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Abstract
Linkage-advertising is the literature and related materials given to customers who respond to advertisers’ offers of these materials. Most print and much broadcast advertising in the United States and Canada includes direct-response linkage-advertising offers. However, the impact of linkage-advertising on customers’ cognitions, affections, purchases, and consumption behaviours is not well known. In this article we describe how quasi-experiments can provide a more valid approach to learning the impacts of advertising than the more widely used single-group case-study approach. A destination-marketing tourism strategy, its research method and results are described. This approach can be applied easily to other industry settings. A quasi-experimental design was used on data from a field study to test the central hypotheses of linkage-advertising effects. The results from the study are used to estimate the net return on investment of the total linkage-advertising marketing program. We conclude with suggestions for additional advertising research using quasi-experimental designs.

Résumé

Linkage-advertising is the literature and related materials given to customers who respond to advertisers’ offers of these materials (Woodside, 1994). Linkage-advertising “links the up-front advertising to the sale with additional arguments and benefits which the up-front advertising [i.e., the print or broadcast advertisement that includes the linkage offer] didn’t have space or time to include” (Rapp & Collins, 1987). In the United States in the 1990s most advertising expenditures include allocations for creating and sustaining direct links with customers, including such actions as linkage-advertising, learning and referring to customers by their names in database marketing programs, and creating “frequency-
marketing” customer clubs (Cappo, 1992; Frequency Marketing, 1993).

Rapp and Collins (1987, 1990, 1994), who have been the most outspoken advocates of linkage-advertising, say that

Too often awareness advertising leaves the prospect dangling, with no idea of what to do next, where to buy, or how to obtain more information. At the very least, the ideal advertising and marketing process should bridge this gap between the advertising and the sale by offering—and providing—additional information. We call this ‘linkage’ (Rapp & Collins, 1987, p. 17).

The use of linkage-advertising may be more valuable in some industries than in others. State/province tourism is a good example of such an industry. In this field, “[in creating image advertising] advertising agencies are thoroughly briefed on all the tourism wonders a state has to offer . . . and then are forbidden to mention them . . . . Presumably due to the political mine-field of highlighting individual cities, much less individual attractions, state tourism advertising is a bizarre enterprise wherein states attempting to lure visitors find themselves being ludicrously vague about why” (Garfield, 1994, p. 32). Rapp and Collins’s proposal of linkage advertising may be useful for solving this dilemma. The following two-step advertising strategy is used often by some destinations (e.g., states and provinces): (1) image advertising in scheduled media that includes heavy emphasis on the availability of linkage-advertising with several easy ways to acquire it, and (2) very detailed linkage-advertising with both lots of reason-why and procedural information about how to go about doing it (e.g., travelling to and inside the destination area; attractions; things to do; specific accommodation by region; restaurants; and shopping and what to buy).

While in later books Rapp and Collins (1990, 1994) provide many exciting and insightful case histories of the sales impacts of linkage-advertising strategies, these fail to include formal comparisons or discussions about drawing valid causal inferences of the impacts of linkage-advertising. Knowledgeable senior executives are likely to require stronger evidence than one-group case studies with no formal comparisons of sales impacts. A substantial body of literature is available on how to use true experiments (i.e., randomly assigning subjects to test and control groups to achieve comparability within known limits of sampling error) to examine causal propositions of advertising’s impact on sales (e.g., Banks, 1965; Caples, 1974; Raymond, 1974). However, substantial practical difficulties and expense are usually associated with meeting the design requirements of using true experiments (see Banks, 1965; Cook & Campbell, 1979, chap. 8).

We advocate greater awareness and use of quasi-experiments in advertising research with nonequivalent, but comparable, groups to examine causal relationships between linkage-advertising and multiple, dependent customer variables. Quasi-experiments are tests of the effects of changing levels of outcome variables (e.g., sales levels) caused by treatment variables (e.g., advertising and linkage-advertising) when random assignment has not been used to create equivalent comparison groups from which treatment-caused change is inferred (Cook & Campbell, 1979, p. 6). We describe a field study application of a quasi-experiment of the impact of linkage-advertising on several dependent variables; the method and results presented support the use of quasi-experiment designs in advertising research and the general proposition that linkage-advertising likely causes substantial changes in multiple customer variables. Also, we describe how the results from the field study can be used to estimate the return on investment of the linkage-advertising program.

First, we describe two quasi-experimental designs: a one-group post-test-only design and a quasi-experimental design with predicted higher order interaction effects. The first is used widely in assessing the effects of linkage-advertising, but we do not recommend it. The second is used sparingly, but we recommend it highly. Second, we apply the method and results to data from a field study. Third, we describe the net revenue analysis of the linkage-advertising program. We close with conclusions and suggestions for using quasi-experiments in advertising research.

**Quasi-Experimental Designs in Advertising**

The research design used most often for assessing the impact of advertising (and a design that should be used less often) is the one-group post-test-only design. We also describe a less known, but more useful, research design: the post-test-only design with predicted higher-order interactions. Given the excellent literature available on the topic (Banks, 1965; Cook & Campbell, 1979), our purpose is not to present a detailed review of the use of experiments and quasi-experimental designs.
Banks and Cook and Campbell provide detailed discussions on validity and research design threats to internal and external validity (see also Churchill, 1991, and Campbell & Stanley, 1966).

**The One-Group Post-Test-Only Design**

Most reported case studies on the influence of linkage-advertising on increasing sales, or generating contacts by customers, are best categorized as examples of the one-group post-test-only design. This design may be displayed with an X standing for the advertising treatment and O standing for an observation or measurement of effect.

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X   O
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A basic deficiency of this design is the lack of pretest observations from people who will be exposed to the advertising treatment. Cooke and Campbell (1979, p. 96) describe the deficiencies thus:

As a result, one cannot easily infer that the treatment is related to any kind of change. A second deficiency is the lack of a control group of persons who did not receive the treatment. Without this control it is difficult to conceptualize the relevant threats (to internal validity) and to measure them individually. In most contexts one needs time-relevant data from pretest measurement to check on maturational trends. One also needs information from groups that have not had the treatment to check on any causally irrelevant factors that could affect post-test scores (e.g., brand purchases) and prevent one from inferring what the post-test mean would have been in the treatment group had there been no treatment.

While these telling weaknesses are well known and reported widely in the scientific and practitioner advertising literature (e.g., Caples, 1974; Raymond, 1976), the one-group post-test-only design still appears to be the research design used most often to assess linkage-advertising effects (e.g., Rapp & Collins, 1987, 1990, 1994). In North America, a majority of the competitive submissions of linkage-advertising impacts for the Direct Marketing Association’s annual Echo Awards Program are based on the one-group post-test-only design (cf. Woodside, Beretich, & Lauricella, 1993). It is possible that advertising managers may select invalid research designs to assess advertising effectiveness because of time and cost constraints. However, it is more likely that the central reasons for the poor choice of research design are lack of knowledge and experience of working with true and quasi-experiments.

By not formally examining results (i.e., comparing the Os) with and without advertising, advertising managers cannot respond adequately to the most often asked question about advertising by senior executives: “How much did the advertising influence changes in dependent variables, such as brand awareness, attitude, image, and purchases, that would not have occurred without the advertising?” Without such specific comparative evidence of impact, the credibility and need for continuing with the advertising program and employing the advertising manager are weak; advertising becomes an activity to do during good times and to eliminate during business downturns. Thus, advertisers often become their own worst enemy by continuing to measure and report the effectiveness of advertising based on the one-group post-test-only design.

**The Post-Test-Only Design with Nonequivalent Groups and Predicted Higher-Order Interactions**

In higher-order interactions, the hypothesized interaction relationship includes a positive (or negative) relationship between two variables for one group (e.g., a group exposed to X, where X is advertising), and a zero or negative (positive) relationship between the same two variables for the other group (a second group not exposed to X, advertising nonexposure). A significant difference in two positive (negative) correlations between the two variables represents a lower-order interaction. In terms of sources of internal invalidity (other causes that could be responsible for the observed difference between the treatment and control group), it is much easier to think of reasons why the members of the experiment and control groups should be maturing at different rates in the same direction than it is to think of reasons why one group should be changing in one direction while the other group is not changing at all, or changing in the opposite direction.

Post-test only, nonequivalent group research designs with predicted higher-order interaction effects look complex, but they will probably provide more accurate estimates of the impacts of advertising on customer behaviour and sales. Cook and Campbell (1979, pp. 134-136) illustrate how, in the absence of pretest information, interaction predictions can be used with intact groups to provide relatively strong inferences about cause. A food-shopping study of overweight and normal-weight people (Nisbett & Kanouse, 1969) may be the best-known example of a higher-order interaction of two nonequivalent groups facilitating cause-and-effect interpretation. Nisbett and Kanouse tested the hypotheses that overweight people lack the ability to discriminate the internal body cues that indicate hunger. They found a higher-order interaction effect: among people with normal weight there was a strong positive correlation between the time they last ate and their supermarket grocery bills, while among overweight people there was a weak nega-
tive correlation. Alternative hypotheses were not plausible for explaining such a higher-order interaction effect. From their review of Nisbett and Kanouse and their case studies with multiple outcomes of several dependent variables strongly following the predictions of one set of hypotheses, Cook and Campbell (1979, p. 135) emphasize that the moral is clear:

causal interpretation tends to be facilitated as the predicted interaction between nonequivalent groups grows more complex. But the chance of obtaining so many data points in the predicted order decreases with the number of data points predicted. There are many reasons for this, including chance, selection differences in the intact groups which influence data patterns but are irrelevant to theory, and theories that are partially or totally incorrect. Replication is crucial when making higher-order interaction predictions. This helps control for chance fluctuations.

General Higher- and Simple-Order Interaction Advertising Hypotheses

The following general hypotheses are the higher-order and simple-order interaction hypotheses applied to linkage-advertising that are tested empirically in the article.

H1A: Within a given time period (buying season), repeat customers exposed to a brand's linkage-advertising will participate in more activities promoted in the linkage-advertising than new customers exposed to the linkage-advertising, while (H1B) repeat customers who are not exposed will participate less in these promoted activities than new customers who are not exposed and all customers who are not exposed will participate in fewer promoted activities than linkage-advertising exposed customers. (H1A and H1B are illustrated in Figure 1, panel A.)

H2A: Within a given time period (buying season), a positive interaction effect on brand-affect (i.e., positive image about the brand) and H2B: intentions-to-buy occur between exposure to linkage-advertising and level of prior experience (e.g., prior visits) with a product-service (see Figure 1, panels B and D).

H3: Within a given time period (buying season), repeat customers who are exposed to a brand's linkage-advertising will spend more money on the brand than new customers who are exposed to the brand's linkage-advertising, while repeat customers who are not exposed will spend less than new customers not exposed, and all customers not exposed will spend less money than linkage-advertising exposed customers (see Figure 1, panel C).

H1, H2, and H3 are higher-order interaction hypotheses that are particularly relevant in tourism-destination marketing where a destination, such as the State of Texas, is analogous to a given brand. Advertising of such "brands" often includes a free catalogue offer; that is, a detailed visitor's information guide (VIG), usually consisting of 100-300 pages of promotional information on local tours, attractions, accommodations, festival events, restaurants, and other information.

The rationale for these higher-order advertising interactions includes the following points. Repeat visitors (customers) who are not exposed to such advertising can be expected to engage in fewer activities and spend the least because they focus their visiting time on repeating activities they enjoyed on prior visits, do not repeat marginally enjoyable activities or activities found previously to be unenjoyable, and have not been exposed to advertising promoting many additional activities. New customers who have not been exposed to advertising can be expected to participate in more activities, tour the destination area more fully, and spend more money than repeaters who have not been exposed to advertising, because the many new customers come to explore the destination-unique sights and events for the first time. Repeat visitors who have been exposed to advertising are likely to spend the most money, partly because the advertising increases their knowledge of things to do at the destination area, they have the most positive attitude about the activities available at the destination (based on the learning theory of preferences; see Krugman, 1962; and the knowledge-based affect; Woodside, 1994), and they are most efficient in doing more activities compared to new customers exposed to the advertising. The new customers who have been exposed to the advertising will learn about and do more activities and therefore spend more money than new customers who have not been exposed, because the exposed customers know about more activities.

Linkage-advertising may be particularly effective in increasing brand-affect and intentions to return to the destination among visitors with prior visits to the destination because it stimulates deeper mental processing of current and former experiences by the visitor. Thus, destination linkage-advertising may serve as an album that helps to build, maintain, reenew, and strengthen mental connections of places/events and outcomes experienced, in some ways comparable to a family photograph album.

Basic Research Plan

The basic plan for the post-test-only design with nonequivalent groups is shown in the first two rows below. This design can become more complicated than that shown if observations (Os) are collected from several sets of two nonequivalent groups exposed versus not exposed to the treatment (rows 3 and 4). Including additional sets of nonequivalent groups means Cook and
Campbell’s (1979) requirement of replication being crucial for making higher-order interaction predictions.

The broken line between each set of nonequivalent groups indicates that they were not formed randomly. For building replications into the design, each group could represent brand buyers from different (geographic) markets. For the tourism advertising example, Group 1 might be visitors to Texas from nearby markets, Group 2 from more distant U.S. markets, and Group 3 from foreign markets. Analogous to Nisbett and Kanouse (1969) asking each subject about the time since she or he had last eaten and classifying each according to whether they...
were normal or overweight, each subject in the advertising quasi-experiment would be asked about the number of previous purchases of the brand (i.e., previous visits to the state) and their exposure to the recent advertising brochure (the VIG), as well as their origin, other demographic information, and additional buying behaviour information.

If the predicted higher-order interaction pattern is found consistently across groups, the case for strong inference that the advertising was responsible for additional customer expenditures is strengthened; and we can estimate from the overall interaction effect how much additional customer expenditure was due to advertising. Consequently, a profit and loss statement can be prepared based on the revenues and costs associated with the advertising/marketing program.

A Word of Caution

Cook and Campbell (1979, p. 96) caution that while results from a one-group post-test-only design and related designs are “generally uninterpretable, we urge the reader not to conclude that studies using them are invariably uninterpretable.” The one-group post-test-only design and the post-test-only design with nonequivalent groups without specifying higher-order interactions can be made more complex; degrees of freedom (Campbell, 1975) can be built into the design by adding many dependent variables that are expected to behave at different levels based on theory. When data on many variables are collected carefully from one group following exposure to a treatment variable, then the one-group post-test-only design may be better classified as a one-shot case study. Consequently, contextual knowledge is rich, even if impressionistic, and as Cook and Campbell said, “intelligent presumptions can be made about what this [one] group would have been like without X [the treatment]” (1979, p. 96). In such rich, post-test contexts, predictions of different levels of the multiple dependent variables from competing theories can be compared with empirical observations (see Wilson & Wilson, 1988, for an industrial buying behaviour example of testing competing theories by building in degrees of freedom). Thus, the researcher can sometimes function as a detective (see Shulman, 1994), noting the levels of different variables, using this information to rule out some threats to both internal and construct validities, and conclude that one theory is supported while at the same time refuting a competing theory. We attempted to follow this caution and advice by building in multiple dependent variables and predictions from the theory of linkage-advertising effects on these variables.

Method

The use of the post-test-only design, with nonequivalent groups and predicted higher-order interactions, was made possible by Prince Edward Island's (PEI) marketing strategy and the research method used for the province: an island tourist exit survey. Each year, most of PEI’s tourism marketing strategy is focused on creating and advertising the free offer of a high-quality linkage-advertising. Advertising is placed in scheduled media vehicles in selected Canadian (English and French), U.S., and European markets offering a free copy of PEI’s annual Visitor’s Information Guide.

The linkage-advertising, that is, the Visitor’s Information Guide (referred to as the VIG in the following discussion), consists of a 170-page, glossy, soft-covered book in magazine format. For the 1992 marketing campaign, a total of 280,000 VIGs were published: 250,000 in English and 30,000 in French. A total of 96% of the VIGs were distributed during 1992; 84% of the distributed guides (267,860) were sent to customers and potential visitors who requested the guide in response to the advertised free offer. The remaining 16% were distributed at PEI provincial information centres.

To test the three hypotheses, the data collected for the 1992 PEI exit survey were used. These data and detailed marketing/advertising expenditure data were provided to us on a computer disk and in reports prepared by the marketing agency, a PEI government-sponsored organization. The only use of the data made by the marketing agency was to profile visitors’ demographics, attitudes toward PEI, behaviours—including expenditures—while in PEI, according to their origins. The data were not analyzed to measure the impact of the linkage-advertising on the attitudes and behaviours of PEI customers.

The Questionnaire

The questionnaire used to collect the data for the study consisted of 12 pages of questions. Data were collected on the purpose of the current trip; the number of previous trips and their purposes; the length of time since the last trip to PEI; visitors’ reception of the VIG and whether or not they received the guide before or after entering PEI; their awareness and extent-of-use of the VIG; their evaluations of the visual appeal, ease of use, and amount of information in the VIG; their perception of the usefulness of the VIG; their mode of entry into PEI (e.g., ferry, air, cruise ship); the type of accommodation they chose in PEI; their evaluation of the accommodation; their participation in 15 activities while in PEI and evaluations of it; information on visiting 10 attractions in PEI and evaluations of these attractions;
the areas visited in PEI and overnight stays there; the perceived quality of PEI’s road signage; their evaluations of PEI on 10 image items; their expenditures in Canadian dollars while in PEI (including credit-card purchases and spending by children); the proportions of total PEI expenditures by 8 categories; the travel-party size and description; and demographic information (age; marital status; education; employment outside the home; life-cycle stage; annual household income; and origin by province, state, and country).

Specific Operationalizations

Knowledge

Increased customer knowledge about PEI is the result of customer search-acquisition-use of external information and previous experience. However, in operationalizing knowledge we separate external information from previous experience and empirically define knowledge as acquiring the province’s VIG. An aided-recall question was asked, respondents were shown the cover of the VIG and were given five options: “Did you receive a Visitor’s Guide a) prior to entering PEI; b) when you arrived in PEI; c) both prior and upon entry into PEI; d) did not receive a Visitor’s Guide; e) don’t know/don’t remember.”

Data of the degree-of-use of the VIG were collected: “To what extent would you say you used the Visitor’s Guide during your trip to PEI?” Four options were read to each respondent from “I completely depended on it to plan what we would do while on PEI” to “I did not use any portion of the Visitor’s Guide.”

Previous Experience

The following two questions were asked to learn about previous experience: “Is this your first visit to PEI as an adult or have you been here on either pleasure or business travel or both before?” and “About how many times have you been to PEI as an adult before, for either business or pleasure?”

Activities

“Yes” and “no” responses were collected on participation in 15 activities while on PEI. The activities included going to the beach, golfing, harbour cruises, attending live theatre, and enjoying nightlife. Also, using a 4-point scale ranging from “very disappointed” to “very pleased,” the respondents were requested to evaluate the activities they participated in.

Attractions

“Yes” and “no” responses were collected on visiting 10 attractions. The attractions included the historic home of William Henry Pope, Cavendish Beach, and PEI National Park, among others. A 4-point scale was used to collect data on visitors’ evaluations of the 10 attractions.

Regions Visited

PEI has 3 counties (Prince, Queen, and King) consisting of 11 distinct regions. Data were collected on visiting and staying overnight in the 11 regions. The regions included Cavendish, Charlottetown (the provincial capital), Eastern Kings, Southern Kings, West Prince, and Summerside, among others.

Image

A total of 10 questions on visitors’ associations of PEI with specific attributes and benefits was used to collect data on the perceived image of the province. The 10 questions included the following: “There’s more to do in PEI than I had imagined,” “PEI’s people are friendly,” “It’s boring on PEI,” “PEI’s beaches are superior,” and others. Four-point scales were used with these items, ranging from “strongly agree” to “strongly disagree.”

Behavioural Intention

Two items were used to assess behavioural intention: “I would recommend PEI to friends and relatives” and “I would definitely come to PEI again.” Four-point scales were used with these items, ranging from “strongly agree” (scored as +2) to “strongly disagree” (scored as -2).

Expenditures

Data were collected on amounts (in Canadian dollars) and proportions of expenditures for seven expense categories (including accommodation, meals, purchases of food and alcohol in stores, day-time recreation and entertainment, night-time entertainment, handicrafts and souvenirs, and other).

Demographics

Data were collected on 7 demographic related variables: age (5 categories); marital status (3 categories); formal education completed (6 categories); work outside the home (7 categories); total household income before taxes and deductions (in Canadian dollars) for 1991 (5 categories); and home province, state, or country.

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Procedure

The interviews were completed during the seasonal period (May 22 to October 5, 1992) when over 95% of leisure travellers visit PEI. The questionnaire was administered person-to-person at all points of exit from PEI. Partly because PEI was an island with no fixed link at the time the data were collected, over 93% of all the province's visitors arrived via one of two ferries; 6% via the airport, and less than 1% via cruise ship. (With the opening of the bridge connecting PEI to the mainland, collecting data involving visitors to the island will be more complex.) The interviews were conducted orally at both ferry locations, the province's major airport near Charlottetown, and selected cruise ships. The team of nine interviewers worked on a three-day-on, two-day-off schedule to ensure that week days and weekends were covered adequately.

The proportions of completed interviews of leisure-travel visitors by their origins were very similar to previous empirical estimates of visitors by origins. For example, 65% of completed interviews were with Canadians residing in other provinces and 31% were with respondents from the U.S.; two-thirds of PEI leisure visitors were previously estimated to be Canadian residents each year during 1990 and 1991 and one-third Americans.

The only exception to this procedural rule involved Japanese visitors. Because we wanted a profile of Japanese visitors and their visiting behaviour, of the selected total respondents nearly 1% were Japanese; this segment of customers is estimated to represent less than 0.2% of total leisure visitors. To insure a high cooperation rate (88%), the interviews with Japanese respondents were conducted in Japanese by native Japanese interviewers.

Results Related to Data Collection

Possibly because some delays and waiting at the exit points is involved in leaving PEI, the substantial majority of visitors requested to participate in the study did comply. A total of 2,239 interviews of PEI leisure visitors were completed. The overall cooperation/completion interview rate was 94%. In addition, a total of 453 business travellers were interviewed briefly; the data for these visitors are not included in this report.

Due mainly to some nonresponses to some of the questions, the useable number of responses to test the hypotheses was around 88% of the completed interviews. In the following section, sample sizes are reported in the tables of findings for specific issues.

Assessment of the Data Collection Method

Visitor recall of acquiring and using the VIG, length of stay, activities participated in during the visit, expenditures, places stayed at overnight, and other destination-travel events is likely to be minimized by the exit-intercept method used. Also, the very high cooperation rate is a positive feature of the method; reported response rates in advertising, effectiveness research studies to assess "inquiry conversion" are below 70% (for example, Messmer & Johnson, 1993, report a 67% response rate in a telephone study). Inquiry conversion is the proportion of inquiries requesting the linkage-advertising who converted into customers (e.g., destination leisure visitors).

The most important advantage of the exit-intercept method may be the opportunity it provides to compare buying behaviour of visitors acquiring linkage-advertising with that of visitors not acquiring the linkage-advertising. A quasi-experimental design, in the form of a post-test-only design with higher-order interactions, can be used to provide relatively strong inferences about cause and effect. Two negative features should be noted about the exit-intercept method. First, the cost per completed face-to-face interview is substantially higher than mail surveys; the difference for this study was estimated to be three times that of a mail-survey response.

Second, as an island with limited entry-exit access, PEI provides a somewhat unique natural laboratory for leisure-travel research. It should be easier to collect substantial amounts of trip data per travel party in such circumstances compared with provinces and states with many entry-exit points such as Ontario, South Carolina, and California. However, the method described can probably be modified successfully to permit useful data collection in those circumstances by, for example, interviewing leisure travellers at representative gasoline service stations and convenience stores.

Findings

The findings related to the three hypotheses are summarized in Figure 2. Experience (E) in Figure 2, represents two levels of prior visit experience to PEI: new and repeat visitors. In Figure 2, knowledge (K) includes two customer levels: acquiring versus not acquiring the VIG. We analyzed the data in several ways, for example, including only respondents receiving the guide and reporting "some use" and "complete use" (81% of receivers of the guide) versus people reporting no exposure to the guide; the results were more supportive of the hypotheses using this restrictive sample of respondents versus comparisons for all respondents receiving versus not receiving the VIG. No main effect was found for...
receiving the VIG before versus after arrival on PEI. We report the more conservative findings based on the total respondents; thus, in the following results, the 20% of the respondents reporting very limited or no use of the VIG are included in the overall high-K group, because they did receive the VIG.

Also, comparisons were made of respondents having 0, 1.5, 3.5, 5.5, 7.5, 9.5, and 13.0 (mid-point values on possible responses) previous visits among those receiving the guide and not receiving the guide; the patterns and statistical significance of the results were not different from the following results we report based on two levels of experience.

H1: Higher-order interaction effect of knowledge and experience on destination activities

The results summarized in panel A of Figure 2 and statistical tests of main and interaction effects provide strong support for Hypothesis 1. Using multiple regression analysis, increasing K is associated with increasing numbers of destination activities engaged in by visitors ($p < .0000$); increasing E is associated with decreasing numbers of destination activities ($p < .0000$); and the interaction effect shown in panel A of Figure 2 is highly significant ($p < .0002$).

The results for the test of main and interaction effects model include an adjusted $R^2$ equal to .09. Here is the model (with standard errors of the partial regression coefficients) of predicting activities (A) by K, E, and K by E:

$$ A = 6.03 + .81(K) - 1.06(E) + .81(K)(E) $$

The betas in the standardized model (transforming all raw scores for each variable into standardized scores) indicate that all three variables are important influences on changing the number of activities, and that E has a stronger influence than the interaction of K by E. The standardized model:

$$ A = .17(K) - .22(E) + .14(K)(E) $$

Additional findings support the proposition that increasing the number of destination activities leads to increasing destination-related expenditures. In fact, several path analyses for predicting destination expenditures indicated that the increasing number of destination activities is associated more strongly with increases in destination expenditures compared with the direct influence of any other variable, such as acquiring the guide, the number of regions visited, and the number of previous trips to the destination. More specific findings on this issue are described later.

<table>
<thead>
<tr>
<th>Acquired guide?</th>
<th>Expenditures ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Average 834</td>
</tr>
<tr>
<td>No</td>
<td>Average 345</td>
</tr>
</tbody>
</table>

Previous experience

| Novice | Average 509 | SD 516 | N 1,183 |
| Repeat | Average 480 | SD 638 | N 793  |

Acquired guide?

| Novice | Average 347 | SD 394 | N 344 |
| Repeat | Average 339 | SD 339 | N 375 |

Yes

| Novice | Average 576 | SD 545 | N 839 |
| Repeat | Average 606 | SD 784 | N 418 |

$F = 9.184, df = 1, 2115, p < .0000, \omega^2 = .04$

$F = 1.30, df = 1, 1974, p < .2545, \omega^2 = .00$

$F = 0.0753, df = 1, 717, p = .7838, \omega^2 = .00$

$F = 0.61, df = 1, 1255, p < .4337, \omega^2 = .00$

Thus, high- versus low-K, that is, acquiring versus not acquiring the guide, is associated directly (and indirectly via increasing activities) with increases in destination expenditures. More important, the strong support of the proposed second-order interaction effect of K and E on increasing participation in destination activities facilitates the causal interpretation that acquiring the guide is responsible for increasing activities of visitors.

H2A: Single-order interaction effects of K and E on positive image and (H2B): intentions-to-return to the destination

The two parts of the second hypothesis were not supported by the results: a positive interaction effect of K and E on positive image and intentions to return to the destination was not supported. The results are summarized in panels B and D in Figure 2.

Psychometric Properties of the Image Scale Items

One of the limitations of the empirical study is that a systematic approach as described by Churchill (1979) was not followed in developing the image and behavioural intention scale items. The 10 items that were used...
to assess visitors' images of PEI were selected by the PEI Department of Tourism, Parks, and Recreation based on the results of several previous image studies. Before testing the third hypothesis, we did examine the psychometric properties of the 10 items related to assessing visitors' images of PEI. The psychometric properties of the 2 items in the behavioural intention scale were also examined. Several factor analyses were performed, both using only the 10 image items and using these 10 items along with the 2 behavioural intention items (the same 4-point scale was used for each of the 12 items: "strongly disagree" to "strongly agree"). Our review of several varimax rotations of the factor matrices led to the conclusion that a 4-factor solution provided the most useful interpretation of meaning for the image and behavioural intention scale items; 59% of the total variation in response was explained by the 4-factor solution. The construct names, coefficient alphas, and correlations among the 4 scales are summarized in Table 2.

Based on the results summarized in Table 2, we concluded that the nomological validities (cf. Peter, 1981) of these scales were useful for further analyses. The 2 behavioural intention items loaded in a separate factor in the rotated factor analysis; the correlation coefficient...
Table 2
*Image and Behavioural Intention Measures*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Coefficient alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Atmosphere</td>
<td>1. PEI's people are friendly</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td>2. PEI offers a relaxing atmosphere</td>
<td></td>
</tr>
<tr>
<td>(C) Complain</td>
<td>1. PEI is too old-fashioned for me</td>
<td>.51</td>
</tr>
<tr>
<td></td>
<td>2. There's not enough nightlife</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. It's inconvenient to reach PEI</td>
<td></td>
</tr>
<tr>
<td>(D) Delight</td>
<td>1. There's more to do in PEI than I had imagined</td>
<td>—</td>
</tr>
<tr>
<td>(B) Behavioural</td>
<td>1. I would definitely come to PEI again</td>
<td>.61</td>
</tr>
<tr>
<td>Intention</td>
<td>2. I would recommend PEI to friends and relatives</td>
<td></td>
</tr>
</tbody>
</table>

*Correlation matrix of scales*

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>C</th>
<th>D</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-.27</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>.21</td>
<td>-.11</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>.46</td>
<td>-.33</td>
<td>.24</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*All correlations are significant (p < .01)*

(.61) for this 2-item scale is substantially higher than the correlations among the four scales formed from the data analysis, as shown in Table 2. Two general image items, which we named Atmosphere, loaded in the same factor in the rotated factor matrix with a correlation of .68. The 3 negatively worded items among the 10 image items loaded on one factor, named Complain (Table 2), with a coefficient alpha of .51. The finding that these 3 negatively worded items all loaded on the same factor may reflect a response style (see Babakus & Boller, 1992, pp. 261-262). Only 1 item loaded heavily in the rotated factor we named Delight. The limitation should be recognized that in factor analysis, a single item does not constitute an unobservable construct and that this entire analysis is limited because it follows, when it should precede in pretests, the collection of the data.

As suggested by Churchill (1979) and Nunnally (1978), alphas of .50 to .60 suffice for early stages of basic research. Thus, we concluded that the three image scales and the behavioural intention scale shown in Table 2 were useful for examining the second hypothesis.

Note that the results in panel B in Figure 2 are for one item representing Atmosphere in Table 2. The results for Delight and Complain are consistent with the results shown for this Atmosphere item in panel B, as well as the total factor score average values for Atmosphere: the main effects of both K and E on these dependent variables are positive and significant. The visitors acquiring the \( VIG \) (the high-K group) had a significantly lower Complain average and those with high prior experience (E) had a lower Complain average than low experience visitors. The interaction effects of K and E on Delight and Complain were not significant (these results are not illustrated).

H3: Higher-order interaction effect of knowledge and experience on expenditures

In panel C of Figure 2, the pattern of the results supports the third hypothesis in direction. As summarized in Table 1, the main effect of knowledge (acquiring the \( VIG \)) on expenditure was highly significant; the main effect for experience was not significant. While supported in direction, the hypothesized higher-order interaction effect of K and E on expenditures was not statistically significant (\( p > .05 \), using a multiple regression test with
Table 3
Market Size, Revenue, and Cost Analysis

<table>
<thead>
<tr>
<th>Market size, revenues, cost variable</th>
<th>Customer segments</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canada</td>
<td>U.S.A.</td>
<td>Other foreign</td>
<td>Total and weighted average</td>
</tr>
<tr>
<td>Visitors (N)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Number of parties</td>
<td>88,947</td>
<td>25,790</td>
<td>3,371</td>
<td>118,108</td>
</tr>
<tr>
<td>(2) Average party size</td>
<td>3.42</td>
<td>5.62</td>
<td>4.16</td>
<td>3.92</td>
</tr>
<tr>
<td>(3) Total visitors</td>
<td>304,199</td>
<td>144,940</td>
<td>14,023</td>
<td>463,162</td>
</tr>
<tr>
<td>(4) Parties acquiring VIG</td>
<td>51,110</td>
<td>17,795</td>
<td>2,010</td>
<td>70,915</td>
</tr>
<tr>
<td>(5) Parties not acquiring VIG</td>
<td>37,837</td>
<td>7,995</td>
<td>1,361</td>
<td>47,193</td>
</tr>
<tr>
<td>Revenues ($)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) Average with guide</td>
<td>518</td>
<td>589</td>
<td>715</td>
<td>588</td>
</tr>
<tr>
<td>(7) Average without guide</td>
<td>320</td>
<td>315</td>
<td>632</td>
<td>345</td>
</tr>
<tr>
<td>(8) Total revenue (000s)</td>
<td>38,578</td>
<td>12,999</td>
<td>2,297</td>
<td>53,874</td>
</tr>
<tr>
<td>(9) With guide (000s)</td>
<td>26,470</td>
<td>10,481</td>
<td>1,437</td>
<td>38,388</td>
</tr>
<tr>
<td>(10) No guide (000s)</td>
<td>12,108</td>
<td>2,518</td>
<td>860</td>
<td>15,486</td>
</tr>
<tr>
<td>(11) VIG mailings</td>
<td>176,234</td>
<td>47,602</td>
<td>2,383</td>
<td>226,219</td>
</tr>
<tr>
<td>(12) Total unit cost</td>
<td>5.10</td>
<td>4.10</td>
<td>4.10</td>
<td>4.43</td>
</tr>
<tr>
<td>(13) Total mailing cost (000s)</td>
<td>899</td>
<td>195</td>
<td>10</td>
<td>1,104</td>
</tr>
<tr>
<td>(14) VIGs distributed at visitors’ centres</td>
<td>50,196</td>
<td></td>
<td>50,196</td>
<td></td>
</tr>
<tr>
<td>(15) Total unit cost at visitors’ centres</td>
<td>3.00</td>
<td></td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>(16) Total cost of VIG at centres (000s)</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

dummy codes for K, E, and K by E interaction, results not shown). However, examining the results for the grouped data does indicate that a net positive $38 interaction effect occurred between K and E, from Figure 2: (606 - 576) -(339 - 347) = 38. The $38 represents 11% of the average expenditures ($343) reported for the total sample of respondents.

We conclude that the increased customer knowledge (via the VIG) is associated with increased expenditures substantially among both novice and repeat customers; and to some limited extent, such knowledge may help reverse the decline in expenditures as customers move from novice to repeat buyers (e.g., visitors).

Analysis of Revenues, Costs, and Net Return on Investment

In this section we present further analysis of the total number of visitor parties, visitor party expenditure estimates, and cost data for the linkage-advertising program. From these analyses we estimate the net revenue and return on investment of the program. These estimates are summarized in Tables 3 and 4.

Calculations of revenues, costs, and net contribution were completed for three separate markets for PEI (Canada, U.S., and other foreign visitors) and for the total leisure visitor market. Other foreign visitors include leisure visitors mainly from European countries and a very small proportion of Japanese visitors. Because of the limited modes of entry/exit for PEI, highly accurate estimates of the total number of visiting parties from the three origins are believed to be achieved (row 1 in Table 3). The average party size for U.S. residents of 5.62 is substantially higher than those of Canadian and other foreign visitors because there is greater proportion of bus tours from the United States to PEI (row 2). Row 3 in Table 3 is calculated by multiplying rows 1 and 2. The estimates in rows 4 and 5 are based on the proportions of acquiring the VIG for each of the three markets.

Note that the estimated total leisure visitor expenditure (row 8) of close to $54 million is based on the weighted total travel party numbers for the three markets (75% of PEI leisure visitors are residents of other Canadian provinces and spend less in PEI than U.S. and other foreign visitors).

A total of 226,219 VIGs were distributed via the mail and 50,196 were distributed at visitor centers. The
Table 4
Net Revenue Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Canada</th>
<th>U.S.A.</th>
<th>Other foreign</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue (000s) ($)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Visitors using guide</td>
<td>26,470</td>
<td>10,481</td>
<td>1,437</td>
<td>38,388</td>
</tr>
<tr>
<td>(2) Advertising and VIG costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Advertising</td>
<td>774</td>
<td>276</td>
<td>55</td>
<td>1,105</td>
</tr>
<tr>
<td>(4) VIG mailing costs</td>
<td>899</td>
<td>195</td>
<td>10</td>
<td>1,104</td>
</tr>
<tr>
<td>(5) VIGs @ visitors' centres</td>
<td>151</td>
<td>0</td>
<td>0</td>
<td>151</td>
</tr>
<tr>
<td>(6) Total cost of VIG marketing</td>
<td>1,824</td>
<td>471</td>
<td>65</td>
<td>2,360</td>
</tr>
<tr>
<td>(7) Net revenue</td>
<td>24,646</td>
<td>10,010</td>
<td>1,372</td>
<td>26,028</td>
</tr>
<tr>
<td>(11) Revenue without VIG marketing</td>
<td>12,108</td>
<td>2,518</td>
<td>860</td>
<td>15,486</td>
</tr>
<tr>
<td>(12) Total net revenue</td>
<td>36,754</td>
<td>12,528</td>
<td>2,232</td>
<td>51,514</td>
</tr>
</tbody>
</table>

Total revenues from visitors using VIG assuming (000s) ($) :

<table>
<thead>
<tr>
<th></th>
<th>Canada</th>
<th>U.S.A.</th>
<th>Other foreign</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(13) No VIG available</td>
<td>16,355</td>
<td>5,605</td>
<td>1,270</td>
<td>23,230</td>
</tr>
<tr>
<td>(14) Parties not using VIG</td>
<td>12,108</td>
<td>2,518</td>
<td>860</td>
<td>15,486</td>
</tr>
<tr>
<td>(15) Total revenue</td>
<td>28,463</td>
<td>8,123</td>
<td>2,130</td>
<td>38,716</td>
</tr>
<tr>
<td>(16) Additional net revenue because of VIG marketing</td>
<td>8,291</td>
<td>4,405</td>
<td>102</td>
<td>12,798</td>
</tr>
<tr>
<td>(17) Provincial tax revenue on additional net revenue (000s) ($)</td>
<td>829</td>
<td>441</td>
<td>10</td>
<td>1,280</td>
</tr>
</tbody>
</table>

Note: Provincial sales tax (PST) is 10% of revenues; federal government tax (GST) is 7% of the selling price. PST is calculated on the combined selling price plus GST, e.g., a product or service priced at $1.00 would incur a $0.07 GST and a $0.107 PST, the payment due is $1.177 or $1.18.

The total revenue estimates (row 15, Table 4) are based on estimated total revenues without the execution of the linkage-advertising program. The additional net revenue attributed to executing the linkage-advertising program (row 16) is calculated by subtracting row 15 from row 12.

Estimated unit costs (rows 12 and 15 in Table 3) of the VIG include postage and handling, publication costs of the VIG, and the envelope expense.

In Table 4 the total cost of the VIG linkage-advertising campaign includes the advertising expenditures in the three markets (row 3) and the total costs associated with publishing and distributing the VIG (rows 4 and 5). Considering the two revenue streams for each of the three markets (visitors acquiring and not acquiring the VIG), the total net revenue (row 12) is presented in Table 4.

For the remaining analysis reported in Table 4 we assumed the most conservative viewpoint that acquiring the VIG influenced only visitors' total expenditures and not in their decision to visit PEI; thus we assume that acquiring the VIG did not "convert" any inquirers into visitors, but those acquiring the VIG did spend more in PEI than they would otherwise. Row 13 in Table 4 includes the revenue estimates that would have resulted from visitors acquiring the VIG, assuming the VIG had not been available (multiplying row 4 by row 7 in Table 3).

The total revenue estimates (row 15, Table 4) are based on estimated total revenues without the execution of the linkage-advertising program. The additional net revenue attributed to executing the linkage-advertising program (row 16) is calculated by subtracting row 15 from row 12.

Given the provincial sales tax of 10% on all products and services, row 17 is calculated by multiplying row 16 by .10. The estimates in row 17 represent the net return in additional tax dollars generated from the linkage-advertising program. Before considering conservative estimates of multiplier effects of expenditures (e.g., 3.0 to 3.5), the net additional tax revenue to the province from the linkage-advertising program ($1,280,000) is below the estimated total cost of the program ($2,360,000). Using a conservative expenditure multiplier of 3.0, the net additional provincial tax generated from the linkage-advertising program is $3,840,000, a net return on investment of $1.63 per dollar invested.

In addition to assuming the linkage-advertising program did not cause a share of VIG requestors to convert into visitors, this analysis assumes no carry-over effects of future visitors keeping and referring to their copy of the VIG when planning future trips to PEI.
Table 5
Rate of New and Repeat Customers Visiting Destination Areas

<table>
<thead>
<tr>
<th>Destination area</th>
<th>New customer</th>
<th></th>
<th></th>
<th></th>
<th>Repeat customer</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VIG</td>
<td>No VIG</td>
<td>Total</td>
<td>VIG</td>
<td>No VIG</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brackley/Stanhope/Dalway</td>
<td>49</td>
<td>24</td>
<td>42</td>
<td>47</td>
<td>25</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cavendish</td>
<td>92</td>
<td>86</td>
<td>90</td>
<td>77</td>
<td>49</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlottetown</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>89</td>
<td>74</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Kings</td>
<td>32</td>
<td>16</td>
<td>28</td>
<td>29</td>
<td>24</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evangeline</td>
<td>16</td>
<td>11</td>
<td>15</td>
<td>11</td>
<td>6</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kensington</td>
<td>52</td>
<td>51</td>
<td>51</td>
<td>46</td>
<td>24</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New London</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>38</td>
<td>16</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Kings</td>
<td>29</td>
<td>14</td>
<td>25</td>
<td>27</td>
<td>16</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Shore</td>
<td>36</td>
<td>24</td>
<td>33</td>
<td>30</td>
<td>19</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summerside</td>
<td>52</td>
<td>38</td>
<td>48</td>
<td>46</td>
<td>31</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Prince</td>
<td>21</td>
<td>13</td>
<td>19</td>
<td>19</td>
<td>13</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Declines in visit rates occur often in this table from VIG to no VIG segments for both new and repeat customers. Both main effects are significant for most destination areas. Detailed f-test results are available from the authors.

The additional total expenditures of $12,798,000 likely represents the difference between life and death for several PEI tourism-related enterprises. Additional analysis of the behaviour of visitors who acquired versus those who did not acquire the VIG indicates that acquiring the VIG is associated with substantial increases in visitor traffic to outlying destinations in PEI (e.g., Eastern Kings and West Prince regions), without decreasing visitor traffic to the two most popular destinations (Charlottetown and Cavendish). Details of this association with the VIG of a spreading movement of visitors throughout the province are summarized in Table 5.

For some of the relatively low-income outlying PEI areas, such as West Prince, tourism is a vital industry for a substantial share of residents' income, even though the tourism expenditures in these areas represent a small share of total tourism expenditures in the province. Without the VIG program, it is estimated that substantially fewer leisure visitors will visit such areas; overnight accommodation expenditures in these outlying areas are estimated to be substantially less without the linkage-advertising program (these estimates are available upon request).

Discussion

The pattern of results presented provides strong support that the linkage-advertising program was a substantial influence on changing destination behaviours and increasing the expenditures of visitors to PEI. On of the unique features of our presentation is the post-test-only design with predicted higher-order interactions of the influence of linkage-advertising. Previous studies have reported the use of formal quasi-experimental designs to measure the effects of marketing and advertising on customer behaviour variables (e.g., Ehrenberg, 1972; Lilien & Ruzicic, 1982; Weinberg, 1960). Unfortunately, the vast majority of reported studies on the influence of advertising on customer expenditures and other customer behaviours do not include attempts to substantiate the interpretation of cause-and-effect relationships between advertising and customer behaviour. Greater effort is needed to use "procedures that reduce the uncertainty about causal connections even though this uncertainty can never be reduced to zero" (Cook & Campbell, 1979, p. 11).

Advertising researchers and strategists need more knowledge about the telling weaknesses of research designs that do not permit reasonable causal inferences of the effect of advertising on customer behaviour, such as the widely used one-group post-test-only design. The continued use of weak tests of causal hypotheses of the effects of advertising on sales likely perpetuates the low faith in advertising among many senior managers.

Equally important, we all need to learn about using generally interpretable, nonequivalent control-group designs and actual applications of such designs in advertising aids such learning. A substantial increase in our
knowledge and application of these designs will increase the credibility of the idea that advertising sometimes has an important influence on sales and profits and that we can usefully estimate sales and profit levels with and without advertising.

The specific findings described in this report support Davidson's (1985, 1994) axiom that visitors to a destination may use linkage-advertising for help in planning where to go and what to do while in the destination area. This may be the primary benefit of linkage-advertising to customers and could lead to substantial increases in customer expenditures among visitors who have already made their destination choices. The results described for PEI lead us to conclude that the increases in customer expenditures and the resulting return on investment justifies the province’s linkage-advertising program, even if the very conservative viewpoint is adopted that the program was not a factor in converting inquirers (persons requesting the linkage-advertising) into visitors.

References


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