ADOLESCENT AND ADULT LANGUAGE (CH. 12)

COMD570: Language Development

Sign(s) of the day

- Deaf ASL interpreting:
  - https://youtu.be/hImNoCYb4Pk

- Difficulties of lipreading:
  - http://www.rachelrkolb.com/other-media

Adolescence & language

- Rate of language development (particularly grammatical development) slows
  - Gradual maturation of abilities
- Greatest area of maturation: vocabulary, pragmatics and semantics
- Much cognitive and neural development

Adulthood & language

- Gains:
  - Vocabulary
  - New syntactic constructions
  - Life experiences and knowledge
- Declines:
  - Hearing loss
  - Executive function (e.g. working memory)

COGNITIVE CHANGES: ADOLESCENCE THROUGH LATE ADULTHOOD

Brain changes in adolescence

- Synaptic growth spurt
  - Substantial development of prefrontal cortex
  - Increased executive function abilities
- Continued myelination
- Maturation of cognitive abilities

Formal Operational Thought

- Early stages of cognition focused on immediate, physical environment
- Formal operational thought (recall Piaget) emerges around age 11 or 12 and solidifies over next 4 to 5 years
  - More abstract
  - Focus on possibilities
  - Make inferences from data
  - Systematically experiment with environment

Features of Formal Operations

- Formal propositional logic:
  - Ability to understand possible combinations and relations about variables
- Hypothetical-deductive reasoning:
  - Ability to imagine possibilities
  - Deductive reasoning
- Advances in metacognition:
  - Knowledge of and awareness of one's own cognitive processes

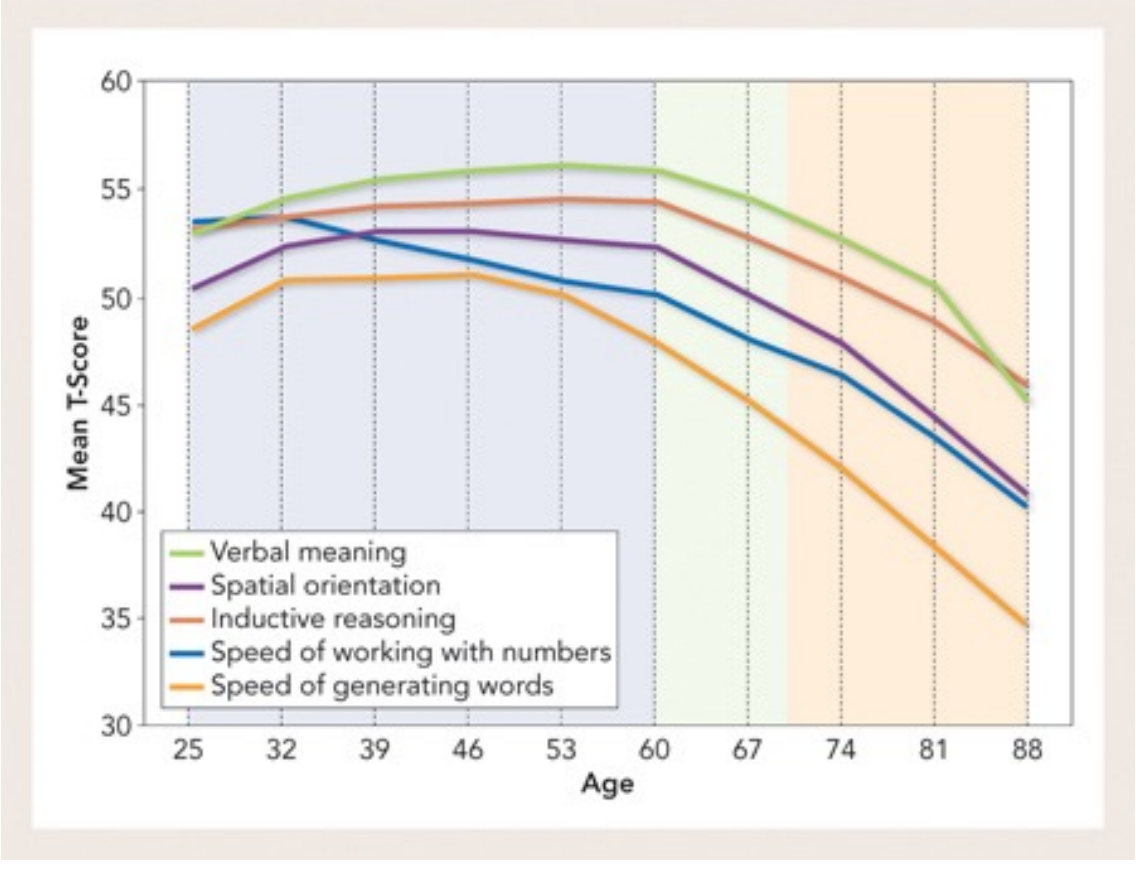
Information Processing

- Growth of formal reasoning at least partly due to basic information processing skills
  - Response inhibition
  - Speed of processing
  - Working memory capacity
- Teenagers improve ability to draw upon prior learning

Cognition & intelligence in late life

- Crystallized intelligence:
  - Factual knowledge and verbal skills
  - Accumulate with age
  - Increases at least to age 60
  - Slow decline into older age
- Fluid intelligence:
  - Processing and problem-solving abilities
  - No substantial drop until age 60
  - Tends to decline substantially post 60s

Cognition & intelligence in late life



Attention (fluid intelligence)

- Focused attention: focusing on one thing and ignoring distractions
  - E.g. studying for an exam
  - Elderly good at this
- Selective attention: searching for something specific
  - E.g. searching for the remote control
  - Performance declines with age
- Divided attention: processing two or more kinds of information at once
  - E.g. talking on the phone while driving
  - Some decline unless activity becomes routine

Memory

- Implicit memory, including procedural skills, not substantially affected by age
- Short-term memory shows little decline but working memory (fluid intelligence) does
- Formation of new long-term memories declines
- Some long-term skills decline:
  - Semantic information (including Tip-of-the-Tongue phenomenon)
  - Episodic memory
  - Source monitoring problems

Language and aging

- As mental processing slows, older adults:
  - Are challenged by rapid-fire conversation
  - Take longer to plan what they want to say
  - Make more speech errors such as false starts
  - Have difficulty understanding & remembering complex sentences
- Elderspeak: specialized speech style for use with the elderly
  - Analogous to child-directed speech
  - Simpler vocabulary & sentence structure, repetition, slower speech

LANGUAGE CHANGES FROM ADOLESCENCE THROUGH LATE ADULTHOOD

Pragmatics

- Increased variety and flexibility of registers in adolescence and adulthood
  - Hobbies/subcultures
  - Professional settings
  - Relationships
- Narrative retell declines with older age
  - More words and utterances, but more extraneous content
  - Less cohesive
  - Less complex speech (e.g., clauses)

Benefits of aging on language

- Older adults are great story-tellers (are they, though?)
- Complexity of people's stories when young predicts their mental sharpness later
- The "Nun study" suggests:
  - Having language complexity in youth predicts later cognitive functioning and incidence of dementia (more than 50 years later!)
  - Some people start out with higher levels of cognitive and linguistic functioning which seems to serve as a protective factor in old age

Kemper et al. (2001)

Pragmatics

- In adolescence, conversations play a crucial role in peer acceptance and development of self-worth
- Mature conversations include:
  - Dynamic gaze and eye contact
  - Neutral and/or positive facial expressions
  - Acknowledgments (~20% of responses)
  - Contingent responses (majority of responses)
    - Responses that build upon what the person has said
  - Topic shading
    - Subtle transition away from one topic to a new topic

Gender differences

- In general, there are more similarities between males and females than there are differences
  - Vocabulary, phonological, morphological, syntactic structure: essentially identical!
- Stereotypical differences between genders mostly include paralinguistic and pragmatic differences:
  - Pitch (how high/low voice sounds), intonation, and timbre (voice quality) differences
  - Paralinguistic differences
  - Word choice
  - Conversational styles

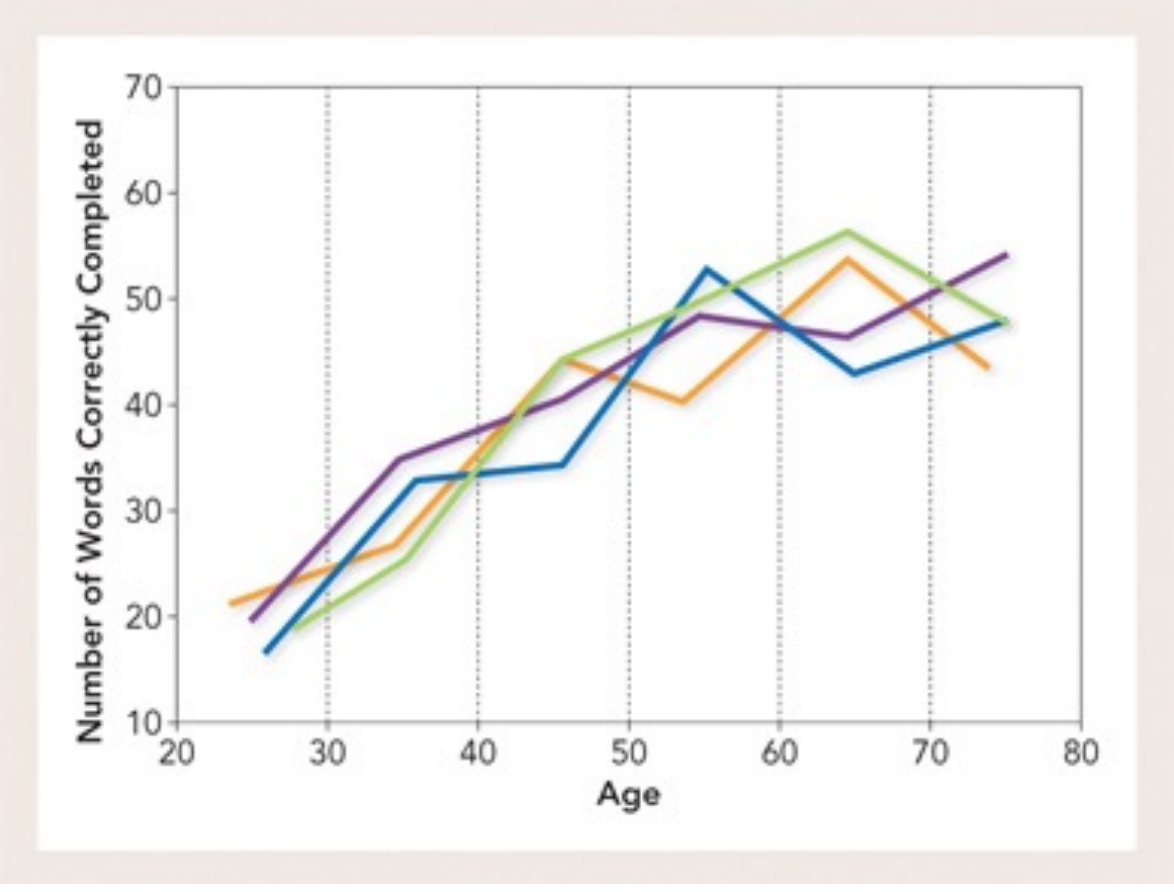
Gender-Affirming Voice Services

- ASHA:
  - https://www.asha.org/public/speech/disorders/voice-and-communication-change-for-transgender-people/
- Introduction to Gender Affirming Voice Services:
  - https://youtu.be/JhKgqRCgPTY
- Before & after comparison:
  - https://youtu.be/pZEILghVjH0

Semantics

- Vocabulary size continues to grow throughout healthy adulthood
  - Rate of vocabulary growth substantially slows
- Lexical access and retrieval speed declines after ~70 years
  - Also more frequent “tip-of-the-tongue” experiences

Crossword performance and age



Syntax and morphology

- Syntactic complexity increases in early adulthood and then stabilizes
  - More embedded clauses
  - Higher density and variety of nouns and noun phrase types
  - Use of conjunctions and disjunctions
- Highly correlated with working memory and attentional capacities
  - More complex structures require more working memory capacity to process

Acoustic-perceptual changes

- Adults are able to pull from a larger variety of perceptual cues (e.g., frequency, intensity, duration) to analyze sounds
- Adults are better able to understand speech that varies widely (accents, computerized voices, dialects)
- High neighborhood density goes from being a negative to a positive thing

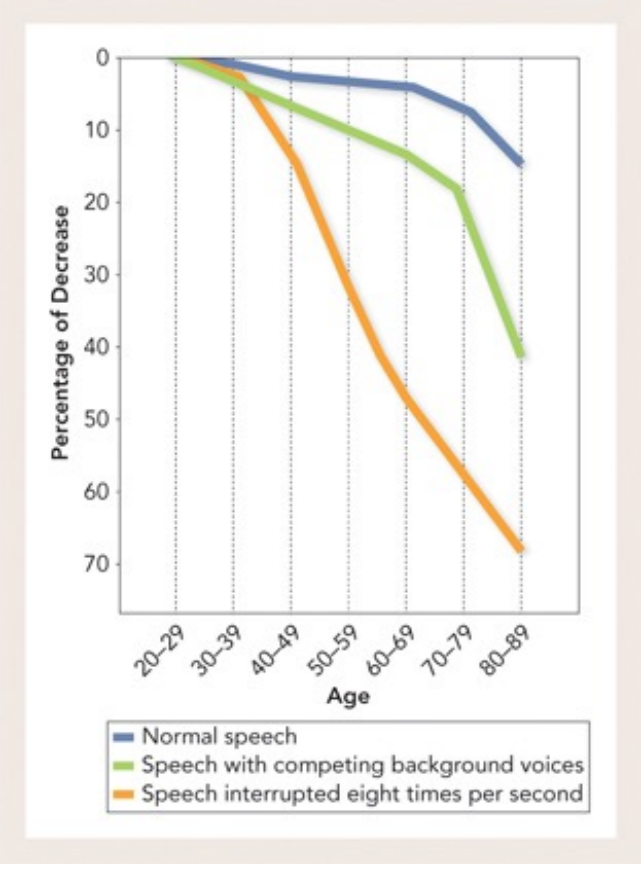
- THEN, hearing loss begins to impact perception

Noise and hearing loss

- Whenever exposed to noise at 110 decibels or higher for > 1 minute
- Prolonged exposure to 90 decibels

Rock Concerts and Firecrackers	140 decibels
Loud Bass and Snowmobiles	120 decibels
Chainsaw	110 decibels
Lawn mowers and motorcycles	90 decibels

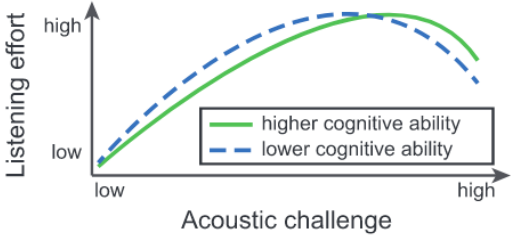
Perceiving speech in adulthood

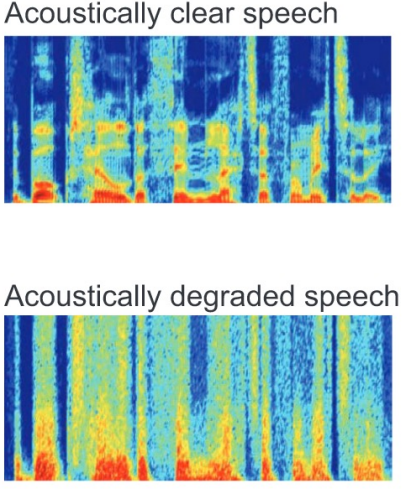


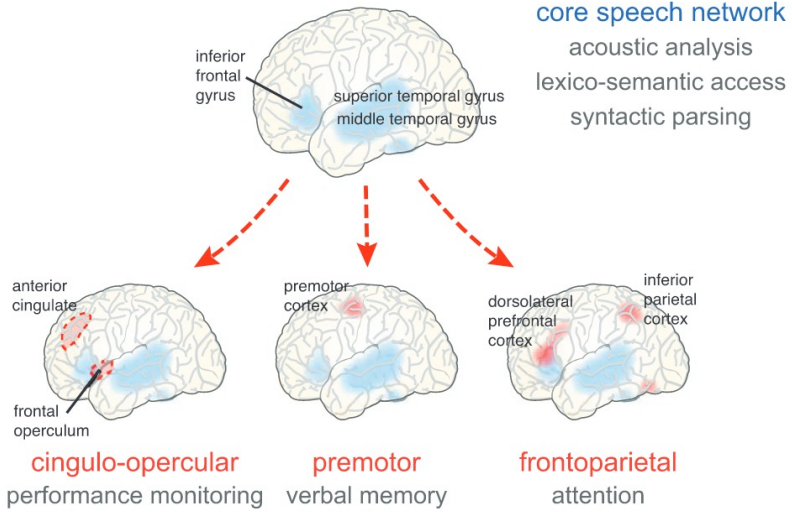
https://www.hear-it.org/sites/default/modules/hear_it/sound-test/en/speech-in-noise/index.html

Hearing loss and reliance on executive function

- Decreased hearing ability increases reliance on executive function resources (i.e., increased top-down processing)
  - Results in roughly similar comprehension, but more taxing/tiresome







Peelle, 2018

Articulatory abilities

- Articulatory fluency increased from adolescence into adulthood
- Due in part by coarticulation
  - Modifications to sounds based on phonemic context, can allow more efficient encoding of speech sounds

Recap

- In adolescence, greatest changes in language development in semantics and pragmatics
- Executive and other cognitive functions mature into old age, and then decline
- Vocabulary knowledge continues to increase until old age
  - Processing speed (e.g., how quickly words are retrieved) slows
- Hearing loss lessens perceptual abilities in old age
  - Increased reliance on executive function resources to compensate