Predicting Coupon Use from Shopper Demographic and Behavioral Characteristics

Kristen Park and Miguel I. Gomez

We surveyed of grocery shoppers in the Northeast United States to measure how demographic characteristics and consumer behavior affect the use of four coupon types (paper, in-store, checkout, and online). We employ logit models to estimate the probability that a consumer is a regular coupon user conditioned to his/her demographic and behavioral characteristics. Readership and economizing-behavior variables have a larger impact on the probability of being a coupon user than do demographic variables, except in the case of online coupons. Our results suggest that targeting specific coupon types using demographic profiles alone is not an appropriate method of coupon distribution. Understanding behavioral characteristics of the coupon users will help target coupon offerings by various distribution methods.

Coupons represent important savings for consumers and an important promotion vehicle for both manufacturers and retailers. NCH Marketing (2003) reported that manufacturers of consumer packaged goods (CPGs) distributed approximately 248 billion coupons in 2002 worth almost $220 billion. Consumers redeemed 3.8 billion of these coupons and saved more than $3 billion on their CPG purchases. Despite the savings they represent, coupon redemptions have been declining since the early 1990s (NCH Marketing 2003). To stem this decline and to increase the effectiveness of their coupon offers, manufacturers frequently target coupon offers to specific consumer segments by using a variety of coupon-delivery methods. Principal among these newer methods are shelf dispensers and shelf tear-off pads, online coupons, and handout coupons electronically dispensed at the checkout register. In addition to these newer delivery methods, traditional methods such as free-standing inserts (FSIs), newspapers, magazines, and store-circular vehicles all remain in use.

The continued use of coupons by manufacturers, coupled with multiple methods of delivery, raise questions regarding optimal segmentation strategies. Our objective is to measure how demographic characteristics and consumer behavior affect the use of various coupon types. Additionally, we develop a model that allows us to identify demographic and behavioral differences across users of alternative coupon types. Our results improve understanding of the various coupon strategies in the food industry.

Park is extension support specialist and Gomez is research associate, Department of Applied Economics and Management, Cornell University, Ithaca, NY.

Literature Review

Most early studies employed demographic descriptors to characterize coupon users. (Narasimhan 1984; Meloy 1988; Bawa and Shoemaker 1987). Marketing practitioners often use data from the U.S. Census Bureau to target specific segments with direct coupon mailings and other promotional offers, yet studies assessing demographic characteristics often offer ambiguous explanations of consumer coupon behavior. For instance, Narasimhan (1984) and Meloy (1988) found that proneness to use coupons is high in middle-income households but lower in low- and high-income households. In contrast, Teel, Williams, and Bearden (1980) and Bawa and Shoemaker (1987) found a positive relationship between income and proneness. Karolefski (2002) reported that dual-income households are not willing to go through the effort of clipping and redeeming coupons in the traditional manner. On the other hand, the increase in the number of senior retirees may have a positive effect on coupon use (Verdon 2001).

A number of academic studies argue that demographic variables do not fully describe coupon users and that other variables and models are needed (Mittal 1994; Meloy 1988). In particular, it is possible that in addition to their direct effect, demographics influence consumer behaviors that are strongly correlated with coupon use. In this spirit, Mittal (1994) suggested that demographics operate through a chain of attitudinal and behavioral mediators such as perception of financial wellness and comparison shopping. Meloy (1988) reported that coupon users were more likely to exhibit certain shopping behaviors such as shopping for more than ten years and

shopping with children, among others.

A growing number of studies measure the impact of alternatives to traditional paper coupons (cf. Green 1997; Heilman, Nakamoto, and Rao 2002). In addition, Ramaswamy and Srinivasan (1998) and Colombo, Bawa, and Srinivasan (2003) examine differences in coupon use by coupon-redemption method among different consumer segments. Yet little research has been conducted on the demographic and behavioral characteristics that could predict the use of alternative types of coupons. Examining whether there are differences (behavioral and demographic) across alternative coupon types is important in order to target promotion practices more efficiently.

Methodology

We investigate the impacts of consumers' demographic and behavioral characteristics on coupon usage for CPGs. We also examine differences across users of alternative coupon types.

Data

We conducted a survey regarding grocery-shopping behaviors, coupon use, and demographic characteristics designed to identify the profiles of shoppers who regularly use various types of coupons. We consider four coupon methods: Paper coupons, from flyers, magazines, newspapers, mail, or product packages; Checkout Register coupons, which are printed on grocery receipts or on separate strips of paper and handed out at the checkout register; In-Store coupons, which are found in the store in dispensers next to the product; and Online coupons, usually found at a retailer, manufacturer, or coupon-provider website.

The behavioral questions included various "readership" and "economizing-activities" variables (other than using coupons). Readership of newspapers and promotional mail may be associated with information-gathering and shopping expertise as well as being a major source for obtaining coupons (Higie et al. 1987). Economizing activities other than coupon use are also associated with thriftiness in shopping and may or may not be associated with coupon usership.

Three retailers located in the Northeast and Mid-Atlantic regions participated in this project, and interviewers distributed surveys and a small monetary incentive to supermarket shoppers in a total of eight stores in a mix of urban and rural areas. Shoppers were asked to complete the survey at home and return it in a provided envelope. A total of 1750 surveys were distributed, with 855 useable returns, a response rate of 48.9%.

Respondent Profile

Descriptive statistics of the variables used in our study are found in Table 1. We compared these with government and industry statistics for Northeast consumers to examine the representativeness of our responses. These comparisons indicate that our study closely represents shopping behaviors of the general population in the Eastern U.S.

Coupon Users

We defined coupon users by how frequently they reported using various coupon methods. We did not attempt to define a single, universal coupon user. For example, those who reported using paper coupons "every time" or "fairly often" when shopping were designated regular paper-coupon users. Respondents reported using paper coupons much more frequently than any other coupon type. Almost 75% of respondents were regular paper-coupon users; 50.3% were checkout-coupon users; 31.3% were in-store-coupon users and only 7.3% of respondents were online-coupon users.

Empirical Model

We employ binary constructs to measure coupon use. That is, CU_i equals 1 if the respondent is a regular user of coupon type i, zero otherwise (i = Paper, Checkout Register, In-Store, Online). Logit models are used to calculate the probability that a consumer is a regular coupon user conditioned to demographic and behavioral characteristics:

(1) $P(CU_i = 1 \mid \mathbf{D}, \mathbf{B}) = G(\gamma + \mathbf{D\alpha} + \mathbf{B\beta})$,

where $\mathbf{D}$ and $\mathbf{B}$ are vectors of demographic and behavioral variables, respectively; γ, α, and β, are the corresponding coefficients; and G is the logistic function. The parameter estimates are presented in Table 2.

Table 1: Respondent Profiles.

Explanatory variables	% of Respondents
Age	
22–35	16.6%
36–50	36.4
51–65	30.8
66 or over	16.2
Household income	
Less than $25,000	14.0
$25,000–$44,999	22.4
$45,000–$64,999	26.9
$65,000–84,999	16.6
$85,000 or over	20.2
Mean household size	2.9
Mean number of earners	1.7
Gender of shopper	
Female	77.9
Weekly grocery expenses	
$0–50	13.4
$51–70	25.6
$71–100	30.7
$100+	30.3
Readership	
Read the daily newspaper	67.3
Read the Sunday newspaper	77.9
Read promotion/ad flyers sent in mail	78.3
Read promotion/ad flyers in newspapers	75.7
Receive an online newspaper	4.8
Shop online	27.7
Economizing behaviors (*"every time I shop"*)	
Look in newspapers for grocery specials	50.5
Buy store brands or lower priced brands instead of national brands	13.3
Stock up on an item when you find a bargain	36.3
Compare grocery prices at different stores	25.5
Go to stores other than your primary grocery store for advertised specials	17.3

Results

We employ the parameter estimates in Table 2 to calculate probabilities of being a coupon user in Table 3. Note that readership and economizing-behavior variables have the largest impact on the probability of being a coupon user except in the case of online coupons. To illustrate the impact of statistically significant variables on coupon usership we construct a baseline profile (Profile 1) that consists of dummy variables included in the intercept (males, no economizing behaviors, no readership,

Table 2. Logit Models of Coupon Usership.

Independent variables	Paper coupons		Checkout coupons		In-store coupons		Online coupons	
Demographics								
Age								
22-35								
36-50	-0.15[a]	(0.32)[b]	-0.32	(0.24)	-0.16	(0.25)	-0.24	(0.40)
51-65	-0.38	(0.34)	-0.33	(0.26)	-0.52*	(0.28)	-1.05**	(0.50)
66 or over	-0.58	(0.48)	-0.53	(0.36)	-0.78**	(0.40)	-0.81	(0.83)
Household income								
Less than $25,000								
$25–$44,999	0.07	(0.41)	0.44	(0.30)	0.03	(0.31)	1.93*	(1.08)
$45–$64,999	0.16	(0.42)	0.05	(0.30)	-0.25	(0.32)	1.92*	(1.07)
$65–$84,999	-0.28	(0.44)	0.07	(0.33)	-0.30	(0.35)	1.29	(1.12)
$85,000 or over	-0.31	(0.45)	-0.34	(0.33)	-0.02	(0.35)	1.41	(1.12)
Household size	0.21*	(0.11)	0.02	(0.08)	-0.08	(0.08)	-0.06	(0.15)
Number of earners	-0.01	(0.17)	0.23*	(0.13)	0.12	(0.13)	-0.14	(0.24)
Gender	0.75**	(0.25)	-0.01	(0.20)	-0.16	(0.21)	0.32	(0.42)
Working status	0.12	(0.54)	0.55	(0.39)	-0.12	(0.44)	-6.39	(13.59)
Weekly grocery expenses								
$0–50								
$51–70	0.65*	(0.37)	-0.02	(0.28)	0.54*	(0.32)	0.06	(0.58)
$71–100	0.42	(0.39)	-0.04	(0.29)	0.19	(0.33)	-0.20	(0.61)
$100+	0.39	(0.41)	0.51	(0.32)	0.91**	(0.35)	-0.07	(0.63)
Readership								
Read a daily paper	0.46*	(0.24)	0.21	(0.19)	0.06	(0.21)	-0.27	(0.37)
Read a Sunday paper	1.02***	(0.27)	0.34	(0.23)	0.15	(0.25)	0.68	(0.51)
Read promos in mail	0.55**	(0.27)	0.45**	(0.23)	0.76**	(0.26)	0.91*	(0.53)
Read promos in paper	0.12	(0.29)	-0.40	(0.25)	-0.66**	(0.27)	-1.05**	(0.47)
Receive online paper	-0.40	(0.45)	0.48	(0.38)	0.89**	(0.37)	1.00*	(0.54)
Shop online	-0.24	(0.25)	0.35*	(0.20)	-0.18	(0.21)	0.63*	(0.34)
Economizing behaviors								
Look in papers for specials	1.76***	(0.24)	1.18***	(0.23)	0.37	(0.25)	1.13**	(0.55)
Buy store brands	-0.33	(0.22)	-0.11	(0.17)	0.09	(0.18)	-0.49	(0.32)
Stock up on bargain	0.20	(0.27)	0.16	(0.22)	0.20	(0.24)	2.07**	(0.77)
Compare store prices	0.62**	(0.28)	0.15	(0.21)	0.71**	(0.23)	-0.14	(0.42)
Shop alternate stores for specials	0.15	(0.29)	-0.42**	(0.21)	0.20	(0.22)	0.01	(0.41)
Buy products unplanned	0.13	(0.24)	0.43**	(0.19)	0.21	(0.20)	0.28	(0.40)
Constant	-2.34***	(0.61)	-2.08***	(0.47)	-2.26***	(0.51)	-6.35***	(1.48)
Observations	735		725		726		682	

Table 3. Probabilities of Coupon Usership.

	Probabil-ity*
Paper-coupon users	
Profile 1: Constant + Age(22–35) + Income(<$25K) + HHSize(3) + Earners(2) + Male + Expenditures($0–$50) + Readership(do not read) + Shop online(no) + Economizing(never)	0.078
Profile 2: Profile 1 + **Readership**(daily paper; Sunday paper; mail promos) + **Economizing**(looks in papers for specials; compares store prices)	0.873
Profile 3: Profile 2 + **HHSize(5)**	0.913
Profile 4: Profile 3 + **Female**	0.957
Profile 5: Profile 4 + **Groceries($51–70)**	0.977
Checkout users	
Profile 1: Constant + Age(22–35) + Income(<$25K) + HHSize(3) + Earners(2) + Male + Expenditures($0–$50) + Readership(do not read) + Shop online(no) + Economizing(never)	0.174
Profile 2: Profile 1 + **Readership**(reads mail promos) + **Shops online** + **Economizing**(specials in newspapers; shops other stores for specials; buys unplanned on special)	0.604
Profile 3: Profile 2 + **Earners(3)**	0.658
In-store users	
Profile 1: Constant + Age(22–35) + Income(<$25K) + HHSize(3) + Earners(2) + Male + Expenditures($0–$50) + Readership(do not read) + Shop online(no) + Economizing(never)	0.109
Profile 2: Profile1+ **Readership**(read mail promos; read newspaper promos; gets online newspaper) + **Economizing**(compares store prices)	0.400
Profile 3: Profile2 + **Age(51–65)**	0.284
Profile 4: Profile2 + **Age(66+)**	0.233
Profile 5: Profile4 + **Groceries($51–70)**	0.342
Profile 6: Profile4 + **Groceries($100+)**	0.431
Online users	
Profile 1: Constant + Age(22–35) + Income(<$25K) + HHSize(3) + Earners(2) + Male + Expenditures($0–$50) + Readership(do not read) + Shop online(no) + Economizing(never)	0.001
Profile 2: Profile 1+**Readership**(mail promos; newspaper promos; receives online paper) + **Shops online** + **Economizing**(specials in papers; stocks up)	0.081
Profile 3: Profile 2 + **Age(51–65)**	0.030
Profile 4: Profile 2 + **Income($25–$44,999)**	0.379
Profile 5: Profile 2 + **Income($45–$64,999)**	0.375

*probabilities calculated using the parameter estimates in the Table 2.

and no online shopping); age of respondent between 22 and 35; annual income less than $25,000; weekly grocery expenditures less than $50; and the mean value for the household-level scale variables (three individuals; two earners). Table 3 shows that the probability that a consumer with the characteristics of Profile 1 is a paper-coupon user is 7.8%. Under Profile 2 for paper coupons, adding the significant readership and economizing behaviors from the logit model (Table 2) substantially increases the probability of coupon use (87.3%). Profiles 3–5 for paper coupons change the significant positive demographic variables. The change of gender to female, an increase in household size from three to five, and an increase in weekly grocery expenses to $51–$70 increases the probability of paper-coupon usership by 10.4%.

This pattern of probability being more highly influenced by behavioral variables rather than demographic variables holds for checkout-coupon users and in-store-coupon users. For online-coupon users, however, demographics do appear to play a more significant role. When significant readership and economizing-behavior variables are added to the online Profile 1, the increase in probability is small (from 0.1% to 8.1%). When income $25,000–$44,999 is added (Profile 4), probability increases to 37.9%. We summarize the main effects of relevant demographic and behavioral variables on the probability of coupon use for each type below.

The Paper-coupon User

The logit results for paper-coupon usership resemble what most practitioners might normally consider a traditional coupon user. Paper-coupon use is positively associated with household size and with being female. Weekly grocery expenses of $51–$70 significantly increase the likelihood of a consumer being a paper user. Users read daily and Sunday newspapers which traditionally are very important sources of paper coupons; they also read promotional materials mailed to them. They search out specials in newspapers and compare store prices. The importance of readership in the model suggest a tendency for the paper-coupon user to be a very active shopper, one who reviews all the information available in order to make informed choices. This is the only user who still reads both daily and Sunday papers.

The Checkout-coupon User

Checkout coupon users tend to have more earners per household than those who do not use checkout coupons; however, household income is not a significant variable in predicting usership. Users are more apt to read promotions sent to them in the mail; however, they are not any more likely to read a daily or Sunday newspaper than are non-users. They shop online more than non-users. Economizing behaviors which are significant to the model include looking in papers for specials, shopping alternate stores for specials, and buying products on special even if they had not planned to. It may be possible to characterize these users as being interested in economizing, but not to the extent of perusing the newspapers and magazines for coupons to clip. When they are offered a valuable coupon which they do not have to search out, however, they may use it.

The In-Store-coupon User

This in-store-coupon user is younger than the in-store non-user. Consumers age 51 and over are less likely to be in-store users. This age variable is the only significant demographic factor. The effect of weekly grocery expenses is bimodal. Grocery expenses of $51–$70 and $100 and over are more likely than age categories to influence the likelihood of a consumer being an in-store user. This user reads promotions in the mail, but reads promotions in the newspapers less than non-users do. She is not any more likely to read a daily or Sunday paper than is a non-user; however, she is more prone to receive an online newspaper. The only economizing behavior this user has over a non-user is that she is more prone to compare store prices.

The Online-coupon User

The online-coupon user may be somewhat younger than the non-user. Consumers age 51–65 are significantly less likely to be online users than are consumers age 22–35. Those consumers whose household income is $25,000–$64,999 are more likely to be users. Online-coupon users are also more likely than non-users to be online in other respects, to receive an online newspaper, and to shop online. They may be more likely to read promotional material in the mail, but they are less likely to read promotions in the papers. Although they more frequently look in

newspapers for specials, this is their only active, participatory economizing behavior. They will stock up on a bargain if they see it.

Implications for Marketers

Our results suggest that targeting specific coupon types using demographic profiles alone is not an efficient method of coupon distribution. Behavioral segmentation, however, may offer marketers the possibility of delivering coupons in a more efficient, targeted manner than mere mass distribution. Consumers' likelihood to be news-media readers, particularly those who read promotional mailings, is more predictive of coupon usership. Not surprisingly, other economizing behaviors are also more closely associated with coupon usership than are demographics. These behavioral segments offer promise for marketers, but also a challenge. Identifying and then isolating these behavioral segments requires difficult and costly research.

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