Neighborhood Grocery Store Density is Associated with Daily Self-Efficacy Among Individuals in a Behavioral Weight Loss Intervention Study


AHA EPI|LIFESTYLE Meeting, 2016
Phoenix, AZ
Conflict of Interest

• None to disclose
Neighborhood Environments and Body Weight

- Physical/Built Environment
Neighborhood Environments and Body Weight

- Social/Economic Environment
Neighborhood Environments and Body Weight

- Service/Retail Environment
Behavioral Interventions: Influence of Neighborhood Environments?

- Prior studies of the effects of neighborhood environments within behavioral interventions
  - Residential retail food store on effect of diet intervention\(^1,2\)
  - Effect of worksite neighborhood on worksite behavioral intervention for weight loss\(^3\)
  - Children: neighborhood environment on effect of pediatric intervention related to physical activity and eating\(^4\)

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Self-Efficacy and Weight Loss

• Self-efficacy enhancement is a common target in weight management interventions
  – Confidence or belief in oneself in initiating and continuing a behavior
  – Individuals are more likely to continue their efforts if perceived self-efficacy is higher

• No previous studies have examined the effects of neighborhood environments on self-efficacy, particularly in a behavioral weight loss intervention
Study Aim

• Examine associations between grocery store density and self-efficacy among individuals in a behavioral weight loss intervention
Secondary Analysis of EMPOWER Study (PI: Burke)

- 12-month prospective study
- All participants received standard behavioral treatment for weight loss for 12 months
  - Daily dietary (calories, fat) goals
  - Weekly physical activity (PA) goals
  - Self-monitor diet, PA, and weight
- **Aim of EMPOWER**: Examine triggers for relapse after intentional weight loss using ecological momentary assessment (EMA)
Ecological Momentary Assessment (EMA)

- Assesses individuals’ experiences as they occur in real time and in their natural environment
- Time dependent EMA prompts were delivered daily:
  - Beginning of the day (BOD)
  - End of day (EOD)
- Random EMA prompts delivered 1-5 times/day to assess background conditions
How CONFIDENT are you that you will be able to stick to your healthy lifestyle plan today?
Measuring Location and Neighborhood

- Residential address at baseline
- Residential address linked with neighborhood-level measures (ArcGIS)
  - Neighborhood: census tracts
Neighborhood Measures and Data Sources

- US Census/ACS
  - Neighborhood income/poverty
  - Neighborhood racial composition
  - Neighborhood socioeconomic position (SEP)

- Pittsburgh Neighborhood and Community Information System
  - Land use/zoning data (e.g., commercial property)
Neighborhood Measures and Data Sources

- Dun & Bradstreet/ InfoUSA
  - Density of grocery stores: # of stores per area & capita
Data Analysis

- Linear mixed model to assess the association between grocery store density and daily self-efficacy
  - Adjusted for time
## Sample Description (N=136)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>% or Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>90%</td>
</tr>
<tr>
<td>Female</td>
<td>80%</td>
</tr>
<tr>
<td>Age (years)</td>
<td>51.3 ± 10.3</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>34.1 ± 4.6</td>
</tr>
</tbody>
</table>
Temporal Trends in Daily Self-Efficacy

Grocery Store Density
Mean: 3.4 [0-22.8]

Daily Self-Efficacy

Grocery Store Quartile
- Low [0-0.4]
- Mid-low [>0.4-1.8]
- Mid-High [>1.8-15]
- High [<15-22.9]
# Self-Efficacy as a Function of Neighborhood

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Low</th>
<th>Mid-Low</th>
<th>Mid-High</th>
<th>High</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery Store/ Supermarket Density</td>
<td>6.39 (0.25)</td>
<td>6.63 (0.25)</td>
<td>7.17 (0.26)</td>
<td>7.31 (0.21)</td>
<td>0.037*</td>
</tr>
<tr>
<td>Restaurant Density</td>
<td>6.44 (0.27)</td>
<td>6.91 (0.26)</td>
<td>7.02 (0.26)</td>
<td>7.12 (0.27)</td>
<td>0.285</td>
</tr>
<tr>
<td>Proportion Black</td>
<td>6.82 (0.26)</td>
<td>6.71 (0.26)</td>
<td>7.01 (0.28)</td>
<td>7.00 (0.26)</td>
<td>0.816</td>
</tr>
<tr>
<td>Proportion Low Income</td>
<td>6.73 (0.28)</td>
<td>6.87 (0.25)</td>
<td>6.88 (0.27)</td>
<td>7.05 (0.27)</td>
<td>0.867</td>
</tr>
<tr>
<td>Neighborhood SES Index</td>
<td>6.64 (0.26)</td>
<td>6.87 (0.26)</td>
<td>6.87 (0.27)</td>
<td>7.15 (0.27)</td>
<td>0.595</td>
</tr>
</tbody>
</table>

Adjusted for time (i.e., month)
Implications and Conclusions

- Grocery stores/supermarket density was significantly associated with individuals’ daily self-report of their confidence in adhering to a healthy lifestyle plan.

- This study needs to be replicated in a larger cohort with a more diverse neighborhood representation.

- Future research
  - Location in real-time throughout duration of study via smartphones
    - GPS (longitude/latitude) collected in real time (2 week pilot)
    - GMA: Geographical Momentary Assessment
Acknowledgements

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• Research team and collaborators

• Study participants