



CASE WESTERN RESERVE
UNIVERSITY EST. 1826

Decision Making in Food Systems: Understanding The Mental Models for Site Placement and Access of Food Retailers in Low- income Markets

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Agenda

1. Introduction
2. Problem Statement
3. Background
4. System Dynamics Approach
5. Dynamic Hypothesis
6. Recommendations

1. INTRODUCTION

Access to supermarkets and food retail has been associated with **fresh food consumption**. However, physical access to food- which is measured by identifying places where a household can obtain food, varies amongst population groups (Mabli et al., 2013).

Studies indicate that access to food for consumers with **low-income is limited primarily or even exclusively** to local independent retailers with limited brands, package sizes, and higher prices (Ver Ploeg et al., 2009).

We examine the mental models of retailers to understand decision-making of store site location and access in low-income markets.

2. PROBLEM STATEMENT

Research indicates food environments with higher amounts of supermarkets are prevalent in **affluent neighborhoods** with higher income (Moore & Diez Roux, 2006).

Policy Intervention

To close the gap in food access the United States Department of Agriculture (USDA) established the Supplemental Nutrition Assistance Program (SNAP) for low-income consumers to receive benefits to purchase food at grocery stores.

Amid endeavors to increase access to food, the **presence of grocery stores** in low-income markets remains scarce.

3. BACKGROUND – ARCHIVAL DATA

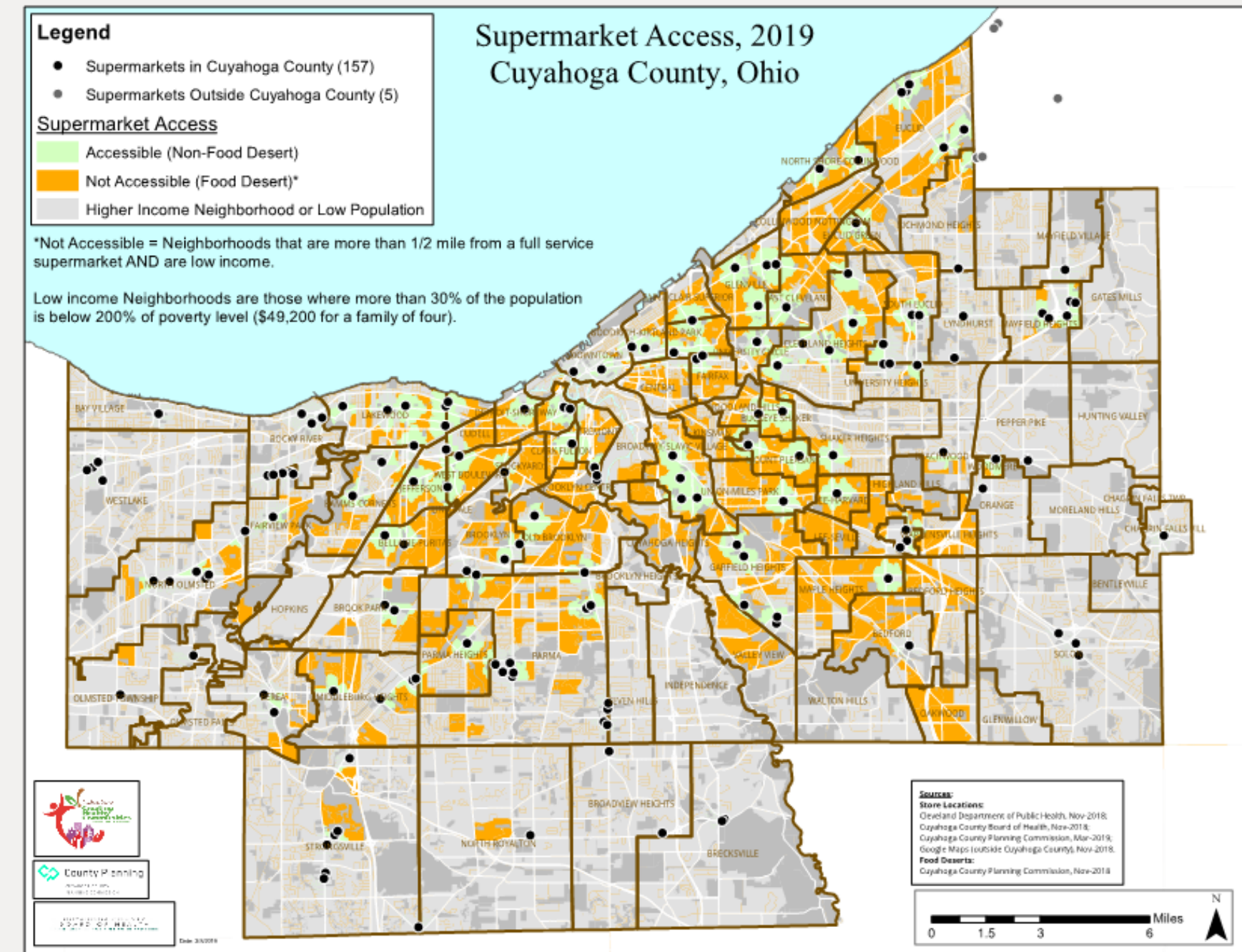
A qualitative study was initiated to **understand food access barriers for retailers** in low-income markets.

The study was conducted in **Cuyahoga County, Ohio** utilizing archival GIS data from the Cuyahoga County Board of Health (CCBH) to locate low-income markets with limited retail access.

The CCBH report provided a 2 year history (2016 -2018) of food retail site locations and consumer demographics.

CCBH Report Metrics

- Non Accessible: neighborhoods more than ½ or more from a supermarket and low-income
- Low-Income: neighborhoods more than 30% of the populations is below 200% of the poverty level (49k for a family of 4)



3. BACKGROUND – ARCHIVAL DATA

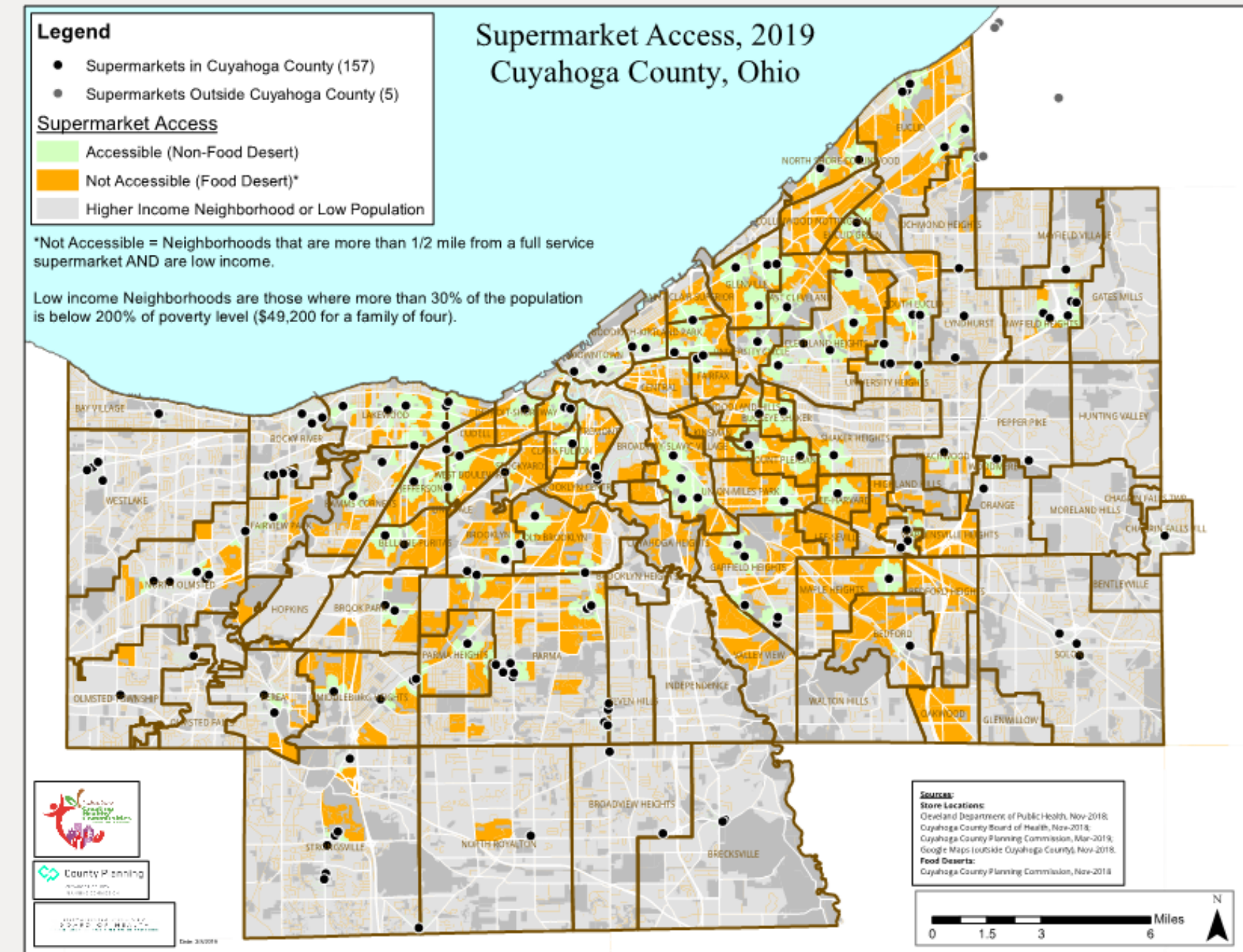
RESEARCH GAP

“A better understanding of the **supply chain for small stores** can inform effective strategies in these challenging retail food environments.”
(Odoms-Young, et. al. March, 2024).

The following research question was developed to anchor the study:

RESEARCH QUESTION

What factors influence local retailers to provide **food access for low-income consumers**?



3. BACKGROUND – QUALITATIVE DATA

INFORMANTS

- A total of 24 informants were interviewed period of (May - August, 2020)
- Informants included local retail operators and food partners.
- Archival data from CCBH study identified neighborhoods categorized as non-accessible to recruit informants

METHODOLOGY

- Constructivist Grounded Theory
- Semi-instructed Interviews (1 hour)
- Conducted Via Zoom
- Recordings, Transcripts and Memos
- Nvivo Software

Detailed Sample Information		
Criteria	Characteristics	Operators
Small Grocer Convenience Farmer's Market	SG: Independent, Co-Op	4
	C: Corner Store, Gas Station	1
	FM: Farmer's Market, Market Garden	3
(Respondents)		8
Criteria	Characteristics	Partners
Nonprofit Financial Government	NP: Health, Academic	8
	F: Funders, Community Development	3
	G: Officials, Organizations	5
(Respondents)		16
Total Informants		24

3. BACKGROUND FINDINGS

BARRIER

Findings reported food retail market analysis (practices) ***does not support*** store operations in low-income markets.

QUOTES

"Yeah, so an area that is distressed. The market analysis can't support the traditional operation of a grocery store."

"I feel like a lot of the larger retailer's kind of shift to more affluent neighborhoods because that's just kind of where their business model lies. That's where it works the best."

3. BACKGROUND FINDINGS

BARRIER

Findings reported food retail market analysis (practices) ***does not support*** store operations in low-income markets.

QUOTES

"Like the way they do market studies and also the kind of stuff on demographics. Grocery stores don't really come to places like this."

"I would say that in low-income areas, I feel like they need something that's more responsive and flexible to their needs. Whereas a big box chain is not going to be able to give necessarily. "

4. SYSTEM DYNAMICS APPROACH

Purpose

Through the use of informal maps we want to uncover the and understand the endogenous sources of system behavior (Richardson, 2011). To understand the complex behavior patterns of local retailers over time, a causal loop system dynamics model was developed.

Research Question

How do retail mental models affect access to food in low-income markets?

Mental Models

Examining the mental models of food retailers help us understand the observed consequences of policy decisions in low-income markets. Mental models not only serve as a source of information for model building, they help visualize information feedback loops and decision-making in complex systems.

5. DYNAMIC HYPOTHESIS

REFERENCE MODES

Qualitative Data

Historical data from the qualitative findings was utilized as a starting point in our model. This also allowed us to examine any inferred future behaviors.

- Barrier: Findings reported food retail market analysis (practices) ***does not support*** store operations in low-income markets.

We utilized historical evidence from the qualitative study as variables to replicate patterns and decision-making from retailers in low-income markets.

5. DYNAMIC HYPOTHESIS

REFERENCE MODES

Literature Review

Literature was utilized to complement the historical qualitative data to inform the model. This helped identify concepts to detect linkages between variables.

Site Location Decisions

- Reynolds, J. and Wood, S. (2010). Location decision making in retail firms: evolution and challenge. International Journal of Retail & Distribution Management, 38(11/12), 828-845.

Forecasting Approaches

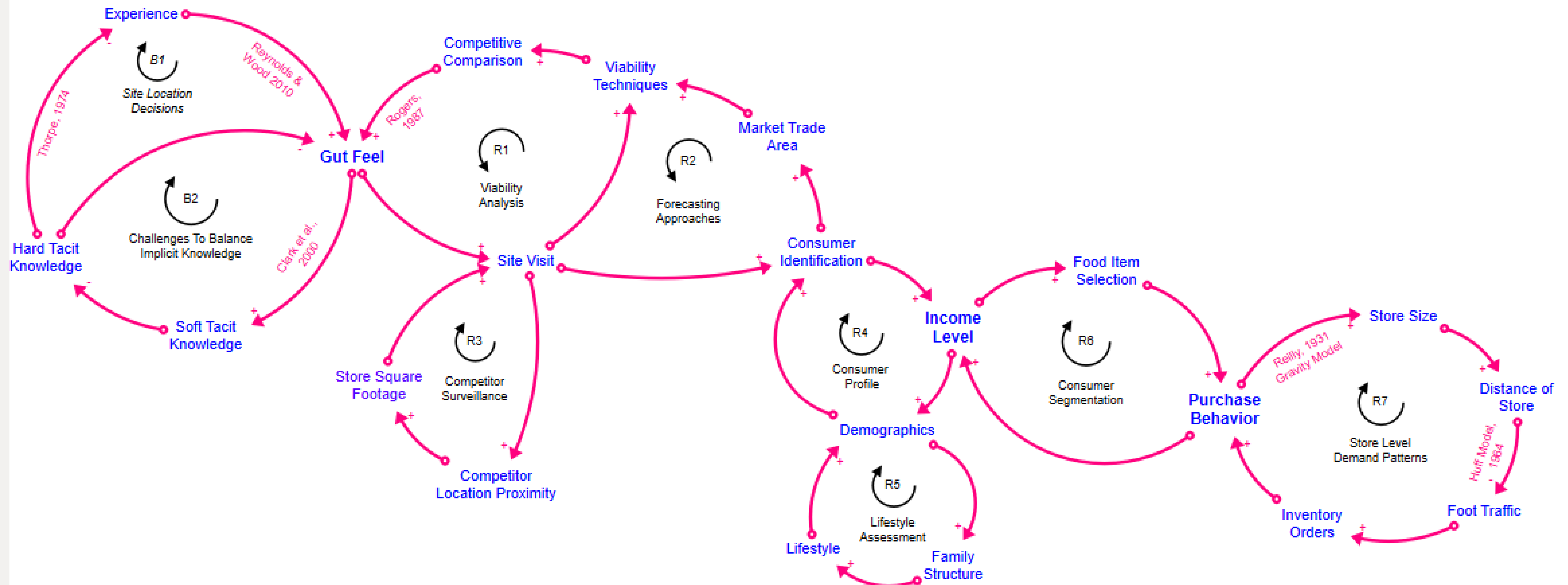
- Wood, S. and Browne, S. (2007). Convenience store location planning and forecasting – a practical research agenda. International Journal of Retail & Distribution Management, 35(4), 233-255.

Store Level Demand Patterns

- Semple, H. and Giguere, A. (2017). The Evolution of Food Deserts in a Small Midwestern City: The Case of Ypsilanti, Michigan: 1970 to 2010. Journal of Planning Education and Research, 38(3), 359-370.

5. DYNAMIC HYPOTHESIS

Retail Site Placement Causal Loop Model



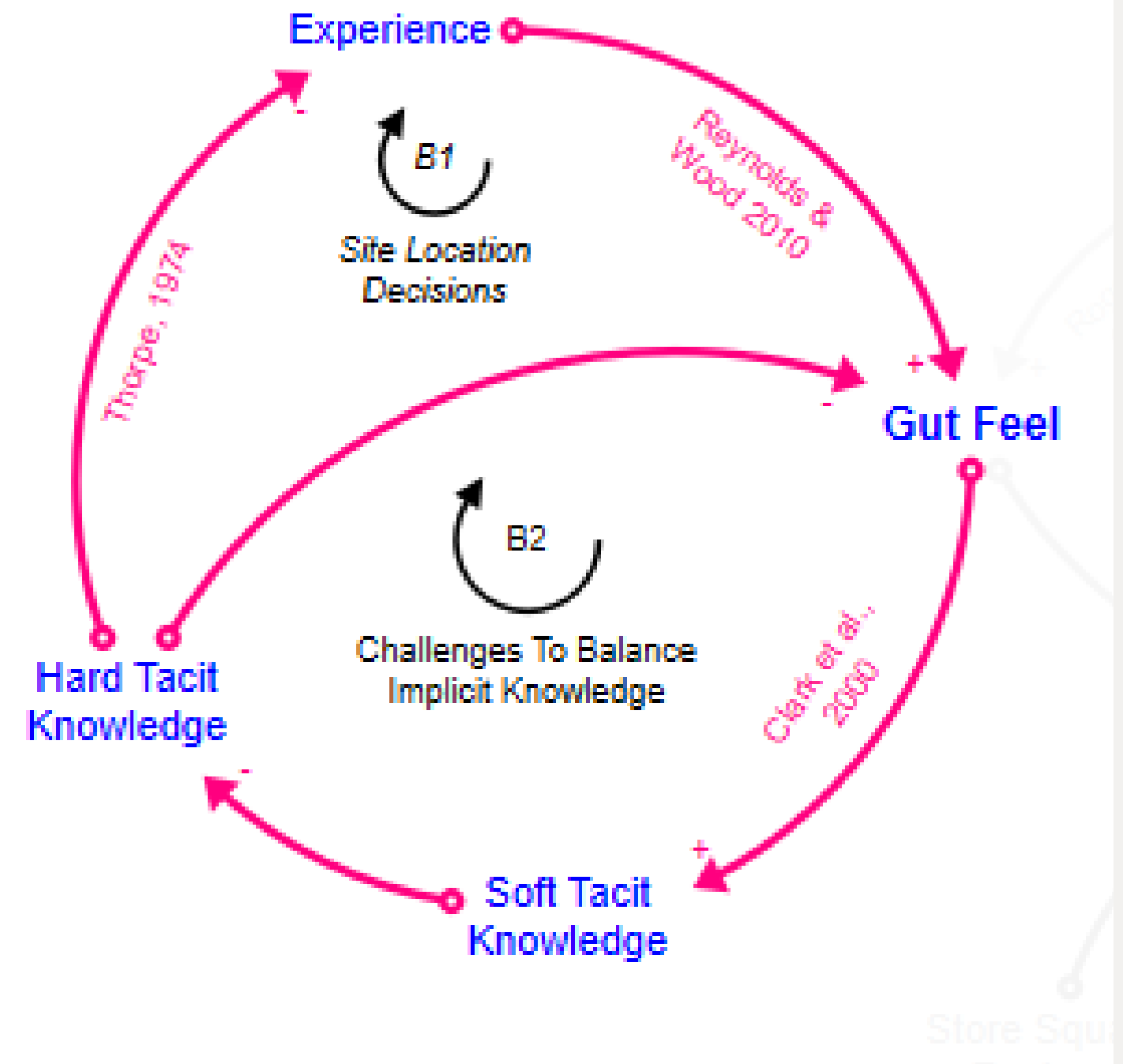
5. DYNAMIC HYPOTHESIS

Site Location Decisions

“The **gut feel** of experienced operational managers was the dominant factor in reaching decisions about new sites or in developing retail trade forecasts (Penny and Broom, 1988).”

Challenges to Balance Implicit Knowledge

Retailers relied upon **soft tacit** knowledge in determining retail store site locations. Hard **tacit knowledge**, i.e. data was utilized as an activity that “*should*” offer reliance for decision-making, yet soft tacit knowledge was still preferred.



5. DYNAMIC HYPOTHEIS

Viability Analysis

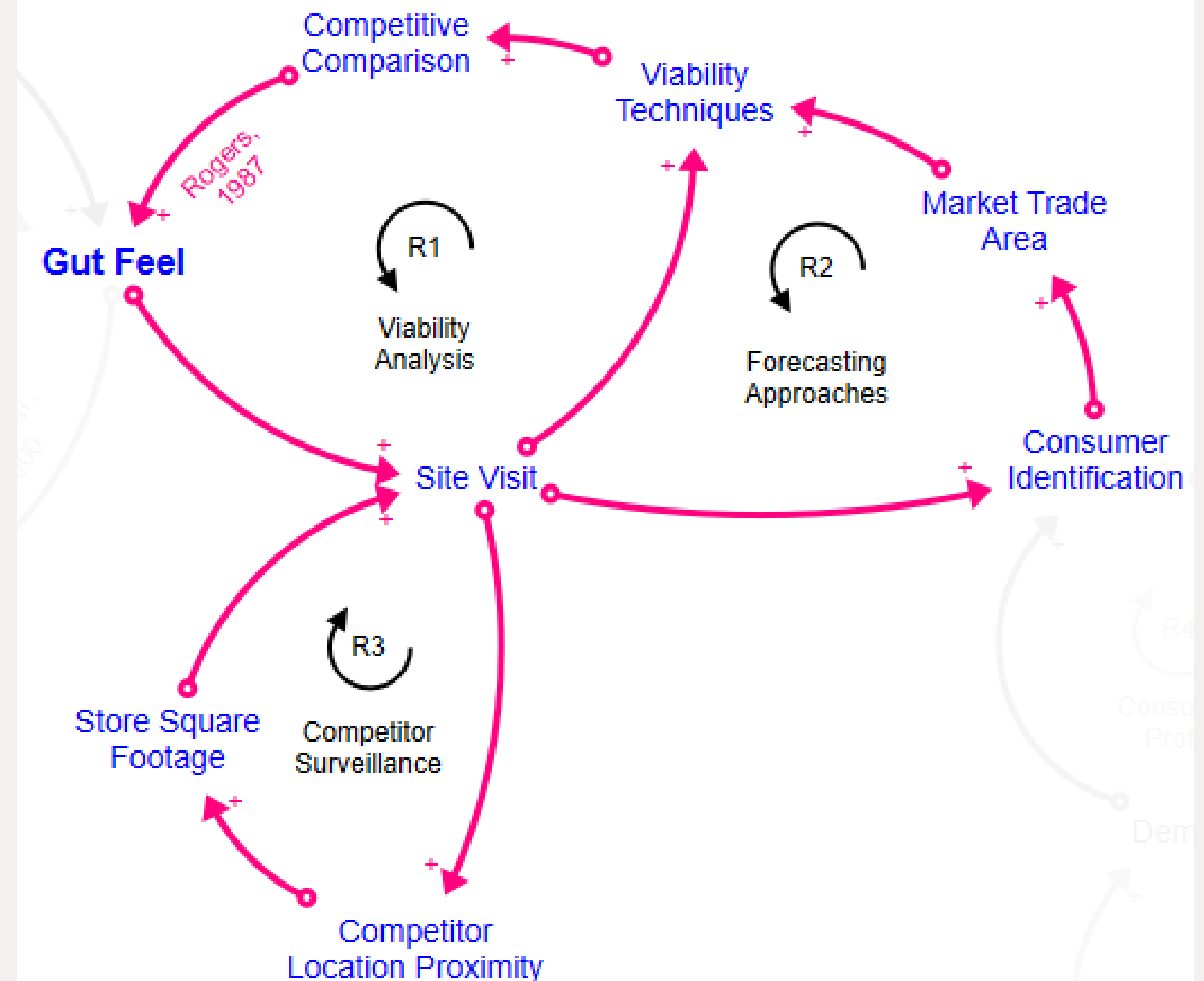
Informants discussed comparing sites with competitive stores (i.e. stores in affluent markets) to test if they were **“viable”** for retail market standards.

Forecasting Approaches

Forecasting approaches were influenced by **“gut feel”** and historical metrics for identifying consumers and describing market trade area.

Competitor Surveillance

The **“gut feel”** reassured the experience of the physical site visit, including how retailers surveilled nearby competitors.



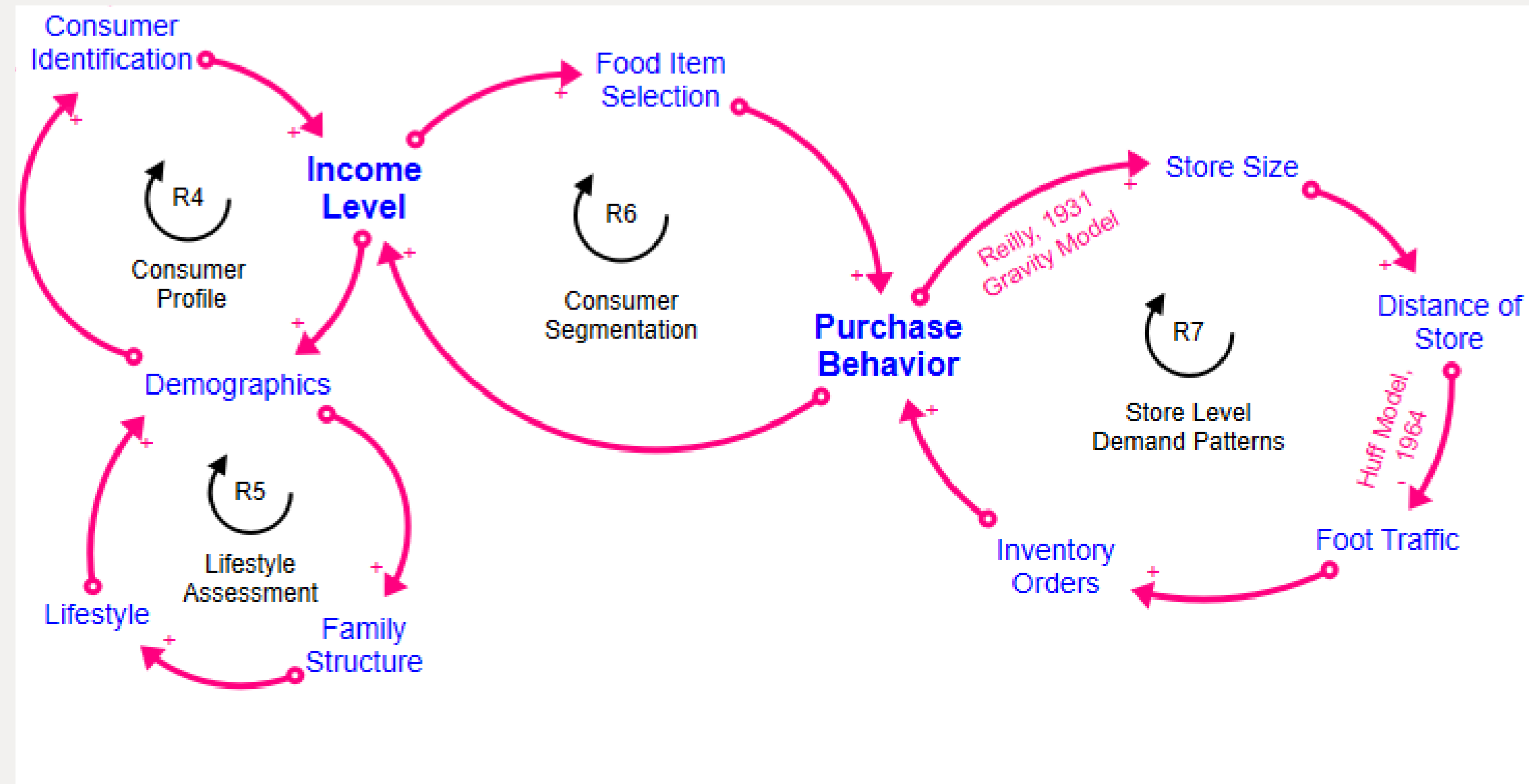
5. DYNAMIC HYPOTHESIS

Consumer Segmentation

Consumer purchase behavior was predicated, income level and food item selection.

Store Level Demand Patterns

According the retail **“Gravity Model”** store size drives consumer purchase behavior. Additionally the **“Huff Model”** predicts consumer foot traffic according store proximity.



6. RECOMMENDATIONS

Next Steps and Opportunities

Additional concepts will be developed in the causal loop model for further hypothesis exploration to prepare for development of a simulation model. Additionally, the study addresses a gap in literature regarding a greater depth of understanding supply chain operations of *independent retail stores* to enhance knowledge of food access in low-income markets.

Gut Feel

While “Gut Feel” is considered no longer to be the pre-dominant factor in site-placement analysis, “*local knowledge*” is still used in determining food retail store location along with situational cues gathered from the physical environment (Ruth et al., 2022).



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THANK YOU!

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