Mechanisms of Age-Related Cognitive Change/Targets for Intervention: Social Interactions/Stress

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No Conflicts

Discussion
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Current (Lack of) Knowledge

- Many reliable associations with level of cognitive functioning, but not with change
- Unclear directionality of social relations, stress and cognitive functioning
- “Firm conclusions cannot be drawn about the association of any modifiable risk factor with cognitive decline or Alzheimer’s Disease”

NIH State-of-the-Science Conference, April 2010
Pieces of the Puzzle

- Early Life Factors
  - Education
- Physical Factors
  - Health
- Psychological Factors
  - Personality, Self-Efficacy, Control Beliefs, Coping
  - Stress- Chronic, Acute, Daily, Cumulative, Reactivity
- Social Factors
  - Social Ties, Network, Integration, Support, Conflict
- Behavioral Factors
  - Exercise, Cognitive Activity
But...

How do these psychosocial and behavioral factors get under the skull?

- What are the pathways?

- If we modify these factors, does this affect cognitive aging?
Some Possible Mechanisms

- Health and Disease
- Hormonal Factors (e.g., Cortisol, Oxytocin)
- Allostatic Load (e.g., Inflammation, Metabolic Parameters)
- Neural Plasticity
- Motivation, Effort, Strategy Use
- Rumination, Intrusive Thinking, Distraction
- Emotional Factors, Depression, Anxiety
Putting the Pieces Together

Identify Mechanisms
Suggest Targets for Interventions

- Mediation
  - \textit{Multiple Mediators}

- Moderation- Interactions
  - Age, \textit{Stress, Intrusive Thoughts and Memory}
  - \textit{Education, Cognitive Activity and Memory}

- Composites- Combined Effects
  - \textit{Protective Effects for Reasoning}
Effects of Stress Condition on Task Irrelevant Thoughts Vary by Age

(Rosnick & Lachman, 2009)
Frequent Cognitive Activity Moderates Education Differences in Episodic Memory

Midlife in the U.S. (MIDUS)  
(Lachman, Agrigoroaei, Murphy & Tun, 2010)

Controlling for age, sex, self-rated health, physical activity, and income
Composites- Combined Effects

Factors

- Social
  - Good quality social relations- High support, low strain = 1

- Psychological
  - High sense of control- High mastery, low constraints = 1

- Physical/Behavioral
  - Frequent vigorous physical exercise = 1

- Composite Scoring 0 to 3 (low or high on each factor)
Protective Effects of Composite for 10-year Changes in Reasoning

Boston Subsample of MIDUS (Agrigoroaei & Lachman, 2010)

Controlling for age, sex, education, race, waist circumference, smoking, alcohol problems, functional health
Intervention Approaches

- Multimodal, Multifaceted
- Integrated into Everyday Life
- Preventive
- Target Vulnerable High Risk Groups

- Experience Corps (*Fried et al.*)
- Healthy Lifestyle Program (*Small et al.*)
- Computer-Mediated Support Groups (*Rains & Young*)

Improve Existing Social Relations or Cultivate New Ones
Next Steps

- Conduct Multidisciplinary Studies
- Integrate Findings from Epidemiological (Survey) and Experimental (Lab) Studies
- Examine Antecedents of Intraindividual Change and Variability with Longitudinal, Prospective Data
- Test Mechanisms and Treatment Benefits with Interventions/RCT’s
- Consider Social Policies to Facilitate Social Interactions, Reduce Stress and Promote Cognitive Health
Summary and Conclusions

Explanation and Modification of Age-Related Cognitive Change

- **Mechanisms**
  - Multiple Pathways/Mediators/Moderators
  - Multifaceted/Composites

- **Interventions**
  - Multimodal
  - Prevention

- **All Roads Lead to Rome**
- **There is More than One Way to Skin a Cat**
- **Moderation in All Things**
- **The More the Merrier**
- **The Whole Is Greater Than the Sum of Its Parts**
- **Kill Two Birds with One Stone**
- **The Early Bird Catches the Worm**
- **An Ounce of Prevention is Worth a Pound of Cure**
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