# Dynamic Inconsistency in Food Choice: Evidence from the Food Desert

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# Behavioral Economics - Theory

- Choices we make for the future are inconsistent with choices we make for the present:
  - People say they will quit smoking, but never do.
  - Everyone plans to go on a diet "tomorrow."
  - People get gym memberships, yet fail to exercise.

- These behaviors are explained by the behavioral economics theory of dynamic inconsistency.
  - Identified in the laboratory when Rewards chosen at time *t* for *t+k,* are different from rewards chosen at time *t+k*

# Main Questions

1. Do people exhibit dynamic inconsistency in food choices?
   - Theory predicts temptation at time of food delivery for less healthy item
   - Then advance choice should be healthier than immediate choice

2. If yes, would people be willing to commit to a stream of "healthier" future choices?
   - If yes, who commits?

# Our Setting

- Louis' Groceries
- Greater Grand Crossing, Chicago, Illinois
- A 'food desert'
- 28% poverty rate
- 97.8% African American
- High incidence of obesity and related diseases (10-40% higher than Chi)

# Our Experiment

- Louis' offers a special food delivery promotion: 2 free home deliveries plus $20 bonus for survey completion.
- Participants make choices about composition of a food basket for delivery a week from now - advance choice.
- When the food is delivered, we surprise participants by allowing them to change their mind – immediate choice.
- The following week, we investigate whether participants are willing to commit to an advance basket.

# Week 1

- Given $10 budget and a choice of 20 foods.
  - 10 'healthy' items, 10 'unhealthy' items. All items cost $1.
  - Foods to be delivered in one week.
- Subjects rate all 20 foods on a scale of 1 to 7 for desirability.

*Please tell us how much you like the following foods, where 1 is DO NOT LIKE AT ALL and 7 is LIKE VERY MUCH.*

| | | | | |
|---|---|---|---|---|
| 2 Granny Smith Apples | 2 Red Delicious Apples | 3 Bananas | 2 Bosc Pears | 2 Bags Cheetos Flamin' Hots (1 1/8 oz. each)0 |
| 1 Bag Cheez-its (1.5 oz. ) | 1 Large Cucumber | 2 Bags Doritos (1 1/8 oz. each) | 2 Fudge Brownies (3 oz. each) | 2 Green Peppers |
| 2 Honey Buns | 4 Nutter Butter cookies (1.9 oz.) | 2 Oranges | 6 Oreo Cookies | 1 PayDay bar (1.85oz) |
| 2 Plums | 2 Bags Potato Chips (1 1/8 oz. each) | 1 Red Pepper | 1 Snickers bar (2.07oz) | 1 Large Tomato |

# Week 2

- Chosen bundle of food delivered.
- In addition, we bring 4 'extra' items.
  - Highest rated unhealthy item
  - Highest rated unhealthy item not in bundle
  - Highest rated healthy item
  - Highest rated healthy item not in bundle.
- All 'extra' items were previously available.

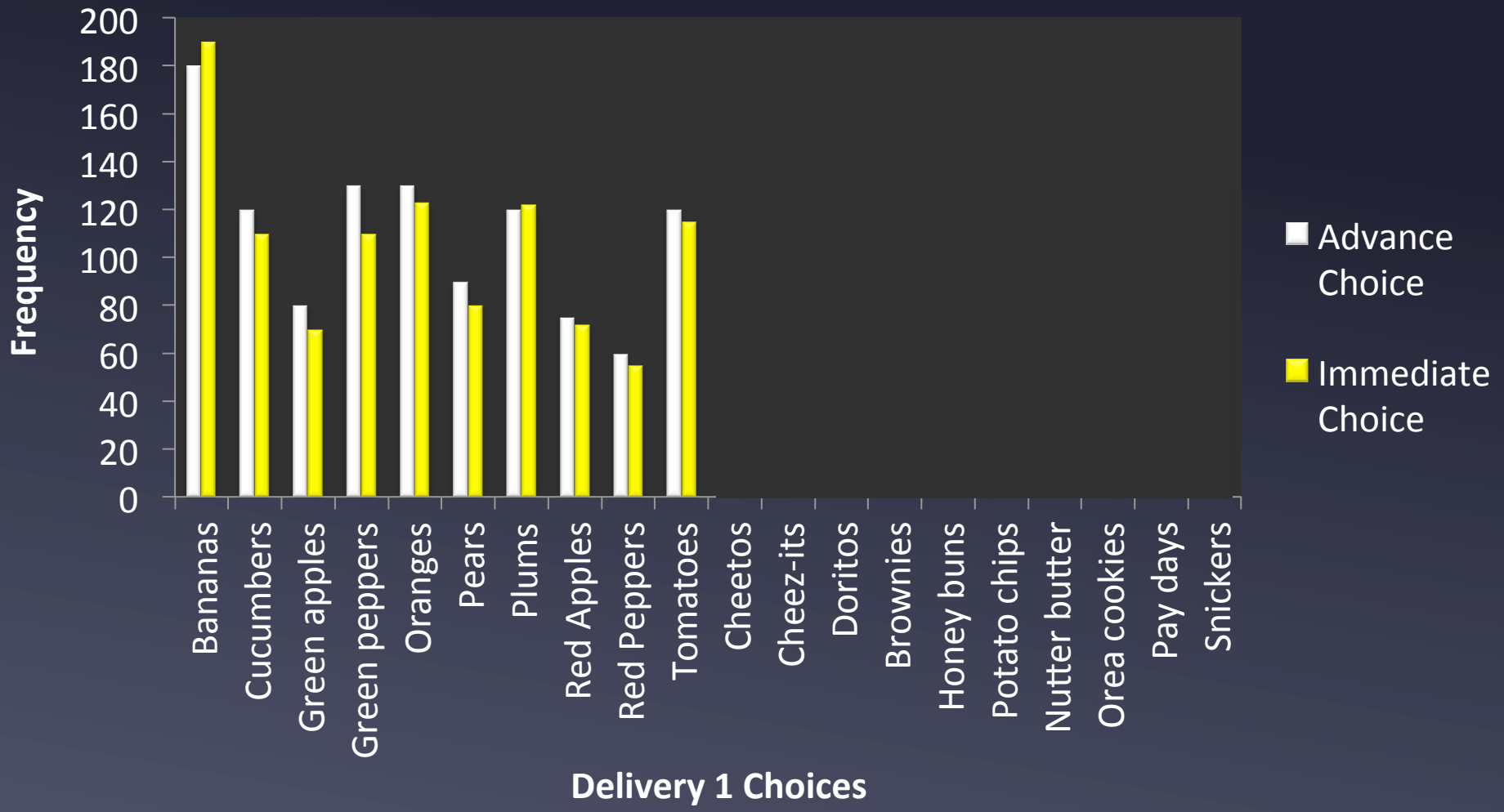
# Week 2

- *Hello, I am here with your basket. Please take a look [Bring open basket, allow person to look through].*
- *We also have some extra items available.*
- *If you like, you can exchange any one item in your basket for one of these items [ show extra items on tray ].*
- *I brought four additional items, so you can make up to 4 exchanges. Do you want to make any exchange? [Thanks, let me note that on your order sheet.]*

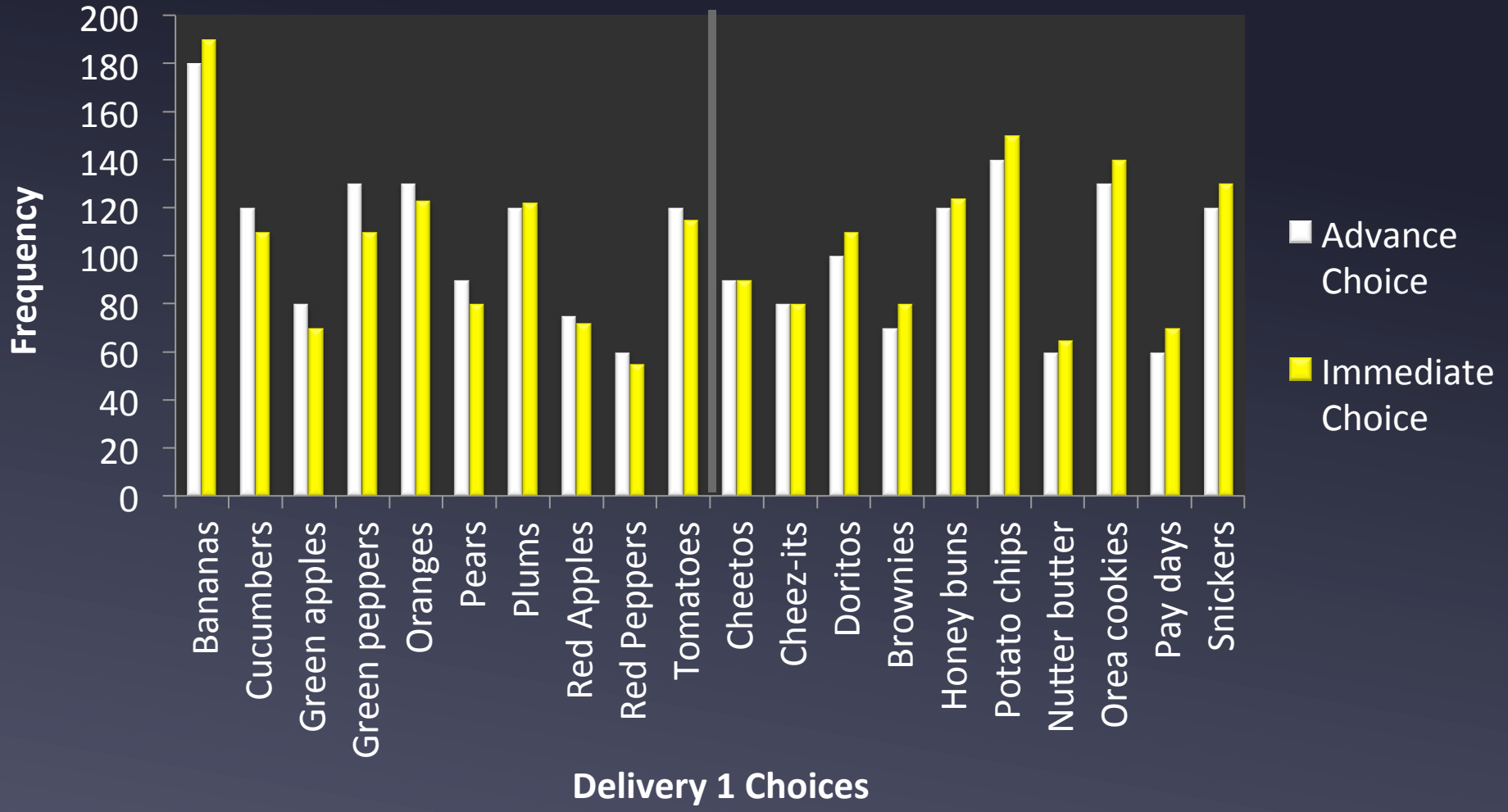
# Testing for Dynamic Inconsistency

- Are advance choices healthier than immediate choices?

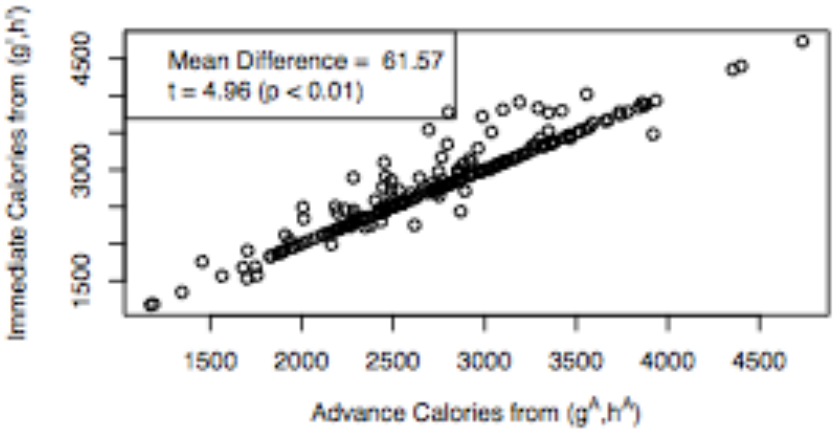
# Results: Basket Composition



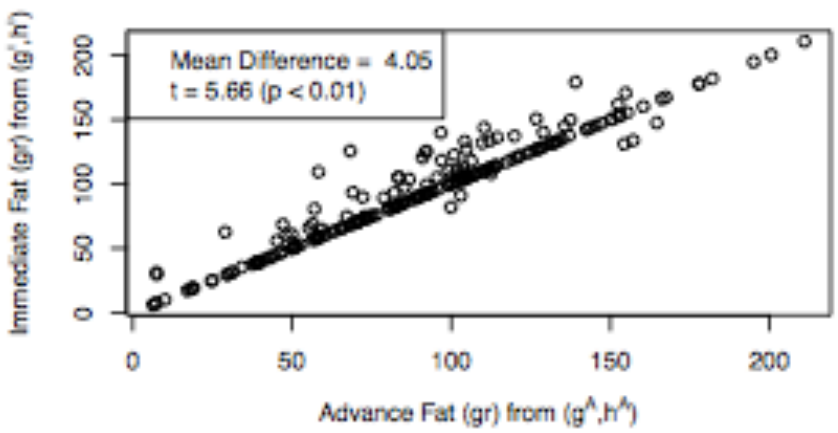
# Results: Basket Composition



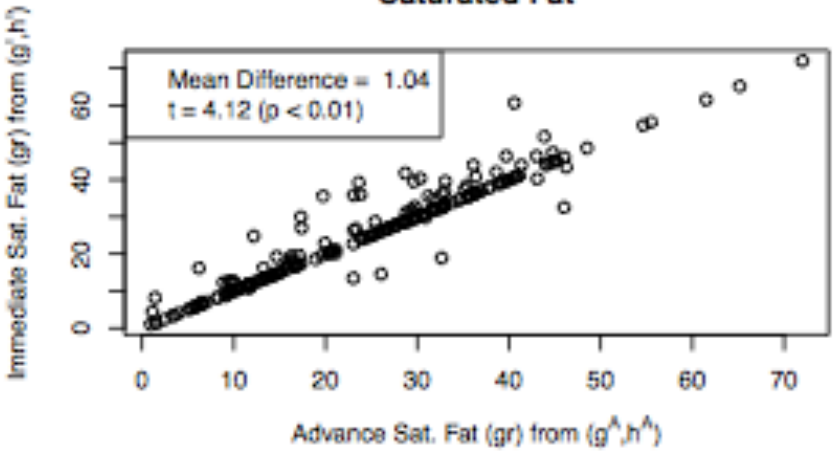
## Calories



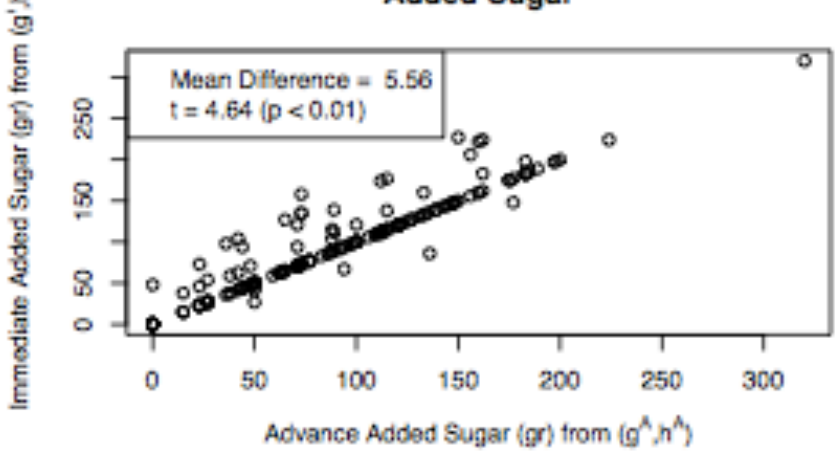

## Fat




## Saturated Fat




## Added Sugar




## Carbohydrates

## Protein

# Where does inconsistency come from?

- Of 218 subjects, 79% have same number of healthy/unhealthy foods.

- But:
  - 21% of individuals exhibit dynamic inconsistency in number of healthy foods
  - 96% of inconsistent individuals have unhealthier immediate bundles.

# Do people want to commit?

- We ask individuals whether they'd prefer to keep their previous choice.
- This is called 'commitment demand.'

# Weeks 2-3

- Week 2: Again given a $10 budget and choice of 20 foods for delivery in Week 3
- Week 2.5: Called to schedule Week 3 delivery.

*Last time, we brought some extra items for you so you could exchange if you changed your mind from your previous choices. This time, we can also bring extra items, but I wanted to check if you'd like that or not. It is up to you: would you like me to bring extra items this time, or not?*

- Week 3: Delivery of basket from Week 2 (non-committed subjects make delivery changes).

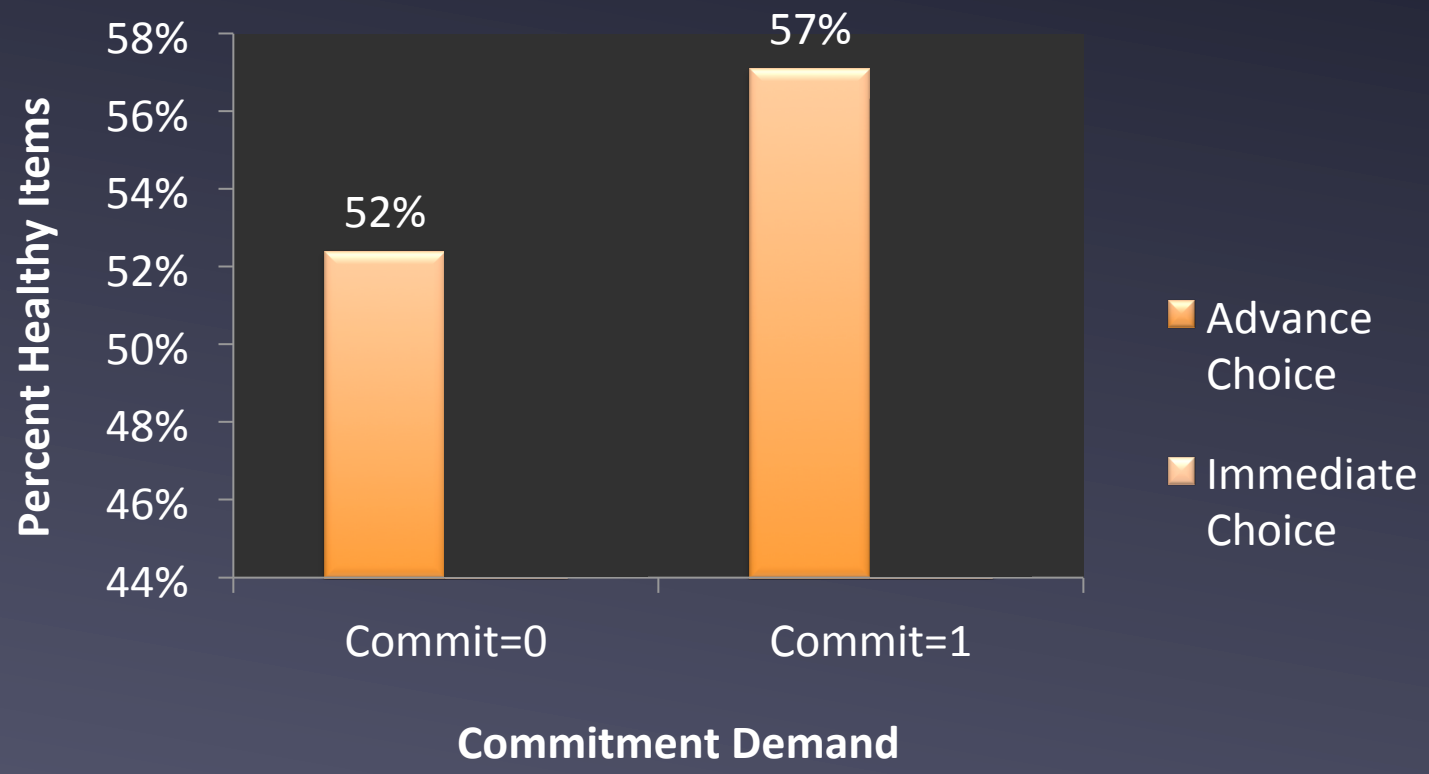
# Commitment Demand

- 33% of participants commit
  - (ask not to get the items for exchange)

- Who commits?
  - Those who struggle to eat healthy?
  - Those already eating healthy?
  - The answer has theory and policy implications

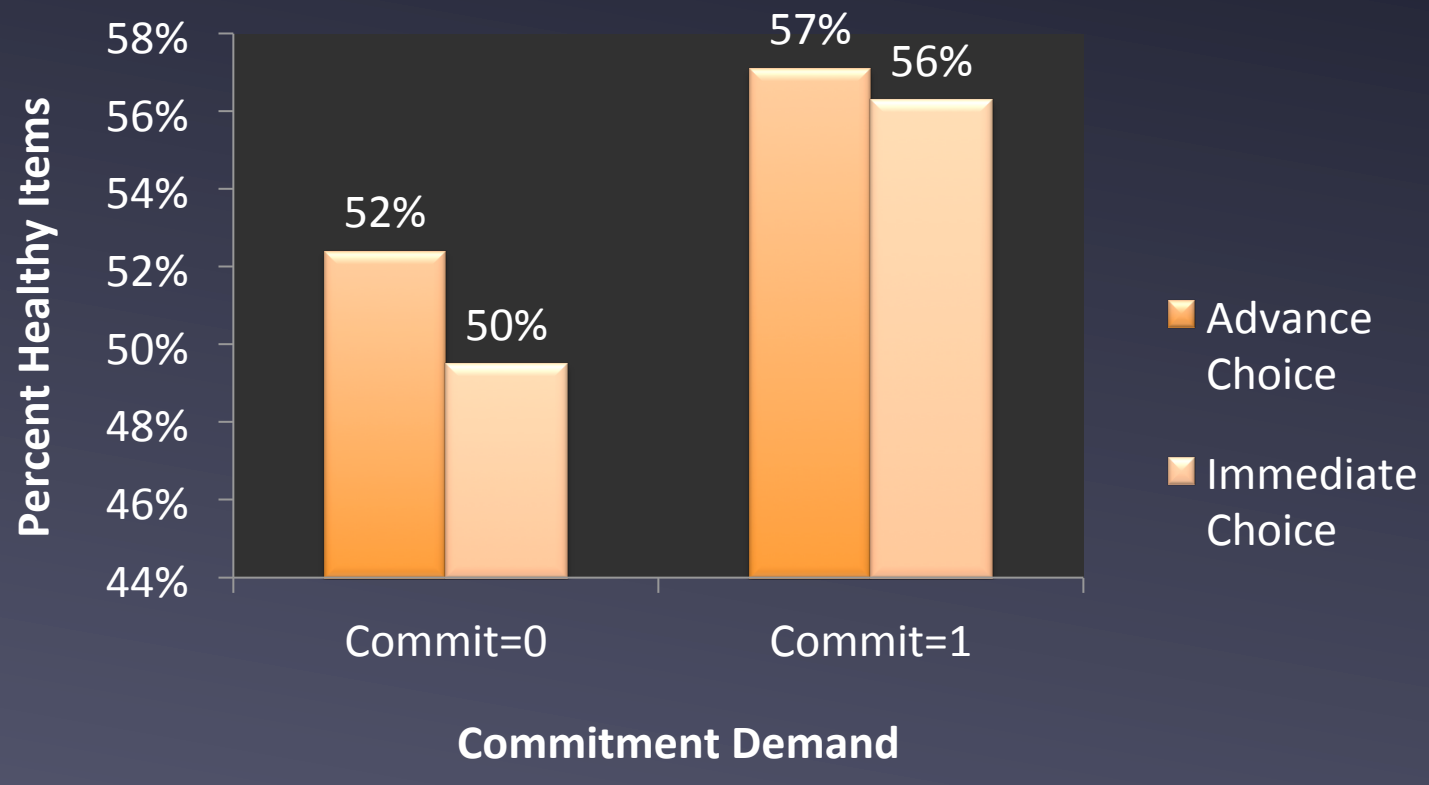
# Who Commits?

- Committing participants are more ‘healthy’ on average



# Who Commits?

- Committing participants are more ‘healthy’ on average.
- And are *less* likely to be dynamically inconsistent in the direction of less healthy items.
- Also construct advance bundles with lower rated foods.



# What have we learned?

1. Advance choices are healthier than immediate
   - Policy implication: Requiring advance choice leads to healthier decisions made
2. One third would commit to advance choices:
   - Policy implication: Government policies could encourage advance choice (in US, USDA-SNAP)
3. Those who overcome temptation are more likely to want to commit
   - Policy implication: Voluntary commitment may not improve health but may benefit those who want it.

# Open Questions

- Do we observe dynamic inconsistency and benefits of commitment in other areas?
  - Health screenings, exercise
- What causes dynamic inconsistency and willingness to commit?
  - Education, life experience, etc.?

# Thank you!

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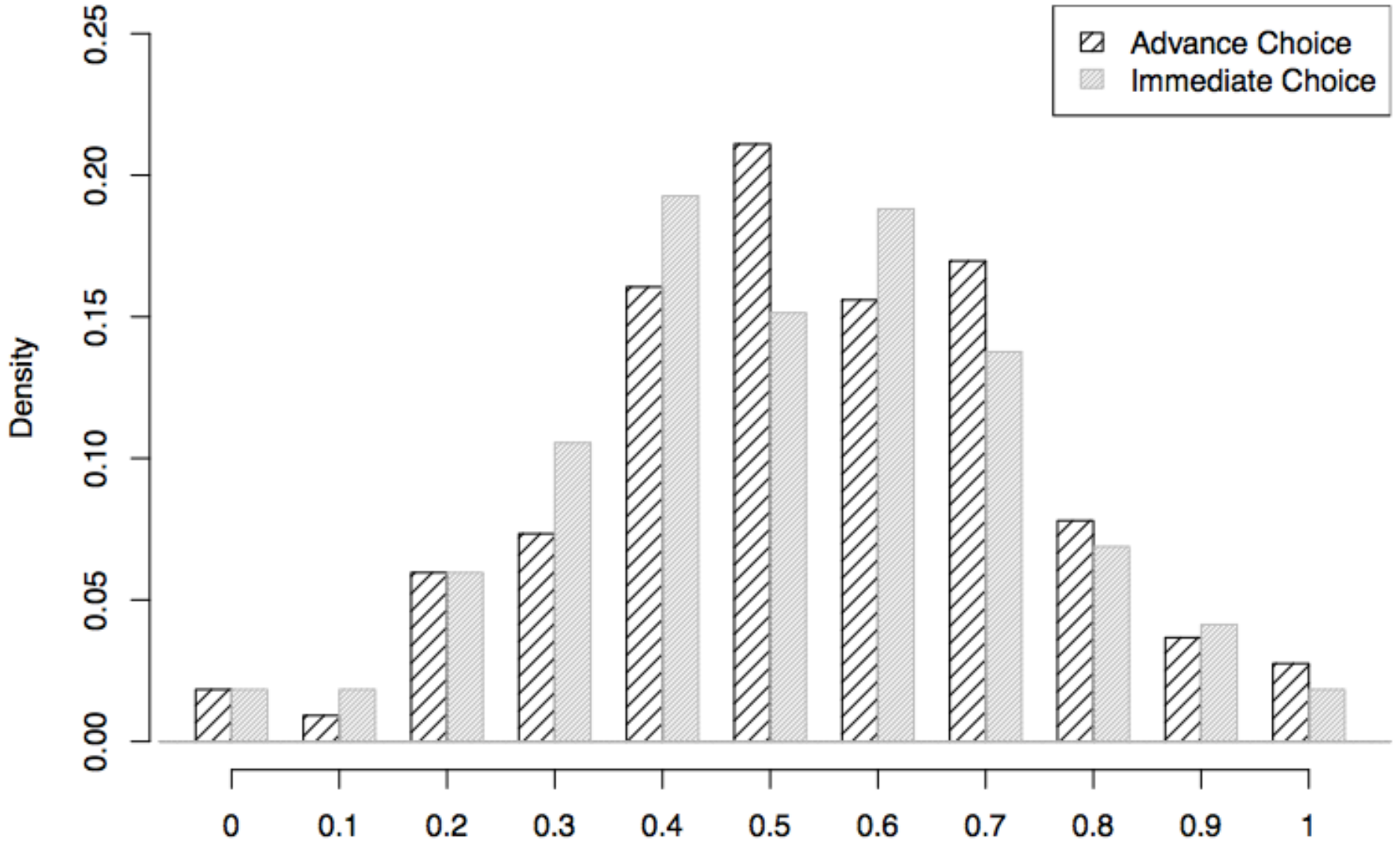
# Additional Information (if needed)

# Hallmarks of Arbitrage

- One concern is subjects may make use of external trading opportunities
  - Intuition: Take only (un)healthy items to generate a dominating opportunity set
  - Implication: Concentrated bundles
- Similar argument for monetary experiments
- Only 10 out of 218 bundles are concentrated in this way
- Also, arbitrage opportunities should not change throughout the course of the experiment


Advance Choice
Immediate Choice
Density
0.00
0.05
0.10
0.15
0.20
0.25
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

# Determinants of Commitment Take-Up

| | *Dependent Variable: Commit = 1* | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| (Advance - Immediate) Proportion Healthy | -1.885*** | | -1.969*** | -1.797*** | -1.769*** |
| | (0.557) | | (0.586) | (0.634) | (0.647) |
| Advance Proportion Healthy | | 0.248 | 0.281* | 0.316** | 0.327** |
| | | (0.150) | (0.150) | (0.155) | (0.154) |
| Age | | | | | -0.001 |
| | | | | | (0.003) |
| Income | | | | | -0.000 |
| | | | | | (0.000) |
| Male (=1) | | | | | -0.036 |
| | | | | | (0.074) |
| Household Size | | | | | -0.001 |
| | | | | | (0.023) |
| Constant | 0.376*** | 0.201** | 0.226*** | 0.229*** | 0.331 |
| | (0.036) | (0.084) | (0.083) | (0.086) | (0.202) |
| # Observations | 218 | 218 | 218 | 192 | 192 |
| R-Squared | 0.039 | 0.012 | 0.054 | 0.051 | 0.063 |

*Notes:* Ordinary least squares regression. Robust standard errors in parentheses. Levels of significance: * 0.10, ** 0.05

# Design Summary

- Subjects make choices in Week 1 for Week 2
  - At Week 2, they can change their mind
- Subjects make choices in Week 2 for Week 3
  - Before Week 3, they choose whether to commit

| Week 1 | Week 2 | | Week 3 |
|---|---|---|---|
| * Select Delivery 1 items<br>* Pre-Questionnaire | * Receive Delivery 1 items<br>* Decide about changes to Delivery 1 items<br>* Select Delivery 2 items | * Commitment choice for Delivery 2 | * Receive Delivery 2 items<br>* If no commitment: Decide about changes to Delivery 2 items<br>* Post-Questionnaire |