

Product Category-Level and Shopping Trip-Level Drivers of In-Store Decision Making



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Presentation Agenda



- Research problem
- Prior Literature
- Variability across:
 - Categories
 - Baskets
- Model
- Results
- Insights and implications
- Conclusions

Past Research on In-Store Decision-Making



- [Kollat and Willett \(1967\)](#): Household characteristics (e.g., household size, gender of shopper, number of shopping trips per week)
- [Park, Iyer, and Smith \(1989\)](#): Store familiarity and time pressure
- [Bucklin and Lattin \(1991\)](#): Choice behavior suggests opportunism
- [Heilman, Nakamoto, and Rao \(2002\)](#): Surprise coupon increases unplanned

Category Decision Types



- Four levels of Planning:
 - Specifically planned (“buy Pepsi”)
 - Generally planned (“buy soft drinks”)
 - Switch (plan Pepsi, buy Coke)
 - Unplanned
- Except for switch, an ordinal variable

Category-Level Drivers of Unplanned Purchases and Self-Control Strategies

■ Category Factors

- **Coupon:** Unplanned purchase less likely
- **Display:** Unplanned purchase more likely
- **Purchase Frequency:** Unplanned purchase less likely for more frequently purchased categories
- **Hedonicity:** Unplanned purchase more likely for more hedonic product categories

■ Self-Control Strategies

- **List:** Makes unplanned purchases less likely
- **Trip type:** Unplanned purchases less likely for nonmajor trip
- **Aisles shopped:** Unplanned purchases increase with aisles visited
- **Payment type:** Unplanned purchases greatest for credit, then check, then cash

Self-Control Strategy x Category Factor Interactions



- **List:** Limits hedonicity effect, mitigates unplanned purchase of infrequently purchased categories, could increase or decrease display effect
- **Trip type:** No interactions expected
- **Aisles shopped:** Shopping fewer aisles mitigates unplanned purchase of infrequently purchased categories
- **Payment type:** Increases hedonicity and display effect

POPAI Consumer Buying Habits Study



- Intercepted 2800 consumers at grocery stores
- Fourteen cities throughout U.S.
- Shopping intentions merged with actual purchases
- All sourced from POPAI survey except:
 - Category purchase frequency ~ IRI Factbook
 - Category hedonicity ~ Wakefield and Inman
- Repeated measures design
 - Categories are nested in respondents

Hierarchical Ordinal Regression

(Raudenbush and Bryk 2002)

For each item in the shopping basket:

$$\varphi_m = \Pr(\text{Planning Level} = m)$$

$$\varphi_m^* = \Pr(\text{Planning level} \leq m)$$

m = unplanned,
generally planned,
specifically planned

$$\eta_m = \ln\left(\frac{\varphi_m^*}{1 - \varphi_m^*}\right)$$

Two-Level Hierarchical Ordinal Regression

Factors that vary within subject (across products in this case)

$$\eta_{mij} = \beta_{0j} + \beta_{1j}COUPON_{ij} + \beta_{2j}DISPLAY + \beta_{3j}PURFREQ_i \\ + \beta_{4j}HEDONIC_i + D_{(GP)ij}\delta_{GP}$$

Factors that vary across subjects

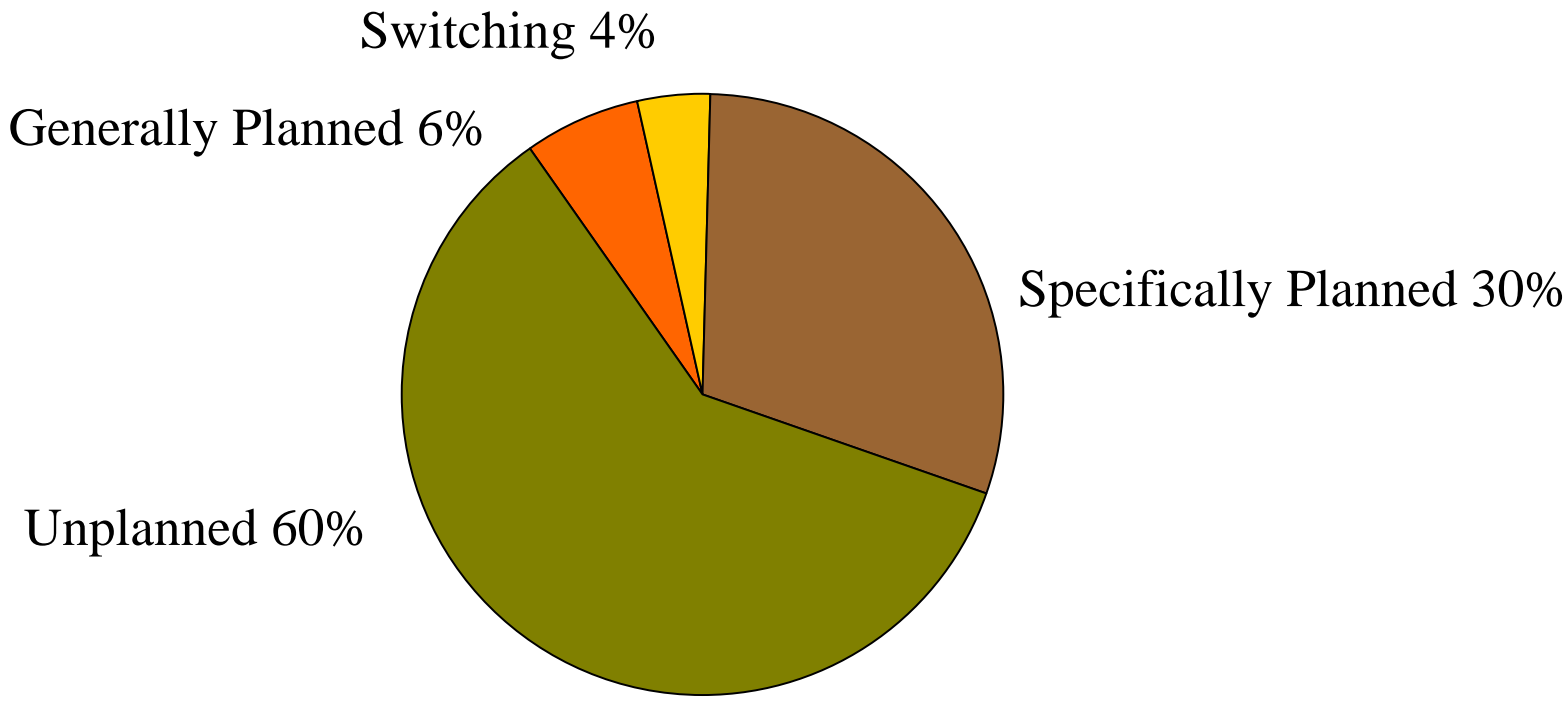
$$\beta_{qj} = \nu_{q0} + \nu_{q1}LIST_j + \nu_{q2}NONMAJOR_j + \nu_{q3}PATTALL_j \\ + \nu_{q4}PATTMOST_j + \nu_{q5}CHECK_j + \nu_{q6}CREDIT_j + u_{qj}$$

$$u_{qj} \sim N(0, \tau_{qq})$$

i indexes categories
j indexes shoppers

$$\text{COV}(u_{qj}, u_{q'j}) = \tau_{qq'}$$

Planning Levels



Supermarket In-Store Decision Rate: 70%

Source: POPAI Consumer Buying Habits Study/Meyers Research Center

Unconditional Model Results

	Coefficient	p-value		u_q	p-value
Intercept	0.310	0.000		0.811	0.000
Coupon (7%)	-0.584	0.000			NS
Display	0.053	0.147			NS
Category Purchase Frequency (47.4 days)	0.022	0.000		0.0002	0.000
Category Hedonicity (3.8)	0.257	0.000			NS
δ	0.355	0.000			

Unplanned probability for average purchase frequency and hedonicity, no coupon is 0.58. Coupon decreases it to 0.43

Figure 1
Probability of Unplanned and Generally Planned vs.
Category Purchase Frequency

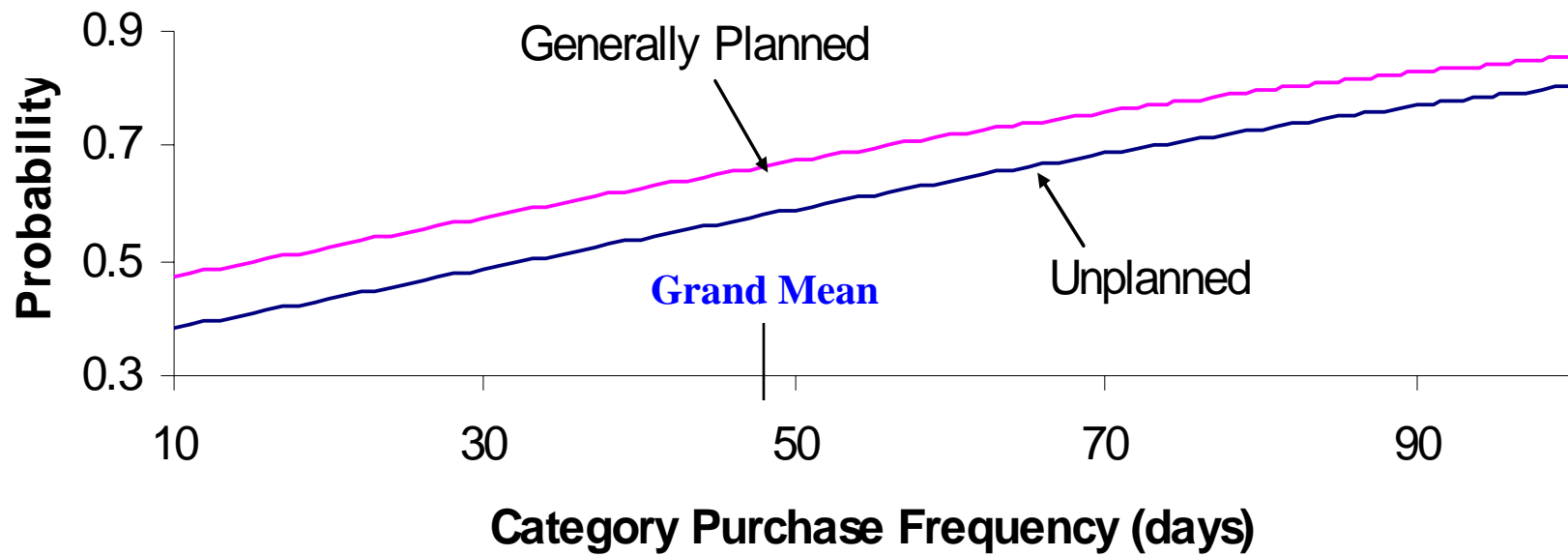
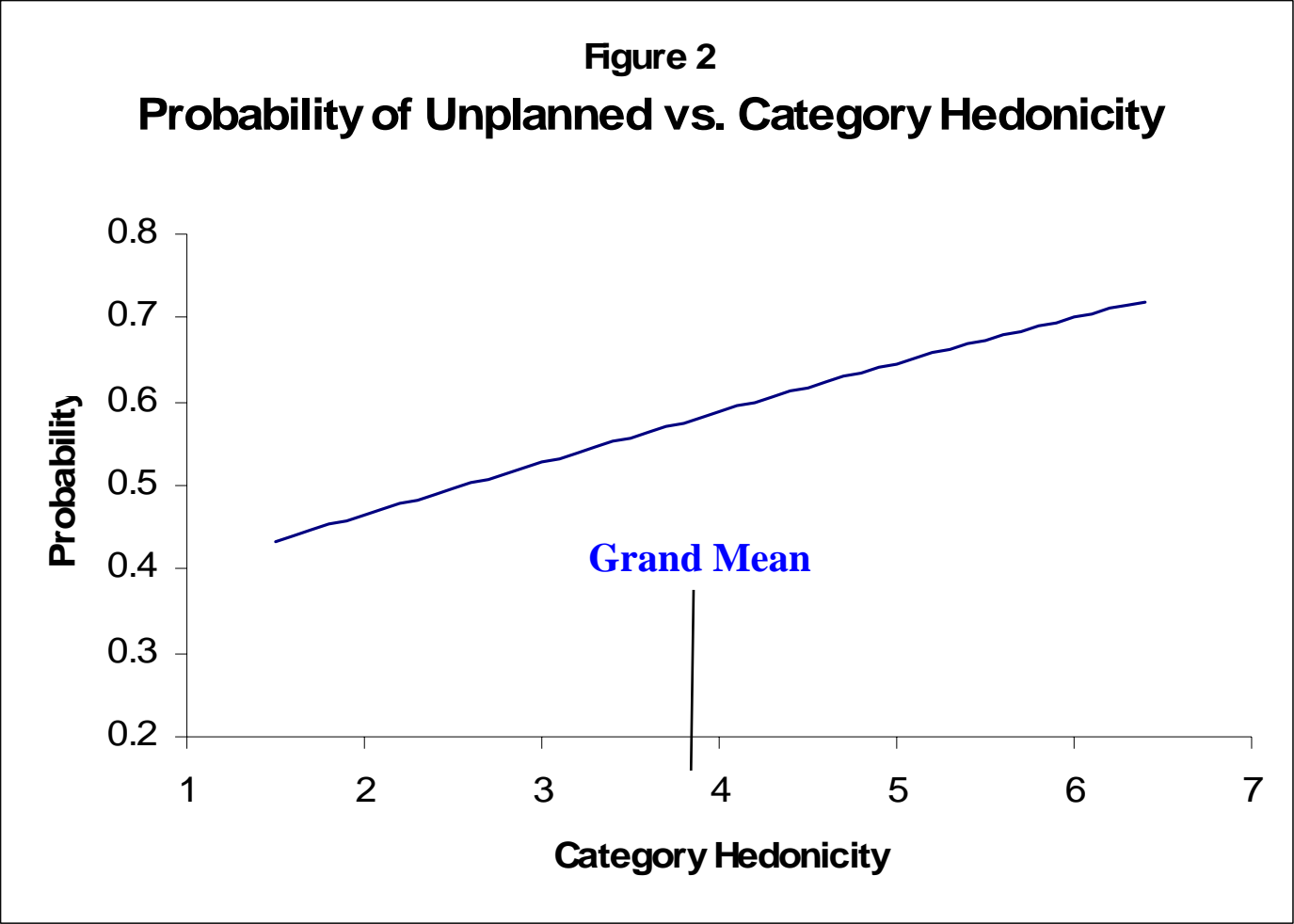




Figure 2
Probability of Unplanned vs. Category Hedonicity



Slopes-as-Outcomes Model

-- Intercept --

	Coefficient	p-value	Unplanned Probability	Change vs. Base
Fixed Effect	0.108	0.000	0.53	
Used List (47%)	-0.259	0.000	0.46	-0.07
Nonmajor Trip (30%)	-0.223	0.000	0.47	-0.06
All aisles (21%)	0.326	0.000	0.61	0.08
Most aisles (37%)	0.291	0.000	0.60	0.07
Check (39%)	0.069	0.075	0.54	0.01
Credit (9%)	0.149	0.016	0.56	0.03

Self-Control Strategy Interactions with Coupon and Category Hedonicity

Coupon

	Coefficient	p-value
Fixed Effect	-0.589	0.000
Used List		NS
Nonmajor Trip		NS
All aisles		NS
Most aisles		NS
Check		NS
Credit		NS

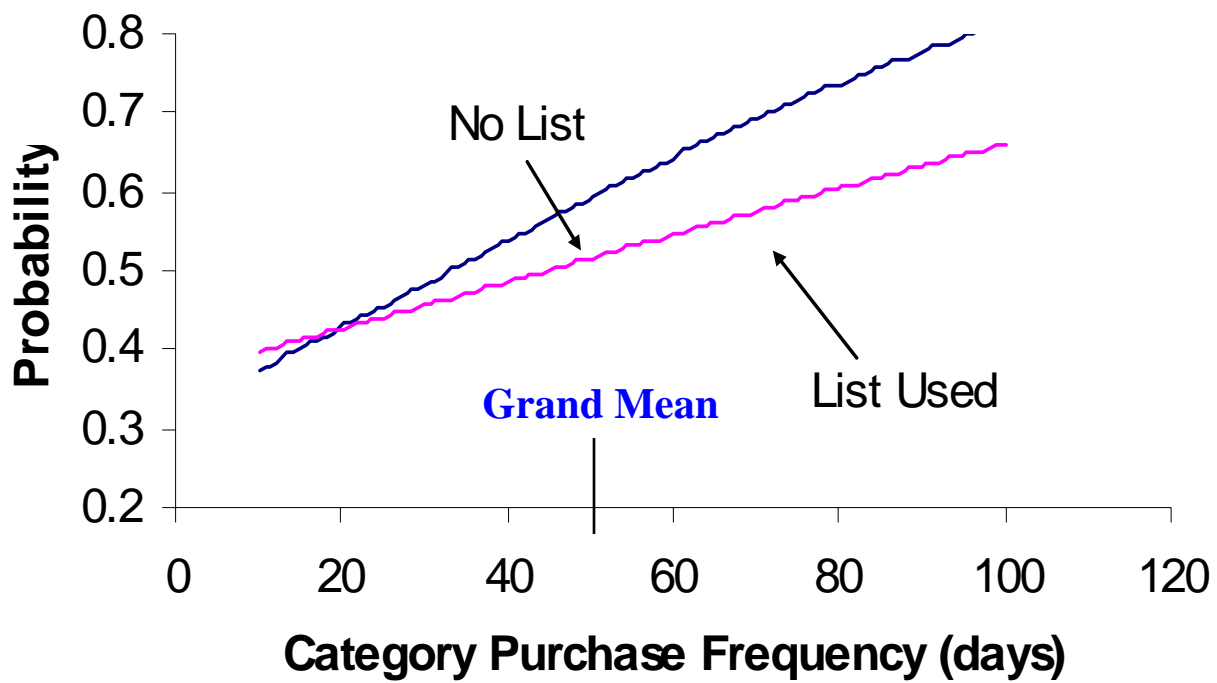
Category Hedonicity

	Coefficient	p-value
Fixed Effect	0.227	0.000
Used List		NS
Nonmajor Trip	-0.078	0.003
All aisles		NS
Most aisles		NS
Check		NS
Credit		NS

Self-Control Strategy Interactions with Category Purchase Frequency

	Coefficient	p-value
Fixed Effect	0.022	0.000
Used List	-0.010	0.000
Nonmajor Trip	-0.006	0.018
All aisles	0.005	0.001
Most aisles	0.002	0.073
Check		NS
Credit		NS
δ	0.354	0.000

Figure 3
Probability of Unplanned vs.
Category Purchase Frequency and List Usage



Random Components (u_q) Across Models

	Unconditional	Intercept Only	Full Slopes-as- Outcomes
Intercept	0.808	0.549	0.552
Category Purchase Frequency	0.00019	0.00018	0.00015

**Full model explains ~ 32% of intercept variance
~ 21% of purchase freq variance**

Conclusions



- Unplanned purchasing is pervasive
- Category characteristics are key drivers
 - Frequently purchased more likely to be planned
 - Hedonic more likely to be unplanned
- Self-control strategies partially explain cross-basket variability
 - Unplanned increases with major trip type, more aisles shopped, paying by check and credit
 - Using a list decreases unplanned purchasing
- To minimize impulse purchases:
 - Use a list!
 - Don't browse the aisles!
 - Pay by cash or check!