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THE INFLUENCE OF PRODUCT PUBLICITY ON PRODUCT SALES IN A NONCOMPETITIVE ENVIRONMENT

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ABSTRACT

In an effort to more fully integrate publicity into the marketing and promotion mix, the present study examines the influence of product-related newspaper, television, and radio publicity on Lotto sales in the state of Colorado. The results of the present study indicate that in addition to Jackpot size, television publicity has a statistically significant positive impact on Lotto sales, whereas newspaper and radio publicity do not. Consequently, in their efforts to generate favorable publicity, lottery managers should emphasize the dissemination of jackpot size information via the television medium. Moreover, considering the observed 90% duration interval of .8651 weeks for the influence of marketing variables on sales, a continuous media placement schedule is suggested.

The neat and tidy divisions separating marketing and public relations are breaking down. It may be that the best way to solve a marketing problem would be through public relations activities (Kotler & Mindak 1978).

INTRODUCTION

Academics and practitioners have recently begun to expand the domain of marketing communications, effectively bringing the role of public relations to the fore in a marketing context. Known as integrated marketing communications, this trend has been described as one of the most important marketing developments of the 1990s (Shimp, 1997).

Integrated Marketing Communications (IMC) may be defined as the process of strategically developing and controlling or influencing all messages used to build and nourish relationships with customers and other stakeholders (Hutton, 1996). Hutton (1996), however, views this definition as simply a description of what public relations is and has been doing for at least a half-century. According to Hutton (1996, p. 160), "public relations practitioners have long dealt with issues that marketing is now targeting for its own future-relationships, organizational equity (as well as brand equity), and a variety of issues pertaining to the organization's environment and its ability to function efficiently in that environment."

Because of its increasing effectiveness and importance as a component of the marketing mix, the public relations industry has also begun to think in marketing terms by considering the
contribution of publicity to marketing objectives (Hartman & Brokaw, 1988; Humer, 1989; Oliver, 1988). As such, it has been suggested that the measure of success for any particular public relations campaign should be related to specific marketing objectives, such as an increase in sales or market share (Hartman & Brokaw, 1988; Nakra, 1991; Oliver, 1988; Wyatt, 1991). Unfortunately, there have been few studies which empirically demonstrate the influence of product publicity on product sales.

Recognizing the need to more fully integrate publicity into the marketing mix, the present study is an attempt to bridge the gap between public relations and marketing research by directly examining the influence of product publicity on product sales. Specifically, the present study focuses on the unique influence of newspaper, television, and radio publicity on Lotto sales in the Denver area of dominant influence (ADI) in the state of Colorado.

PUBLICITY

According to Edward L. Bernays, the history of public relations can be traced as far back as ancient Babylonia, where image conscious kings frequently commissioned artists and historians to sculpt and paint favorable images of them (Kotler & Mindak, 1978). In the United States, public relations can be traced back to the revolutionary war period, when publicity stunts such as the Boston Tea Party were used to swell the ranks of patriots dedicated to the revolutionary war cause (O'Neill, 1991).

Despite the historical significance of publicity, the value of product publicity, or "media coverage of a product or service that aids in reaching marketing goals," only gradually became recognized as a useful marketing tool by the business community as the effectiveness of mass media generated publicity began to increase in the latter part of the twentieth century (Williams, 1988). Today, however, the high cost of television advertising and the clutter of messages in that medium make public relations an increasingly important component of the marketing and promotion mix (Grunig & Grunig, 1991).

Perhaps one reason why marketing managers have begun to develop an interest in public relations is that publicity has two distinct advantages over the other forms of promotion: (1) low cost and (2) high credibility (McIntyre, 1989; Williams, 1988). According to Trent (1991), if potential clients learn about a product from a credible source, their buying decision time will be greatly reduced. Thus, the low cost and high credibility of publicity can serve to extend the reach and create greater impact for an advertising campaign (Wylie, 1991).

HYPOTHESES

In analyzing the impact of marketing mix variables on product sales, competitive activity is often difficult to include in the analysis. Yet without this information, there is a much greater likelihood of obtaining spurious results. As a state sponsored monopoly, the Lotto game is an excellent product with which to analyze the impact of publicity on product sales because no direct
competitive marketing activity exists within the state. Consequently, Lotto sales can be expected to primarily depend on the managerially controlled variables included in the present study.

**Newspaper Publicity**

When people think of publicity, they instinctively think of newspaper publicity. According to Shimp (1997), newspapers reach approximately 60 million households during the week and nearly 63 million on Sundays. As a component of the marketing mix, newspaper publicity has several advantages. Because newspapers are published in local communities, they allow the publicist to precisely pinpoint the targeted audience on a geographic basis (Cullip, Center & Broom, 1985; Shimp, 1997). Also, because they reach most of their readers daily, newspapers are the most acceptable medium for a cumulative publicity build-up (Cullip, Center & Broom, 1985; Shimp, 1997). Consequently, the first hypothesis is proposed:

H1: Newspaper publicity has a statistically significant positive impact on product sales.

**Television Publicity**

According to Shelby (1986), information is most persuasive when the evidence used to support a given argument is delivered well. In the case of television publicity, the combination of sight, sound and movement, and the use of experienced journalists can be said to enhance the evidential content and hence the credibility of the message, making television publicity a particularly powerful source of persuasive information. Consequently, the second hypothesis is proposed:

H2: Television publicity has a statistically significant positive impact on product sales.

**Radio Publicity**

Finally, in addition to newspaper and television publicity, product publicity achieved via the other major broadcast medium, radio, is also likely to influence product sales. In fact, according to Arens (1996), the average adult listens to more than three hours of radio a day. Consequently, the third and final hypothesis is proposed:
H3: Radio publicity has a statistically significant positive impact on product sales.

STUDY AND DATA COLLECTION

In order to test the hypotheses presented, data were collected for the Colorado Lotto game. In the state of Colorado, Lotto is a game in which players are required to choose six numbers between 1 and 49. Players who correctly select all six winning numbers are Lotto grand prize winners. There are two Lotto drawings per week.

In the present study, a total of 57 weekly observations for the jackpot drawings from the week of Saturday, June 1, 1991, to the week of Saturday, June 27, 1992, were employed. Moreover, given that Colorado Lotto drawings are held twice weekly, (Wednesdays and Saturdays), the sales and jackpot data were aggregated into a weekly format in order to remain consistent with the level of aggregation of the other variables included in the present study.

The geographic region examined in the present study included the Colorado area of dominant influence (ADI) encompassing the Denver area. Data concerning each of the variables was provided by the Colorado Lottery Commission.

A multiple-regression equation was calculated incorporating each of the independent variables likely to have an impact on Lotto sales, as well as the dependent variable, weekly Lotto sales. Consequently, for the present study, the form of the regression equation is as follows:

\[ S = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + e \]

where: \( S = \) sales in period \( t \)
\( X_1 = \) newspaper publicity in period \( t \)
\( X_2 = \) television publicity in period \( t \)
\( X_3 = \) radio publicity in period \( t \)
\( X_4 = \) television advertising in period \( t \)
\( X_5 = \) radio advertising in period \( t \)
\( X_6 = \) distribution in period \( t \)
\( X_7 = \) jackpot size in period \( t \)
\( X_8 = \) sales in period \( t-1 \)
\( \beta_n = \) standardized regression coefficients
\( e = \) error term associated with sales in period \( t \)

Because current sales depend not only on current marketing efforts, but on marketing efforts in previous periods as well, the lag with which marketing effects sales is distributed over a number of periods (Maddala, 1977). Recognizing the need to easily estimate the number of lagged periods for distributed-lag equations, the Dutch economist, L.M. Koyck, proposed a regression equation in which the influence of the independent variables on the dependent variable decays geometrically with time (Koyck, 1954). The Koyck distribution requires us to lag the independent variable, sales. With
the parameter estimate for lagged sales, $\Lambda$, one can calculate the 90% duration interval, or the period of time in which 90% of the effects of the independent variables are felt, $\ln(1.9)/\ln \Lambda$.

**VARIABLES**

Independent variables in the present study include equivalent dollar-value measures for newspaper publicity, television publicity and radio publicity, as well as summary variables for television and radio advertising, number of distributors, and jackpot size. All variables are estimated on a weekly basis, with weekly sales serving as the dependent variable.

**Newspaper Publicity**

Traditionally, newspaper-generated public relations success has been measured by counting publicity clips and the size of the clips in column-inches (Lindenmann, 1988). The column-inch is a space one inch high and one newspaper column wide. In recent years, the column-inch measurement has become the standard measure for determining newspaper advertising rates (Jugenheimer & White, 1991). Consequently, the independent variable representing newspaper publicity in the present study is calculated for each week by adding the total column-inches of Lotto-related newspaper publicity achieved in each of the 16 daily newspapers and 20 weekly newspapers operating in the Denver ADI.

The old public relations dictum: "It matters not whether they think well of you or ill of you so long as they remember your name" suggests that all forms of publicity, both positively and negatively slanted, are equally desirable. The body of research concerning "mere exposure effects" may provide some support for this view. Mere exposure refers to a positive repetition-affect relationship that results from exposure alone (Obermiller, 1985). Applied to publicity, the mere exposure phenomenon could suggest that regardless of the actual content of an article (whether favorable, unfavorable, or neutral) the fact that newspaper-generated publicity may increase consumer exposure to a product could serve to enhance the overall positivity with which the product is viewed by the consumer, and hence stimulate sales.

Because the vast majority of the total newspaper publicity concerning the Colorado Lottery during the period analyzed is in fact favorable or neutral (1062 favorable or neutral articles v. 59 unfavorable articles), it is reasonable to include all newspaper publicity in the present study. Consequently, the independent variable representing newspaper publicity in the present study is calculated by adding the total column-inches of all Lotto related newspaper articles, positive, negative, and neutral appearing in the Denver ADI during the period analyzed.

**Television and Radio Publicity**

While newspaper-generated publicity is available in archival data from clipping services, the publicity achieved via radio and television is much more difficult to quantify. However, the Colorado
Lottery has diligently documented radio and television publicity in terms of the number of seconds of air time achieved by the Lottery, as well as the equivalent dollar value of the achieved publicity. In other words, if the channel 7 six o’clock news airs a five minute news report on the Lotto game, television publicity would be measured by the cost of five minutes of commercial time on that given television station during that given time block.

**Additional Variables**

When attempting to model the unique influence of newspaper, radio, and television publicity on Lotto sales, it is important to recognize and account for the presence and potential interaction of several additional marketing variables. Specifically, the present study incorporates not only newspaper, radio, and television publicity, but also television advertising, radio advertising, distribution, and jackpot size in the analysis of Lotto sales in the state of Colorado.

The television advertising variable is measured in the form of total gross rating points (GRP—percentage of the market reached x frequency) achieved each week among the four major network-affiliated television stations operating in the Denver ADI. Similarly, radio advertising is measured by total weekly gross rating points achieved each week among the six major radio stations operating in the Denver ADI. Distribution includes the total number of Lotto distributors each week located in the Denver ADI, while jackpot size consists of the combined weekly jackpots of the Wednesday and Saturday drawings for the Lotto game in the state of Colorado.

Finally, previous period sales are included in order to assist in the calculation of the 90% duration interval. If the calculated duration interval is less than 1.0, it can be assumed that the effects of the independent variables are not felt in subsequent weeks. Therefore, it would be reasonable to conclude that there is no significant marketing mix carry-over effect for the present product category.

**RESULTS**

In order to test each of the three hypotheses, the regression equation specified in the methodology section was calculated. According to Johnston (1972), if the model has been specified correctly, ordinary least-squares will produce the best linear unbiased estimates. Consequently, OLS is employed in the present study, and the results of the regression analysis are provided in Table 1:

| Variable                   | Parameter Estimate | T for H0: Parameter = 0 | Prob>|T| |
|----------------------------|--------------------|-------------------------|-------|
| Newspaper publicity        | -840.5930          | -2.370                  | 0.0218|
| Television publicity       | 111.93345          | 6.602                   | 0.0001|
| Radio publicity            | 1168.900           | 1.316                   | 0.1944|
| Television advertising    | -50.6521           | 0.057                   | 0.9550|
| Radio advertising         | -263.5390          | -0.201                  | 0.8418|

*Table 1: Regression Results*

Dependent Variable: Sales

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In addition, Table 2 presents a series of descriptive statistics and Table 3 presents a correlation matrix for each of the variables in the present study.

### Table 2
**Descriptive Statistics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspaper Publicity</td>
<td>116.28</td>
<td>214.52</td>
</tr>
<tr>
<td>TV Publicity</td>
<td>26.652</td>
<td>56.150</td>
</tr>
<tr>
<td>Radio Publicity</td>
<td>31.93</td>
<td>57.02</td>
</tr>
<tr>
<td>Distribution</td>
<td>1,166.28</td>
<td>33.21</td>
</tr>
<tr>
<td>Jackpot Size</td>
<td>9,189</td>
<td>6.72</td>
</tr>
<tr>
<td>Sales</td>
<td>2,350,066</td>
<td>1,619,377</td>
</tr>
</tbody>
</table>

### Table 3
**Correlation Analysis**

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspaper</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV Pub.</td>
<td>0.8130</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio Pub.</td>
<td>0.5204</td>
<td>0.6158</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV Adv.</td>
<td>0.0506</td>
<td>0.0228</td>
<td>-0.056</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio Adv.</td>
<td>0.0594</td>
<td>0.0323</td>
<td>-0.06</td>
<td>0.9592</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution</td>
<td>-0.072</td>
<td>0.1716</td>
<td>-0.032</td>
<td>-0.096</td>
<td>-0.034</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jackpot Size</td>
<td>0.5226</td>
<td>0.6832</td>
<td>0.457</td>
<td>-0.001</td>
<td>-0.008</td>
<td>-0.095</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>-0.641</td>
<td>0.8476</td>
<td>0.5718</td>
<td>-0.021</td>
<td>-0.024</td>
<td>0</td>
<td>0.9424</td>
<td>1</td>
</tr>
</tbody>
</table>
The first hypothesis proposed that newspaper publicity has a statistically significant positive impact on Lotto sales. As seen in Table 1, however, newspaper publicity does not appear to be significantly related to Lotto sales. Moreover, not only is the variable not statistically significant, but the parameter estimate is actually in the opposite direction hypothesized. Consequently, the first hypothesis is not supported.

The second hypothesis proposed that television publicity has a statistically significant positive impact on Lotto sales. Based on an alpha level of .05, television publicity does in fact appear to be significantly related to Lotto sales. Consequently, the second hypothesis is supported by the results of the present study.

The third and final hypothesis proposed that radio publicity has a statistically significant positive impact on Lotto sales. However, using an alpha level of .05, this relationship is not supported.

Finally, as shown in Table 3, $\Lambda = 0.069844$. Consequently, in calculating the 90% duration interval, the results are as follows: 90% Duration Interval $= \text{ln}(-0.9)/\text{ln} \Lambda = 0.8651$ weeks. Because the 90% duration interval is less than 1.0, it can be assumed that the effects of the independent variables are not felt in subsequent weeks. Therefore, it is reasonable to conclude that there is no significant marketing mix carry-over effect for the present product category.

**MANAGERIAL IMPLICATIONS**

When employing the column-inch measure of newspaper publicity, newspaper publicity does not appear to be positively related to product sales. Instead, newspaper publicity appears to be significantly related to Lotto sales in a negative direction. Although the original hypotheses did not include a test of this inverse relationship, and the relationship cannot be statistically supported by the present study as a consequence, the results imply that lengthy Lotto-related newspaper publicity is actually associated with lower Lotto sales.

This counter-intuitive finding may best be explained by taking the nature of the target audience into consideration. Specifically, according to Meinert, Lumpkin, and Reich (1989), frequent lottery players are more likely than non-players to have less than a High School level of education. As such, despite the widespread distribution of newspapers in America, newspaper publicity may nevertheless be ineffective in reaching the majority of Lotto players. Instead, due to their lower education, Lotto players are likely to disregard newspaper publicity and instead rely largely on television and radio for the majority of their information on current events.

Overall, the variable with the greatest correlation to Lotto sales appears to be jackpot size ($R = .9424$). Since jackpot size depends on whether or not a jackpot was claimed in a previous week, Lotto managers can do little to increase jackpot size. Lotto managers can, however, actively disseminate jackpot size information to their target audience. Therefore, making the target audience aware of the size of the jackpot, particularly for any unusually large sum, is the most important activity for the Lotto marketing team. Yet, in order to save on media costs, Lotto advertising is routinely purchased months in advance. However, with a 90% duration interval of only 8651 weeks, continuous media exposure is vital to the success of this product category. Consequently, unless

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advertising is purchased on a week-to-week basis, it is unlikely to support and encourage the heightened consumer interest and activity which naturally results from a large Lotto jackpot.

Instead, publicity and word-of-mouth communications may be the chief means by which jackpot size information is disseminated. Given the simplicity of the message, television, with the greatest reach and frequency advantages of the major media, appears to be the best medium for the dissemination of Lotto related publicity. In fact, based on the present study, of all the marketing mix variables at management's disposal, television publicity appears to be the variable most significantly related to Lotto sales (p=.0001).

Although widely considered highly credible, publicity has frequently been neglected in the marketing mix because of the lack of empirical evidence demonstrating its effectiveness. Consequently, it is hoped that the results of the present study will alert marketers to the potential benefits of a well-planned and fully integrated public relations program for state sponsored lotteries.

REFERENCES


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