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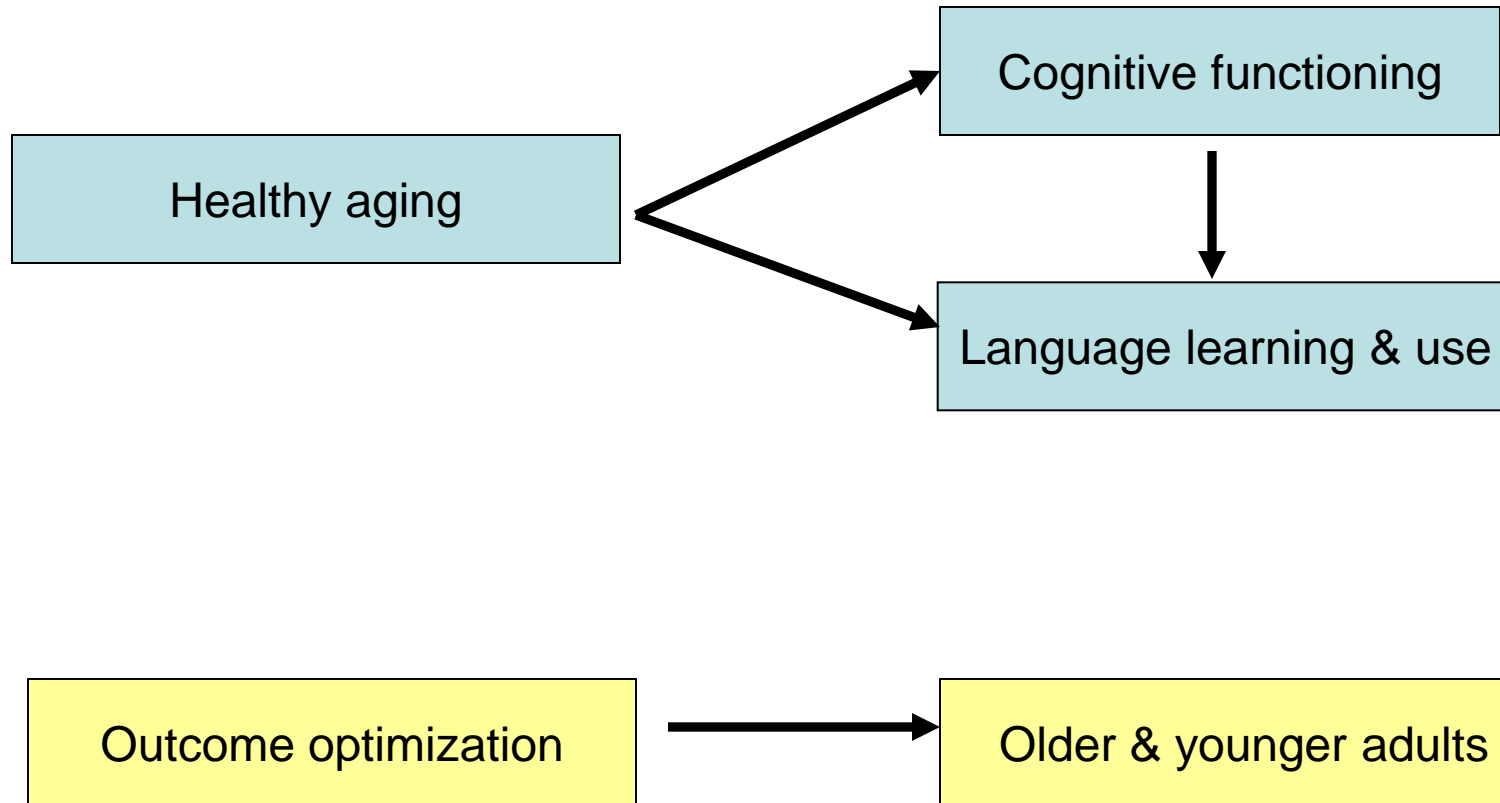
# A cognitive perspective on language learning in young and older adults

*Henk Haarmann*

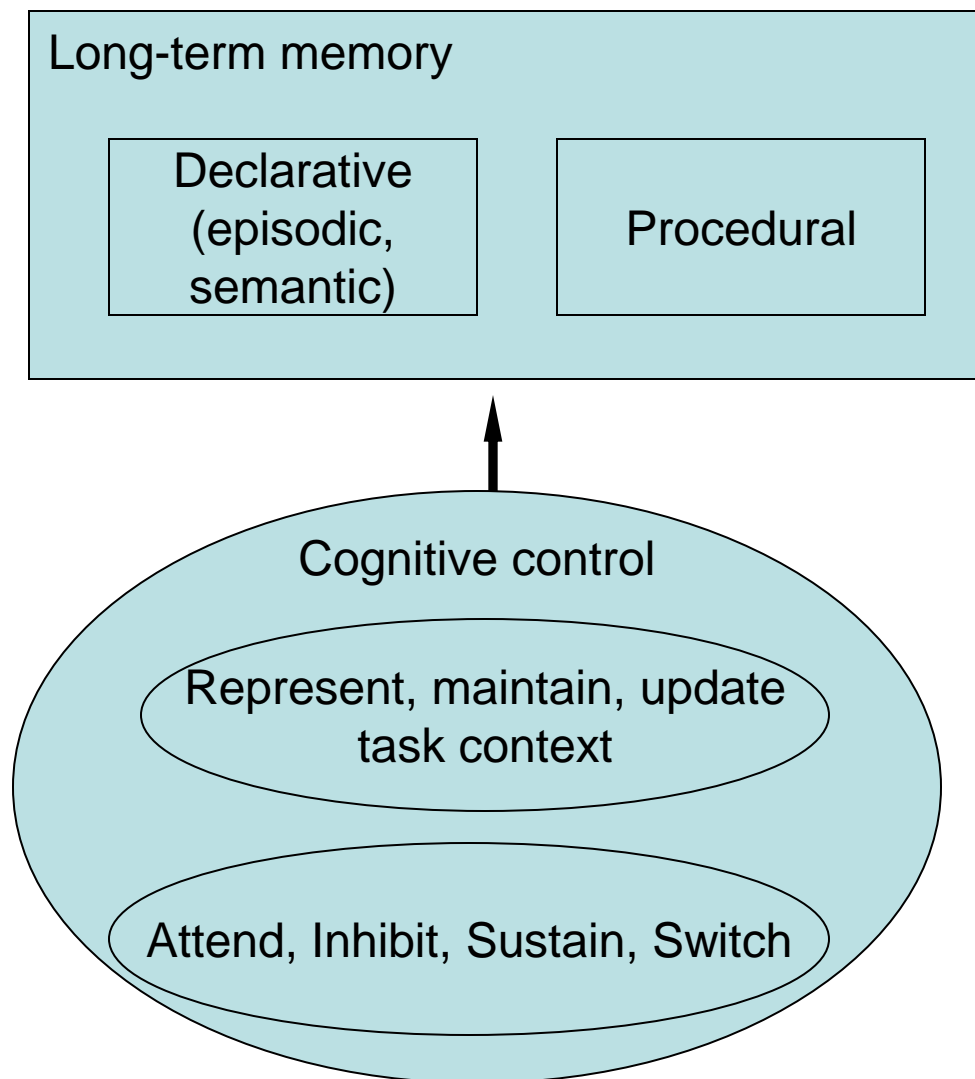
ILR Plenary Session, Foreign Service Institute  
(February 15, 2008)

# Schema

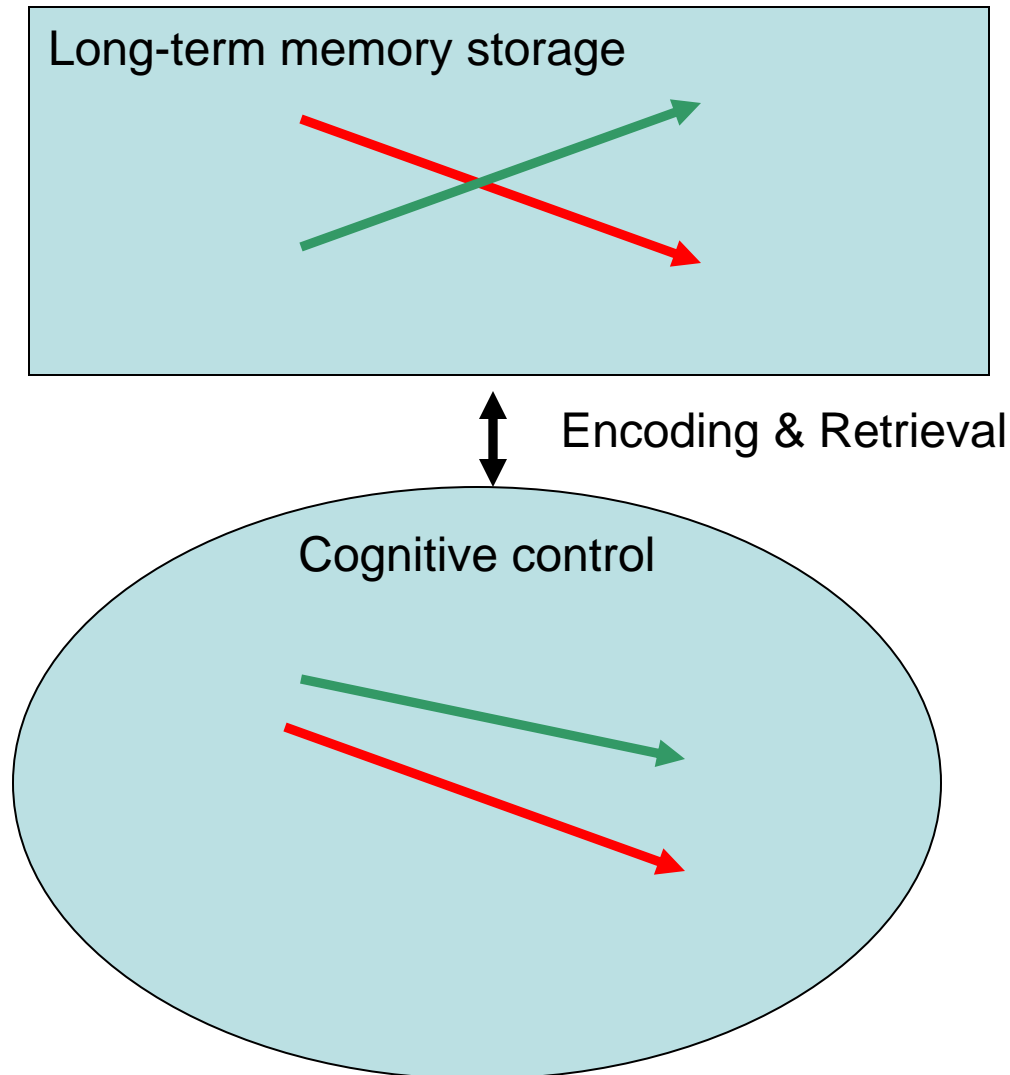
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# Memory & cognitive control



# Cognitive aging: *healthy* vs. *pathological*



# Healthy cognitive aging

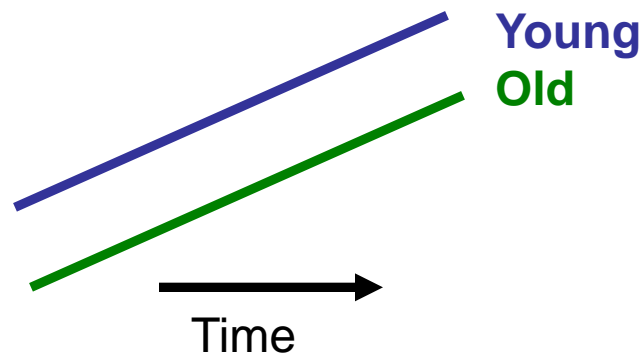
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- Working memory
- Inhibition (early, balanced bilinguals)
- Attention
  - Selective, Divided, Alternating, Sustained
- Episodic memory
  - Free recall, temporal order memory, source memory
- Processing speed
  - Simple perceptual
  - Complex cognitive

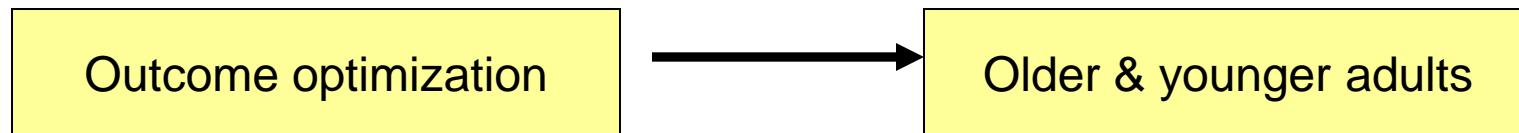
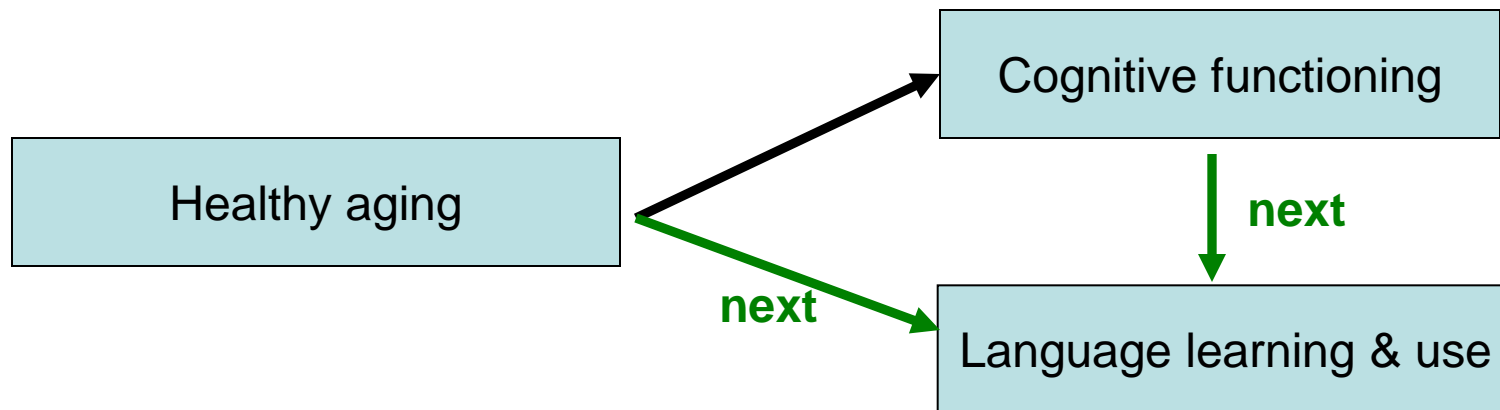
# Healthy cognitive aging

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- Learning
  - Declarative memory
  - Procedural memory
    - Explicit learning (versus implicit learning)
    - Performance level (versus learning rate)



# Next topic



# Age-related language declines have been well documented

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	young	older
dementia		
healthy		



# Age-related language declines

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- Comprehension
  - Syntactic complexity/ambiguity
  - Anaphoric reference
  - Rapid presentation of linguistic stimuli
  - Noisy conditions
- Spontaneous speech
  - Syntactic complexity
  - L2 pronunciation (*Larson-Hall, 2006*)
- Naming
  - Tip of the Tongue (TOT)
  - Nouns & action verbs (isolation vs. context)

# Age-related language declines

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- Language learning in adults
  - Gradual decline in language learning ability well into adulthood
    - Laboratory-based learning (e.g., vocabulary learning)  
*(Service & Craik, 1993)*
    - Classroom instructed learning  
*(Bialystok and Hakuta, 1994; Perales & Cenoz, 2002; Wang, 1998)*
  - Artificial grammar learning *(Midford & Kirsner, 2005)*
    - Impaired: Explicit learning, simple grammar
    - Relatively preserved: Implicit learning, complex grammar  
*(cf. non-linguistic learning: D'érédita & Hoyer, 1999)*
  - Knowledge of prior languages

# Age-related language declines

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- Foreign language processing
  - Shows greater decline than native language processing
  - Michel Paradis' explanation:
    - Child language learning
      - implicit memory, automatic processing
    - Adult language learning
      - explicit memory, controlled processing
        - » Greater vulnerability to distraction and overload, especially in older adults, with deficit in controlled processing

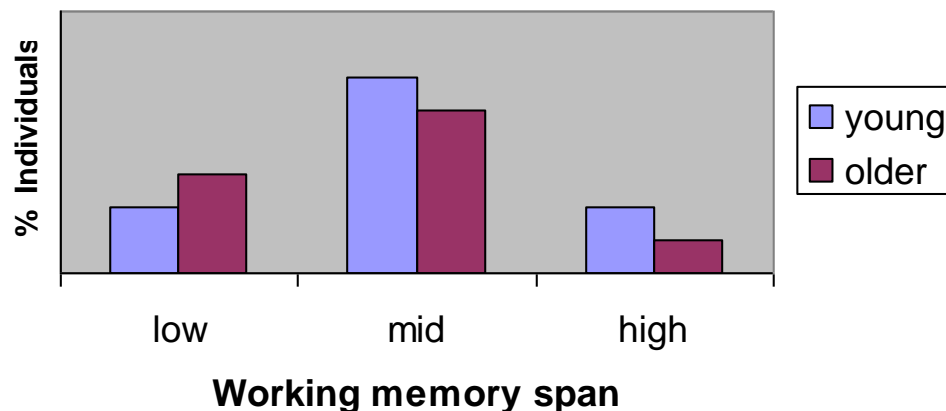
# Other considerations

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- Non-cognitive factors: Anxiety
  - Negative impact on learning a second language  
*(review in Peralis & Cenoz, 2002)*
  - Greater in older than young adult language learners  
*(Bailey et al.)*
- Inter-individual variability
  - Larger within group of older than young adults
- Research methodology
  - Cross-sectional vs. longitudinal design
- Non age-related factors
  - Gubarchuk & Kemper (1997) examined learning of Russian (proficiency & syntactic production)
    - The following factors had a greater impact than age
      - Education level
      - Knowledge of English and other languages

# Program optimization

- Reduced cognitive control impairs language learning & use
- Individual differences (IDs) in cognitive control are due to healthy aging but also occur **within** age-groups



- Measures aimed at compensating for reduced cognitive control should help **both** young and older individuals with reduced cognitive control

# Potential measures

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- **Mental fitness training**
  - to improve cognitive control functions (*Ball et al., 2002, JAMA*)
- **Immersion-like settings**
  - for minimizing need for effortful suppression of the native language
- **Individualized graduated interval training**
  - for more successful retrieval from long-term memory
- **Distributed practice / context variation**
  - for minimizing similarity-based interference & promoting transfer from context-dependent episodic memory to context-independent semantic memory

# Potential measures continued

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- **Extended time on task \ more efficient use of time**
  - for deeper memory encoding
- **Reduction in distractions**
  - for reducing need for effortful inhibitory control
- **Heightened context predictability**
  - for reducing conceptual-level processing load
- **Slower presentation rates, exaggerated prosody, & visible articulatory movements**
  - for coping with slower perceptual speed
- **Smarter methods for engaging implicit memory / procedural memory**
  - to reduce reliance on error-prone cognitively-controlled processing

# Potential measures (final slide)

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- **Use of computer chat rooms**
  - for minimizing working memory load while practice different components of speech planning *(Payne and Whitney, 2002)*.