Matilda White Riley Award Lecture: Long Life in the 21st Century

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NIH, June 18, 2010
US: From pyramid to cube as the population ages

2030
360.9 million
Jeanne Louise Calment
1875-1997
A New Magazine for Parents

Baby Brain Power

What to Expect In the First Year of Life
National Health Interview Survey:
Percent reporting Serious Psychological Distress

Centers for Disease Control and Prevention, 2003
Lang, Staudinger & Carstensen, 1995
Socioemotional Selectivity Theory
Carstensen, 1993; Carstensen et al., 1999; Carstensen, 2006)

- Humans are uniquely able to monitor time – including lifetime -- and do so at both conscious and subconscious levels.
- Goals are always set in temporal contexts.
- Because chronological age is associated with time left in life, goals change across the life span.
• Expand horizons
• Acquire knowledge
• Meet new people
• Take chances
• Live in the moment
• Know what’s important
• Invest in sure things
• Deepen relationships
• Savor life
Time horizons influence preferences

- When time horizons are manipulated experimentally, preferences change systematically. Younger people show preferences similar to the old when time horizons are shortened and older people show preferences similar to the young when time horizons are expanded. (Fredrickson & Carstensen, 1990; Fung, Carstensen & Lutz, 1999; Fung, Lai & Ng, 2001)

- When natural occurrences, such as personal illnesses, epidemics, political upheavals, or terrorism prime endings, preferences of the young come to resemble those of the old (Carstensen & Fredrickson, 1998; Fung et al. 1999; Fung & Carstensen, 2006)
Poignancy by Condition

Ersner-Hershfield, Mikels, Sullivan, & Carstensen, 2008, *JPSP*
Capture the unexplored world.

ARNOLD Camera
111 First Street  |  Palo Alto, California  |  650.355.1212  |  arnoldcamera.com
Capture those special moments.

ARNOLD Camera
111 First Street | Palo Alto, California | 650.355.1212 | arnoldcamera.com
Success is within reach. Don’t let time pass you by.
Take time for the ones you love. Don’t let time pass you by.
Preferences for Emotional Ads by Age

- Younger
- Older

Control

% Selecting Emotional Headline

Preferences for emotional ads by age and condition


Graph: % Selecting Emotional Headline

- Control
  - Younger: 20
  - Older: 60

- Time-Expanded
  - Younger: 40
  - Older: 40
Recognition Memory: Type of Advertisement Slogan by Age


![Bar graph showing proportion correct for emotionally meaningful slogans and knowledge-related slogans by young participants.](image-url)
Recognition Memory: Type of Advertisement Slogan by Age


The graph shows the proportion of correctly recognized slogans by age group. For emotionally meaningful slogans, the proportion is higher for young individuals compared to old individuals. Conversely, for knowledge-related slogans, the proportion is higher for old individuals compared to young individuals.
In subsequent studies we identified a relative preference among older people for positive information over negative. We postulate that there is a developmental shift in motivation across adulthood in which a preference for negative information becomes a preference for positive information (Charles, Mather & Carstensen, 2003; Mather & Carstensen, 2003; Mather & Carstensen, 2005; Carstensen, Mikels & Mather, 2006; Lockenhoff & Carstensen, 2008). We call this shift the “positivity effect.”
Amygdala activity

Amygdala Activity

Mather, Canli, English, Whitfield, Wais, Ochsner, Gabrieli & Carstensen, Psychological Science, 2004
Attentional bias scores

Mather & Carstensen (2003) *Psychological Science*
What are the costs and benefits associated with the positivity effect?
Does the positivity effect influence anticipatory responses to monetary gains and losses?
Gain Anticipation

Samanez-Larkin, Gibbs, Khanna, Nielsen, Carstensen, & Knutson, 2007

Younger

Older
Loss Anticipation

Younger

Older

Samanez-Larkin, Gibbs, Khanna, Nielsen, Carstensen, & Knutson, 2007
Cue Ratings

Samanez-Larkin, Gibbs, Khanna, Nielsen, Carstensen, & Knutson, 2007
Cue Ratings

Samanez-Larkin, Gibbs, Khanna, Nielsen, Carstensen, & Knutson, 2007
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If older adults focus on their feelings versus the information when making decisions, will they make better choices?
HealthNow: dental care is fully covered

HealthNow: routine exams are not covered

CareNet: prescription drugs are fully covered

CareNet: physical therapy is covered

Choice
HealthNow: dental care is fully covered

HealthNow: routine exams are not covered

CareNet: prescription drugs are fully covered

CareNet: physical therapy is covered

… query

… query

… query

… query

Choice
HealthNow: dental care is fully covered

HealthNow: routine exams are not covered

CareNet: prescription drugs are fully covered

CareNet: physical therapy is covered

Choice

... query

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Main Effect of Age: $F(1, 114) = 5.49$, $p < .05$
Age by Condition Interaction: F(1, 114) = 6.62, p < .005
Does the positivity effect influence learning to seek gains and avoid losses?
### Gain Trial

**Decision**

- Optimal Cue: 0.66, +$1.00
- Non-optimal Cue: 0.33, +$0.00

**Choice**

- Optimal Cue: 0.33, -$1.00
- Non-optimal Cue: 0.66, -$0.00

**Feedback**

- Optimal Cue: +$1.00
- Non-optimal Cue: -$1.00

**Fixation**

- Optimal Cue: x
- Non-optimal Cue: x

### Loss Avoidance Trial

**Decision**

- Optimal Cue: 0.66, -$0.00
- Non-optimal Cue: 0.33, -$1.00

**Choice**

- Optimal Cue: 0.33, +$1.00
- Non-optimal Cue: 0.66, +$0.00

**Feedback**

- Optimal Cue: -$1.00
- Non-optimal Cue: +$1.00

**Fixation**

- Optimal Cue: x
- Non-optimal Cue: x
Using Message Framing for Health Behavior Promotion

- Pos > Neg & Neu (p=0.036)
- Pos > Neg (p=0.023)

**Older Adults**
- Pos > Neg & Neu (p=0.036)
- Pos > Neg (p=0.023)

Error bars: +/- 1 SE
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