

Speech-Language Pathology/Audiology
Comprehensive Examination Study Guide
Revised December 2009

STUDY QUESTIONS FOR SLP COMPS

CATEGORY I: NORMAL PROCESSES

Anatomy and physiology of the speech and hearing mechanisms, including speech production. *This category of comps will contain no questions on disorders.*

1. **Respiration** Be able to describe the anatomy and physiology of respiration in as much detail as possible, starting with muscles of the abdomen and going up through the thorax and larynx (for the larynx, mention only those portions which are important for quiet breathing). Please note that for this section, we are NOT interested in how the larynx accomplishes phonation -- only how it works to support quiet breathing vs. breathing for speech (phonation will be covered in the next item).

You might want to organize your answer according to the following outline -- use the Roman numerals and letters as shown here. If you write the answer out using a list format, remember that you also need to be able to describe everything here in paragraph form, if called for.

I. Anatomy

- A. Abdomen (bones, cavities, soft tissues including membranes & muscles)
- B. Thorax (same)
- C. Lower neck and larynx (same)

II. Physiology

- A. How the system works from bottom to top during quiet breathing, inhalation and exhalation.
- B. How the system works from bottom to top to accomplish "speech breathing" during speech production. Be sure to note in this section if and how the actions of each part of the system (and the ratios of inhalation and exhalation) are different for speech breathing as opposed to quiet breathing. (Remember, for this part of your review, do not discuss phonation in detail for the larynx -- just give a general description of what the job of the larynx is with regard to breathing for speech, including protecting the airway.)
- C. In your physiological descriptions, be sure to mention both passive and active mechanisms, and identify them as such.

Sample comps question: *Describe the anatomy and physiology of one cycle of quiet breathing, from abdomen to tip of the nose, including telling how passive as well as active mechanisms contribute.*

2. **Phonation.** Be able to describe the anatomy and physiology of the larynx in as much detail as possible (bones & cartilages, muscles, folds, nerves, etc.). Organize your answer according to the following outline -- again, use the Roman

numerals and letters as shown here, and if you do use a list format, also be able to write everything out in paragraph form if called for:

I. Anatomy

- A. Cartilages and bones (go from bottom to top)
- B. Extrinsic laryngeal muscles (names and attachment points)
- C. Intrinsic laryngeal muscles (names and attachment points)

II. Physiology

- A. Describe how all this anatomy works to achieve a very simple act of phonation, such as in producing voicing for a sustained vowel

/a/. (If a particular part of the system is more or less relaxed for this type of phonation, be sure to mention that.) As part of this section of the answer, be sure to mention and define briefly the “myoelastic aerodynamic theory” and the Bernoulli effect, and tell how they relate to phonation. Also be able to explain “why” these this theory was needed -- why couldn’t neural commands simply be sent to the muscle for each and every vocal-fold cycle, 150 times a second for a 150 Hz frequency, 200 times a second for a 200 Hz frequency, etc.?

- B. Describe how the parts of this system would be manipulated in order to make

the following speech gestures:

1. change the pitch of the /a/ downward (as when you want to make a “valley” in your vocal melody)
2. change the pitch of the /a/ upward (as at the end of a question)
3. change the intensity of the /a/ to make it softer, or even whisper instead of phonating
4. change the intensity of the /a/ to make it louder or even shout it while holding pitch constant

Sample comps questions: 1) Explain the myoelastic-aerodynamic theory of voice production. 2) Describe what must occur done in order to change voice pitch & intensity.

3. **Swallowing.** Describe (in detail!) the stages of a normal swallow.

Sample comps question: Describe the stages of a normal swallow.

4. **Resonance and articulation** Be able to describe the anatomy and physiology associated with speech resonance and articulation in as much detail as possible, starting with the laryngopharynx and ending with the lips/nostrils.

Organize your answer according to the following outline -- use the Roman numerals and letters as shown here, and if you use a list format, be sure you can also write everything in paragraph form if called for:

I. Anatomy

- A. Pharyngeal cavities (what are their names?) -- muscles & other features, such as connection between pharynx and middle ear
- B. Oral cavity -- framing bones, muscles & other features
- C. Nasal cavity -- framing bones, muscles & other features, including division from (palate) and connection to (VP port) oral cavity

II. Physiology

- A. Describe the source-filter theory of speech production in general terms. (The following items give you details for specific examples.)
- B. Describe how the speech-production system described in Anatomy above is manipulated to make the different vowels -- highlight just those parts that are needed to distinguish between vowels, and tell how they do it; also tell what needs to be done so that all vowels are kept non-nasal, and what has to be done to nasalize a vowel.
- C. Describe how this system works to create the stop consonant /t/ and then to make a separate production of the stop consonant /g/. Highlight just those parts that are needed to make each consonant, and how they create the difference between the two. At the end, tell whether and how the larynx is involved or contributes to this type of production.
- D. Describe how this system works to create a nasal consonant such as /m/, and then to make a separate production of /n/. Highlight just those parts that are needed to make each consonant, and how they create the difference between the two. At the end, tell whether and how the larynx is involved or contributes to this type of production.

E. Describe how this system works to create a fricative consonant such as /f/, and then to make a separate production of /s/. Highlight just those parts that are needed to make each consonant, and how they create the difference between the two. At the end, tell whether and how the larynx is involved or contributes to this type of production.

Sample comps questions 1) Describe the active and passive mechanisms that allow the VP port to be opened and closed, and identify which is which.

5. Articulatory phonetics -- sound labels & classes In the Speech Science course we reviewed two versions of articulatory phonetics: (1) the conventional one, based on four features for vowels (tongue advancement & height, tension, lip rounding) and 2) a voice-place-manner designation for consonants.

Using the outline given below: a) first list all the English phonemes included under that general class (vowels, laterals & glides, etc.); b) then for each phoneme, give its designation according to the conventional system.

- A. Vowels
lips
tongue)
1. 4-feature system (sample: /u/ is a high back tense vowel produced with rounded; “high back” refers to the position of the dorsum of the tongue)
- B. Liquids & glides
tongue tip
1. voice-place-manner system (sample: /l/ is a voiced liquid with the touching the alveolar ridge briefly, and held open at the sides)
- C. Nasals
1. voice-place-manner system (sample: /m/ is a voiced bilabial nasal)
- D. Fricatives
fricative)
1. voice-place-manner system (sample: /v/ is a voiced labiodental)
- E. Stops (plosives)
1. voice-place-manner system (sample: /p/ is a voiceless bilabial plosive)
- F. Affricates
affricate)
1. voice-place-manner system (sample: /dz/ is a voiced linguopalatal)

Sample comps question: Describe the phonemes ____ and ____ according to the voice-place-manner system of articulatory phonetics.

6. **The auditory system – peripheral.** Be able to describe the anatomy and physiology of the peripheral auditory system in as much detail as possible, starting with the pinna and going through to the VIIIth nerve.

Organize your answer according to the following outline, but be able to answer any portion in paragraph form if called for:

I. Anatomy

- A. Outer ear
- B. Middle ear
- C. Inner ear (describe the vestibular portion briefly, but spend most of your time on the hearing portion; also explain how the VIIIth nerve makes both afferent [inner hair cells] and efferent [outer hair cells] contacts within the cochlea)

II. Physiology (in each case, summarize the function(s), and describe how they are

accomplished, and for each one, be sure to talk about the ways that sound frequency is involved and/or coded)

- A. Outer ear
- B. Middle ear
- C. Inner ear

III. Assessment

- A. Outer ear
- B. Middle ear (behavioral tests; physiological “objective” tests)
- C. Inner ear (behavioral tests; physiological “objective” tests)

Sample comps questions: 1) Describe how the middle ear accomplishes its “transformer” function, and why this is important for hearing. 2) List and explain very briefly the available physiological tests for middle- and inner-ear function. 3) Describe the anatomical and physiological mechanisms responsible for otoacoustic emissions, by telling how they are produced: a) how are spontaneous emissions produced by the ear? b) how are evoked emissions produced by the ear?

7. **The auditory system -- central** Be able to describe the anatomy of the central auditory system in as much detail as possible, starting with the entry of the VIIIth nerve into the lower brainstem, and continuing into association auditory cortex.

Organize your answer according to the following outline -- use the Roman numerals as shown here; if you use a list format, also be able to write out everything in paragraph form if called for:

- I. Brainstem: entry point of the VIIIth nerve, and brainstem centers and pathways (any crossings? -- if so, name and describe where they are)
- II. Auditory portions of the diencephalon (any crossings? -- if so, name and describe where they are)
- III. Auditory cortical areas (give Brodmann numbers; any crossings? -- if so, name and describe where they are)
- IV. Assessment
 - A. Brainstem (what physiological tests?)
 - B. Diencephalon (what physiological tests?)
 - C. Cortex (physiological tests; behavioral tests) [CAPD will be covered in a later section]

Sample comps question: Describe the auditory system from VIIIth nerve to association cortex; include the names of nuclei and fiber tracts, and tell which are which. Identify the points of right-left crossing, including the amount of exchange involved at the first major crossing.

8. **The nervous system in general:** Be able to discuss the anatomy of the nervous system according to the following outline.
- I. Spinal cord
 - A. Numbers and categories of spinal nerves (cervical, thoracic, etc.)
 - B. Cross-section of cord: spinal nerves, dorsal & ventral roots, other anatomical subdivisions of the cord (how do these match up with sensory vs. motor function?)
 - C. How is the cord important for speech?
 - II. Cranial nerves
 - A. know by number, name, and function
 - B. be able to identify which are important for hearing & speech, and how
 - III. Cranial central nervous system (CNS)
 - A. brainstem -- names of parts
 - B. diencephalon -- names of parts (including thalamic nuclei)

- C. cerebral hemispheres -- names of parts (including: cerebral ventricles, basal ganglia, internal & external capsule, arcuate fasciculus, corpus callosum, cerebral cortex with names of gyri important for speech areas)
- D. arterial supply of brain
- E. surface anatomy of brain -- names of fissures, lobes, general function by lobe
- F. primary and association areas; Broca's area & Wernicke's area (know Brodmann numbers for all these)

Sample comps question: Name and describe the "geography" of the lobes of the cerebral cortex, and tell which major functions (vision, audition, somatosensation, motor control) are located in each. Identify in which lobes Broca's area and Wernicke's area are located.

9. **Normal development, prenatal.** Describe head and neck embryology as it impacts on structures for speech and hearing. This should include discussion of the branchial apparatus (arches, grooves, pharyngeal pouches, and nerves) with identification of which portions give rise to which structures in the adult. Describe how and when midline structures in the head and neck are formed.

Sample comps questions: 1) Describe the process of midline closure involving the mouth. Tell at what time in prenatal development this occurs, 2) List the branchial arches, and name the nerve plus 2 bones or cartilages for each.

SPEECH ACOUSTICS & SPEECH PERCEPTION

1. **General acoustics:** In Speech Science we said that all sounds, whether speech or non-speech, can be analyzed as consisting of just three types of acoustic events, which can either occur alone, or in different combinations -- and they can occur simultaneously, or one at a time in sequence. To organize your answer, use the following outline. First name the three types of events, then describe each of them as shown below. You should be able to write out any section of this outline in paragraph form:

I. Names of the three types of acoustic events.

II. Descriptions of the three types of events

A. Type One (use the name here)

1. Appearance on a waveform (add a drawing, if you like)
2. Appearance on a spectrogram (“)
3. Environmental (non-speech) example
4. Example from speech (alone/simultaneous/sequential --

whichever are

possible)

5. Periodic or aperiodic? (give definition, then answer)
6. Does the distinction between simple vs. complex tone apply to

this type

of event? (if so, give definition then answer the question, giving examples from nonspeech sounds, speech, and sounds used in audiology)

B. Type Two (use the name here)

1. Appearance on a waveform (add a drawing, if you like)
2. Appearance on a spectrogram (“)
3. Environmental example
4. Example from speech (alone/simultaneous/sequential?)
5. Periodic or aperiodic?
6. Does simple vs. complex tone apply? (if so, give examples as

noted in

#6 above)

C. Type Three (use the name here)

1. Appearance on a waveform (add a drawing, if you like)
2. Appearance on a spectrogram (“)
3. Environmental example
4. Example from speech (alone/simultaneous/sequential?)
5. Periodic or aperiodic?
6. Does simple vs. complex tone apply? (if so, give examples as

noted

in #6 above)

Sample comps question: Name the three types of acoustic events, and give two environmental examples of each. Then analyze the phoneme /f/ in these terms.

2. **Acoustic phonetics.** For each of the following classes of speech sounds, be able to describe briefly how they appear on a waveform and on a spectrogram. Also, for each, tell whether spectral or temporal cues are more important (or, if they are equally important), and briefly describe what the distinguishing cues are for each set of sounds, whether one type or several. (Examples might be -- center frequency of formants, timing between onset of burst and onset of

voicing, etc.). If a set of sounds includes both voiced and voiceless versions, be sure and talk about each of these under each of the headings for that set.

Organize your answer according to the following outline: Use the letters and numbers as shown here (for the “cues” portions, use the breakdown of features modeled for you in Speech Science class). If you use a list format to organize these topics, you should also be able to write out everything in paragraph form if called for:

A. Vowels

1. appearance on a waveform (add a drawing, if you like)
2. appearance on a spectrogram (“)
3. cues: spectral vs. temporal

B. Consonants -- liquids and glides

1. appearance on a waveform (add a drawing, if you like)
2. appearance on a spectrogram (“)
3. cues: spectral vs. temporal

C. Consonants -- nasals

1. appearance on a waveform (add a drawing, if you like)
2. appearance on a spectrogram (“)
3. cues: spectral vs. temporal

D. Consonants -- fricatives

1. appearance on a waveform (add a drawing, if you like)
2. appearance on a spectrogram (“)
3. cues: spectral vs. temporal

E. Consonants -- stops/plosives

1. appearance on a waveform (add a drawing, if you like)
2. appearance on a spectrogram (“)
3. cues: spectral vs. temporal

F. Consonants -- affricates

1. appearance on a waveform (add a drawing, if you like)
2. appearance on a spectrogram (“)
3. cues: spectral vs. temporal

Sample comps question: Give a complete acoustical description of the phonemes /k/ and /s/ including how they can be distinguished on the basis of their acoustics.

3. **Phonetic transcription.** Be able to provide a broad transcription of any English word or phrase using the International Phonetic Alphabet, including indication of stress for any word of two or more syllables.

Sample comps question: Transcribe the following words and phrases:

Minds are like parachutes, they only function when open.

Dedication

Seattle

*United
Sanctuary
Bungalow
Julia
Convoy*

You should also be able to provide a narrow transcription, to capture a specific dialectal feature or any characteristic of the sound.

Sample comps question: *Transcribe the following phrases:*

1. *Monkey named Monte (All vowel following nasals are nasalized)*
2. *Suzy sells seashells by the seashore (produced with dentalization of all unvoiced, lingua-alveolar fricatives)*
3. *Tooth fairy costume (All fricatives have nasal emission)*

CATEGORY II: EVALUATION AND INTERVENTION

The Evaluation and Intervention section of the comprehensive evaluation includes short answer, listing, and essay style questions. The questions cover the diagnosis and treatment of all communication disorders across the life span, infancy through elderly. Disorders of communication include articulation/phonological disorders, voice disorders, fluency disorders, and language disorders. A listing is attached.

You should be prepared to identify appropriate diagnostic protocols including formal instruments and informal procedures. The questions will describe the disorder, the age and sex of the client, and any pertinent history. Be ready to name the tests, describe any informal procedures, and the sequence of administration.

You should be prepared to design a remediation plan for a given patient. The questions will provide a scenario including diagnostic information and other identifying factors such as age, and positive history. You will be specifically asked for treatment goals, or options. Published treatment programs with which you are familiar can be included in your remediation plans. Then you will need to be able to describe specific treatment techniques for targeted concerns. For example, techniques associated with various voice disorders to raise pitch or increase loudness.

Other questions will ask for information related to the diagnostic structure such as standardization, reliability, validity, norm references, criterion referenced, etc.

The last question always includes reviewing a diagnostic evaluation report. You will be provided the case history and results sections. Your job will be to write the Summary and Recommendations section of the report. You will also write the suggested therapy goals, if appropriate.

The best study guide will be to review the text used in the introductory course for the major. Though limited in depth, it does include all of the basic information for all sections of the test. You can read parts and then seek the in-depth information from the particular courses dealing with each disorder area.

DISORDERS MAY INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

- Articulation
- Phonological
- Voice
- Fluency
- Motor speech disorders
- Speech and language disorders associated with
 - aphasia
 - cleft palate
 - cerebral palsy
 - mental retardation
 - autism
 - stroke
 - traumatic brain injury
 - progressive neurological diseases
 - dementia
 - common genetic syndromes
- Dysphagia
- Language learning disabilities
- Central auditory processing disorder
- Prematurity in infants
- Laryngectomy
- Velopharyngeal insufficiency
- Elective mutism

**CATEGORY III:
SPECIFIC DISORDERS**

(Etiology, Behavioral Characteristics, and Types)

A. Aphasia, including TBI

- 1. Definitions and Distinctions**
 - A. Define Aphasia
 - B. Differentiate between acquired and developmental language disorders.
 - C. Differentiate among aphasia, dementia, TBI, and right-hemisphere syndrome.
- 2. Classification (category-type-subtype)**
 - A. Major Types

1. Cortical Syndromes
 2. Subcortical Syndromes
 3. Fluent Aphasias
 4. Nonfluent Aphasias
- B. Subtypes
1. Cortical Syndromes
 - a. Broca's aphasia
 - b. Wernicke's aphasia
 - c. Conduction aphasia
 - d. Anomic aphasia
 - e. Transcortical motor aphasia
 - f. Transcortical sensory aphasia
 - g. Global aphasia
 2. Subcortical Syndromes
 - a. Anterior capsular/putaminal aphasia
 - b. Posterior capsular/putaminal aphasia
 - c. Global capsular/putaminal aphasia
 - d. Thalamic aphasia
 3. Fluent Aphasias
 - a. Anomic aphasia
 - b. Conduction aphasia
 - c. Transcortical Sensory aphasia
 4. Nonfluent Aphasias
 - a. Broca's aphasia
 - b. Global aphasia
 - c. Transcortical Motor aphasia
3. **Etiology**
- A. Stroke (types, causes, and symptoms)
 1. Ischemic: reduced or interrupted blood supply because of a *thrombosis*, often associated with *arteriosclerosis* or *embolism*
 2. Hemorrhagic: ruptured cerebral blood vessel causing *cerebral hemorrhage*
 - B. Traumatic Brain Injury (TBI)
 1. Penetrating (open): skull is fractured and meninges are torn
 2. Nonpenetrating (closed): meninges are intact although skull may be fractured or intact
 - C. Brain Tumor
 1. Primary: tumors originally grown in the brain
 2. Metastatic: tumors migrated into the brain
 3. Meningiomas: tumors within the meninges
 - D. Toxicity
 - E. Infections
 - F. Metabolic Disorders

- G. Nutritional Disorders
4. **Symptoms**
- A. Primary Symptoms
1. Auditory Comprehension Deficit
 - a. Auditory Agnosia
 - b. Auditory Verbal Agnosia
 2. Fluency Problems
 3. Impaired Repetition
 4. Word Finding Problems
 5. Agrammatism
 6. Alexia
 7. Agraphia
 8. Differential Bilingual Deficit
 9. Pragmatic Problems
- B. Associated Symptoms
1. Paraphasias
 - a. Literal/phonemic paraphasias
 - b. Verbal/semantic paraphasias
 - c.. Neologistic paraphasias
 2. Substantive/functor word balance
 3. Speech Prosody
 4. Syntax Use
 5. Phrase Length
 6. Articulatory Agility
 7. Verbal Agility
 8. Seizures (types and symptoms)
 - a. Generalized Seizures
 1. Absence (petit mal)
 2. Major motor (grand mal, tonic-clonic)
 3. Myoclonic
 4. Infantile spasms
 5. Febrile
 - b. Partial Seizures (Focal Seizures)
 1. Simple (Primary Focal)
 - a. motor
 - b. sensory
 - c. autonomic
 2. Complex
 - a. psychic/cognitive/affective
 - b. automatisms

- B. **The Dysarthrias and Apraxia of Speech (acquired and developmental).**
In addition to the information listed in your neuropathologies of speech course syllabus, your motor speech disorders review should focus on the nature and course of neuropathologies that affect speech production including:

Congenital Dysarthrias

Cerebral palsy - spend some time with this; identify the multiple types of dysarthrias that are associated with CP

Moebius Syndrome

Adult-Onset Nonprogressive Dysarthrias

Stroke

Locked in Syndrome

Traumatic brain injury

Degenerative Dysarthrias

Parkinson

Progressive supranuclear palsy

Dystonia

Huntington's Chorea

Myoclonus

Tic disorders

Essential tremor

Wilson's disease

Multisystems atrophy

Amyotrophic lateral sclerosis

Friedreich's ataxia

Multiple sclerosis

Myasthenia gravis

Gullain Barre Syndrome

Developmental apraxia of speech**Acquired apraxia of speech*****In addition, you should review:***

Characteristics associated with dysarthria types according to Darley, Aronson & Brown's Classification of Dysarthrias

Typical sites-of-lesion associated with the dysarthrias and apraxia

Differentiate between the characteristics of developmental apraxia of speech, phonological processing disorders, and the dysarthrias

Differentiate between the characteristics of acquired apraxia of speech and aphasia

C. Articulation and Phonological Disorders**I. Definitions and Distinctions**

A. Differentiate between articulation disorder and phonological disorder

B. Differentiate between functional articulation disorder and organic articulation disorder.

C. Differentiate between functional articulation disorder and developmental apraxia of speech

II. Classification (category-type-subtype)

A. **Describe Articulatory Errors. Identify or give examples.**

1. **Omission or Deletion**
 2. Substitution
 3. Distortion
 4. Addition
 5. Devoicing
 6. Frontal Lisp
 7. Lateral Lisp
 8. Labialization
 9. Nasalization
 10. Pharyngeal Fricative
 11. Stridency Deletion
 12. Unaspirated
 13. Initial Position Error
 14. Medial Position Error
 15. Final Position Error
 16. Intervocalic Error
- B. **Define Phonological Process**
1. Differentiate between natural processes and idiosyncratic processes. Identify or give examples.
 2. Differentiate between syllable maintaining processes and syllable reducing processes. Identify or give examples.
- C. **Describe Phonological Processes. Identify or give examples.**
1. **Syllable Structure Processes**
 - a. Syllable Deletion
 - b. Reduplication (total or partial)
 - c. Epenthesis
 - d. Final Consonant Deletion
 - e. Initial Consonant Deletion
 - f. Cluster Deletion (total or partial)
 - g. Cluster Substitution
 2. **Substitution Processes**
 - a. Stopping
 - b. Stridency Deletion
 - c. Fronting
 - d. Depalatalization
 - e. Palatalization
 - f. Affrication
 - g. Deaffrication
 - h. Backing
 - i. Alveolarization
 - j. Labialization
 - k. Gliding
 - l. Vowelization
 3. **Assimilation Processes** (partial or total, regressive or progressive, contiguous or noncontiguous)

- a. Labial Assimilation
- b. Alveolar Assimilation
- c. Velar Assimilation
- d. Nasal Assimilation
- e. Prevocalic Voicing
- f. Postvocalic Devoicing
- g. Metathesis
- h. Coalescence

III. Etiology

- A. Auditory Perceptual Problems
- B. Cleft Palate
- C. Hearing Loss
- D. Tongue Thrust

IV. Symptoms

A. Symptoms of Phonological Disorders

- 1. Leonard: Characteristics of Unusual Sound Changes (Lowe, p. 109)
- 2. Hodson & Paden: Processes Common to Phonological (Lowe, p. 111)
- 3. Stoel-Gammon & Dunn: Profile of Phonologically Disordered Children (Lowe, p. 158)
- 4. Grunwell: Error Patterns (Lowe, p. 112)
 - a. Persisting Normal Processes
 - b. Chronological Mismatch
 - c. Unusual/Idiosyncratic Processes
 - d. Variable Use of Processes
 - e. Systematic Sound Preference
- 5. Homonymy
- 6. Phonological Idiom/Regression

A. Symptoms of Developmental Apraxia of Speech

D. Augmentative and Alternative Communication

- 1. Be able to identify characteristics of clients for whom augmentative communication systems would be appropriate.
- 2. What populations would benefit from AAC?
- 3. How do you make the decision to provide AAC?
- 4. What kind(s) of challenges do we face regarding funding and/or billing for AAC services?

E. Autism/Pervasive Developmental Disorders

I. Definition of Autism- Be able to define and differentiate between the diagnostic categories.

A. DSM-IV

- 1. 5 Diagnostic Categories

Autistic Disorder
 Asperger's Syndrome
 Pervasive developmental disorder
 Childhood disintegrative disorder
 Rhett's Disorder

2. The term "spectrum" as used in the context of Autism
 Spectrum Disorders

B. Classic Definition from Autism Society of America

1. Behavior Symptoms

C. Diagnostic Criteria: Be able to describe these categories and behaviors. Describe how these behaviors would be manifested in both younger and older children. (Reed text book)

1. Impairment in social interactions (2 behaviors)

Examples

2. Qualitative impairment of verbal and nonverbal behaviors (1 behavior) Examples

3. Restrictive repertoire of activities (1 behavior)

Examples

II. Etiologies - be able to discuss current theories of the cause of autism.

A. Neurophysiological

1. Distinguishing between children with autism and other neurophysiological disorders.

a. Autism versus Mental Retardation

b. Autism versus Schizophrenia

c. Autism versus Developmental Disorder of Receptive

Language

B. Heredity

III. Associated problems in children with Autism - Be able to provide and describe these problems as associated with children with autism.

A. Mental Retardation

B. Motor deficits

C. Unusual sensory behavior

D. Hearing loss

E. Seizures

F. Fragile X-syndrome

IV. Communication in Children with Autism - Be able to describe generalizations about the language abilities of children with autism. Your descriptions should include examples.

A. Preserved abilities

1. Segmental phonology and syntax

2. Lexical and syntactic comprehension

3. Imitation

B. Impaired abilities

1. Non segmental phonology
2. Idiosyncratic language
3. Pronoun difficulties
4. Echolalia
5. Communicative function

F. Voice and Craniofacial Anomalies –

In addition to the information listed in your voice and craniofacial disorders course syllabi, your review should focus on the definitions and perceptual characteristics for vocal and resonance pathologies, including:

Hypernasality
 Hyponasality
 Breathiness
 Hoarseness
 Monopitch
 Hard glottal attack
 Strain/strangled voice quality
 Glottal fry
 Aphonia
 Cul-de-sac resonance
 Tremor
 Pitch breaks
 Stridor
 Nasal emission
 Shimmer and Jitter

Also, review (a) the site of lesion, etiology, symptoms and signs, of problems of vibratory trauma of the vocal folds, organic disease, Vagus nerve lesions, central nervous system involvement and trauma and (b) the acoustic, aerodynamic, physiologic and perceptual characteristics of the following phonatory and/or resonance disorders:

Vocal fold edema
 Laryngitis
 Vocal fold nodules
 Vocal polyps
 Contact ulcer
 Keratosis
 Granulomas
 Papillomas
 Carcinoma of the larynx
 Ankylosis of the cricoarytenoid joint
 Spasmodic Dysphonia (adductor and abductor)
 Essential Tremor
 Muscle Tension Dysphonia
 Vocal Fold Movement Disorder (aka Paradoxical VFM Disorder)

Myasthenia Gravis
 Parkinson's Disease
 Shy-Drager Syndrome
 ALS

In addition, review:

Five main “philosophies” of voice therapy
Five main “categories” of voice disorders
Classification schemes for cleft lip and cleft palate
Surgical procedures for craniofacial anomalies
Members of the craniofacial team

- The primary speech-related and non-speech concerns associated with laryngectomy.
- Embryological development of primary and secondary palates and the etiology and epidemiology specifically associated with cleft lip and cleft palate.
- Factors involved in clefting and the major types of clefts
- Syndromes associated with clefting
- Characteristic feeding problems, orthodontic problems and audiologic problems associated with clefts in newborns.
- Functional and structural differences found in resonance disorders

G. Communication Disorders in Multicultural Populations

1. Definitions and Distinctions

- A. Differentiate between compound bilingualism and coordinate bilingualism.
- B. Differentiate between simultaneous bilingualism and sequential bilingualism.
- C. Differentiate between language difference and language disorder.
- D. Differentiate between language and dialect.
- E. Differentiate between social dialect and regional dialect.
- F. Differentiate between standard and nonstandard dialects.

2. Classification (category-type-subtype)

- A. Describe variations in child socialization practices across cultures and their implications for assessment and treatment
- B. Describe theories of second language acquisition and their implications for assessment and treatment.
- C. Describe the phonological, morphological, semantic, and pragmatic characteristics of English and Spanish.
- D. Describe the development and use of inter-language, language mixing, and code switching, and their implications for assessment and treatment.

3. Assessment

- A. Describe the legislative and legal mandates affecting the education of language minority children.
- B. Describe nondiscriminatory assessment procedures.
- C. Describe criterion-referenced assessment.
- D. Describe dynamic assessment.
- E. Describe assessment tools available to evaluate the phonological, semantic, morphological, syntactic, and pragmatic characteristics of Spanish and social dialects of English.

4. Treatment

- A. Demonstrate knowledge of culturally and linguistically appropriate IFSP's and IEP's.
- B. Demonstrate knowledge of methods for the adaptation of programs, instructional materials, and activities in order to make them linguistically and culturally appropriate for clients.
- C. Demonstrate knowledge of attitudes appropriate for collaborative consultations with school personnel.
- D. Demonstrate knowledge of techniques and approaches to work effectively with parents of cultural and language minority children.

H. Dysphagia

1. Definitions and Distinctions:

- Compare/Contrast aspiration and penetration
- Define/describe and give the role in swallowing: valleculae, epiglottis aryepiglottic fold, false vocal fold, true vocal fold, tongue base, cricopharyngeus muscle (UES), mandible, pyriform sinus, laryngeal vestibule, LES.
- Compare NOP, Advanced Directive, DNR, PEG, NG tube, suck/swallow/breathe pattern, burst cycles, fluid expression, endurance, Osteophites, Zenker's Diverticulum, maneuvers and positioning techniques used in treatment, diet consistencies.

2. Classification:

- Describe in detail the four stages of swallowing to include muscles used and cranial nerves used in each.
- Describe in detail disorders that are demonstrated in each of the four stages.

3. Etiology:

- What disorders in swallowing are found with the following disorders: CVA, TBI, MS, Parkinson's, Huntington's?
- Causes of swallowing disorders in neonates; GERD, Short Bowel Syndrome, AIDS, CP, FAS, craniofacial anomalies, genetic disorders.

4. Symptoms:

- Logemann states that we do not treat symptoms we treat physiology – but you also need to know the symptoms of swallowing disorders found in each stage of swallowing.

What are the symptoms of aspiration?

What are the symptoms of penetration?
 What are the symptoms of GERD??

- I. Fluency Disorders - *In addition to the information listed in your fluency course syllabus, your fluency review should focus on the following items:***
1. Assessment Strategies
 2. Assessment instruments for various age groups
 3. Major approaches to therapy
 - Direct vs. Indirect
 - Fluency shaping vs. Stuttering modification
 4. Differences in therapy/management and goals of tx based on the age and severity of the problem
 5. Definitions and terminology of stuttering and other fluency disorders
 6. Current theories regarding onset, continuation, and spontaneous recovery of stuttering and other fluency disorders
 7. Methods and procedures used in clinical and theoretical research of stuttering and other fluency disorders
 8. Differentiation between the characteristics (i.e., speech behaviors, associated motor behaviors, attitudes and emotions, variability and consistency factors, characteristics predictive of recovery, etc.) of a child's normally disfluent speech, language-based disfluency, the speech of a child at risk for stuttering, and the speech of a child who has already begun to stutter
 9. Differentiation between the characteristics (i.e., speech behaviors, associated motor behaviors, attitudes and emotions, variability and consistency factors, characteristics predictive of recovery, etc.) of cluttering, developmental disfluency, neurogenic disfluency and psychogenic disfluency
- J. Genetics and Syndromes**
- A. Define Terms**
 1. Incidence and Prevalence
 2. Morbidity and Mortality
 3. Endemic and Epidemic
 4. Deformation and Malformation
 5. Genotype and Phenotype
 6. Syndrome and Sequence
 7. Congenital and Genetic
 8. Dominant Inheritance and Recessive Inheritance
 9. Sporadic Inheritance
 10. Idiopathic
 - B. Define Craniofacial Anomalies**
 1. Achondroplasia
 2. Aglossia
 3. Apnea
 4. Arachnodactyly

5. Aural Atresia
6. Brachycephaly
7. Dysplasia
8. Epicanthal Folds
9. Exorbitism
10. Glossoptosis
11. Hypertelorism
12. Hypoplasia
13. Hypotonia
14. Microcephaly
15. Microdontia
16. Micrognathia
17. Microtia
18. Polydactyly
19. Strabismus
20. Stridor
21. Syndactyly

C. Describe Syndromes (including speech, language and hearing symptoms)

1. Alport Syndrome
2. Apert Syndrome
3. Cornelia de Lange Syndrome
4. Crouzon Syndrome
5. Down Syndrome
6. Fetal Alcohol Syndrome
7. Fragile X Syndrome
8. Pierre-Robin Syndrome
9. Treacher Collins Syndrome

K. Language Disorders in Infants, Children, and Adolescents

1. Be able to identify causes and symptoms associated with SLI, autism, mental retardation, hearing impairment, visual impairment.
2. Be able to identify issues associated with “at risk” infants and toddlers.
3. Be able to describe the manifestations and characteristics of language disorders in the school-aged child. How would the disorder manifest itself in the older student’s syntax, semantics, morphology, pragmatics and meta-skills? What puts the adolescent with a language disorder “at risk”?
 - A. Ability to differentiate normal language variation from language disorders in school settings. What language disorders would you expect to find in a school setting? What acquired language disorders would you expect to find in a school setting?
 1. Down Syndrome
 2. Language Learning Disorders
 3. Autism Spectrum Disorder
 4. Landau-Kleffner Syndrome

5. Traumatic Brain Injury

- B. Ability to identify language disorders in classroom setting using discourse analysis.
- C. Ability to identify the language complexities of the school curriculum as they related to assessment of language. How does the school-age/adolescent language disordered student demonstrate difficulties in the school setting and in particular with the demands of the curriculum?

CATEGORY IV: Audiology and Aural Rehabilitation

Communication is a process and is often described as a seven step cycle. To isolate the steps and say that one needs little knowledge and understanding of any one of the steps demeans the understanding of the process and those who choose to make the study of the process and the management of the disordered process her/his profession. The *complete* speech-language pathologist always seeks to understand all of the steps in the cycle of communication and disorders of such, including hearing and understanding the message (input processing) .

When you chose the profession of disordered communication as a career you are taking responsibility for what Van Riper has called “that which is most human about us.” Communication disorders occurs in a large percentage of individuals of **all** ages and walks of life and you are in many respects taking the lives of others in your own hands. Audiology and Aural Rehabilitation are indeed in your purview and it is the speech-language pathologist that often works with hearing-impaired individuals more than does the audiologist, who is sometimes concerned more about diagnostic testing than anything else. In Texas, as well as most other states, the SLP cannot perform diagnostic audiological testing, as it should be. But many times the SLP has been working with the patient and knows and gets along better with the patient (of all ages) than the audiologist who may see the patient only one or two times. And most of the rehab for the person with hearing impairment is likely to be provided by the SLP.

Therefore, it behooves the speech-language pathologist to gain skills as great as is practical in audiology and aural rehabilitation. The SLP should take advantage of every opportunity to understand the entire input process and take initiative to learn even more than is required by the degree/certification/licensure procedure.

The speech-language pathologist must acquire appropriate sagacity of all aspects of audiology and aural rehabilitation. Although it is not possible to delineate all the areas of this process and its disorders, for formal study they include, though are not limited to:

- I. **Audiology as a profession, its evolution and relationship to the SLP.**
- II. **The impact of auditory impairment on the acoustical properties of the spoken message.**

- III. **The impact of auditory impairment on the effectiveness of the function of the auditory pathway and processes**
 - A. Auditory Conduction System
 - B. Auditory Transduction System
 - C. Auditory Transmission System
 - D. Auditory Processing System
- IV. **Evaluation of the function of the auditory pathway, both by the SLP and the audiologist and the implications of such.**
 - A. Screening procedures
 - B. Diagnostic procedures
 - C. Implications and applications of screening and diagnostic information
- V. **(Re)habilitation of persons with hearing loss.**
 - A. Prelingual hearing loss
 - B. Postlingual childhood hearing loss
 - C. Young adult hearing loss
 - D. Presbycusis hearing loss and other acquired hearing loss in adulthood
 - E. Medical management

More precisely, delineated areas include:

- I. **Profession of Audiology**
 - 1. The birth of the profession of audiology
 - 2. Audiology and ASHA
 - 3. Audiology and licensure, specifically in Texas
 - 4. Audiology and AAA
 - 5. The evolution of audiology from primarily pure tone air and bone conduction behavioral testing, to objective diagnostic testing, including immittance, AEP, OAE, among others
- II. **Effects of Auditory Impairment on:**
 - 1. The acoustical properties of sound
 - 2. The relationship of acoustics to phonemes
 - 3. Effects of environment on acoustical properties
 - 4. Acoustical properties of speech
- III. **Impairment of Auditory Pathways**
 - 1. Outer ear, anatomy and physiology, including TM
 - 2. Middle ear, anatomy and physiology, including TM, muscles and Eustachian tube
 - 3. Inner ear, anatomy and physiology, especially relative to the process of transduction of motion to electrical current and efferent anatomy and physiology
 - 4. Auditory-vestibular nerve, its anatomy and physiology, especially as related to tonotopic organization
 - 5. Central Auditory Nervous System

- A. Auditory neural centers of the medulla, pons, midbrain, thalamus and cerebral cortex
- B. Auditory neural descending pathway

IV. Evaluation

1. **Hearing screening** of children in Texas as per the Texas Department of Health, including referral and followup
2. **The role of the SLP in:**
 - A. Immittance testing
 - B. Otoacoustic emissions testing
 - C. Auditory evoked potentials testing, especially ABR
3. **Adequate understanding of diagnostic audiological testing to evaluate audiological reports**
 - A. Pure tone threshold testing and masking
 - B. Speech threshold and discrimination testing and masking
 - C. Advanced immittance testing
 - D. Otoacoustic emissions, especially in infant screening, and specifically in Texas
 - E. Auditory brainstem response testing, especially in infant screening, and specifically in Texas
4. **Informal screening of young children by the SLP**
5. **Counseling with the hearing-impaired person and when appropriate with parents.**

V. (Re)habilitation

1. Educational approaches available to the SLP in working with young children, including but not restricted to auditory training, speech and speech reading.
2. Approaches to aural rehabilitation of the post lingually hearing-impaired persons
3. Hearing aids, especially the role of the SLP in maintaining them
4. Cochlear Implant, especially the role of the SLP in maintaining them and (re)habilitative aspects
5. Assistive listening devices, especially FM (frequency modulated) personal listening systems
6. Improvement of the signal to noise ratio
7. The role of the SLP in medical management of treatable hearing loss
8. The role of the audiologist in fitting, dispensing and maintaining hearing aids
9. The role of the audiologist in cochlear implant, fitting and maintaining.
10. Impact of hearing loss on speech and language development.

PRAXIS Test Category Descriptions

Audiology and Aural Rehabilitation

1. Pathology and evaluation of the auditory system and interpretation of the test results, including speech audiometry and discrimination.
2. Hearing screening and conservation
3. Habilitation and rehabilitation, including medical-surgical management
4. Hearing aid selection and use (and cochlear implant)
5. Communication, social and emotional implications of hearing loss

In addition to this study guide and list of PRAXIS “Test Category Descriptions” for “Audiology and Aural Rehabilitation”, approximately 400 “Audiology Study Questions” are in each student’s possession and should be mastered.

CATEGORY V: THEORETICAL AND EMPIRICAL ASPECTS OF THE SCIENTIFIC METHOD

Scientific method:

What are the three components of the scientific method?

Why is the scientific method important to speech-language pathologists and audiologists?

How is the scientific method applied to clinical practice?

Measurement Issues:

Describe and differentiate between levels of measurement, including nominal, ordinal, interval and ratio scaling Provide specific examples of each.

Identify and describe the factors that affect quality of measurement such as test environment, instrument calibration, instructions to participants and observer bias.

Define reliability. Provide examples of measurement reliability, including stability, equivalence and internal consistency.

Define validity. Provide examples of measurement validity, including content, criterion and construct validity.

Research Design:

What is the purpose of research design? Provide answers to research questions and to control variance. Design helps the investigator obtain answers to the questions of research and also helps the investigator control the experimental, extraneous, and error variances of the particular research problem under study.

Describe and differentiate experimental and descriptive research.

For example, both types of research are used as indicated above, under research design purpose. These differ in their basic objectives. That is, objectives of experimental research include (1) manipulation of the IV in order to answer the questions “What effect does this have on the DV?” and (2) arrangement of the experiment so that extraneous variables are controlled and therefore, cannot have a confounding effect on the DV.

Objectives of descriptive research include (1) selection of variables for observation in order to answer questions such as “What are the dimensions or differences or relationships found in the natural phenomena?” and (2) to make these observations in a systematic and unobtrusive fashion so that the dimensions, differences, or relationships of the criterion variables are not confounded by extraneous variables.

What are between-subject, within-subject and mixed designs? How does the research decide which design to use?

Define and differentiate independent variables versus dependent variables.

What is random assignment?

What are sequence/order effects? Why are these important to consider when designing a treatment study?

Single-Subject Research Designs:

Describe how a single-subject research design can be used to observe change in the dependent variable. In particular, baseline stability of the behavior across level, trend, slope and variability.

Why is replication important?

How does a single-subject research design differ from a case study?

Identify the advantages and disadvantages of group versus single subject research designs.

What is meant by the phrase *generalizability of results*?

Provide an example of how generalization can be improved *to* and *across* populations.

Describe external and internal validity issues in research design.

Organization and Analysis of Data: Basic concepts of data analysis

Define and differentiate descriptive statistics, including:

Measures of central tendency: mean, median, mode

Measures of variability: range, standard deviation, variance

Interpret differences/similarities across measures apply these measures to clinical practice

Description and assumptions of the normal curve

Parametric and nonparametric statistical procedures: Define, differentiate and identify assumptions for each. When would we use each index in statistical analysis of the data?

Null hypothesis: Statistical analysis is concerned with making decisions about the existence versus the nonexistence of differences between groups or relationships among variables. This is usually done by examining the plausibility of a null hypothesis in light of obtained data. A null hypothesis is a hypothesis that states that there is no difference between groups or no relationship among variables. The concept of testing a null hypothesis is the basis for statistical inference.

Probability for making decisions related to the null hypothesis

Level of significance/level of confidence

Statistical significance vs. practical importance of finding

Methods for Analyzing Relationships:

Why do we use correlational analysis techniques to describe existing relationships among the data?

What is a correlation coefficient?

How is the correlation coefficient used to indicate the strength and direction of a relationship?

Identify and describe common parametric and nonparametric methods of analysis based on level of measurement. For example,

Nominal: contingency coefficient, chi square, nonparametric

Ordinal: Spearman Rank-Order Correlation Coefficient, nonparametric

Interval or ratio: Pearson Product-Moment Correlation Coefficient and multiple regression, parametric

Describe how the chi square is used to determine the presence of relationships in nominal level data.

Methods for Analyzing Differences:

Inferential analysis techniques are used to describe existing differences among the data

Identify and describe common parametric and nonparametric methods of analyzing differences among the data that consider level of measurement, parametric vs. nonparametric indices and sample independence. For example,

Nominal: related samples, Cochran Q Test, nonparametric
 Nominal: independent samples, Chi Square Test for Independent Samples, nonparametric
 Ordinal: two related samples, Wilcoxon Matched-Pairs Signed-Ranks Test (T), nonparametric
 Ordinal: independent samples, Mann-Whitney U Test, nonparametric
 Ordinal: more than two related samples, Friedman Two-Way ANOVA, nonparametric
 Ordinal: independent samples, Kruskal-Wallis One-Way ANOVA, nonparametric
 Interval or ratio: t-test for correlated groups, z-ratio, parametric
 Interval or ratio: t-test for independent groups, z-ratio, parametric
 Interval or ratio: more than two related or independent samples, ANOVA, ANCOVA, MANOVA, parametric

Describe the concepts of main effects and interaction as it applies to the ANOVA.

Evaluation of Treatment Efficacy Research:

What are the basic considerations related to internal validity? Consider history, maturation, test-retest practice effects, instrumentation, statistical regression, differential subject-selection, mortality, interaction of factors.

What are the basic considerations related to external validity? Consider subject-selection, reactive/interactive effects of pretesting, reactive arrangements, multiple-treatment interference.

What is the ASHA NOMS?

Where do we obtain treatment efficacy data? That is, what sources do clinicians use?

How is empirical data used to make treatment decisions?

**CATEGORY VI:
 PROFESSIONAL ISSUES**

I. ASHA

A. History - date, name

B. Structure of organization

1. Legislation
2. Officers/ Office holders
3. Membership
 - a. Who?
 - b. Why ?
 - c. Benefits

C. Code of Ethics - Be familiar with **newest** version!!! Be aware of differences from older version.

1. Violations
2. Penalties
3. ASHA Ethical Practices Board

D. Accreditation

1. CAA
 - a. Standards
 - b. Responsibility - faculty
 - c. Responsibility - students
2. PSB

E. Journals

F. National Office

1. Purpose
2. Location
3. Responsibility for administration of office activities

G. Governing Bodies

1. ASHA Executive Board
2. ASHA Executive Council
3. ASHA Legislative Council
4. ASHA President
5. ASHA Executive Director

H. Certification of Clinical Competency

1. Requirements
 - a. National Exam
2. CFY
3. Timelines

I. NSSLHA

1. Membership - benefits

II. TSHA

- A. Membership
- B. Executive Board - President
- C. Executive Council
- D. TSH Foundation

III. Licensure in the State of Texas

- A. Requirements
- B. CEU's
- C. Licensed Speech Pathology Assistants
 1. Requirements
 2. Supervision
 3. Limitations
- E. Continuing Education
- F. State Board of Examiners

G. Penalties

IV. Public School Issues and Legislation

- A. PL 94-142
- B. PL 99-457
- C. PL 101 - 476 IDEA
- D. Public School terminology
 - 1. Least restrictive environment
 - 2. Free and appropriate public education
 - 3. Individual Educational Program
 - 4. Admission Review Dismissal
 - 5. Due Process
- E. Service delivery models - be able to list and describe service delivery models other than “pull out” as mandated by IDEA
- F. Inclusion - be able to describe pros and cons
- G. Assessment as mandated by IDEA
- H. Eligibility for sl services as mandated by IDEA
- I. Describe time line from referral to placement.
- J. Describe the SLP’s various roles in a public school setting

V. Professional Organizations and Related Issues

- A. Characteristics of Autonomous Professions
- B. ETSHA
 - 1. Structure
 - 2. President
- C. Position Statements
 - 1. Dialects
 - 2. Dysphasia
 - 3. Literacy
 - 4. Scope of Practice
- D. Current issues
 - 1. Public Schools
 - a. Caseload size
 - b. Salaries
 - 2. Cultural Competency

VI. History of the Profession

- A. University programs
- B. First Ph.D./University
- C. Early professional organizations
 - 1. History of ASHA
 - 2. History of TSHA

This portion of the exam is multiple choice. The questions may range from traditional multiple choice to scenario style questions.