Retail Price Promotion and Regular Price Purchases: A Replication

Professor Roger Heeler (rheeler@bus.yorku.ca)
Brent McKenzie (Doctoral student) (bmckenzi@bus.yorku.ca)
Schulich School of Business, York University

An often voiced concern of business practitioners relates to the value of academic research to their enterprise operations. The purpose of our research is to analyze a specific academic article that purports to provide retailers with insights as to the sales impact of pricing promotions and regular priced merchandise.(Mulhern and Padgett, Journal of Marketing, October, 1995). We replicated and extended the original study to test for possible effects of survey question positioning. The data was collected with the cooperation of a large Canadian Hardware store, and although this is a work in progress, the preliminary findings indicate the possibility of question positioning affecting the data collected. A further contribution of our research is to demonstrate the belief that a healthy scepticism of recommendations found in published academic research can be lessened through the use of replication and extension research.

Context

Research in marketing serve two masters, social science on the one hand and managerial practice on the other. This work-in-progress paper explores the interface between the two, using as a basis an article by Mulhern and Padgett (1995 - subsequently referred to as MP). The original article explored the relationship between retail price promotions and regular price purchases.

The Journal of Marketing's editor states that in virtually all cases the articles published in JM must be managerially relevant (Lusch, 1997). This priority to practice is less in some other journals in the marketing orbit, but remains important because research findings published in journals make their way into the lexicon of management. Thus findings which are false or have important delimiters of applicability may misdirect practice if the limitations are not known.

Similar issues in the natural sciences have led to a steady tradition of replication and extension of original research (Madden, Easley and Dunn, 1995). Unfortunately this tradition has not been followed in the social sciences. In marketing, Hubbard and Armstrong (1994) found that once published, findings are rarely challenged. The cause appears to be both a reluctance of journals to publish replications and a belief by academicians that replications are not helpful to career advancement (Kane, 1994).

Several cases where replications have been important to science are given by the authors cited above and by Wells (1993). Examples of previous "classical" research subsequently not supported through the use of replications include Gorn's (1982) classical conditioning experiments (later refuted by Kellaris and Cox 1989, Allen and Madden 1985) and the use of subliminal advertising at movie theatres to boost the sales of Coca-Cola and popcorn (replications by DeFleur and Petranoff 1959, Moore 1982 could not support the original findings).

A significant contribution to marketing research is in its generalizability. Replications and research extensions help to determine which results are valid and reliable, and therefore

generalizable (Campbell and Jackson 1979). In support of replication, Ehrenberg (1990), proclaims that published results should be generalizable to a defined degree using different data sets. We propose that marketing practitioners benefit from increased generalizable research. For example, if an empirical marketing research piece, is, as stated by Heeler and Ray (1972) , "single measure, one shot affairs with little attention to reliability, much less validity", what degree of pragmatic benefit is there to the practitioner?

The limited generalization of one time studies, especially those published in the major marketing journals, is further questioned by the fact that these one time studies are predominantly American based research. This custom perpetuates the often voiced criticism of American data being assumed to be generalizable to other countries (Albaum and Peterson 1984, Leone and Schultz 1980). Replications of practitioner relevant research in other countries can play an important role in easing this charge. As marketing, as a profession, continues to have a greater global perspective (Keegan 1995), the significance of international generalizable research increases.

Additional research concerns that can be lessened through the use of replications and extension research include errors that can be attributed to Demand artifacts. Demand artifacts, or demand biases, as defined by Kruglanski (1975, page 103), refer to the "error of inference regarding the cause of an observed effect". A notable piece of research that addressed this question was by Shimp, Hyatt and Snyder (1991), who review in detail, demand bias errors that occur in published research. Although the most frequent examples of demand bias occurs in laboratory experiments, similar errors can occur in all forms of data collection (Shimp et al 1991).

Objectives

As part of an on-going examination of the external validity of research in marketing, MP was selected as an article with important implications to line managers. Price promotions are an important management tool in retailing, so findings reported in the Journal of Marketing are likely to be of importance in practice.

The original research was exemplary in external validity. Instead of so many "volunteers", undergraduates acting out a role, actual behaviour by real shoppers was studied. Moreover, the subjects did not know they were being measured until after the behaviour had occurred, so reactive effects were avoided as in Dickson and Sawyer (1990).

The excellence of original design left two features to be examined by the current research. The first was context specificity. MP research was conducted in two stores of one chain of hardware stores in the United States. Both stores were located in small metropolitan areas. The results obtained by MP could have been dependent on the particular country (USA), chain, and time. The first objective of replication was therefore to determine whether the same results would be achieved in a different (though similar) country (Canada), with a different chain, and a different time (about six years after the original fieldwork). Americans and Canadians differ in shopping habits (American Demographics, 1993).

The second feature to be examined was the internal structure of the MP research. The reported results depended on comparison of (self reported) promotion shoppers and non-promotion shoppers. Self reports are subject to measurement error. The form of measurement used by MP appeared likely to promote error.

The relevant question to respondents was;

"Why did you come to XXXX Retailer today rather than another store?

[ ] For an item in the sale flyer	[ ] I saw a XXXXX television ad
[ ] I live nearby	[ ] I always shop here
[ ] Other	

Respondents who, inter alia, indicated "for an item in the sale flyer" were designated as promotional shoppers.

This question could bias responses in several ways. First, because it involves a check list, respondents are encouraged to answer to the specific items even if they had not been on their minds. Second, the question does not specify whether one main reason or multiple responses are required. In the event of multiple responses, "sale flyer" might have been an entirely secondary reason. Third, the positioning of "sale flyer" as the North West item maximizes the attention that will be paid to this item, and the answers that will be given to it, because of its relative prominence and signalled importance.

With limitations on feasible sample size for fieldwork, the third biasing item, position effect, was chosen for research. In the method described below, "sale flyer" was alternated from the MP North West position to the South East position of, "I always shop here". This way it could be determined if there was a measurement bias due to position, and if so what its effect was on the results.

Original Hypotheses and Method

The MP method collected data at two hardware stores during price promotions advertised by free standing inserts in newspapers. Store clerks asked shoppers to complete the pencil and paper survey at the check-out area while purchases were scanned. The survey led with the question, reproduced above, on motivation for store visit. In addition, several store satisfaction questions were asked. The 412 usable surveys were matched with the record of purchases.

MP had five hypotheses. H1 stated that at the individual level, promotion purchases are positively related to regular price purchases. MP claim that the hypothesis was supported by a 2 x 2 contingency table analysis. The table is not reproduced in the article, which is unfortunate because the available numbers belie the MP conclusion. MP table 1 shows that shoppers who purchased promoted items purchased $15.13 of regular merchandise, while shoppers who did not purchase promoted items bought $23.39 of regular items. Thus on the available published data, there was in fact a negative relationship between promotion and regular price purchases, thus disproving the hypothesis.

H2 state that shoppers visiting the store for the promotion are more likely to purchase one or more regular price items than not to purchase any regular price items. MP claim that this is supported because 76.8% of shoppers visiting for the promotion purchased one or more regular price items ($F = 32.5$, $p = 0.0$). The exact nature of the test is not described. From H2, the appropriate null hypothesis would appear to be a proportion of shoppers visiting for the promotion and buying regular price items equal to 50% or less, with a one way t-test of proportions versus this null. The null is rejected by this test and H2 is therefore supported by MP's results.

H3 stated that shoppers visiting the store for the promotion are more likely to purchase promotion items than other shoppers. This hypothesis was supported by an appropriate comparison of ratios.

H4 stated that shoppers visiting the store for the promotion are less likely to shop primarily at the store offering the promotion. Respondents were asked if this store was their primary source for home improvement products. The hypothesis was supported by an appropriated comparison of ratios.

H5 stated that customer profitability is lower for shoppers who visit the store for the promotion than for other shoppers. This hypothesis was not supported statistically. However, shoppers visiting for the promotion were 2% (13 cents) less profitable to the store than those visiting not for the promotion, so it is possible that a study with higher statistical power might have supported the hypothesis.

Replication Method

The MP study was repeated in Summer 1998 in one store of a Canadian chain of hardware stores. The store was located in a small metropolitan area. Price promotion was by door-to-door flyers rather than by newspaper insert. The customer questionnaire omitted the customer satisfaction questions (not reported in MP). The key question on "why did you come to the store" was rotated through two versions, the first with "sale flyer" in the MP North West position, the second with "sale flyer' rotated with the South East item, "always shop here".

Normal marketing research practice would have been to use four versions of the question, with "sale flyer" alternately in all four of the (non - Other) positions. The two extremes were used to preserve *n* for statistical comparisons, while, by using the extremes, allowing the normal marketing research compensation for position effect through rotation.

The design first allowed for testing of the degree to which the MP results would reproduce in another time and place. The overall results (with rotation balancing position) could be used to see how a study conducted according to routine marketing research practice conformed. In addition, the half of the sample that used the MP position for "sales flyer" would provide an exact replication.

Second, the design allowed for testing of the effect of item position by study of the half of the sample with "sales flyer" in the diametric opposite position to MP. First this sample would be tested to see if the changed item position resulted in a different proportion of self reported "promotion as reason for visit". Second, the original hypotheses of MP would be re-tested with this sample. It was expected that the MP positioning of "sales flyer" would induce some respondents to check that box, even if they were not really motivated by the promotion. It was therefore expected that the alternate position (South East) would both (a) result in a lower proportion of self respondent "promotion as reason for visit" and (b) that because the South East position would not be diluted by false "promotion as reason for visit" respondents, the shopping behaviour of the alternate sample could be different with respect to the MP hypotheses, and would provide a truer test of these hypotheses.

Replication Results

At the time of writing, only a first wave of data collection has been completed, so the results must be regarded as tentative. In particular the overall sample size (192) limits statistical power. Because of this limitation, and of the work-in-progress nature of this paper, results that are directional but not statistically proven are included.

The first analysis retested the hypotheses of MP with the complete set of the Canadian data. As such the test differed from the original MP because it used "sales flyer" data balanced for position effect.

H1, that promotional price purchases are positively related to regular price purchases, is the hypothesis that MP claimed supported, but their own reported data appeared not to support. The replication data was in the direction of the hypothesis. Those buying promoted items averaged $20.44 of regular purchases versus $18.91 for those not buying promoted items, but this result was not statistically significant, and the size of apparent effect is unlikely to be of managerial importance. So this hypothesis remains unproven in both MP (using their data but not their conclusions) and in the replication.

H2 and H3 were supported with statistical significance as in MP.

H4 was also supported directionally, but not at conventional statistical levels.

H5 was rejected as in MP. The results in the replication were even more favourable to the cause of promotions than obtained in MP. In MP, promotion and non-promotion customers were approximately equal in profitability. In the replication, promotion shoppers averaged $11.14 in profit versus $5.96 for non-promotion shoppers. That is, each promotion shopper was worth about twice as much to the store as each non-promotion shopper. Perhaps the flyer at the replication store draws a core of loyal, heavy hardware shoppers.

The significant findings from our research appears to be the profitability of "sales flyer" shoppers. It remains to be seen as what makes Canadian hardware shoppers differ from American hardware shoppers, but from a managerial perspective this would be an important finding.

The second set of comparisons between the replication and MP, concern the effect of the position of the "sales flyer" item. In the MP North West position, 12.31% of subjects answered "sales flyer" versus 7.0% in the rotated South East position. This difference is in the expected direction but is not significant with the sample size so far obtained.

The next test is with the subsample of respondents whose question concerning "sales flyer" was in the South East (non - MP) position. Because these subjects are less likely to be biased in their self-designation, their results, with respect to the various hypotheses may differ. The total sample was 86 surveys limiting the statistical power of the findings, but none the less the directionality of the statistical results were worthy of examination.

H1, that promotional price purchases are positively related to regular price purchases, was not in the direction of the hypothesis (as in the MP study). Those buying promoted items averaged $7.61 of regular purchases versus $18.02 for those not buying promoted items. This difference may have possible implications for managerial importance, but because the sample size of promotional purchase shoppers was very small (8 shoppers) further data collection is required.

H2 and H3 were not supported with statistical significance, unlike MP, and the entire sample set replication. The small sample size (only 6 "sales flyer" shoppers - tables 1 and 2) again prevents the drawing of relevant conclusions.

H4, the ability of the flyer to attract shoppers that did not primarily shop at the test store was inconclusive due to the small size of "sales flyer" shoppers. There was an even split, 50%, (3 out of 6) of "sales flyer" shoppers surveyed who were shopping at their primary store, while 55% (44 out of 80) of "not sales flyer" shoppers were also shopping at their primary store. The "draw effect" is also inconclusive even at the directional level.

H5 was not supported as in MP. The results in the South East replication were less favourable (table 3) to the cause of promotions than obtained in the full sample set replication and similar to the results obtained in MP. As mentioned above, in MP, promotion and non-promotion customers were approximately equal in profitability. The South East position replications showed that shoppers visiting for the promotion were 1% (6 cents) less profitable to the store than those visiting not for the promotion, but as in with the MP findings it is possible that a study with higher statistical power might have supported the hypothesis. This finding, if supported with a larger sample, may cause questions to be asked about the value of running promotional flyers if the shoppers attracted by the flyer are of little difference in profitability than non-flyer shoppers.

Although the analysis of shoppers whose self reported surveys indicated "sales flyer" shoppers when the option was placed in the South East position did result in conflicting findings from the replication results (as well as MP), the confidence in the findings is limited due to the small sample size. On the positive side, these work-in-process findings do appear to encourage the additional collection of shopper data using multiple question positioning.

Conclusions

For the applied researcher, our findings provide a number of questions from several perspectives. Considering them as a whole, the consistency of our replication results, when viewed in conjunction with Mulhern and Padgett's earlier research, strengthens the managerially relevant findings with respect to Canadian versus American promotional and regular price shoppers. It has been shown that shoppers continue to view sales promotions as an impetus for frequenting certain retailers, but that the sales items themselves are only part of the total shopping basket. Furthermore, we have empirically demonstrated preliminary support for similarities between Canadian and American hardware store shoppers in terms of promotion and regular merchandise purchasing, although differences in the profitability of those same shoppers warrants further research.

For academic researchers, our findings continue to assert the need for replications and extension of managerially relevant research in addition to theoretical research. A simple data collection procedure such as alternating the position of self respondent survey questions can prevent erroneous managerial findings from being published. We have also demonstrated that additional rigor by Journal editors in terms of asking authors to include more research data in their articles would add value to the journal readers.

Table 1 - Promotion Purchasing and Reason for Visiting the Store Replication

	Shoppers Purchasing Promoted Items	Shoppers Not Purchasing Promoted Items	TOTAL
Shoppers Indicating the Promotion as a Reason for Store Visit	n = 6 3.13% average purchase promotion $ 51.68 regular $ 12.59 Total: $ 64.27	n = 13 6.77% average purchase promotion $ ------ regular $ 36.04 Total: $ 36.04	n = 19 9.90% average purchase promotion $ 15.2 regular $ 29.93 Total: $ 44.95
Shoppers Not Indicating the Promotion as a Reason for Store Visit	n = 19 9.90% average purchase promotion $ 31.50 regular $ 22.92 Total: $ 54.42	n = 154 80.21% average purchase promotion $ ------ regular $ 17.46 Total: $ 17.46	n = 173 90.10% average purchase promotion $ 3.46 regular $ 18.06 Total: $ 21.52
TOTAL	n = 25 13.02% average purchase promotion $ 36.34 regular $ 20.44 Total: $ 56.78	n = 167 86.98% average purchase promotion $ ------ regular $ 18.91 Total: $ 18.91	n = 192 100.00% average purchase promotion $ 4.73 regular $ 19.11 Total: $ 23.84

Replication - "For an item in sale flyer" question in South East Position

	Shoppers Purchasing Promoted Items	Shoppers Not Purchasing Promoted Items	TOTAL
Shoppers Indicating the Promotion as a Reason for Store Visit	n = 3 3.49% average purchase promotion $ 46.70 regular $ 3.29 Total: $ 49.49	n = 3 3.49% average purchase promotion $ ------ regular $ 13.57 Total: $ 13.57	n = 6 6.98% average purchase promotion $ 23.35 regular $ 8.43 Total: $ 31.78
Shoppers Not Indicating the Promotion as a Reason for Store Visit	n = 5 5.81% average purchase promotion $ 69.72 regular $ 10.19 Total: $ 79.91	n = 75 87.21% average purchase promotion $ ------ regular $ 18.20 Total: $ 18.20	n = 80 93.02% average purchase promotion $ 4.36 regular $ 17.70 Total: $ 22.06
TOTAL	n = 8 9.30% average purchase promotion $ 61.09 regular $ 7.61 Total: $ 58.69	n = 78 90.70% average purchase promotion $ ------ regular $ 18.02 Total: $ 18.02	n = 86 100.00% average purchase promotion $ 5.68 regular $ 17.05 Total: $ 22.74

Table 2 - Distribution of Purchase Dollars of Survey Respondents
Replication

	Number of Respondents *% of Total*	Promotion Sales Dollars *% of Total*	Regular Price Sales Dollars *% of Total*	Total Sales Dollars *% of Total*
Shoppers Indicating the Promotion as a Reason for Store Visit	19 *9.9%*	$310.08 *6.8%*	$544.06 *11.9%*	$854.14 *18.7%*
Shoppers Not Indicating the Promotion as a Reason for Store Visit	173 *90.1%*	$598.80 *13.1%*	$3,124.32 *68.3%*	$3,722.82 *81.3%*
Shoppers Purchasing Promoted Items	25 *13.0%*	$908.58 *19.8%*	$510.73 *11.2%*	$1,419.31 *31.0%*
Shoppers Not Purchasing Promoted Items	167 *87.0%*	---	$3,157.97 *69.0%*	$3,157.97 *69.0%*
Total	192 *100.0%*	$908.58 *19.8%*	$3,668.70 *80.2%*	$4,577.28 *100.0%*

Replication - "For an item in sale flyer" question in South East Position

	Number of Respondents *% of Total*	Promotion Sales Dollars *% of Total*	Regular Price Sales Dollars *% of Total*	Total Sales Dollars *% of Total*
Shoppers Indicating the Promotion as a Reason for Store Visit	6 *7.0%*	$140.10 *7.2%*	$50.58 *2.6%*	$190.68 *9.8%*
Shoppers Not Indicating the Promotion as a Reason for Store Visit	80 *93.0%*	$348.60 *17.8%*	$1,415.95 *72.4%*	$1,764.55 *90.2%*
Shoppers Purchasing Promoted Items	8 *9.3.%*	$488.70 *25.0%*	$61.38 *3.1%*	$550.08 *28.1%*
Shoppers Not Purchasing Promoted Items	78 *90.7%*	---	$1,405.56 *71.9%*	$1,405.56 *71.9%*
Total	86 *100.0%*	$488.70 *25.0%*	$1,466.94 *75.0%*	$1,955.64 *100.0%*

Table 3 - Profitability By Shopper Type
Replication
Average Profit Dollars
Total Profit Dollars

	Shoppers Purchasing Promoted Items	Shoppers Not Purchasing Promoted Items	TOTAL
Shoppers Indicating the Promotion as a Reason for Store Visit	*$11.97* $71.80	*$10.81* $140.57	*$11.18* $212.37
Shoppers Not Indicating the Promotion as a Reason for Store Visit	*$11.46* $217.67	*$5.28* $813.19	*$5.96* $1,030.87
TOTAL	*$11.58* $289.48	*$5.71* $953.76	*$6.48* $1,243.24

Replication - "For an item in sale flyer" question in South East Position

Average Profit Dollars
Total Profit Dollars

	Shoppers Purchasing Promoted Items	Shoppers Not Purchasing Promoted Items	TOTAL
Shoppers Indicating the Promotion as a Reason for Store Visit	*$8.25* $24.75	*$4.07* $12.21	*$6.16* $36.96
Shoppers Not Indicating the Promotion as a Reason for Store Visit	*$17.69* $88.44	*$5.46* $409.50	*$6.22* $497.94
TOTAL	*$14.15* $113.19	*$5.41* $421.71	*$6.22* $534.90

Table 4 - Summary of Hypothesis Findings

H(1) At the individual level, promotion purchases are positively related to regular price purchases.

Mulhern and Padgett Study - Supported
Replication, Full Sample - Not supported
Replication, "South East" Position Sample - Opposite finding to original hypothesis, directionally supported

H(2) Shoppers visiting the store for the promotion are more likely to purchase one or more regular price items than not to purchase any regular price items.

Mulhern and Padgett Study - Supported
Replication, Full Sample - Supported
Replication, "South East" Position Sample - Not Supported

H(3) Shoppers visiting the store for the promotion are more likely to purchase promotion items than other shoppers.

Mulhern and Padgett Study - Supported
Replication, Full Sample - Supported
Replication, "South East" Position Sample - Not Supported

H(4) Shoppers visiting the store for the promotion are less likely to shop primarily at the store offering the promotion.

Mulhern and Padgett Study - Supported
Replication, Full Sample - Supported directionally, but not at conventional statistical levels
Replication, "South East" Position Sample - Inconclusive directionally and statistically

H(5) Customer profitability is lower for shoppers who visit the store for the promotion than for other shoppers.

Mulhern and Padgett Study - Not Supported
Replication, Full Sample - Not Supported
Replication, "South East" Position Sample - Not Supported

References

Albaum, G. and R.A. Peterson (1984), "Empirical research in international marketing", Journal of International Business Studies, 15, (Spring/Summer), 161-173

Allen, Chris T. and Thomas J. Madden (1985), "A Closer Look at Classical Conditioning", Journal of Consumer Research, 12, (December) 301-315

Anonymous (November, 1993), American Demographics

Campbell, K.E. and T.T. Jackson (1979), "The Role of and Need for Replication Research in Social Psychology", Replications in Social Psychology, 1, 3-14

DeFleur, M.L. and R.M Petranoff (1959), "A televisions test of subliminal persuasion", Public Opinion Quarterly, 23, 170-180

Dickson, Peter R. and Alan G. Sawyer (1990), "The Price Knowledge and Search of Supermarket Shoppers", Journal of Marketing, 54 (July), 42-53

Ehrenberg, A.S.C. (1990), "A hope for the future of statistics: MSOD", American Statistician, 4, 195-196

Gorn, G.J. (1982), "The effects of Music in Advertising on Choice Behavior: A Classical Conditioning Approach", Journal of Marketing, 46 (Winter), 94-101

Heeler, Roger M. and Michael L. Ray (1972), "Measure Validation in Marketing", Journal of Marketing Research, 9, (November), 361-370

Hubbard, Raymond and J. Scott Armstrong (1994), "Replications and extensions in marketing: Rarely published but quite contrary", International Journal of Research in Marketing, 11, 233-248

Kane, E.J. (1984), "Why journal editors should encourage the replication of applied econometric research", Quarterly Journal of Business and Economics, 23. 3-8

Keegan, Warren J. (1995), Global Marketing Management: Prentice Hall, New Jersey, 10-11

Kellaris, J.J. and A.D. Cox (1989), "The effect of background music in advertising: A reassessment", Journal of Consumer Research, 16, 113-118

Kruglanksi, Arie W. (1975), "The Human Subject in the Psychology Experiment: Fact and Artifact", in L. Berkowitz (ed.), Advances in Experimental Social Psychology, vol. 8, Orlando: Academic Press, 101-147

Leone, R.P. and R.L. Schultz (1980), "A study of marketing generalizations", Journal of Marketing, 44 (Winter), 10-18

Lusch, Robert F. (1997), "From the Editor", Journal of Marketing, 61, (January), 1-2

Madden, Charles S., Richard W. Easley, and Mark G. Dunn (1995), "How Journal Editors View Replication Research," Journal of Advertising, 24, (Winter), 77-87

Moore, T.E. (1982), "Subliminal Advertising: What You See is What You Get", Journal of Marketing, 46, 38-47

Mulhern, Francis J. and Daniel T. Padgett (1995), "The Relationship Between Retail Price Promotions and Regular Price Purchases", Journal of Marketing, 59, (October), 83-90

Shimp, Terence A., Eva M. Hyatt and David J. Snyder (1991), "A Critical Appraisal of Demand Artifacts in Consumer Research", Journal of Consumer Research, 18, (December), 273-283

Wells, William D. (1993), "Discovery-oriented Consumer Research", Journal of Consumer Research, 19, (March) 489-504