Sedentary Behavior & Older Adults: The Role of Neighborhood Walkability

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A Walkable Neighborhood is...

What is Walkable Neighborhood?

- A place that is accessible to all.
- A place where walking, biking, or mass transit are the preferred means of transportation.
- A building block of the walkable community, where neighborhoods are interconnected.
What is Sedentary Behavior

- A group of behaviors that occur whilst sitting or lying down.
- Requires very low energy expenditure.
What is Sedentary Behavior

• To be engaging in “sedentary behavior”, a person must meet three very basic criteria:
  a. You must be expending very little energy (≤1.5 Metabolic equivalents)
  b. You must be sitting or lying down
  c. You must be awake

Photo Credit: early movement academy inc.
The aim of the proposed research is: To Investigate the role of neighborhood walkability on **objective measures** of physical activity and sedentary behavior in older adults with and without Alzheimer’s Disease.
We hypothesize that “individuals whose neighborhoods are more connected and accessible will be more likely to walk frequently and less prone to sedentary behavior compared to individuals with neighborhoods low in connectivity and accessibility.”
RESEARCH SIGNIFICANCE

We chose to focus on walking because
RESEARCH SIGNIFICANCE

Positive health outcomes related to walking are:

• Cardiorespiratory capacity
• Speed of physical performance, and
• Body composition
RESEARCH INNOVATION

Environment and Behavior

• Focused on interaction between behavior & environment
• Promotes healthy activity
• Reduced cognitive decline risk & improved health for those with AD
• Relatively under-studied area of research
Methodological Innovation

- Cutting edge and rigorous methodology
- Objectively measure sedentary and walking behavior via accelerometry
- Advantage over traditional self-reported measures
- Objectively measure neighborhood walkability via GIS data and space syntax analysis
SPATIAL BEHAVIOR-INTERACTION MODEL

Spatial Variables

- Visibility (Visual connectivity, openness)
- Proximity (Visual integration, accessibility)

Figure: Spatial behavior-interaction model
METHODOLOGY

- **Multi-method Research Design**
  
  a. Neighborhood characteristics/ Physical environment (via WRATS)
  
  b. Objectively measure sedentary and walking behavior (via accelerometry)
  
  c. Geographical Information Systems (GIS) and Space Syntax (via ArcGIS and Depthmap)
METHODOLOGY

a. Neighborhood characteristics/ Physical environment

- Measuring Instrument: Walking Route Adult Tool for Seniors (WRATS)
- Used by laypeople to identify the best walking routes for older adults
- Focuses on perceived functionality, perceived safety, aesthetics, and destinations
- 3-point scale of 59 items
METHODOLOGY

b. Sedentary and walking behavior

- Measuring Instrument: Accelerometry
- Objectively measurable
- Provides an objective measure of activity frequency, intensity and duration.
METHODODOLOGY

c. Geographical Information Systems (GIS) and Space Syntax

- Measuring Instrument: ArcGIS and Depthmap

Figure: Objective representation of street network with global integration value of space syntax
**METHODODOLOGY**

Figure: Objective representation of street network with global integration value of space syntax.
**NEXT STEPS** (Research)

- **RESEARCH**

  a. Research grant  
  b. Journal article.
NEXT STEPS (Design Practice Implications)

• DESIGN PRACTICE IMPLICATIONS

To identify the relationship between neighborhood walkability and sedentary behavior.
Thank You

Questions/ Comments?