired subjects.

Assessment and rehabilitation of Maxillofacial anomalies

- . Velopharyngeal dysfunction – types, assessment and remediation.
- . Rehabilitation in maxillofacial anomalies – medical, surgical, prosthesis and speech therapy.

UNIT 5

CHILD LANGUAGE DISORDERS

Language acquisition and models

- . Current theories of language acquisition
- . Models of language acquisition and their applications in child language disorders.
- . Present status & prospects of child language disorders.

Language disorders in children

- . Developmental and acquired language disorders in children- Linguistic, pragmatic, prosodic, behavioral and literacy characteristics in children with: (a) Mental Retardation (b) Hearing Impairment (c) Autism and Pervasive Developmental disorders (d) Specific Language Impairment (e) Aphasia (f) Dyslexia (g) Attention Deficit Hyperactivity Disorders (h) Seizure and other related disorders

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Psycholinguistic and neurolinguistic correlates in child language disorders

- . Psycholinguistic, neurolinguistic and cognitive processes in child language disorders.

Assessment and Management of child language disorders

- . Co-morbidity of child language disorders – Differential diagnosis & assessment of: (a) Cognitive – linguistic (b) Psycholinguistic & (c) Neurolinguistic parameters.
- . Management- medical, surgical, linguistic, behavioral, remedial, physio-occupational & special educational perspectives.

Multilingual and multicultural issues

- . Multilingual & cultural issues and its relevance in:
[a] assessment of child language disorders
[b] management of child language disorders

UNIT 6

FLUENCY AND ITS DISORDERS

Aspects of fluency disorders

- . Factors affecting development of and dimensions of fluent speech
- . Physiological, linguistic, prosodic basis of fluency & its disorders.
- . Auditory processing in fluency and its disorders.
- . Theories of fluency disorders - Recent advances.

Articulatory and Laryngeal dynamics in fluency disorders

- . Articulatory dynamics in fluency disorders.
- . Laryngeal dynamics in fluency disorders.

Processing in fluency disorders

- . Neurological processing in fluency disorders
- . Speech motor control in fluency disorder.

Assessment and management - fluency disorders

- . Severity of stuttering - Theoretical foundations for assessment & methods.
- . Prevention, relapse of stuttering & related issues.
- . Therapies of fluency disorders - Recent advances.

Cluttering and efficacy of fluency therapies

- . Cluttering - Recent advances.
- . Efficacy of fluency therapies.

UNIT 7

APHASIA AND ADULT LANGUAGE DISORDERS

Aphasia and non-aphasic language disorders

- . Classification systems in Aphasia - Cortical v/s subcortical types - Traditional v/s linguistic approaches
- . Non-aphasic language disorders in adults-causes, types, characteristics & classification of: (a) Traumatic Brain Injury (b) Dementia (c) Acquired Dyslexias (d) Alcohol induced language disorders (e) Metabolic disorders of language

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Cognitive-linguistic impairments

- . Linguistic impairments in Aphasia - Phonological, semantic deficits, agrammatism & paragrammatism.
- . Non-linguistic impairments in aphasia
- . Cognitive-linguistic-communicative impairments in non-aphasic language disorders in adults
- . Semantic disabilities - types of semantic disability, semantic analysis of disordered speech and language.
- . Pragmatics –pragmatic disability and their types.

Assessment

- . Investigative & assessment procedures in clinical aphasiology – (a) Language tests (b) Linguistic analysis-subjective/objective tests (c) Functional profiles.
- . Differential diagnosis of non-aphasic language disorders in adults on the basis of neurodiagnostic, cognitive, linguistic, communicative speech - motor and behavior deficits.
- . Assessment of non-aphasic language disorders in adults-procedures for neurological, cognitive - linguistic, communicative, speech motor and behavioral measurements.

Management

- . Management of aphasia - Neurological, linguistic & communicative, physiotherapeutic, vocational & social aspects.
- . Management of non-aphasic language disorders in adults-Interdisciplinary approach – (a) Pharmacotherapy (b) Behavior therapy (c) Physiotherapy (d) Cognitive and communicative rehabilitation procedures.

Other issues

- . Aphasia in multilinguals, illiterates, left-handers & sign language users, right hemisphere disorders, schizophasia, traumatic brain injury (TBI), primary progressive aphasia (PPA) & language disorders.

UNIT 8

VOICE AND ITS DISORDERS

Vocal fold physiology

- . Vocal fold physiology, neurophysiology of the Larynx, vibratory modes of vocal folds
- . Models of vocal fold vibration - one-mass model, two-mass model, multiple mass model
- . Development of the vocal fold
- . Mechanical properties of the vocal fold
- . Measurement of vocal fold vibration
- . Electroglottography in understanding the movements of the muscles of vocal folds.

Pathophysiology of voice

- . Pathophysiological changes in different voice disorders.
- . Acoustical, aerodynamic & perceptual aspects of pathological voices.

Assessment of voice and its disorders

- . Voice evaluation: Aerodynamic tests - vital capacity, mean airflow rate, maximum duration of sustained blowing.
- . Tests for assessing functions of the resonatory system, acoustic analysis, psychoacoustic evaluation and tests for laryngeal measurements (Model frequency, frequency range, Jitter, Intensity, Intensity range, Shimmer, Glottogram, Harmonic analysis) and other measures (LTAS, Nasality Measurements).

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Management of voice and its disorders

- . Ageing and voice disorders. Management.
- . Neurogenic voice disorders. Differential diagnosis and management.
- . Endocrinal voice disorders & voice disorders related to transsexuals.
- . Rehabilitation of laryngectomee – Recent advances.
- . Acoustical, perceptual & physiological aspects of laryngectomee speech.
- . Medical and surgical intervention in voice disorders.
- . Vocal rehabilitation

Professional voice users

- . Elite and non elite professional voice users – causes, prevention, remediation, vocal hygiene, vocal exercises.
- . Respiratory & phonatory bases of singing
- . Posture, resonance and articulation issues related to professional voice and its care.

UNIT 9

MOTOR SPEECH DISORDERS

Sensory motor bases of motor speech disorders

- . Correlates of oral sensor- motor dynamics
 - (a) Neural substrates
 - (b) Findings in dysarthrics and apraxics.

Motor speech control

- . Models of speech processing in motor speech disorders
- . Their relevance in understanding Dysarthria and apraxia.

Types, Assessment and management of Dysarthria

- . Dysarthria in children & adults –types
- . Assessment of dysarthria: methods, differential diagnosis between age related changes and motor speech disorders.
- . Management - Prosthetic, medical & surgical management (a) Issues related to vegetative therapy/sensory motor training for oral musculature (b) Principles of physiotherapy & occupational therapy in speech therapy (c) Speech correction – facilitatory approaches & compensatory approaches.

Types, Assessment and management of Apraxia

- . Apraxia: verbal and nonverbal in children & adults –types
- . Assessment of apraxia: methods, differential diagnosis
- . Management – Various approaches, specific and non specific remedial approaches

Dysphagia

- . Normal swallow physiology and stages of swallow
- . Dysphagia in children & adults: Etiology, types
- . Assessment – Objective and subjective methods
- . Remediation: Surgical options, Direct and indirect management options

UNIT 10

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION

Components of AAC

- . AAC components – Classification, Symbol sets and systems
- . Aided AAC – Types, and their structure: Standardized & non-standardized.
- . Unaided AAC- Types and their structure

Technology and other issues in AAC

- . Technology in aided and unaided AAC: Low and high tech aids
- . Relevance of electronics & computers – high tech aids
- . Technology in Indian context.

Language issues in AAC

- . Processing of signals, signs & symbol in AAC users.
- . Inner language, comprehension and use of language in:
 - [a] Unaided AAC users and
 - [b] Aided AAC users
- . Multilingual and multicultural context

Assessment in AAC

- . Models and Types of assessment
- . Selection of modes,
- . Vocabulary selection/language & oral/motor considerations
- . Applicability with different speech-language disorders

Management in AAC

- . Team effort in the implementation of AAC.
- . AAC: general intervention principles in different types of speech-language disorders.
- . AAC intervention for children & adults with communication disorders – Type specific selection considerations.
- . Partnership issues and generalization.
- . AAC in Indian context.