Experiences of Discrimination, Feelings of Purpose in Life, & Brain Health in the MIDUS Affective Neuroscience Project

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Today’s roadmap

1. Introduction to the Midlife in the U.S. study
2. MIDUS Affective Neuroscience goals
3. Emotional reactivity & recovery
4. Brain health & aging
5. Discrimination experiences vs. purpose in life
6. The future potential
• Begun in 1995

• Aged 25-74

• More samples added including Black Americans from Milwaukee

• Now 35 - 100+

• Data publicly available
  www.midus.wisc.edu

ADVANCING KNOWLEDGE OF FACTORS THAT PROMOTE POSITIVE HEALTH AND RESILIENCE

MID-LIFE IN THE UNITED STATES
A National Study of Health and Well-Being

MIDUS (Midlife in the U.S.) is a national longitudinal study of how many factors (behavioral, social, psychological, biological, neurological) come together to influence health and well-being as people age from early adulthood into midlife and old age. It was conceived by a multidisciplinary team of scholars interested in understanding aging as an integrative process.

MIDUS Samples
In 1995, MIDUS survey data were collected from a total of 7,108 participants. The baseline sample was comprised of individuals from four subsamples: (1) a national RDD (random digit dialing) sample, (2) a strata sample, (3) oversamples from

In addition, the twin subsample was administered a short screener to assess zygosity and other twin-specific information. With funding provided by the National Institute on Aging, a longitudinal fol-
Multidisciplinary content with huge breadth.
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Multidisciplinary *integration*: investigating the factors influencing health & well-being throughout adulthood & aging
MIDUS Affective Neuroscience Project goals are to identify

- **Linkages** between emotions, health, wellbeing, & the brain

- **Factors** (sociodemographic, psychosocial, lifestyle, experiential, environmental) moderating the linkages

- **Age-related changes** in these processes & linkages.
Emotional responses are evoked with pictures.
Measured with facial electromyography (EMG) and functional magnetic resonance imaging (fMRI).
Multimodal MRI provides brain structure, function, & connectivity information.
Emotional Stimulus

REACTIVITY to the stimulus
Emotional Stimulus

REACTIVITY

RECOVERY from the stimulus

Emotional Response Intensity

Time (s)
Differences in emotional responses are associated with indices of health and aging:

- Physical and mental health
- Inflammation
- Glucose regulation (diabetes)
- Cognitive and brain aging
- Mortality
Differences in emotional responses are associated with psychosocial factors:

- **Wellbeing Factors**
  - purpose & meaning in life

- **Personality**
  - conscientiousness & self-control

- **Coping and regulatory strategies**

- **Social relationships**
  - marital support vs. strain

[https://midus.wisc.edu/findings/pubtopics.php?topic=Neuroscience](https://midus.wisc.edu/findings/pubtopics.php?topic=Neuroscience) for publications
MIDUS includes psychosocial stress information such as *discrimination*, both lifetime and daily measures.
Dr. Williams’ questions assessing Perceived Daily Discrimination

- You are treated with less courtesy than other people.
- You are treated with less respect than other people.
- You receive poorer service than other people at restaurants or stores.
- People act as if they think you are not smart.
- People act as if they are afraid of you.
- People act as if they think you are dishonest.
- People act as if they think you are not as good as they are.
- You are called names or insulted.
- You are threatened or harassed.

Items are rated as *often, sometimes, rarely, or never.*
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60.9% reported daily discrimination
(Kessler, Mickelson, & Williams, 1999)
- Race/ethnicity
- Gender (e.g. female)
- Appearance (e.g. weight)
- Age
- Religion
- Socioeconomic status
- LGBTQ
- Disability
Suppression of emotional expression

- Changes outward emotional expression but not internal emotional experience

- Linked to negative outcomes
  - Worse cognition and memory
  - Reduced rapport, closeness, likeability, & social support
  - Increased sympathetic nervous system activity like sweating and systolic blood pressure
Exhibit less facial reactivity to negative pictures.

Report more use of expression suppression.

Report more daily discrimination.

These relationships are seen in Black Americans, *not* in White Americans.
Again, these relationships are seen in Black Americans, not White Americans.
Turn to brain health
The hippocampus

• Brain temporal lobe structure critical for learning, memory, and emotion.
• Plastic and vulnerable to aging and chronic or severe stress
• Affected in many neurological and psychiatric disorders.
• Important marker of brain health and brain aging.

The hippocampus

LEWY BODY DEMENTIA

ALZHEIMER’S DEMENTIA

HEALTHY CONTROL

Hippocampal volume decreases with age.

MIDUS Refresher Sample (2011-2016)
Hippocampal volume decreases with age.

MIDUS Core Sample (2017-2022)
The hippocampus

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Will racial inequity and experiences of daily discrimination be associated with hippocampal volume and microstructure?
Yes, smaller hippocampal volumes are found in those reporting higher levels of daily discrimination.
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In addition to overall racial differences in volume.
Discrimination is associated with a measure of greater diffusivity in the hippocampus - sensitive to white matter integrity & degeneration.
This diffusivity measure increases with age.
This suggests experiencing daily discrimination may prematurely age the brain.
Turn to resilience – purpose in life
Purpose in life

“Life is never made unbearable by circumstances, but only by lack of meaning and purpose...“

-Viktor Frankl
Dr. Ryff’s questions assessing Purpose in Life

(-) I live life one day at a time and don’t really think about the future.
(+ ) I have a sense of direction and purpose in life.
(-) I don’t have a good sense of what it is I am trying to accomplish in life.
(-) My daily activities often seem trivial and unimportant to me.
(+ ) I enjoy making plans for the future and working to make them a reality.
(-) Some people wander aimlessly through life, but I am not one of them.
(-) I sometimes feel as if I’ve done all there is to do in life.

Items are rated from strongly agree to strongly disagree.
Greater purpose in Life is associated with

- Better coping with stress and recovery from negative emotion
- Lower levels of depression symptoms
- Better sleep
- Better cognition
- Reduced risk of cognitive impairment, dementia, and Alzheimer’s Disease
- Reduced risk of cardiovascular events and all-cause mortality
Will feeling more purpose in life be associated with hippocampal volume and microstructure?
Hippocampal volume is larger in those with more purpose.

MIDUS Refresher Sample (2011-2016)
Hippocampal volume is larger in those with more purpose.
Feeling more purpose is also associated with better preserved hippocampal microstructure.
Summary

• Discrimination is a stressor impacting health and wellbeing, including
  • How people respond to emotional stimuli and display their emotional responses (expression suppression)
  • Cardiovascular health
  • Brain health ~ decreased volume and microstructural integrity of the hippocampus
Summary

• Purpose in life impacts many health and wellbeing processes

  • Better recovery from negative emotion and coping with stress

  • Better brain health including larger volume and microstructure integrity of the hippocampus.
As MIDUS samples grow older, we have new opportunities to learn

- The socioemotional determinants of accelerated aging

*but also*

- The early and midlife factors that promote resilience and better functioning *despite* experiences of adversity, inequity, genetic vulnerability, or the presence of pathology.
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- The early and midlife factors that promote resilience and better functioning *despite* experiences of adversity, inequity, genetic vulnerability, or the presence of pathology.

This knowledge will inform public policy & intervention science.
WHAT’S NEXT FOR MIDUS?

New Waves of Data:
• A fourth wave of data from original participants will span 30 years of data.

New Focus on Alzheimer’s:
MIDUS is uniquely situated to
• identify markers of risk before symptomatology appears
• discover factors that protect against cognitive decline.

Examining the Impact of the Pandemic:
• MIDUS will look at whether those hit hardest by the Great Recession also suffer disproportionately during the pandemic.
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