به نام خداوند مهربان

مدل Bellis/Ferre
برای اختلال پردازش شنوایی مرکزی

پریسا جلیل زاده افشاری

دکتری شنوایی شناسی

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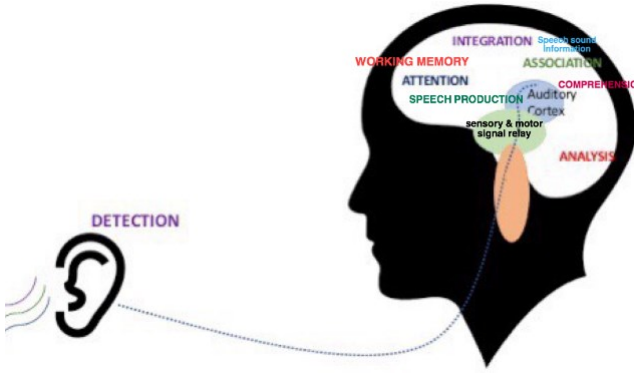
اختلال پردازش شنوایی مرکزی

اولین بار توسط انجمن شنوایی و گفتار و زبان آمریکا (ASHA) در سال ۱۹۹۲ مطرح شد.

اختلال در بازیابی، انتقال، آنالیز، سازماندهی و ذخیره اطلاعات از سیگنال های صوتی



اختلال پردازش شنوایی مرکزی

- Localization/lateralization
- Auditory discrimination
- Auditory temporal pattern recognition
- Temporal processing
- Performance in presence of degraded or competing signals

CENTRAL AUDITORY PROCESSING TEST BATTERY APPROACH

باید از مجموعه آزمون هایی استفاده شود تا سیستم شنوایی مرکزی در سطوح مختلف را ارزیابی نماید.

- ✓Auditory Pattern Temporal Ordering (APTO)
- ✓Monaural separation/closure (MSC)
- ✓Binaural separation (BS)/Binaural Integration (BI)
- ✓Auditory discrimination

	Monaural	Targeted Processes	Sensitive To:
Low-Pass Filtered Speech Tests			
Band-Pass Filtered	X	Auditory closure	Brainstem/cortical lesions
Compressed Speech	X	Auditory closure	Primary auditory cortex
Speech Recognition in Noise	X	Auditory closure	Brainstem to cortex
Dichotic Speech Tests			
Staggered Spondaic Word		Binaural integration	Brainstem/cortical/corpus callosum
Dichotic Digits		Binaural integration	Brainstem/cortical/corpus callosum
Synthetic Sentence Identification w/Contra Competing Message		Binaural separation	Cortical vs. brainstem
Competing Sentences		Binaural separation	Language processing
Dichotic Sentence Identification		Binaural integration	Brainstem/cortical
Dichotic Rhyme		Binaural integration	Interhemispheric
Dichotic Consonant Vowels		Binaural integration	Cortical
Temporal Patterning Tests			
Pitch Pattern Sequence (PPS)	X	Temporal ordering Linguistic labeling	Cerebral hemisphere lesions Interhemispheric transfer
Duration Patterns	X	Temporal ordering Linguistic labeling Duration discrimination	Cerebral hemisphere lesions Interhemispheric transfer
Random Gap Detection Test		Temporal resolution	Left temporal/cortical
Gaps-in-Noise	X	Temporal resolution	Interhemispheric transfer
Frequency Pattern (FP)	X	Temporal ordering Linguistic labeling Frequency discrimination	Cerebral hemisphere lesions
Other Tests			
Binaural Fusion		Binaural integration	Low brainstem
Masking Level Difference		Binaural interaction	Low brainstem
Rapid Alternating Speech		Binaural interaction	?Low or high brainstem

CENTRAL AUDITORY PROCESSING TEST BATTERY MODELS

ماهیت هتروژنوس APD (C)

ایجاد طبقه بندی پس از ارزیابی نتایج، مشاهده رفتار فرد و بررسی ارتباطات متقابل پردازش های شنوایی–شناخت– زبان

مرتبط ساختن هر طبقه با نوروفیزیولوژی زیرساخت آن

مرتبط کردن علایم فرد با توانایی های شناختی سطح بالاتر مانند زبان و یادگیری و نقایص ارتباطی–آموزشی

ارائه رویکردهای مداخله ای فردمحور

تمامی مدل ها بر اساس آزمون های ارزیابی CANS می باشند، درنتیجه اثر خستگی و توجه را بر نتایج آن ها باید مدنظر داشت.

Bellis/Ferre MODEL

CAT files

بر اساس نوروفیزیولوژی زیرساختِ رمزگذاری سیگنال های شنوایی در نیمکره چپ، راست و مسیرهای بین نیمکره ای طراحی شده است.

با بررسی الگوی نتایج در عملکردهای پردازش شنوایی، زبان و یادگیری می توان به پروفایل APD (C) دست یافت.

- ✓اختلال عملکرد در منطقه خاصی از مغز منجر به نقص پردازش شنوایی متناظر آن میگردد
- ✓بررسی روابط مغز–رفتار و تفسیر ارزیابی های پردازش شنوایی مرکزی با دید نوروسایکولوژیک
- ✓تمرکز بر تظاهرات شنوایی و اختلالات cross-modality

Bellis/Ferre MODEL

Primary sub-profiles:

- Auditory decoding deficit
- Prosody deficit
- Integration deficit

Secondary sub-profiles:

- Auditory association deficit
- Output organization deficit

Bellis/Ferre MODEL

Auditory decoding deficit **(signs)**

- Difficulty hearing in noisy situations **"mishearing"**
- Substituting similar-sounding words for the actual auditory target
- Spelling and reading decoding difficulties (specially nonsense words & word attack)
- Verbal skills poorer than visuospatial abilities
- Weak receptive and expressive vocabulary
- Poor sound blending abilities
- Difficulty learning foreign languages

Bellis/Ferre MODEL

Auditory decoding deficit (central auditory processing test results)

Poor results in right ear in comparison to the left on dichotic tasks

+

significant deficit on monaural low-redundancy speech tasks

- A pattern that is suggestive of **left-hemisphere dysfunction**
- Poor neural representation of acoustic/phonetic features of speech in the **primary auditory cortex**

Bellis/Ferre MODEL

Auditory decoding deficit (management)

- Traditional aural rehabilitative strategies (used with hearing impairment)
- Environmental modifications to improve signal clarity
  - Preferential seating
  - Visual augmentation
  - Provision of a note taker
  - Assistive listening technology.
- Activities to enhance auditory closure abilities via the use of contextual cues
- reading activities focusing on the association of the speech sound with the orthographic symbol

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Prosody deficit **(signs)**

- Sight word difficulties (the ability to spell and recognize irregularly spelled words in the language)
- Inefficient gestalt patterning abilities
- Misinterpretation of the intent, specially understanding sarcasm, humor, irony, gestures, and facial expressions
- Weak social communications & pragmatics
- Difficulty with comprehending the main idea of a spoken or written narrative
- Difficulty with taking notes during lecture-based classes
- Speak with little or no affect, monotonic, or flat
- Problems in mathematic calculations

Bellis/Ferre MODEL

Prosody deficit **(central auditory processing test results)**

Left ear deficit on dichotic speech tasks

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difficulty with both verbally labeling and humming tonal patterns (frequency and/or duration patterns testing)

- This pattern is suggestive of **right-hemisphere dysfunction**
  - **Lower performance abilities than verbal**
  - **Difficulty with visual-spatial abilities**
  - **Social-emotional concerns due to deficient social interaction skills**

Bellis/Ferre MODEL

Prosody deficit **(management)**

- Specific therapy focusing on perception and production of suprasegmental aspects of speech (rhythm, stress, and intonation)
- Gestalt patterning skills exercises
- Training activities that focus on searching for and extracting **key words** from oral or written narratives of increasing linguistic complexity.
- Speech-language intervention for pragmatics
- Psychological counseling for social/ emotional concerns
- special educational services to improve math calculation
- Environmental modifications

  Animated teacher

  visual augmentation

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Integration deficit **(signs)**

Integration Deficit is a deficit in **interhemispheric integration** via the **corpus callosum**, or the large fiber tract that connects the left and right hemispheres.

Auditory symptoms of Integration Deficit vary widely.

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Integration deficit (signs)

- Difficulty linking prosodic elements with linguistic content of a spoken message
- Deficits in auditory verbal learning and memory
- Syntactic, pragmatic, and semantic receptive language deficits
- Difficulty hearing in noise (deficit in auditory localization and the concept of auditory space)
- Phonological processing and decoding difficulties associated with inefficient interhemispheric integration due to difficulty combining component phonetic features into a gestalt pattern to achieve a cohesive whole

Bellis/Ferre MODEL

Integration deficit **(central auditory processing test results)**

Left ear deficit on dichotic speech tasks

✚

Difficulty on temporal patterning tests requiring **verbal labeling** of the tonal pattern, with normal performance in the humming condition

- Poor performance in nonverbal tasks, poor localization abilities
- This pattern is suggestive of **inter-hemispheric or Corpus Callosum dysfunction**

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Integration deficit **(other neuropsychological signs)**

- Difficulty combining visual and auditory input
- Bimanual and bipedal coordination problems
- Difficulty with any other task that requires integration between right- and left-hemisphere-based activities like painting, dancing, and multi-modal tasks.
- Poor performance when visual or tactile augmentation is added

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Integration deficit **(management)**

- A note taker should be provided in classroom situations so that the individual is not required to listen and write **(a task that requires efficient interhemispheric dynamics)**
- Information be provided via **one modality at a time**, and can be reinforced via another modality provided the two **do not occur simultaneously.**
- Direct intervention techniques include many aspects **of sensory integration therapy**
- Audiologist and occupational therapist are the integral part of the management team
- Specific activities designed to improve interhemispheric transfer

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Auditory associative deficit (signs)

- This specific profile may be more properly considered as an **"auditory-language"** deficit rather than a CAPD
- Inability to apply the rules of language to incoming auditory input
- Poor Receptive language skills (syntactic difficulties, especially with linguistically complex messages such as passive voice)
- Semantic skills also are affected, with poor use and understanding of antonyms, categorizations, synonyms, or homonyms
- Difficulty with Understanding words that have multiple meanings
- Errors of punctuation, grammar, verb tense indicating difficulty with the use of the rules of the language
- Difficulty with learning a foreign language

Bellis/Ferre MODEL

Auditory associative deficit **(central auditory processing test results)**

Bilateral deficit on dichotic speech tasks

✚

auditory closure and phonemic decoding abilities are **intact**, which indicates intact functioning of the primary auditory cortex

- The **associative auditory cortex** (usually left hemisphere), where acoustics and meaning come together and syntactic analysis occurs, is hypothesized to be the region of dysfunction in Auditory Associative Deficit

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Auditory associative deficit (management)

- Rephrasing of information, using smaller linguistic units
- The child with Associative Deficit will do better in an environment that includes the use of a systematic, multisensory, rule-based approach to language and learning.
- Speech-language therapist has an integral role to focus on receptive language deficits
- Metalinguistic/metacognitive strategies training to enhance auditory comprehension and memory

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Output organization deficit (signs)

- Might represent an **expressive language/executive function** disorder
- Difficulty in acting on incoming auditory information
  - inefficient sequencing abilities
  - poor notetaking and assignment completion
  - weak expressive language, articulation, and syntactic skills
- Significant difficulty hearing in backgrounds of noise
- In quiet environments, “heard it, understood it, but couldn’t remember it.”
- Disorganization and impulsive or perseverative behavior both at home and at school

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Output organization deficit **(central auditory processing test results)**

perform poorly on any auditory task that requires report of more than **three** critical elements

performance on tasks requiring phonemic decoding and report of only one element, as with monaural low-redundancy tasks, is spared.

Because of this pattern, along with associated behavioral difficulties it is hypothesized that there is a dysfunction in the **efferent system**, and also **inefficient temporal-to-frontal intrahemispheric communication**

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Output organization deficit (management)

- Similar to that of those with Associative Deficit
- Placement in a systematic, rules-based learning or work environment
- Provision of directions and information one step at a time.
- Training in the use of organizational aids often is useful, including making lists, using planning books and calendars, and reauditorizing to strengthen the memory trace
- Speech-language therapy focusing on expressive language and word retrieval deficits typically is indicated
- Occupational therapy to address planning and execution skills
- **use of assistive listening technology.**

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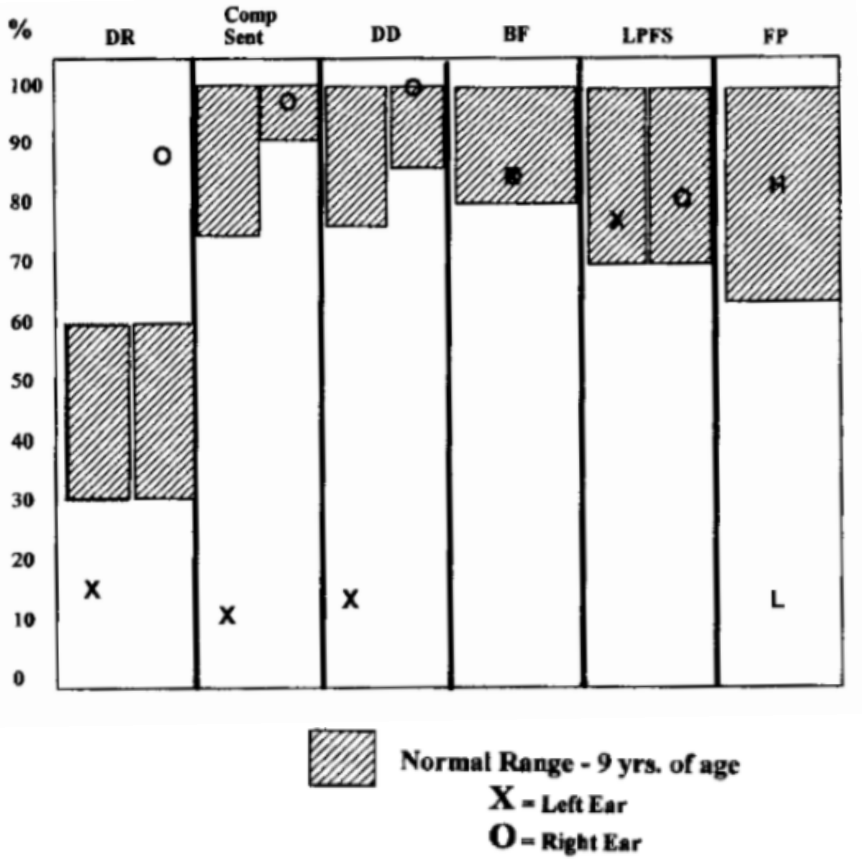
Integration deficit (case study)

- normal range for age on low pass filtered speech, indicating intact auditory closure/decoding skills
- complete left-ear suppression, on both Competing Sentences and Dichotic Digits testing
- Low performance on Frequency Pattern testing, linguistic labeling condition.



the pattern of left-ear suppression on dichotic speech tasks, combined with a deficit on temporal patterning tests in the linguistic labeling condition and intact functioning on monaural low-redundancy speech tasks, was consistent with a deficit in the interhemispheric transfer of information via the corpus callosum


با سپاس از توجه شما