

Cherry Picking

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Cherry Picking

Using two years of household panel data, we compare the behaviors of cherry picking shoppers to other consumer shopping segments—store switchers and store loyals. For present purposes, we define cherry pickers (18% of the sample) as households that shopped at two or more grocery stores on the same day at least once per month. Households are defined as store loyals (27%) if they shopped at a single retailer more than 80% of the time. The rest of the households are classified as switchers (55%), because they shopped at multiple retailers but not on the same day. Although cherry picker households are more likely to be elderly and have slightly lower incomes, demographic and geographic differences are minor. However, significant differences in both within and across store shopping behavior do emerge. Cherry pickers shop more often, and buy more merchandise that is on deal and feature advertised. They buy larger quantities and pay lower unit prices even after controlling for package size. This greater price sensitivity is accompanied by both lower brand and store loyalty. We calculate the economic surplus that consumers gain from shopping more than one store on a given day. Across all shoppers, the extra savings is \$15.05, with cherry pickers saving \$17.45 compared to \$10.89 for switchers and \$8.68 for store loyals. Part of the savings comes from shoppers saving about 5%/item over and above what they save on single store shopping occasions. A bigger part of the savings is due to the fact that shoppers spend about two-thirds more when they cherry pick, indicating that there is a reasonable level of planning and forethought when making the decision to cherry pick. Irrespective of exactly how one calculates the incremental time taken to visit one extra store and per capita wage rates, the surplus generated appears economically justifiable for the average shopper given reasonable estimates of opportunity costs. Finally, we find that it is the shopper's secondary stores that absorb a disproportionate cost of cherry picking. Not only do consumers save six percentage points more at secondary stores, but secondary stores capture only 60% of the expenditures made at the primary store on the same day.

Cherry Picking

Merriam-Webster Dictionary defines cherry picking as “selecting the best or most desirable” or to describe one idiom with another “taking the pick of the litter.” The term cherry picking is used to describe the behavior of both sellers and buyers in a variety of settings. Sometimes the phrase is used to describe a seller who is selective about which customers they wish to serve. For example, Southwest Airlines cherry picks price sensitive travelers who place little premium on standard airline perks and Dell Computer cherry picks customers who are capable of buying over the Internet and are savvy enough to make the necessary customization choices without much hand holding. Both of these firms choose not to serve other customers with a higher willingness to pay because it would require significant changes to efficient operating models. The Cambridge International Dictionary of Idioms defines cherry picking as choosing “only the best people or things in a way that is not fair”, as when financial institutions and insurance companies are vilified because they refuse to serve high-risk populations. The term also describes behavior of buyers who are selective about which products or services they purchase at what locations and prices. In both the seller and buyer contexts, the essential meaning of cherry picking is the same—take the best and leave the rest.

This paper focuses on cherry-picking behavior on the buyer side. In the context of buying at retail, there are a number of different ways that customers can take the best and leave the rest. Cherry picking clearly can occur within a single store visit. Literally, consumers can stand at the colorful end-cap display of Mt. Rainer cherries in June and pick through each and every cherry, choosing the largest and plumpest and leaving behind smaller, bruised or overripe ones. Some retailers do not appreciate cherry picking

of their produce and so pre-package it (think strawberries), avoiding both the wear and tear from excessive handling and ensuring that later consumers will also encounter a good quality selection. More than one American tourist, accustomed to supermarket self-service, has been caught off guard by the reaction of an open air produce vendor in Asia or Europe who acts as if picking one's own is an affront to their very reputation.

Levy and Weitz (2004) define cherry pickers as customers who visit a store and only buy merchandise sold at big discounts. This is more difficult to do in the context of grocery shopping, especially when consumers display high store loyalty, because of the many replenishment purchases not easily deferrable. But if consumers are not store loyal, then they can follow Consumer Reports' (1988) advice to "scrutinize the food-day ads and 'cherry pick' the specials" (p. 158). Some industry experts believe that this type of shopping behavior is on the rise—"For many Americans, the ... hunt for value has replaced loyalty as a deciding factor in planning which stores to patronize - and how many. Instead of going to the same outlet each week, every week, to complete their grocery shopping, price-conscious consumers often visit more than one store in search of special prices - a bargain-hunting practice known in the industry as 'cherry picking.'" (Mogelonsky 1994).

Recent store choice research has shown that store loyalty is low (Woolf 1994), as the typical shopper visits supermarkets 2.2 times/week but shops 3-4 different chains on a regular basis. Ehrenberg and colleagues (Kau and Ehrenberg 1984, Uncles and Ehrenberg 1990) documented very high levels of penetration by competitive retailers over a year period. Frisbie (1980) found that households average one major shopping trip and two filler trips/week, where a filler trip is one where spending is <20% of the weekly

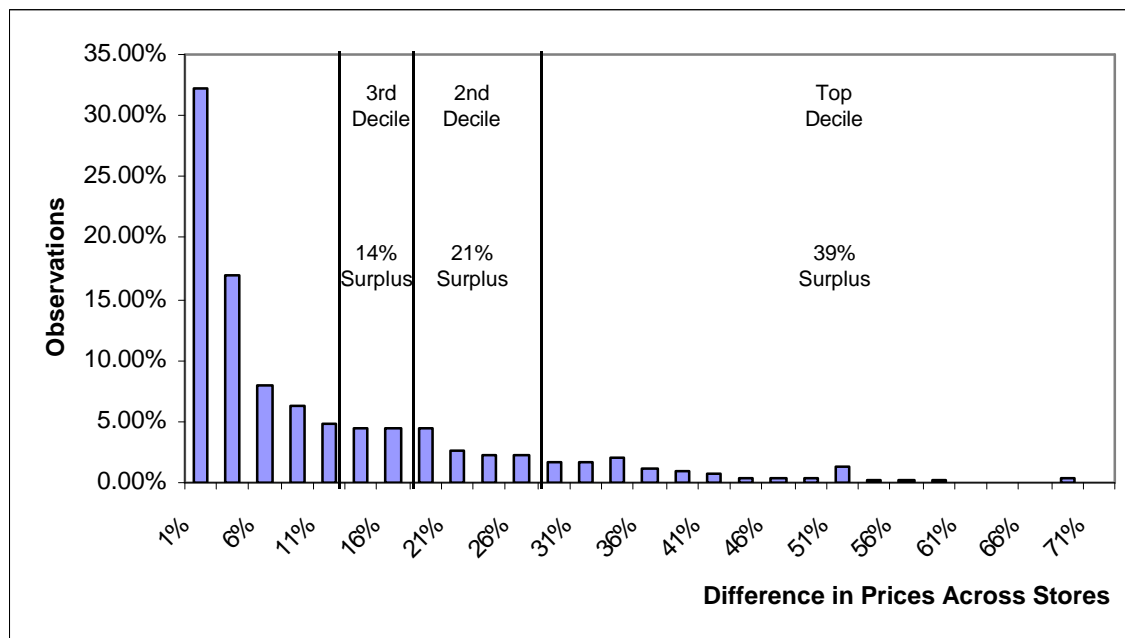
average. Kahn and Schmittlein (1989) uncovered two shopper segments: quicks, the one third of shoppers who average two small and one large trip/week; and regulars, the two thirds of shoppers that average one large trip/week and one quick trip every other week. The fact that consumers make many trips per week to buy groceries and frequent a diverse portfolio of different retailers leads to plenty of opportunities to cherry pick both within and across stores.

Let us imagine a market with two grocery chains, say Jewel and Dominick's Finer Foods for example. The preceding comments imply that consumers can cherry pick in at least two related ways. First, each week they can decide which chain to visit depending on where they expect to get the best deals. Each week they buy their complete market basket at the one store that they visit. Store switching across weeks in this manner would seem to increase the number of cherry picking opportunities as compared to consumers who are store loyal. Moreover, the transaction costs associated with switching stores across weeks do not seem to be much greater than those incurred by store loyal shoppers, assuming that travel costs to stores from which they choose are similar and that consumers switch often enough so that they are adequately familiar with store layouts.

Second, shoppers could engage in a more extreme version of cherry picking, where store switching occurs within weeks. In this case customers split their market basket of purchases across stores within a week (or potentially within the same day) to benefit from deals offered by different stores—in essence cherry picking two stores rather than just one. Since grocery retailers typically offer new specials each and every week and often have uncoordinated promotions on the same brands (Drèze 1999; Lal 1990), this second form of shopping behavior offers many more cherry picking opportunities.

The nature of these opportunities is illustrated in Figure 1, a histogram of the differences in prices at Jewel and Dominick's for about 21,000 sku's over a several week period. The average difference in prices is about 10% even though the average prices in the two chains are almost identical. Moreover, there is substantial surplus available to the cherry picker that is selective about which cherries they pick. For example, the top decile of price differences is 41%, the second decile 21%, and the third 14%.

Figure 1: Histogram of Differences in Prices Across Chains



But unlike cherry picking across weeks, within week (or day) cherry picking is likely to substantially increase transaction costs. Compared to time-constrained shoppers, cherry pickers apparently have lower opportunity costs of time and are therefore willing to search for information on deals and visit more than one store to benefit from them (Lal and Rao 1997).

As pointed out by Drèze (1999), retailers bemoan this second form of extreme cherry picking because it is seen as damaging to margins (e.g., MMR 2002) and penalizing to the practice of using loss leader pricing to increase store traffic. Loss leader

pricing involves the retailer aggressively pricing a few key items below cost in order to bring more consumers into the store with the hope that either: (a) on that occasion the consumer will buy a market-basket of goods including both sale- and regular-priced merchandise; and/or (b) the consumer will enjoy the shopping experience, evincing a higher probability of patronizing the store in the future and so increasing store traffic in the long-run. Instead extreme cherry picking consumers only buy deeply discounted items and go elsewhere to do the rest of their weekly shopping for household goods. Retailers vilify cherry pickers but, excepting quantity limits, have not developed effective mechanisms for discouraging the practice. At one point retailers had hoped that frequent shopper cards could serve such a purpose, but that has not happened.

We view cherry picking as one end of the price sensitivity/deal proneness continuum. In terms of models of horizontal competition in the Hotelling tradition, cherry pickers are assumed to have very low travel and search costs (Narasimhan 1988; Raju et al 1988).

The goal of this paper is to gain an in depth understanding of the shopping behavior of consumers in the far right tail of the cherry picking distribution, specifically shoppers who visit two or more grocery stores on the same day at least once per month (actually this group averaged more than two cherry picking occasions per month), as compared with shoppers whose cherry picking behaviors are less extreme. There is nothing magical about this cut-off except that it guarantees that the group to be examined is fairly committed to what might be considered by many to be a perverse form of shopping behavior. Because there are obvious time and travel costs associated with such vigilant cherry picking, we attempt to calculate the surplus (money saved) gained through

such behavior and argue that it represents a reasonable estimate of shoppers' opportunity costs of time. We find that the savings on cherry picking days average over \$15 more than that saved on single store days. This economic benefit exceeds the opportunity costs of the extra store visit for about half of consumers (at a median income of \$30,000/year).

The Study

The remainder of the paper is organized as follows. The next section describes the data and presents our typology of shopping behaviors—store loyals, switchers and cherry pickers. Comparing and contrasting these shopper types, the following section examines demographic and geographic characteristics, general shopping behaviors, and in-store shopping behaviors. This section also links within and between store shopping by relating store loyalty to brand loyalty. The next section measures the economic returns that shoppers generate by cherry picking and includes a comparison of cherry picking versus single-store shopping occasions. Drilling down into cherry picking occasions, this section also investigates differences in shopping behavior on primary (larger) and secondary (smaller) store visits while cherry picking. The concluding section discusses the results of our study, its limitations and future research.

Data Source

The data come from a multi-outlet IRI household panel in Chicago covering a two-year period (104 weeks) between October 1995 and October 1997. This dataset is different from the majority of panel datasets used in academic research because panelists record their purchases using in-home scanning equipment, so their purchase histories are not limited to the usual small sample of stores. All purchases, including the UPCs of packaged goods purchases, are captured on all trips to a wide variety of retailers. Our

analysis will focus on grocery retailers. We find that the two largest grocery chains, Jewel and Dominick's, together account for 75% of panelists' purchases at known grocery stores; the eight largest grocery chains together account for 99% of purchases. Each packaged goods purchase in the panel dataset is accompanied by the purchase price and indicators of whether the item was sold on deal and/or feature advertised.

The purchase database is supplemented by a merchandise file containing all item prices at Jewel and Dominick's for the following ten packaged goods categories: candy, carbonated beverages, coffee, diapers, dog food, household cleaners, laundry detergent, salty snacks, sanitary napkins, and shampoo. The availability of item prices at the two largest retailers allows us to compare them directly and quantify the savings due to cherry picking. The dataset also includes demographic information for each household, enabling us to test the relationship between household characteristics and cherry picking. The dataset is further augmented by locations of panel households and grocery stores.¹ These locations allow us to compute travel distances both from shoppers' homes to stores and between stores in order to assess the relationships between geographic variables and cherry picking.

We conduct a broad set of analyses. For most of these analyses, we report shopping trips, purchases, spending, etc. across the eight largest grocery store chains in the market. This permits our investigation to be as comprehensive as possible. However, calculating the economic benefits of cherry picking requires us to measure savings in a relative rather than an absolute context. Because this market is essentially a duopoly, we have chosen to compute savings based on direct comparison of Jewel and Dominick's

¹ The household location provided is the centroid of the panelist's zip+4. Actual street addresses are unavailable to preserve panelists' privacy. Travel distances are Euclidean distances between stores and households (or other stores).

prices in the ten categories where we have item-level price information. We then extrapolate from these sample categories to the entire market basket in order to assess the magnitude of savings. Using this approach, our analysis of the economic benefits of cherry picking includes a sample of 23,452 individual purchases made during 9,973 shopping trips. We should also point out that our analyses of store loyalty and store switching refer to behavior across, not within, store chains. After all, the retailer's primary interest is that shoppers patronize its stores, not that they choose any particular store in preference to others in the same chain.

Because preliminary analyses suggested that some of the panel households were not faithfully recording all of their shopping trips and purchases, we developed criteria to screen households that did not appear to be recording diligently. Panel households were included in the dataset only if, over the 24 month duration of the panel, (a) they recorded grocery purchases in each month, (b) they averaged 14 days or less between shopping trips, and (c) they spent at least \$30 per week at grocery stores. This resulted in a total of 201 households with complete data. These households reported a total of 28,816 shopping days over the two-year period. Aware that our screening criteria may have resulted in the omission of households that were accurately recording sparse grocery purchases or that less vigilant recorders behave systematically different from those that are more diligent, we ran the same analyses after relaxing the screening criteria. The inferences were substantially the same as those reported here.²

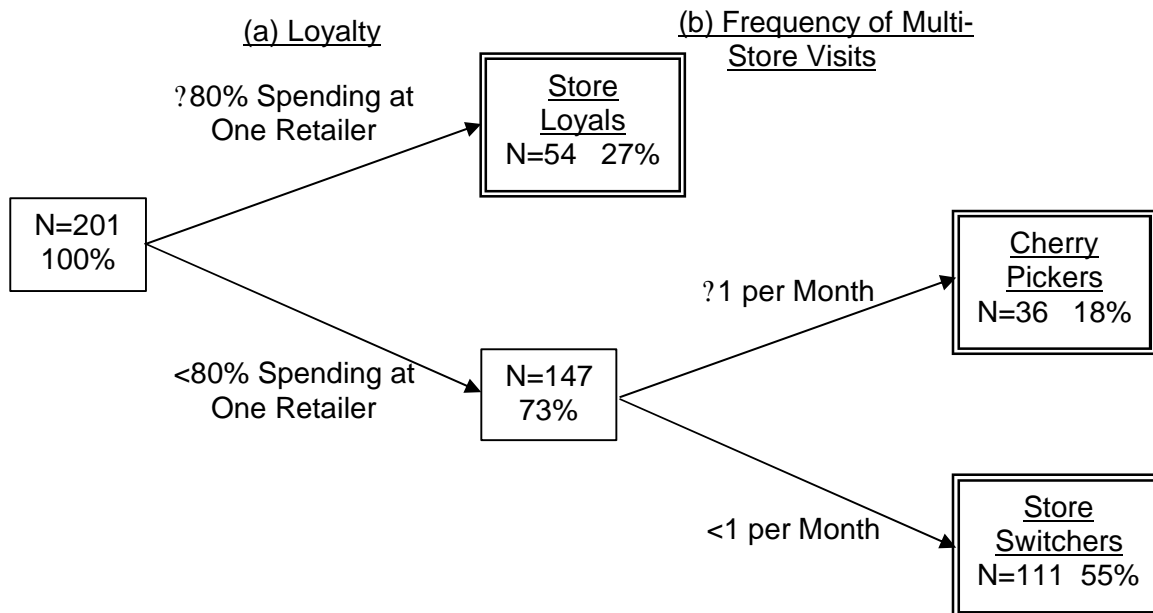
² Note that the supercenter format had very low penetration in the market during the period that data were gathered. Thus, panel households eliminated by our screen were very unlikely to have been shopping at supercenters as an alternative to grocery stores.

Classifying Shoppers

As mentioned earlier, we view cherry picking as a continuum much like a shopper's degree of price sensitivity or deal proneness. Our research strategy is to isolate a group of shoppers at the extreme tail of the distribution, people who display a major commitment to cherry picking over a significant time interval, and compare their behavior to that of the rest of the shopping population. For the purpose at hand, households are labeled cherry pickers if they shop at two grocery stores on the same day at least once per month. Clearly, this operationalization misses some cherry picking households who, with complete foresight, visit two or more stores on different days during the same week to acquire that week's worth of provisions. At the same time, we avoid confusing fill-in trips, where the consumer runs out of items or forgets to get everything on their list, with a pre-planned and purposeful attempt to split their complete market basket of purchases in order to save money. We find that $36\% \times 201 = 18\%$ of shoppers meet or exceed the once per month cherry picking cut-off; in fact the average number of cherry picking occasions per month (days when the household visits two or more stores) for this group is 2.3 or 25% of the 9.4 total shopping occasions/month).

The remaining 82% of the sample cherry picks less frequently (on average 0.3 times/month). However, there is substantial heterogeneity in this group and so we divide the complete sample according to the scheme shown in Figure 2, where shopper types are determined by two factors: (a) extent of store loyalty, and (b) frequency of same day multi-store visits. Store switchers represent 55% of the sample and store loyals 27%.

Figure 2: Classification of Shopper Types



Demographic and Geographic Differences

Table 1 shows the demographic characteristics of the three shopper types. This table shows mean levels of the variable for cherry pickers, store loyals and switchers, F-values and associated probabilities for a one-way ANOVA testing the null hypothesis that the three types are the same, and Dunnett's two-tailed test comparing cherry pickers (as a control) to both other shopper types separately. As can be seen, compared to loyal shoppers cherry pickers have low household incomes and are more likely to be elderly and married; the differences, however, are not large for any of the variables.

Table 1 also displays information about the proximity of grocery stores to the shopper's home. Loyals live closer to the nearest store, though not significantly so, and 65% of the time that nearest store is the loyal shopper's preferred store. Retail concentration is comparable across shopper types. It is the case that the distance between the nearest and next nearest store is smaller for cherry pickers and switchers, making it relatively less costly for these groups to shop multiple stores, though again the differences are not large

Table 1: Demographic and Geographic Characteristics

Variable	Cherry-Pickers	Loyals	Switchers	F value	Pr > F	CP vs S	CP vs L
Household Income (000's)	\$ 47	\$ 59	\$ 55	2.29	0.10		<
% Wealthy Households (>\$75k)	8%	24%	21%	1.86	0.16		
% Working Female Households	64%	78%	64%	1.73	0.18		
% Households with Young Kids (age<7)	22%	9%	22%	2.07	0.13		
% Elderly (≥65)	31%	7%	19%	4.13	0.02		>>
% College Educated	22%	25%	28%	0.18	0.83		
% Large Households (≥ 5 people)	22%	20%	17%	0.28	0.76		
% Home Owners	94%	85%	87%	0.93	0.40		
Household Size	3.3	2.9	3.1	0.71	0.49		
% Solo Consumers	8%	15%	13%	0.42	0.66		
% Married Households	83%	74%	73%	0.8	0.45		
Distance to Nearest Store (miles)	1.1	0.9	1.3	2.16	0.12		
Distance between Nearest and Next Nearest Store (miles)	1.1	1.5	1.2	2.66	0.07	<	
Retail Concentration (number of grocery retailers within two miles)	2.2	2.2	1.9	1.88	0.16		

note: << >>=p<.05
< >=p<.10

Although the univariate results indicated small differences in demographic and geographic characteristics of the shopper types, we ran a multiple discriminant analysis. The percent correct classifications were greater than chance, but the results also revealed lack of systematic and substantively important differences. Finally, we ran a stepwise logistic regression with a binary dependent variable distinguishing cherry pickers from non- cherry pickers (loyals and switchers). Statistically significant variables were (in order of entry) elderly, income, family size, distance between nearest and next nearest stores, home ownership, and college education.

Basic Differences in Shopping Behavior

Although there are few demographic and geographic differences between shopper types, there are meaningful differences in shopping behavior. Table 2 reports a variety of different measures of shopping behavior for the three shopper types: cherry pickers, loyals and switchers. By definition, cherry pickers cherry pick more frequently than other shoppers. They also shop on more days/month, irrespective of whether they go to

only one or more stores, 38% more often than loyals and 27% more often than switchers. By virtue of their higher shopping frequency, cherry pickers spend less and buy fewer units per shopping day. They also wait for a shorter interval between shopping days.

Table 2: General Shopping Behavior

	Cherry-Pickers	Loyals	Switchers	F value	Pr > F	CP vs S	CP vs L
% of Shopping Days with Cherry Picking	24%	2%	6%	1489.98	0.0000	>>	>>
Shopping Days/Month	9.4	6.8	7.4	114.62	0.0000	>>	>>
Cherry Picking Days/Month	2.0	0.1	0.3	238.81	0.0000	>>	>>
Spending/Shopping Day	\$67	\$82	\$71	137.28	0.0000	<<	<<
Number of Items/Shopping Day	30	38	33	111.38	0.0000	<<	<<
Inter-Shopping Interval (# Days between Shopping Days)	4.1	5.5	6.1	274.8	0.0000	<<	<<
\$ Spending/Month Grocery	\$615	\$527	\$490	69.69	0.0000	>>	>>
\$ Spending/Month Non-Grocery (Mass, Drug, Club)	\$271	\$244	\$288	12.99	0.0000		>>
Total \$ Spending Across Channels	\$886	\$778	\$771	25.46	0.0000	>>	>>

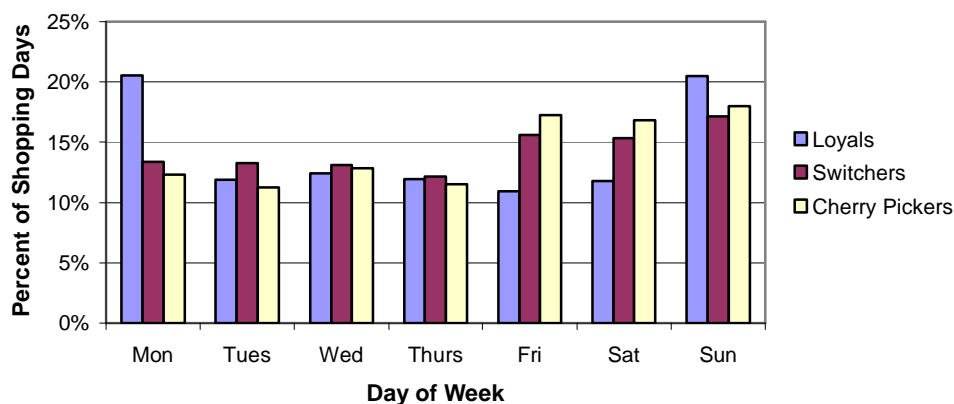
note: << >>=p<.05
< >=p<.10

Table 2 also indicates that cherry pickers report spending more money at grocery stores, as well as across retail formats (grocery, drug and club stores and mass merchandisers), than the other two groups. It is not clear exactly what to make of this difference since household sizes are comparable across groups and, by virtue of lower household incomes, cherry pickers generally face a more severe budget constraint. We offer two possible explanations for this result. An interesting possibility is that cherry pickers eat out less frequently, which is possible given their lower household incomes. This implies that grocery purchases are an inferior good, given the alternative of eating outside the home. This conjecture is consistent with survey results from the Food Marketing Institute (2002). Unfortunately, panel members do not report whether they eat in versus out of home, so we cannot test this conjecture in our data. A second possibility is that cherry pickers were more vigilant than other panelists in recording all of their purchases. Given their obvious commitment to shopping, we cannot rule this out. We

are confident, however, that our substantive conclusions are unaffected if this is the case; we conducted a variety of sensitivity analyses including or excluding lower spending loyals and switchers and found our results were robust to the selection criteria.

Figure 3 shows each type's shopping frequency by the day of the week. Cherry pickers and loyals display similar patterns, where the three biggest shopping days are Sunday followed by Friday and Saturday. Cherry pickers shop 52% of the time on those three days and switchers 48%. Loyals also shop extensively on Sunday but shop just as frequently on Mondays.

Figure 3: Shopping by Day of the Week



Within Store Shopping Behavior

Table 3 shows differences in within store buying behavior for the three shopper types. These results clearly show that cherry pickers are more sensitive to in-store promotions and more likely to buy products that carry a temporary price discount: 36% more likely than loyals and 19% more likely than switchers. They also are more likely to buy products that are feature advertised, probably because they are more vigilant in reading retailers' feature ads (Urbany, Dickson and Key 1991 and Urbany, Dickson and Sawyer 2000 hint at this), though we cannot observe this directly. Cherry pickers are

56% more likely to buy a featured item compared to loyals and 32% more likely than switchers. It is also the case the cherry pickers tend to buy larger quantities of the items that they purchase, apparently stockpiling to exploit the low prices that reward their vigilance and to take advantage of the quantity discounts that retailers often offer.

Standardizing across categories, we find that cherry pickers purchase sku's that are 8% larger than those bought by loyals (1.104 ? 1.018) and 32% larger than those bought by switchers (1.104 ? 0.838). We also calculated unit prices to examine differences in price sensitivity. Unit prices (\$/oz) were calculated controlling for both category and size, since we observed large package size differences across groups. Even after controlling for package size, cherry pickers paid substantially less per unit volume, 7% less than switchers (0.923 ? 0.996) and 16% less than loyals (0.923 ? 1.094). Thus, there is substantial evidence that cherry pickers are more price sensitive than the other shopper types.

Table 3: Within Store Shopping Behavior

	Cherry-Pickers	Loyals	Switchers	F value	Pr > F	CP vs S	CP vs L
% Items Bought at Discounted Prices	36.5%	27.6%	31.7%	218.7	0.0000	>>	>>
% Items Bought That Are Advertised	24.3%	15.4%	18.7%	291.1	0.0000	>>	>>
% Surplus	81.8%	74.1%	64.1%	2475.4	0.0000	>>	>>
Quantity/Size (standardized across categories, avg=1.0)	1.104	0.838	1.018	61.5	0.0000	<<	<<
Price per Unit (standardized across categories, avg=1.0)	0.923	1.094	0.996	48.7	0.0000	<<	<<

note: << >>=p<.05

Brand and Store Loyalty

Let us imagine a shopper who is contemporaneously both very price sensitive and brand loyal. One benefit of cherry picking would be that both of these motives could be

achieved at the same time. To determine whether brand loyal consumers seeking low prices drive cherry picking, we calculate Herfindahl indices for each household in each of the ten product categories (if the household made at least five category purchases) using brand-level market. The higher the Herfindahl index, the more brand loyal is the consumer. Table 4 show that cherry pickers are significantly less brand loyal than either of the other two shopper types. And so, although the act of cherry picking theoretically does afford more opportunities to buy one's favorite brands at a lower price, it appears that cherry pickers are just extraordinarily price sensitive. We also computed a separate Herfindahl index using store-level market shares to assess loyalty to grocery stores (recall that store loyalty refers to the store chain, not an individual outlet). We find that cherry pickers also display less store loyalty. We recognize that comparing cherry pickers with store loyals is not interesting since the group was defined by virtue of their revealed loyalty, though the comparison to switchers is not contaminated in the same way.

Table 4: Brand and Store Loyalty

Variable	Cherry-Pickers	Loyals	Switchers	F value	Pr > F	CP vs S	CP vs L
Brand Loyalty (Herfindahl Index of Brands within Category)	0.26	0.33	0.32	5.75	0.0032	<<	<<
Store Loyalty (Herfindahl Index of Grocery Store Chains)	0.44	0.92	0.60	130.07	0.0000	<<	<<

note: << >>=p<.05
< >=p<.10

Economic Surplus Generated by Cherry Picking

The previous analyses show that as a group cherry pickers are more sensitive to in-store temporary price discounts, pay more attention to feature advertising, and pay less per unit than other shoppers. Moreover, they are less brand and store loyal. The overall portrait suggests that cherry pickers reside in the upper tail of the price sensitivity and deal proneness distributions, clearly more price sensitive than store loyals but also more price sensitive than store switchers. One key unresolved question is whether cherry pickers behave in the observed manner because: (1) their cherry picking behavior affords them a greater number of opportunities to take advantage of lower prices; (2) their cherry picking behavior simply is a reflection of their greater price sensitivity; or (3) both of these effects. Another important issue is whether there is any economic justification for cherry picking. Clearly, cherry pickers shop more often than other people. Undoubtedly they may experience some transaction utility from being a market maven (Feick and Price 1987) and a smart shopper (Schindler 1992). Beyond these psychological benefits, however, it is interesting to see whether cherry pickers save enough money to justify the extra store visit. Our priors were that the savings would be modest at best; it turns out that we were wrong. The next set of analyses sets out to answer these questions by examining cherry picking shopping days versus single store visit days, first for the entire sample of shoppers and then broken down by shopper type.

Cherry Picking Versus Single Store Shopping Days: For each shopper on each shopping day at Jewel and/or Dominick's, we determined whether they paid the lower or higher price at those two retailers for all purchases in the ten categories for which we have detailed price data. We also calculated the amount that they saved relative to the

higher price. Recall that the large majority of panelist purchases across all categories were made at Jewel and Dominick's, so direct comparison of these two alternatives is appropriate. For simplicity of presentation, the first set of analyses ignores shopper types and simply examines shopping behavior on cherry picking days (when a shopper visits two stores) compared to single store days. It should be pointed out that 65% of the cherry picking days in the data come from shoppers classified as cherry pickers whereas 80% of the single store days come from loyals and switchers.

Table 5 shows the results. When shoppers cherry pick, they are 8% more likely (80% ? 74%) to pay the lower price compared to those days when they only patronize one store. The reason for this difference is that cherry picking increases the probability that the shopper will buy lower priced discounted items. This occurs irrespective of whether only one or both stores are selling the item at a discount. Interestingly, shoppers are more successful selecting items that are sold by both stores at regular price when not cherry picking. This may be because cherry picking shifts the shopper's focus to buying promoted items. Table 5 also suggests that people are really on a shopping mission when they decide to cherry pick two stores; that is, the act of cherry picking is premeditated and thought out. For example, shoppers buy larger quantities on cherry picking days, as package sizes are 9% larger. In addition, shoppers spend \$46 more on cherry days, which is 67% greater than the \$69 they spend on single store days. A similar finding obtains for number of items bought—shoppers buy 21 more items on cherry days, 66% more than the 32 items they buy on single store days. This of course is not completely surprising since the shopper is visiting twice as many stores, but again it does suggest that the shopper planned on spending more than normal to take advantage of the extra store

visit. Cherry picking appears to be a case of planned opportunism (Hayes-Roth and Hayes-Roth 1979).

Table 5: Cherry Picking Versus Single Store Shopping Days

Variable	Cherry Picking Days	Single Store Days	F value	Pr > F
	n=2,620	n=26,196		
Prob(Buying at Lower Price Store)	80%	74%	633.0	0.000
Prob(Buying at Lower Price Store) when Neither Store Discounts	76%	80%	130.0	0.000
Prob(Buying at Lower Price Store) when Both Stores Discount	66%	58%	267.6	0.000
Prob(Buying at Lower Price Store) when Only One Store Discounts	87%	76%	1049.7	0.000
Quantity (standardized across category, avg=1.0)	1.073	0.985	17.0	0.000
\$ Spending/Day	\$115	\$69	1523.3	0.000
Units/Day	53	32	1026.6	0.000
% Items Bought at Discounted Prices	37.1%	31.0%	229.1	0.000
% Items Bought that Are Advertised	25.2%	18.2%	385.5	0.000
% Savings Off Higher Price	15.6%	10.5%	1940.9	0.000
% of Potential Surplus	82.3%	71.8%	1697.1	0.000
\$ Savings	\$ 22.90	\$ 7.85	12554.8	0.000

As expected, shoppers are more likely to buy items at discounted prices and items that are feature advertised when cherry picking, and as a result save 15.6% off the higher price compared to only 10.5% on single store days. Moreover, shoppers appropriate 12.5% (82.3%-71.8%) more surplus when cherry picking. Finally, we calculate the overall dollar savings, which in this case is simply:

$$\text{\$ Savings} = \frac{\text{\$ Spending/Day}}{100\% - \% \text{ Savings Off Highest Price}} - \text{\$ Spending/Day} .$$

The economic benefit when shoppers cherry pick is \$22.90 off of the higher price available that day compared to \$7.85 on single store visit days, which is a \$15.05 difference. Before discussing whether a savings of \$15.05 is worth the extra store visit

that shoppers make on cherry picking days, we will discuss the results in Table 6, which presents the same analyses as Table 5 broken down by the three shopper types.

Table 6: Cherry Picking Versus Single Store Shopping Days for the Three Shopper Types

Variable	Cherry Pickers		Loyals		Switchers	
	Cherry Pick	No Cherry Pick	Cherry Pick	No Cherry Pick	Cherry Pick	No Cherry Pick
Total Number of Purchases	1690	5286	113	7281	749	12772
Prob(Lower Price Store)	83%	78%	75%	71%	76%	75%
Prob(Lower Price Store) when Neither Store Discounts	77%	80%	84%	81%	70%	79%
Prob(Lower Price Store) when Both Stores Discount	67%	57%	60%	51%	64%	63%
Prob(Lower Price Store) when Only One Store Discounts	91%	82%	81%	70%	80%	76%
Quantity (standardized across category, avg=1.0)	1.145	1.058	1.253	0.819	1.072	1.011
Trip Size \$	\$115	\$51	\$121	\$81	\$113	\$68
Trip Size Units	53	23	53	38	52	32
% Items Bought at Discounted Prices	38.1%	35.3%	31.1%	27.5%	35.6%	31.2%
% Items Bought that Are Advertised	26.4%	22.8%	18.8%	15.3%	23.6%	18.1%
% off Higher Price	16.7%	12.5%	10.2%	8.4%	14.0%	11.0%
% of Potential Surplus	85.6%	78.4%	65.5%	63.7%	76.6%	73.7%
\$ Savings	\$ 25.04	\$ 7.59	\$ 16.07	\$ 7.39	\$ 19.11	\$ 8.22

Note: All Cherry Picking vs. Non-Cherry Picking differences are significant at $p < .05$ except for shaded cells.

These results largely replicate those in Table 5 with cherry pickers usually a bit more extreme than switchers and store loyals. An exception is that loyals experience an increase in the probability of buying at the lowest price when both items are regularly priced, an opportunity not usually available to them given their normal store loyalty. All three shopper groups spend more money and buy more items when they shop two rather than one store on the same day, though the cherry picker group shows the biggest differences, spending 125% more (\$115 ? \$51) dollars and buying 130% more items (53 ? 23) on cherry picking days compared to single store days. As a consequence, the

marginal benefit that cherry pickers gain from the extra store visit is larger, \$17.45, compared to \$10.89 for switchers and \$8.68 for store loyals.

There appear to be two reasons why cherry pickers benefit more from the extra store visit. First, they are more experienced and consequently more accomplished at taking advantage of the extra savings opportunities afforded by the extra store visit. Cherry pickers appropriate more of the potential surplus irrespective of whether it is a cherry picking occasion or not, but the difference in % of surplus is greatest for cherry pickers, 7.2% (85.6%-78.4%) compared to a 2.9% and 1.8% difference for switchers and loyals. Cherry pickers also save 16.7% off the highest price when cherry picking while loyals save only 10.2%. However, switchers are almost as opportunistic at 14.0%, suggesting that cherry pickers' in-store shopping acumen is not the entire story. Instead, a key contribution to their greater marginal benefit is the fact that they appear to opportunistically plan their shopping trips into two types: much smaller single store visits that may be fill-in trips, and larger two store trips where they buy significantly more (+125%).

Cherry Picking at Primary Versus Secondary Stores: We also were interested how cherry picking behavior varies depending upon whether the store is the shopper's primary grocery outlet or a secondary grocery outlet. The reasoning for this analysis is that it is one thing to be a shopper's primary store, where every so often the shopper cherry picks your competition and thus spends a bit less money in your store that week as compared to a non-cherry picking week. It is another thing to be a secondary store—the one which is actually being cherry picked. Not only does the shopper fail to spend as much in your store, but when they do patronize it, they opportunistically buy more sale

items. Since we could not directly observe whether a store was primary or secondary, for each household we determined at which grocery chain they spent the most money over the two-year period and designated this retailer as the primary store. All other stores were designated secondary outlets. Note that this analysis is confined to store visits made on cherry picking days.

Table 7 shows the results. The basic finding is that secondary stores are hurt more by cherry picking than the primary store, which is probably not unexpected. Shoppers get 42% more savings off of the highest price (17.0% ? 12.0%) and appropriate 8.4% more of the surplus when shopping at a secondary store compared to the primary store. Some of this savings is due to buying at the lower price more often (82% at a secondary store vs. 75% at the primary store), but the magnitude of the savings suggests that most of the benefit comes from shoppers using feature advertising to plan out their shopping trips. This result is corroborated by the fact that shoppers are more than 25% more likely to buy advertised items at the secondary store (27.5% ? 21.9%). Dollar savings are greater at the primary store in large part because most of the market basket is purchased there. Shoppers allocate most of their day's expenditures to the primary store, with primary store spending 67% greater than spending at a secondary store (\$70 ? \$42). The net result is that the secondary store is cherry picked to a greater extent than the primary store, a state of affairs that the secondary store might (fairly accurately) characterize as adding insult (selling a higher percentage of lower margin, discounted merchandise) to injury (receiving a significantly lower share of the shoppers market basket expenditures).

It is also interesting to note that a visit to the primary store in many ways resembles the average shopping day, shown in the right-most column of Table 7. In particular, the probability of selecting items at the lower price, the size of the trip (in dollars and units), the percent savings off the higher price and the dollar savings are very similar. This suggests that the primary store fares about as well on a cherry picking day as it does when it alone is visited on a single store shopping day.

Table 7: Cherry Picking at Primary vs. Secondary Stores

	Primary	Secondary	F	Pr > F	All Shoppers, All Occasions
Prob(Lower Price Store)	75%	82%	159.2	0.0000	75%
Prob(Lower Price Store) when Neither Store Discounts	76%	79%	6.0	0.0140	80%
Prob(Lower Price Store) when Both Stores Discount	58%	66%	44.9	0.0000	60%
Prob(Lower Price Store) when Only One Store Discounts	83%	90%	154.1	0.0000	77%
Quantity (control for keycat)	1.111	1.057	1.54	0.2151	1.000
Store Visit Size \$	\$70	\$42	561.2	0.0000	\$73
Store Visit Size Units	32	19	432.1	0.0000	33
% Items Bought at Discounted Prices	35.6%	38.1%	8.2	0.0016	32.3%
% Items Bought that Are Advertised	21.9%	27.5%	49.8	0.0000	18.9%
% Off Higher Price	12.0%	17.0%	294.7	0.0000	11.2%
% of Potential Surplus	75.6%	84.0%	148.1	0.0000	73.4%
\$ Savings	\$9.85	\$9.05	9.9	0.0016	\$9.07

Conclusions

This paper has examined buyer side cherry picking, asking and hopefully answering a number of previously open questions. Specifically, is cherry picking worthwhile for consumers in the sense that the surplus generated from visiting two grocery stores on the same day is greater than the costs associated with the extra store visit? And secondly, how badly is the retailer hurt by this extreme manifestation of high price sensitivity? Our research strategy was to isolate a group of habitual cherry pickers,

those shoppers who undeniably reside at the extreme tail of the price sensitivity and deal proneness continuum, and then compare this group to other shopper types, i.e., store loyalists and switchers. Despite the fact that cherry pickers are more likely to be elderly and have slightly lower household incomes, we found no dramatic differences in demographics or geographic proximity to stores. At the same time, we uncovered substantial differences in both within and across store shopping behaviors.

Cherry pickers shop more often than loyalists and switchers and, as a consequence of shorter inter-shopping intervals, spend less and buy fewer units on the average shopping day. Cherry pickers are more vigilant, price sensitive shoppers. They buy significantly more merchandise at discounted prices, at least partly due to the fact that they are more aware of and attentive to retailers' weekly feature advertising of specials. Cherry pickers also buy larger-sized packages, suggesting that they are more willing to incur inventory holding costs to reduce their per unit purchase costs, which indeed are significantly lower than those of loyalists and switchers. It is also the case that, owing to their greater price sensitivity, cherry pickers are less loyal both to specific stores and individual brands.

Our analysis of cherry picking versus single store shopping days reveals two related but separate ways in which consumers save money by visiting two grocery stores on the same day. First, two same-day store visits afford the shopper more opportunities to save money, especially when they can plan out their shopping informed by feature advertising. When people cherry pick, they buy more items on deal, buy more items that are advertised, and are more likely to buy any given item at the lowest available price, compared to single store shopping days. As a result, cherry picking affords the shopper

about a 5% savings on their total shopping basket. But this is only part of the story, and in fact arguably not the most important aspect of cherry picking from a consumer welfare perspective. A key reason that cherry picking can generate surplus is because consumers plan out their cherry picking days and purchase significantly more (two thirds more on average) on such occasions. And so due to planned opportunism the 5% savings is applied to a much larger price tag than what would normally be spent on a single store shopping day.

Is the decision to make an extra store visit on the same day economically justifiable? Our answer is yes for a large percentage of shoppers. Across all shopper types, the incremental saving from cherry picking is $\$22.90 - \$7.85 = \$15.05$. Habitual cherry pickers, by virtue of extended practice, gain a greater incremental savings of $\$17.45$ compared to $\$10.89$ for switchers and $\$8.68$ for store loyals. Let us assume that the shopper incurs the following time costs for an extra store visit: (a) transit to and parking at a second store = 10 minutes; (b) shopping time to buy 30 items = 30 minutes (Bishop 1991, Sorenson 2003); and (c) check-out time = 5 minutes (Tom and Lucey 1995). Using these assumptions the cost of an incremental store visit works out to 45 minutes (very close to InsightExpress.com's (2003) survey estimate of 47 minutes), but to allow for the possibility that planning the larger trip is time consuming, we will assume a range of 45 minutes to one hour. The implied wage rate and opportunity cost of time are therefore $\$15.05$ to $\$20.07/\text{hour}$ for all shoppers and $\$17.45$ to $\$23.27/\text{hour}$ for cherry pickers. The average per capita income in Chicago in 1996 was approximately $\$31,500$, with a median household income of $\$45,800$. Assuming 2000 work hours/year, this implies a wage rate of $\$15.76$. Because the households in our sample have slightly

higher incomes (\$55,000, about 20% higher), we increase the implied wage rate accordingly to $1.2 \times \$15.76 = \$18.93/\text{hour}$. Irrespective of exactly how one does these “back of the envelope” calculations (like Blattberg, et al 1981 we have assumed no extra holding costs for the bigger basket purchased when cherry picking), the surplus generated appears economically justifiable for many households, given reasonable estimates of their opportunity costs.

Finally, we consider the impact of cherry picking on the retailers being cherry picked. The fact is that cherry picking gives shoppers access to more of the consumer surplus—more than five percent of the premium (higher) market price per item. Is this tolerable or excessive? That is a tough question in the absolute, though comparing this savings to supermarket gross margins of roughly 25% and net margins of 1.5% - 2% suggests that cherry picking has a material effect on customer profitability. However, it is clear that cherry picking shoppers are far more likely to be unprofitable for their secondary stores compared to their primary store. Not only do secondary stores sell less per shopper, but they also make lower margins on what they sell to those cherry pickers, which really do “pick the best and leave the rest.”

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