Coupon response in services

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Abstract

To date, most marketing research has focused primarily on the use of coupons for the promotion of packaged goods. Coupons are widely used in service establishments, even though little is known about a coupon’s impact on consumer behavior. Through the use of a field experiment, this study examined coupon redemption, purchase timing, and repeat purchase for 984 subjects. Consumer purchase histories and coupon response data were gathered via identification cards and electronic cash register reports. Results of the study show, as with packaged goods, prior purchase frequency is a significant predictor of coupon redemption. Coupon redeemers were almost seven and a half times more likely to make a repeat purchase during the postpromotion period compared to nonredeemers and subsequent purchase timing was not influenced by coupon redemption. As it relates to redemption, consumers’ behavioral response to coupons in the test establishment appeared to be similar to those found in some packaged goods studies, but different as it relates to purchase timing and repeat purchase probability. © 2001 by New York University. All rights reserved.

1. Introduction

Service marketers frequently use coupons (Hartley & Cross, 1988; Lovelock & Quelch, 1983) with the hope of influencing consumer behavior and enhancing firm profitability. Coupons are used in restaurants, hair salons, laundry and cleaning services, film processing and travel industries (Narasimhan, 1984; Peattie & Peattie, 1995). Narasimhan (1984) states,

... the practice of offering a reduced price through such instruments (coupons) is prevalent in the consumer goods industries, more noticeably in the frequently purchased nondurable products and services markets (p. 128).

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Coupons have been found to be effective tools in influencing sales and customer counts at the store level in service industries (Matosian, 1982; Varadarajan, 1984; Chapman, 1986). However, little is known as to whether consumer response to coupons is the same for services purchases as it is for packaged goods purchases.

Despite the extensive literature exploring the use and functions of coupons, a relatively small set of consumer goods has been repeatedly used to test hypotheses and develop theories in this area (Bawa, 1996; Cole, 1990). Most promotion studies have used a single packaged good or a group of packaged goods as a means of collecting empirical evidence.

A shortcoming of the promotion literature is that it is too narrowly focused on consumer packaged goods. This study fills a void in the services marketing and sales promotion literature by examining a coupon promotion in a setting previously underserved. In doing so, the study highlights the importance of product characteristics on predictions of promotional impact on consumer response. Research in services marketing clearly indicates that people and organizations buy services differently than they buy goods (George & Meyers, 1981). Intangibility, heterogeneity, perishability, and simultaneous production and consumption are key differences between goods and services that suggest the need for different marketing approaches (Zeithaml, Parasuraman, & Berry, 1985). As a result of these differences, coupon response in a service environment should be examined. Sales promotions are designed to generate an immediate response by consumers whether in a service setting or a packaged goods environment. Because of this shared common goal, the literature and theories that have been explored in packaged goods settings provide a good starting point to explore how coupons impact consumer behavior for a service purchase.

The objective of this paper is to investigate a coupon’s impact on two important consumer behaviors, repeat purchase and purchase timing, as well as consumer response via redemption. Each of these areas has been examined extensively in packaged goods studies providing a strong foundation to explore similarities and differences in response in a service environment. Hypotheses are generated for each of the three areas of interest by drawing on the specific characteristics of services and knowledge gained from the study of coupons in packaged goods settings. The hypotheses are then tested in a service setting.

1.1. Redemption

Preference for brands is a good predictor of purchase (Banks, 1991) whether for the purchase of a packaged good or service. Consumers who exhibit weak preference for a brand are less sensitive to promotions for that brand than are consumers with moderate brand preference (Ortmeyer, Lattin & Montgomery, 1991). Prior purchase history indicates that a degree of preference for a particular brand or product has been established.

In one of the first direct tests of prior patronage and coupon redemption, Shoemaker and Tibrewala (1985) find that as prior patronage level increases so does redemption intentions. Other packaged goods studies have also shown that regular purchasers of a brand have a higher likelihood of coupon redemption than purchasers with low prior purchase probabilities (Bawa & Shoemaker, 1987).

The findings in packaged good studies related to prior purchase and redemption intentions are similar to that expected in a service environment. The more prior purchase experience a
consumer has had with a service provider the more likely they are to have received acceptable service. It is suggested that prior purchase history will be a significant predictor of coupon redemption in services just as it is has been in packaged goods.

\( H_1 \): The number of prior purchases with a given service provider has a positive influence on likelihood of redeeming a coupon at that service establishment.

1.2. Purchase timing

Researchers have found that consumers buy more products at one time or buy products at an earlier time than usual in the presence of a coupon (Blattberg, Eppen, & Lieberman, 1981; Shoemaker, 1979). Coupons can also be used to increase consumer inventories (stockpiling) or accelerate purchase timing thereby insulating consumers against competitive activity (Ailloni-Charas, 1984; Blattberg & Neslin, 1990; Krishna & Shoemaker, 1992). In a study of purchase quantity and timing for bathroom tissue and coffee, Neslin, Henderson and Quelch (1985) found that coupons were effective in increasing purchase quantity. As a result of shifting inventory from the retailer to the consumer, less of the brand and product category may be purchased by the consumer on subsequent purchase occasions (Neslin & Shoemaker, 1983). Further, in instances of stockpiling, consumers purchase larger quantities than usual during a sales promotion and wait longer for a subsequent repurchase (Totten & Block, 1994). The delay in repurchase following the promotional purchase is due to the transfer of inventories from the retailer to the consumer, resulting in a longer category repurchase cycle in the time period immediately following the promotion.

The concept of stockpiling and the subsequent effect on purchase timing does not generalize to services. Services are perishable and as a result cannot be held in inventory. Lovelock and Quelch (1983) state that the inability to inventory services plays an important role in how services are promoted. Since excess production capacity cannot be inventoried, service marketers utilize promotions to shape demand.

The inability to inventory or stockpile services suggests that consumers will not drop out of the purchase arena following a coupon purchase. In order to determine if a coupon is affecting purchase timing following a coupon purchase, the following hypothesis is proposed:

\( H_2 \): There will be no significant difference in the interpurchase time following a coupon purchase compared to the interpurchase time preceding the coupon purchase.

1.3. Repeat purchase

Theoretical arguments on the effects of coupons and promotions on subsequent purchase behavior in packaged goods environments have drawn conflicting conclusions. Consumer learning has been used to suggest a positive association between promotion use and repeat purchase behavior. Blattberg and Neslin (1990) suggest promotions may be viewed by consumers as rewards for their purchase behavior hence enabling them to learn to continue to buy a product. In an empirical investigation of direct mail coupon effects on brand choice
behavior, Bawa and Shoemaker (1987) found a significant increase in purchase probability following coupon redemption for subjects classified as new or infrequent users of a brand. Conversely, theoretical perspectives also suggest promotions may have a negative impact on repeat purchase. According to attribution and self-perception theories, if a consumer attributes their purchase of a brand to a coupon or a promotion as opposed to brand characteristics they would be less likely to purchase the brand in the absence of the promotion. Consumers who would most likely respond in this fashion would be those who were attracted to the brand because of economic factors associated with the savings from the promotion. These consumers would be, more than likely, brand switchers and as a result would have a high likelihood of switching once the promotion has been retracted.

Neslin and Shoemaker (1989) conclude that coupons attract a disproportionate number of consumers with a low prior purchase probability, which explains why they have a lower likelihood of repurchase after a promotional purchase. Additionally, consumers who attribute their purchase to a promotion may deduce that the brand is inferior or of low quality (see Blattberg & Neslin, 1990 for a complete discussion of theoretical justifications related to promotions and repeat purchase). Both of the propositions, (1) attraction to the brand mainly for the value implications associated with the promotion and (2) perceptions of an inferior product, lead to lower repeat purchase after the promotion has concluded.

Empirical investigations have found that the average purchase probability is lower if the prior purchase was made on promotion (Shoemaker & Shoaf, 1977; Dodson, Tybout & Sternthal, 1978). In their study examining deals and deal retraction on brand switching, Dodson, Tybout and Sternthal (1978) found that when media coupons were retracted repeat purchasing was undermined for both loyal users and switchers.

The nature of services and the way consumers purchase services makes it unlikely that the negative theoretical perspective will hold in most service environments. Researchers have suggested that switching behavior is less frequent for service purchases (Iacobucci, 1998; Zeithaml & Bitner, 1996; Friedman & Smith, 1993) thereby reducing the likelihood of attraction to the brand mainly for the value implications associated with the promotion. Because of the reluctance to switch service providers, a coupon alone may not provide a strong enough incentive to attract a large number of low prior probability consumers to an established service firm. As a result, it is unlikely that a large number of consumers will utilize a coupon to try an unfamiliar service provider with the intention of returning to their regular provider.

A consumer who redeems a coupon during a promotion period would be expected to have a high likelihood of repeat purchase once the promotion is retracted because they will tend to come from the pool of regular users. If coupons in services attract a high proportion of regular users, it is possible that the coupon may be perceived as a reward, as suggested by operant conditioning, and learned behavior (continued patronage) may result. Due to the nature of services, the proposed hypothesis suggests that coupons will have a positive impact on repeat purchase.

H3: Subjects who redeem a coupon during the promotion period will have a higher likelihood of making a purchase during the postpromotion period than subjects who did not redeem
To summarize the relationships presented, Table 1 identifies key differences and similarities in consumer response to coupons in goods versus service environments based upon a synthesis of existing coupon literature and an extrapolation of that literature to services.

2. Empirical study

2.1. Study environment

Data were gathered from a self-contained minimarket consisting of five retail fast food establishments and two sit-down establishments. All five fast food restaurants together constitute the entire fast food category in this minimarket. In order to ensure control, no other promotions were implemented during the promotion or postpromotion periods in any of the establishments in the marketplace.

Subjects utilized an electronically coded identification card that allowed them to make purchases at the five fast food establishments mentioned above and the two sit-down establishments. For all purchases, subjects presented their cards at the cash register for payment.

2.2. Treatment

A random sample of college students who contracted to obtain food service through the use of a prepaid meal program was used in the study. Alva (1992) describes college students as “a fast feeder’s dream” because consumers age 18–34 are the largest consumers of fast food. This fact supports the use of college students to test the proposed hypotheses. Subjects received a numerically coded direct mail coupon. The coding allowed the identity of the coupon recipient to be cross-referenced with the identity of the actual coupon redeemer. A stipulation on the coupon indicated that the coupon could only be redeemed in the test establishment. The average menu price for a sandwich in the test establishment was $4.09 with the price of a sandwich ranging from $2.99 to $4.99. Each coupon was good for $1.00 off the purchase price of any sandwich on the menu representing a 20–33% saving with
redemption. The test establishment was centrally located in the marketplace and had been in existence for one and a half years prior to the commencement of the study.

2.3. Time periods

The entire study is divided into three time periods. The prepromotion period contains purchase histories for sixty-eight days. The promotion period, containing purchase histories for fourteen days, is the time from the first day the coupon could be used (all coupons were delivered on the same day) until the last day that the coupon could be redeemed. Finally, the postpromotion period contains purchase histories for eighteen days beginning the first day after the coupon had expired and concluding on the last day of the study. There was no overlap among the three time periods in the study.

2.4. Data

Data from 984 subjects were utilized in this study. In order to determine if subjects redeemed a coupon and on what date, consumer purchase histories were matched with a data set that contained all cash register information in the test establishment during the promotion period. Each transaction record included the items purchased, amount spent, date, time, a four-digit transaction number, subject identifier and whether a coupon was used.

3. Analyses and results

Table 2 provides a summary of redemption behavior and repeat purchase behavior of subjects in the study. As indicated in the table, 12.5% of the subjects redeemed coupons and 82% returned to the test establishment during the postpromotion period.

3.1. Redemption

A total of 123 subjects redeemed a coupon. Based on Hypothesis 1, we want to determine if the number of prior purchases affects the likelihood of redemption. The following logistic model is used to understand the impact of prior purchase frequency on coupon redemption:
logit \( p_i \) = \log \left( \frac{p_i}{1 - p_i} \right) = \alpha + \beta_1 X_1 \tag{1}

where

\[ p_i = \text{Prob} (y_i = y_1 \mid x_i) \] is the probability of coupon redemption for the \( i \)th subject.

\[ \alpha \] is the intercept parameter.

\[ \beta_1 \] is the parameter estimate for prior purchase.

\[ X_1 \] is the total number of prior purchases in the test establishment for the \( i \)th subject.

This logistic regression equation models the logit transformation of the \( i \)th subject’s probability of coupon redemption, \( p_i \), as a linear function of their prior purchase history. In order to test Hypothesis 1, all subjects \( (n = 984) \) were included in the analysis.

The results (Table 3) show the parameter estimate for the number of prior purchases is significant. Based upon the odds ratio \( (e^\beta) \), for each additional prior purchase in the test establishment the odds of coupon redemption increase by 3%. Even though prior purchase was significant, the low \( \rho^2 \) (0.052) for this model suggests there are other variables that may be helpful in explaining the likelihood of redemption. One must keep in mind that the service environment in which this study was conducted was highly differentiated (no other sandwich shops of this type were in the marketplace). Prior purchase history in the presence of direct competition may reveal different results.

### 3.2. Purchase timing

Hypothesis 2 holds that the interpurchase cycle (number of days between purchases) following coupon redemption will not be significantly different from the interpurchase cycle preceding coupon redemption. A paired sample \( t \) test was conducted as this analysis utilized multiple measures for each subject. In order to determine the number of days in the interpurchase cycle prior to redemption at least one purchase prior to redemption was required. In order to determine the purchase interval following the promotion at least one purchase must be made following the coupon redemption. Only those subjects \( (n = 119) \) who redeemed a coupon, made at least one prior purchase in the prepromotion time period, and at least one purchase following coupon redemption, are included in the analysis.

#### Table 3

Prior Purchase Effects on Redemption Parameter estimates \( (\chi^2 \text{ values}) \)

<table>
<thead>
<tr>
<th>Number of Prior purchases</th>
<th>Constant model</th>
<th>Model 1</th>
<th>Odds</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-\text{LL}^b) ( (n = 984) )</td>
<td>370.742</td>
<td>351.498</td>
<td>1.036</td>
</tr>
<tr>
<td>(\rho^2c)</td>
<td>—</td>
<td>0.052</td>
<td></td>
</tr>
<tr>
<td>(\chi^2)</td>
<td>—</td>
<td>38.488^d</td>
<td></td>
</tr>
<tr>
<td>d.f.</td>
<td>—</td>
<td>1</td>
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</tr>
</tbody>
</table>

\(^a p < .01\)

\(^b -\text{LL} = \text{minus log likelihood}\)

\(^c \text{likelihood ratio index with respect to the null model}\)

\(^d \chi^2 \text{ for Model 1 with respect to the null model}\)
As shown in Table 4, the mean number of days immediately preceding the coupon redemption was 4.10 while the mean number of days between the coupon redemption and the next purchase was 4.16. No significant difference exists between these two values ($t = 0.52, p = .606$), thereby providing support for Hypothesis 2. This suggests that in this study, the use of the coupon did not result in subjects delaying their subsequent purchase in the test establishment.

3.3. Repeat purchase

The dependent variable in Hypothesis 3 is a dichotomous categorical variable reflecting repeat purchase behavior. The hypothesis holds that subjects who redeem a coupon have a higher likelihood of purchasing in the test establishment in the postpromotion period compared to subjects who do not redeem. A logistic model was utilized to assess the likelihood of postpromotion purchase. If a subject made at least one purchase in the postpromotion period, that subject was classified as a repeater. If a subject made zero purchases in the postpromotion period, they were classified as a nonrepeater. In the proposed model, the number of prior purchase occasions is included as a control variable to separate the base consumer purchase behavior from the purchase activity due to the promotion stimulus.

Only those subjects who made a minimum of one purchase in either the prepromotion or the promotion periods ($n = 871$) were included in the analysis. Without at least one purchase prior to the postpromotion period the subject would not be making a repeat purchase. The following model is used to test the relationship between coupon redemption and postpromotion purchase behavior:

$$\logit (p_i) = \log \left( \frac{p_i}{1 - p_i} \right) = \alpha + \beta_2 X_2 + \beta_3 X_3 \tag{2}$$

where

- $p_i = \text{Prob}(y_i = 1 \mid x_i)$ is the probability of $i$th subject making at least one purchase during the postpromotion period.
- $\alpha$ = the intercept parameter.
- $\beta_2$ = the parameter estimate for coupon redemption.
- $X_2$ = a dummy variable representing coupon redemption.
- $\beta_3$ = the parameter estimate for prior purchase.
- $X_3$ = the total number of prior purchases in the test establishment for the $i$th subject made during the prepromotion period.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Paired Sample T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>N</td>
</tr>
<tr>
<td>Purchase interval prior to redemption</td>
<td>120</td>
</tr>
<tr>
<td>Purchase interval following redemption</td>
<td>122</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysis of Difference Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Difference between purchase intervals</td>
</tr>
</tbody>
</table>

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The logistic regression parameter estimates give the estimated coefficients of the fitted logistic regression model. The results are shown in Table 5. The explanatory power of the proposed model is high as is evidenced by the fit of the model ($r^2 = 0.30$). Both coupon usage and prior purchase frequency provide substantial help in explaining subjects’ likelihood of making a repeat purchase in the postpromotion period. Based upon the odds ratio ($e^B$), a subject who redeemed a coupon was almost 7.5 times more likely to make a purchase in the postpromotion period than a subject who did not redeem a coupon. The odds ratio is particularly important in this study because it allows for the impact of coupon usage to be ascertained while controlling for the effects of prior purchase in the model.

4. Conclusion

The findings of this study reveal that consumer response to coupons for service purchases is similar to packaged goods in some ways but different in others. The fact that differences were found supports the recommendation to expand the study of coupon response beyond the packaged goods environment. Consistent with the findings in packaged goods studies, consumers who have exhibited a strong preference as demonstrated through prior purchase frequency are most likely to take advantage of a coupon. This implies that a consumer’s prior purchase behavior, whether for the purchase of a service or a good, provides a good indicator as to their likelihood of redemption. Mixed results have been seen in packaged goods studies as it relates to a coupon’s impact on repeat purchase. The findings of this study revealed that coupon redemption did not negatively impact repeat purchase behavior. 98% of all subjects who redeemed a coupon also made a purchase during the postpromotion period. Even when controlling for prior purchase history, subjects who redeemed the coupon were seven and a half times more likely to return to the test establishment than nonredeemers. The coupon did not deter repeat purchase behavior as has been evidenced in some packaged goods studies. Finally, the area where a difference between goods and services was most evident related to a coupon’s impact on purchase timing. The coupon did not lengthen the repurchase cycle following redemption because of the inability to stockpile a service.

Table 5

Redemption Effects on Repeat Purchase Parameter Estimates ($\chi^2$ values)

<table>
<thead>
<tr>
<th></th>
<th>Constant model</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of prior purchases</td>
<td>.1879 (84.06$^a$)</td>
<td>.1831 (79.42$^a$)</td>
<td>1.207</td>
<td></td>
</tr>
<tr>
<td>Coupon Redemption</td>
<td>2.00 (7.299$^a$)</td>
<td>7.418</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$-\text{LL}^{b}$ (n=871)</td>
<td>354.642</td>
<td>255.750</td>
<td>249.463</td>
<td></td>
</tr>
<tr>
<td>$\rho^{c}$</td>
<td>.28</td>
<td>.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>197.770$^d$</td>
<td>12.586$^e$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.f.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$ p < .01
$^b$ $-\text{LL} = \text{minus log likelihood}$
$^c$ likelihood ratio index with respect to the null model
$^d$ $\chi^2$ for Model 2 with respect to the null model
$^e$ $\chi^2$ for Model 3 with respect to Model 2
Although attitudinal data were not gathered, it is possible that subjects who redeemed and were prior users of the test establishment may have perceived the coupon as a reward or bonus; thereby suggesting that a coupon promotion may be a powerful tool in building relationships with a firm’s existing customers. This is consistent with prior research that suggests promotions may function as rewards allowing consumers to learn to continue their purchase behavior (Blattberg & Neslin, 1990; Ehrenberg, Hammond, & Goodhart, 1994). If so, the coupon serves a dual purpose both to create goodwill as a result of the perceived bonus and to encourage the desired purchase behavior.

The coupon was not effective as an incentive to initiate trial among prior nonusers. A total of 129 subjects had not visited the test establishment during the prepromotion time period. Of this number, only three (2%) redeemed the coupon. The findings of this study suggest that other promotional techniques should be utilized if the goal of a promotion is to generate trial. Services seeking to expand patronage rather than to maintain it should moderate the use of coupons. The fact that so few nonusers in this study redeemed the coupon supports this conclusion.

The mean interpurchase cycle following the coupon redemption was not significantly different from the mean interpurchase cycle preceding the coupon redemption. This illustrates that the inability to stockpile services negates the influence of the coupon to affect consumer purchase timing. Consumers have not removed themselves from the purchase environment following the promotion as seen in some packaged goods studies.

4.1. Limitations and suggestions for future research

Although this study has provided an initial base for understanding promotional response in service industries, a few limitations should be mentioned. Efforts should be made to test the hypotheses proposed here in a less controlled environment. Although the average repurchase cycle for the test establishment was 5.8 days, the relatively short coupon redemption and postpromotion periods may not have allowed for the observations of “slow” redeemers or “slow” postpurchasers. In addition, the relatively short (18 days) postpromotion period in this study limits what can be said about long term effects following coupon redemption. In this study it was only determined whether the subject came back to the establishment in the postpromotion period not the coupon’s specific effects on long term behavior.

Future research should be conducted to test these and similar hypotheses in an environment that would allow for further generalizations of the results. In a less controlled setting, competition from other sandwich shops may exist which may impact promotional response. Although the fast food industry has been classified as a service industry (Lovelock, 1991; Vandermerwe & Chadwick, 1989; Mitchell & Greatorex, 1993), it is a hybrid of goods and services industries. Research should move toward studying the effects of coupons and similar promotions in pure service industries to better ascertain if there are marked differences in how promotional tools affect consumer behavior within service industries. Consumers may be more responsive to coupons in certain types of service firms but not others, as well as for new service firms as opposed to existing service firms. As such, a cross-industry study should be completed to better understand differences within service industries.
Research continuing in this area should also make an effort to gather attitudinal data to accompany behavioral data. Attitudinal data combined with behavioral data would allow researchers to better understand the reasons consumers behave as they do. Though the results of the hypothesis test revealed the number of prior purchases was significant in predicting coupon redemption, other potentially relevant variables such as loyalty or personal attachment should be incorporated in future models. Additionally, the value of the coupon offer should be varied to determine if larger value coupons might result in a different response than was evidenced in this study. It is possible that higher percentage off coupons or free coupons (e.g., 100% off) may result in differential responses than those seen in this study. The findings of this study support the recommendation to examine the effects of coupons on consumer behavior outside of the packaged goods arena.

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Notes

1. The prepromotion period is calibrated from January 9th–March 17th. The test establishment was closed on January 16th and March 18th–March 26th.
2. A total of 137 students redeemed coupons. Due to cross-referencing of the cash register tape with identification codes on the coupons it was discovered that seven students redeemed two coupons. These students were excluded from the study. Two students redeemed a coupon but were not included in the analyses due to termination of program participation (they canceled their program participation or were dropped for unknown reasons). Five students who were not part of the study redeemed coupons. It is assumed that a study participant passed the coupon along to a nonparticipant. 123 students are classified as redeemers in the study (137 – 14 = 123).
3. 129 subjects made zero purchases in the prepromotion period. Three redeemed coupons during the promotion period and thirteen made a purchase during the promotion period without redeeming the coupon (3 + 13 = 16). The remaining 113 subjects are not included in the analysis of Hypothesis 3 because they did not make a purchase in either the prepromotion or the promotion period (984 – 113 = 871).
4. An additional test was conducted to determine if there were subjects who would have returned to the test establishment had the postpromotion period been longer than 18 days. Based upon a comparison of their last purchase cycle (or their average interpurchase time, whichever was greater) and the days remaining in the study it was
determined that 24 subjects may have returned to the test establishment had the postpromotion period been longer. However, when reanalyzing the data counting these subjects as repeaters, the result of the hypothesis test was unchanged. Incidentally, the odds ratio dropped from 7.5 to 5.5 for coupon usage. This was a conservative additional test, as the return of all 24 subjects would be unlikely.

References


