Social Isolation & Loneliness in Midlife and Older Age

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World Population

Source: Population Reference Bureau
Successful aging is associated with:

- Improvements in life satisfaction and emotional well-being
- Increases in world knowledge
- Prioritizing of social and emotional goals
- Aptitude in managing social relationships

Sources:
Life Satisfaction and Emotional Well-being Improve with Age

Source:
Isolating or impoverished social environments
Experimental Effects of Social Isolation in Non-Humans

Decreases lifespan of the fruit fly, *Drosophila melanogaster*  
(Ruan & Wu, *PNAS*, 2008)

Promotes the development of obesity and Type 2 diabetes in mice  
(Nonogaki, Nozue, & Oka, *Endocrinology*, 2007)

Exacerbates infarct size & edema and decreases post-stroke survival rate following experimentally induced stroke in mice  
(Karelicna et al., *PNAS*, 2010)

Delays the positive effects of running on adult neurogenesis in rats  
(Stranahan, Khalil, & Gould, *Nature Neuroscience*, 2006)

Increases the activation of the SAM response to acute stressors in rats  

Decreases the expression of genes regulating glucocorticoid response in the frontal cortex of piglets  

Decreases open field activity, increased basal cortisol concentrations and decreased lymphocyte proliferation to mitogens in pigs  
(Kanitz, Tuchscherer, Puppe, Tuchscherer, & Stabenow, *Brain, Behavior, and Immunity*, 2004)

Promotes larger morning rises in cortisol in squirrel monkeys  
(Lyons, Ha, & Levine, *Hormones and Behavior*, 1995)

Increases 24 hr urinary catecholamines and evidence of oxidative stress in the Watanabe Heritable Hyperlipidemic rabbit  

Source: John T. Cacioppo, Matilda White Riley Lecture, OBSSR, NIH, 2011
Social isolation poses a mortality risk.

Source: House, Landis & Umberson, 1988

Loneliness predicts increases in systolic blood pressure over time in a sample of individuals over the age of 50.

Source: Hawkley et al. (2010).
Low Social Integration, Loneliness, and Risk of Death

Meta-analysis: Lack of good social relationships poses equivalent mortality risk to smoking.

Source: Holt-Lunstad, Smith, & Layton, Plos Medicine, 2010
2 Concepts: Objective vs. Subjective

Social isolation - the objective physical separation from other people (living alone, residing in a rural area), or poor quality social networks

Loneliness – perceived social isolation – the subjective, distressing feeling state of being alone, separated, or outcast

*Both matter for health.*

*They call for different types of intervention.*
Social Isolation: An Objective Phenomenon

Measurement of social networks:

• **Structural dimensions:** density/complexity, size, reciprocity, geographic proximity, form of affiliation…
• **Quality of interactions:** frequency, intensity, durability, strength

Example: SHARE Social Networks Module

• “Name generator” approach defines an ego-centered network
• Questions about frequency of contact, emotional closeness, geographical distance, …
Living Alone Over 65 in the U.S.

Percent of a county's residents aged 65 and over living alone in a non-family household in 2000.

- 0.0% - 21.6%
- 21.6% - 26.5%
- 26.5% - 30.0%
- 30.0% - 33.7%
- 33.7% - 80.8%

Source: US Census
Historical Trends in Living Alone: Changing Demographics

One-Person Occupancy Rates: 1940 to 2000

Source:
US Census
After rising for nearly a century, share of older women living alone is on decline

% of adults ages 65 and older living alone

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>All</th>
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<tbody>
<tr>
<td>1900</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>1930</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>1960</td>
<td>15</td>
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<tr>
<td>1990</td>
<td>29</td>
<td>26</td>
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<tr>
<td>2014</td>
<td>38</td>
<td>32</td>
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</tbody>
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Share of adults ages 85 and older living alone has increased since 1990 for both men and women

% of adults ages 85 and older who live alone

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>2000</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>2014</td>
<td>46</td>
<td>27</td>
</tr>
</tbody>
</table>

- Less financial security
- Less contact with family
- Less satisfaction with number of friends (men)

Source:
PEW RESEARCH CENTER
Relative Risk of Developing Dementia as a function of Social Isolation

Source: Fratiglioni et al, Lancet, 2000

Relative risks and 95% CIs from Cox-regression model for social network summary index

The relative risks are adjusted for age, sex, education, baseline Mini-Mental State Examination score, and depression symptoms.
Loneliness: A Subjective Phenomenon

Measurement by questionnaire:
- 20-Item UCLA Loneliness Scale
- 3-Item Loneliness Scale:

INSTRUCTIONS:
The next questions are about how you feel about different aspects of your life. For each one, tell me how often you feel that way.

Response Scale: Hardly ever, Some of the time, Often

1. First, how often do you feel that you lack companionship?
2. How often do you feel left out?
3. How often do you feel isolated from others?
Loneliness among Older Adults

Over 40% of adults 60+ in the Health and Retirement Study report being lonely at least sometimes (Perrissinotto et al., 2012).

9% of older adults in UK report severe loneliness (Victor & Bowling, 2012).

**Loneliness ≠ social isolation**, but social isolation increases risk for feelings of loneliness.

Social interactions of those who feel isolated are more negative and less satisfying (Cacioppo & Hawkley, 2009).
A vicious cycle connecting isolation and loneliness

Fig. 2. The effects of loneliness on social cognition. Modified from J. T. Cacioppo and Hawkley (2009).

Source: S. Cacioppo et al., Perspectives in Psychological Science, 2015
Lonely individuals don’t activate reward systems when viewing positive social stimuli

Source: Cacioppo et al., J Cog Neuroscience, 2007
Loneliness has adverse impact on health in humans. It predicts ...

Cognitive decline and the development of AD (RMAP; Wilson et al., 2007)
Incident coronary heart disease (NHANES; Thurston & Kubzansky, 2009)
Impaired immune responses (Flu vaccine study; Pressman et al, 2005)

Chicago Health And Social Relations Study:
• Increases in depressive symptoms over 1 year (Cacioppo et al., 2010)
• Larger cumulative increases in systolic blood pressure over 4 years (Hawkley et al., 2008)
• Morning cortisol response & sleep quality (over days) (Adam et al., 2006; Hawkley et al, 2010)
• Number of comorbid health conditions (Hawkley et al., 2006)

Health and Retirement Study:
• Increases in functional limitations over time (Luo et al., 2012; Perissinotto et al, 2012)
• Mental health problems and poor self-rated health (Coyle & Dugan, 2012)
• Poor health behaviors (Theeke, 2010)
Both **loneliness** and **social isolation** predict mortality

**Health and Retirement Study**
*Over 6 years, feelings of loneliness* were associated with increased mortality risk, an effect not explained by social relationships or health behaviors.

**English Longitudinal Study of Aging**
*Over 7 years*, both social isolation and loneliness are associated with increased mortality. But after adjusting for demographic factors and baseline health, **only the impact of social isolation remains significant.**

**Sources:**
**HRS:** Luo et al., *Soc Sci Med*, 2012;
**ELSA:** Steptoe et al., *Proceedings of the National Academy of Sciences*, 2013.
Can we successfully intervene?

Some examples ...
Most successful loneliness interventions focus on changing “social cognition”

Four common approaches to reducing loneliness:

1) improving social skills
2) enhancing social support
3) increasing opportunities for social contact
4) addressing maladaptive social cognition

…the most successful interventions addressed maladaptive social cognition, consistent with current theories regarding loneliness and its etiology.

Problems: most studies very small, many pre-post, few randomized trials

Building social resilience and combating loneliness in US soldiers

Focused on changing maladaptive social cognition
- Improving “mind-reading” – the ability to take others’ perspectives
- Learning how to maintain connections at a distance (empathy, mimicry, listening & speaking)

Results
- Reduced loneliness
- Improved social cognition (empathy, perspective taking)

Sources: Cacioppo, NAS Expert Meeting, June 2012;
Cacioppo et al., Journal of Personality and Social Psychology, 2015
The “Synapse” Project: Leveraging social engagement to improve cognition

Quilting Class

Photography Class

- Cognitive intervention leveraging social networks in combination with productive engagement yields improvements in episodic memory
- Neither social engagement alone nor cognitive engagement alone yielded benefits.

Source: Park et al., Psychological Science, 2013
Preliminary efforts to use internet to improve social connections/engagement in older adults

Source: Czaja et al., Contemp Clin Trials, 2015
– The Personal Reminder Information and Social Management System (PRISM)
Promoting Socially Meaningful Roles
Experience Corps Trial: Intervention Impact on Brain Volume

Source: Carlson et al., *Alzheimer’s & Dementia*, 2015
Experience Corps Trial: Intervention Impact on Physical Activity

Experience Corps Participants: Positive Expectations Regarding Aging Linked to More New Friends

Source: Menkin et al., Journals of Gerontology: Psychological Sciences, 2016
There Are No Labels in Here
Experience Corps member
Cleveland

I was assigned to a boy [who] got in trouble in the classroom and was often sent to the principal. After about two or three weeks, he looked up from the book and asked why I did not get angry with him. I told him it was because he did not do anything wrong.

"But everyone calls me a trouble maker," he said.

"Not me," I answered. "There are no labels in here."

Ever since that day his reading has improved.

There Are Children Waiting for Me
Delores Bell, Experience Corps member
Baltimore City

When they say, "Miss Bell I need some help," ... it gives me a feeling that I am needed.

I now have a purpose to get up in the morning, knowing that there are children waiting for me.
Where do we go from here?
Proposed Strategies for Intervention Research: Advice from the Experts

• Consider collaboration with voluntary and local government groups for evaluating their initiatives to increase engagement and reduce social isolation. – Andrew Steptoe, UCL

• Many public efforts are driven by good intentions, but poor for hypothesis testing. Interventions should be based on theory, so that even if it doesn't work, you learn something about the pathways.  
  – John Cacioppo, U Chicago

• Conduct many small studies with shorter term outcomes rather than a small number of large studies; target social isolation, loneliness, and networks rather than health to demonstrate ability to impact these targets.  
  – Lisa Berkman, Harvard
People want to remain at home, remain active, have some sense of purpose, be productively engaged.

But we need to have a society that sponsors this and is behind it.

So far, people are not really recognizing this need. They are in denial. They don’t want to deal with their own aging.

… We pretend it is not going to happen to us.

Robert Butler
1927- 2010
Founding Director, National Institute on Aging
Healthy older populations bring both desire for engagement and unique talents. ... Creating a new vision for the opportunities of an older age is the first critical step toward experiencing the benefits of our longer lives and creating a sustained third demographic dividend.