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An Empirical Investigation of the Influence of Information on Reference Prices for Public Swimming Pools

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The impact of supplying contextual information on the reference price for public swimming pools was investigated. Three randomly assigned groups received different information treatments and a control group received no information. The information given to the three treatment groups was (1) the cost of service delivery; (2) the price charged by a private competitor; and (3) both service delivery cost and the private competitor's price. Provision of this information led to a substantially higher reference price in each of the three treatment groups when compared to the control group.

KEYWORDS: Reference Price, Swimming Pools, Information

Traditionally, public recreation services have been offered at low subsidized prices or free of charge. However, in the past decade there has been a retrenchment in the public's willingness to support government spending. In terms of real dollars, many local governments have fewer fiscal resources to allocate for the delivery of services (Crompton and Lamb 1986).

Although resources are being reduced, demands for services from local government are spiraling. As the federal government reduces its aid programs, more of the responsibility for social services provision is being passed to local government. These additional service responsibilities, when combined with the impact of reduced fiscal resources, have caused most local governments to urgently reappraise their traditional willingness to substantially subsidize such public services as recreation. Concerns over tax restraint and consequent interest in pricing are not confined to local government administrations. Managers within state agencies and federal agencies such as the U.S. Forest Service and the National Park Service also face the dilemma of generating revenue while maximizing social benefits (Daniels 1987).

Customers of public recreation services expect to pay low prices. The traditional economic model of supply and demand predicts that as government raises its recreation prices in an attempt to reduce the level of subsidy, fewer customers will avail themselves of the service. However, the economic model of price is incomplete, for any discussion of price must
consider consumers' perceptions and particularly the concept of reference price (Monroe 1984, Funkhouser 1984, Nwokoye 1975).

Reference price is the price which a consumer expects to pay for a service (Raman 1985, Nwokoye 1975). The notion of reference price is based upon adaptation level theory which suggests that an individual's evaluation of a price is determined by an adaptation to those stimuli to which the individual is responding, as well as to background and psychological stimuli. Adaptation level theory suggests that the interplay of focal, contextual, and residual stimuli creates an expected or reference price (Monroe and Petroshius, 1981). The existence of this expected price influences the way in which consumers perceive a price change.

Focal stimuli represent those variables that occupy the immediate attention of the consumer. Contextual stimuli represent background variables that provide the context within which the focal stimuli are considered. Residual stimuli refer to the impact of inner psychological and physiological processes that result from previous purchase experiences (Zeithaml and Graham 1983). Residual stimuli may include value systems, defense mechanisms, and other intervening variables for which external sources of variation cannot be determined (Helson 1964). Adaptation level, then, emerges from an averaging mechanism and is a response to all three classes of stimuli. It may be defined as a weighted geometric mean of all stimuli influencing the organism from without and those stimuli affecting behavior from within (Helson 1964).

In the context of public swimming pool pricing, contextual variables may include knowledge of pool location, of services offered, or of the city's subsidization, with tax dollars, of the pool's operation. Residual variables would result from past experiences at a given pool, and perhaps through generalization from experiences at other public pools. Such variables might include a desire for refreshing exercise or a wish to escape the summer heat. Price charged, appearance of staff or attractiveness of the pool area represent possible focal stimuli.

Insight into the formulation of reference price is also offered by the assimilation-contrast model. Assimilation-contrast suggests that extreme values may be used as anchoring stimuli and that a latitude of acceptance (adaptation level range) exists between the upper and lower value levels. Values which fall within this acceptance latitude will be assimilated and will influence the value of the anchor, whereas discrepant values which fall outside the acceptable range will be rejected or ignored (Monroe and Petroshius 1981). In the latter case, the extreme value may be considered as belonging to a distinctive, contrasting separate category or may be integrated with other adaptation level range information to form a new adaptation level range. Price information will be compared to the reference price within the limits offered by existing high and low price levels.

In this way, just as the adaptation level may influence perception of new price information, so too may price information influence the anchors which determine the adaptation level. For example, a consumer who holds
a low reference price for participation in a public swimming pool may consider relatively high prices as unacceptable. Conversely, information that leads the consumer to believe that this existing reference price may be too low may, in turn, encourage the development of higher price anchors.

Although the specific dynamics by which consumers establish a reference price are not well understood, there appears to be consensus that it is derived from experience as well as from immediately accessible information, and that it functions as an anchoring price (Zeithaml and Graham 1983). New price information is compared to the reference price and this determines an individual's assessment of whether the new price is too low, too high, or about right (Monroe and Petroshius 1981). The study reported here explored the dynamic relationship between information and reference price within the context of public swimming pools.

Consumer Decision Making

Even though the relationship between reference price and consumer behavior is not well understood, the impact of changes in reference price on the ultimate demand for a recreation service may usefully be conceptualized as part of the overall consumer decision making process. This process is characterized by need arousal, information processing, brand evaluation, purchase and post purchase evaluation (Assael 1984). During need arousal the consumer is aware of various services or programs that might fulfill perceived needs. At this stage a specific reference price for these services may already have developed, based upon past experience or readily accessible information in the environment (Zeithaml and Graham 1983).

During information processing the consumer is likely to become more aware of relevant information and may actively search for new information. This information may lead to a belief that existing reference price levels are too high or too low which may, in turn, lead to an adjustment of the reference price level.

Information processing and brand evaluation occur simultaneously (Assael 1984). The consumer develops criteria against which incoming information is evaluated. If price is one such criterion, then new price information is evaluated in terms of the existing reference price.

The consumer may decide during this stage of the process how much he or she is willing to pay. Willingness to pay reflects consumer demand for a product or service (Walsh 1986). Through evaluation of the benefits and costs associated with purchase, consumers may develop a level of willingness to pay which reflects the amount of resources they are willing to allocate.

It is also possible that the consumer may simply react to a posted price in making the purchase decision. In other words, the level or amount the consumer is willing to pay is only clarified once specific price information
is provided. Once this price is made available the consumer then decides whether or not to purchase the service. This decision reflects a reaction to the price level rather than a direct comparison to some price level that had been decided upon earlier. Regardless of when consumer willingness to pay is established, it is likely that reference price levels influence subsequent evaluation of incoming price information.

Reference price is likely to moderate a consumer's willingness to pay for a service. In a gaming situation, for example, Davis (1963) found that participants were unwilling to purchase entrance permits for hunting, fishing, or camping in the Maine woods, even when they valued the resulting experience and possessed sufficient resources to do so. These results suggest the influence of reference price on willingness to pay. Entrance fees were not traditionally associated with such activities so reference prices for hunting, fishing, and camping in this area were established at zero. When faced with a fee that violated the level of acceptability suggested by this reference price, participants were unwilling to pay the fee.

Once the purchase is made the consumer will evaluate the price-value relationship. Satisfaction will result in a positive evaluation of the purchase decision and a reaffirmation of reference price and a reaffirmation or revision of willingness to pay.

Thus, although reference price impact may be related to willingness to pay in the decision making process, these are separate and conceptually different components of the process. Reference price represents an expectation, whereas willingness to pay is a measure of demand. In the decision flow, reference price suggests what is fair or appropriate to consumers, and this in turn is likely to influence what they are willing to pay.

Once consumers have decided to participate, reference price provides a standard against which existing prices are evaluated (Raman 1985). In this way reference price may guide consumers in deciding which program to choose once a decision to purchase has been made. If available price levels seem inconsistent with existing reference prices, the consumer may re-evaluate the decision to purchase.

Research Questions

The purpose of the study was to investigate the influence of information on level of reference price for admission to public swimming pools. Four research questions were formulated: (1) Would knowledge of the agency's cost of delivering the services and the level of subsidy attributable to each user change the reference price for public swimming pool admission? (2) Would knowledge of the price charged by a commercial swimming pool operator for a similar service change the reference price? (3) Would knowledge of both the cost of service delivery and the price charged by a commercial swimming pool operator change the reference price? (4) Would pool users have significantly different reference prices from non-users?
Methodology

The sample consisted of 254 adults residing in a Texas city of approximately 52,000 population. Although many users of swimming pools are children, the study was limited to adults because they were considered more likely to have had past experience with paying admission prices for either themselves or their children, and be better able to meaningfully respond to the study questions.

In order to ensure an adequate number of user respondents, the basic sampling frame, which was the city telephone directory, was supplemented with a list of all who had attended one of the city's three pools within the previous two week period. A series of t-tests were undertaken to compare responses from users randomly derived from the telephone directory and users contacted from the pool attendance lists before respondents were assigned to treatment groups. No significant differences in response patterns were found. Hence, the two user samples were collapsed and treated as one sample for subsequent assignment and analysis.

Data Collection

The study was conducted in August. The 254 respondents were contacted by telephone and were asked if anyone in their household had attended a public swimming pool within the last two weeks. Those who reported that someone had visited one of the three public pools were classified as pool users; those who did not were classified as nonusers. This classification of users and non-users was developed because it was anticipated that use experience would influence both the contextual and residual variables which are hypothesized to influence reference price. It is recognized that under this definition the category 'non-user' may be comprised of infrequent users in addition to true non-users. Whenever this distinction is made the definition of non-user is likely to be arbitrary, since almost all the population are likely to have been to a pool sometime in their lives. The operational definition selected was considered to be appropriate for differentiating between those respondents who had recent experience with local public pools from those who did not.

All respondents were told that there were three public pools in the city. Respondents were randomly assigned to one of four groups who were given different information:

1. Control, to whom no price related information was provided;
2. Cost of service delivery to the agency. These respondents were informed that it cost the city $5.05 for each swim at a public pool. This information was provided by the city aquatics superintendent.
3. Price at a commercial alternative. Respondents were informed that if non-members wanted to swim at a nearby commercial recreation center, the price of a guest pass was $6.00.
4. Cost of service delivery and price at a commercial alternative. Respondents were told that it cost the city $5.05 for each swim at a city pool and that if non-members wanted to swim at a nearby commercial recreation center the price of a guest pass was $6.00.

After being given this information, all respondents were asked the same question, “What would you expect to pay for a swim at a city pool?”
Results

The price charged for swimming at the city's pools was $1. The reference prices reported by the four groups each of which contained both users and non-users, are shown in Figure 1. The mean reference price for control group members who received no cost or price related information was $1.19. Group 2, who were given information on the cost of service delivery, reported a mean price of almost $1.60, which represents a 35 percent increase over the control group. Group 3, who received information on the price charged by a commercial alternative, revealed a mean reference price of $1.44, which was a 21 percent increase over the control group. Group 4, who received both pieces of information, exhibited the highest mean reference price of $1.69, which was 42 percent higher than that of the control group. Reference prices for groups 2 and 4 were significantly different ($p > .05$) from those of the control group (Table 2).

Pool users who were assigned to the control group reported a mean reference price of $.95 (Figure 2). This was a reasonably accurate reflection of the entrance fee being charged for the pools during the study period. Some discrepancy between users' reported prices and actual price was expected, since a proportion of users are season passholders who do not pay the single visit $1 admission price. Users who were given the cost of delivering the service reported a mean reference price of $1.31, an increase of 38 percent. This treatment group exhibited the highest reference price among users in the treatment groups and was the only group that exhibited a reference price significantly different (.05 level) from that of the control group. Users who received information on the price of a commercial alternative reported a reference price of $1.08, an increase over the control group of 14 percent. The user group receiving both cost of service delivery and the commercial alternative price information exhibited a mean reference price of $1.29, an increase of 36 percent.

Non-users in the control group who received no cost or price related information reported a mean reference price of $1.42 (Figure 3). The mean reference price for non-users who received cost related information was $1.89, an increase of 33 percent. The mean reference price for those non-users who received information on the price of the commercial alternative was $1.81, an increase of 28 percent compared to the control group. Finally, non-users who received both cost of service delivery and the commercial alternative price information reported a mean reference price of $2.07, an increase of 45 percent. None of the non-user treatment groups' reference prices differed significantly ($p > .05$) from those of the non user control group.

These data were analyzed with the SAS software package. Two-way analysis of variance was used to compare mean responses between user and nonuser treatment groups. The Duncan's Multiple Range post hoc comparison test was applied to determine the source of significant differences at the .05 level of analysis.
The two way analysis of variance (Table 1) revealed that use influenced reference price levels to a significant degree (.0001 level). Those respondents who reported that household members had attended a public swimming pool within the last two weeks revealed reference prices which were significantly different from those who reported no such participation. Pool users revealed price levels which were closer to the actual prices being charged than those of non-users. These data supported the contention that pool use would influence consumers' contextual and residual stimuli when
forming reference prices, causing users to respond to information differently from non-users.

The mean reference prices of the four treatment groups differed significantly (.05 level), indicating that the provision of service cost and competitive price information influenced reference price levels (Table 1). The Duncan's Multiple Range test showed that the control group reference prices were significantly lower than those of both the service cost group and the service cost and commercial price alternative group (Table 2). This

Figure 2  Mean Reference Price for Users of Public Swimming Pools
suggests that reference prices were most influenced by information which pertained to service costs combined with information on the price of competitive opportunities.

A Duncan's multiple range test was undertaken on both user and non-user treatment groups (Table 3). Users who received cost of service information revealed a reference price which was significantly different (.05 level) from that of the user control group. Neither the price of a commercial alternative nor the price of the commercial alternative combined with cost...
of service delivery groups differed from the other treatment groups (Table 3). None of the treatments resulted in significant differences in reference prices among non-users.

Discussion

Each of the three treatment groups exhibited a mean reference price which was higher than that of the control group who received no additional information. In two of the three treatment groups the difference was significant. Even the commercial alternative treatment group whose reference price was not significant, reported a mean reference price which was 21 percent higher than that of the control group.

There are several possible explanations of why reference prices given by non-users were higher than those provided by users. It could be that knowledge of the actual price charged at the pools was more accurate and lower than that suggested by non-users as being appropriate. Alternatively, non-users may have been more apt to respond with a higher reference

TABLE 2
Results of the Multiple Range (Duncan's Procedure) Test for the Main Effect on Information on Total Sample

<table>
<thead>
<tr>
<th>Information</th>
<th>IV (Cost + Commercial)</th>
<th>II (Cost)</th>
<th>III (Commercial)</th>
<th>I (Control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>63</td>
<td>62</td>
<td>64</td>
<td>65</td>
</tr>
<tr>
<td>Mean</td>
<td>169.05</td>
<td>159.52</td>
<td>144.06</td>
<td>119.08</td>
</tr>
</tbody>
</table>

A line is drawn beneath the groups that did not differ significantly from each other (p > .05).
TABLE 3
Results of the Multiple Range (Duncan's Procedure) Test for the Main Effect
Information on Pool Users

<table>
<thead>
<tr>
<th>Information</th>
<th>II</th>
<th>IV</th>
<th>III</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>32</td>
<td>31</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>Mean</td>
<td>131.72</td>
<td>129.03</td>
<td>108.94</td>
<td>95</td>
</tr>
</tbody>
</table>

A line is drawn beneath the groups that did not differ significantly from each other ($p > .05$).

price because they did not expect to pay the price in the future. Finally, it is possible that non-users were non-users because they thought the price was higher than it actually was. Whatever the reason, given this lower base point, the information provided to the treatment groups led to users reporting much lower reference prices than non-users. However, both users and non-users in all three treatment groups reported substantial increases in reference price after they received the information. The reference price of both groups was impacted least by information on the price of the commercial alternative (13 percent and 26 percent increase for users and non-users, respectively). This suggests that the commercial alternative, while related to the public sector opportunity, was viewed as being a distinctively different service, particularly by users who presumably were more knowledgeable of the services' characteristics.

It is likely to be difficult for an agency to change residual variables since these are internal aggregations of an individual's past experiences. However, these findings suggest that the adverse impact of the focal stimulus of a price increase can be ameliorated by using information to change contextual variables. In this study, the contextual variables changed were knowledge of service cost and of a competitor's price for the same service, and this information created different reference prices.

The findings have major implications for public sector managers. Reference prices act as perceptual anchors against which price information is evaluated, and as such represent an opportunity as well as a challenge for the service provider. If a manager is aware of existing reference price levels, then strategies may be adopted to move these perceptual anchors to more advantageous levels. If reference price levels are ignored in pricing decisions, then consumers may make unfavorable comparisons.

Although most public services for which a price is charged are subsidized, there has been little effort by public sector managers to change reference price by providing information on magnitude of the subsidy. Most users probably do not recognize that a subsidy is involved, for it is unlikely to be an issue to which they have given conscious thought. When their awareness of this is aroused, it is likely to change the context within
which they perceive the magnitude of a price. Crompton and Lamb (1986:322) offer an anecdote which illustrates the same principle:

One agency that offered a meals-on-wheels service every mid-day to senior citizens in the city requested they give a $1 donation toward the cost of providing the meal. Over a one-year period, 54 percent of their clients donated a dollar. The agency then included a rider on its standard donation request slip that stated that the cost of providing each meal was $2.50. In the subsequent one-year period the proportion of clients offering a donation increased to 73 percent. The cost information provided a reference point enabling clients to quickly identify the magnitude of the subsidy and made them more willing to contribute toward the meal.

The findings of this study provide a more scientific verification of this phenomenon.

If this strategy is to be used by public agencies to facilitate price increases, they have to be able to identify the cost of delivering a service. Unfortunately, current accounting systems in many government agencies are not structured to capture and report cost data for each specific service delivered. In the past, there was no incentive to develop a cost accounting system which was service specific because prices were only nominal and tax-supported budgets were expanding. However, in recent years agencies have begun to implement such systems and as more of them emerge, this strategy of providing cost information to change reference price can be more widely adopted.

The influence of residual variables was explored by comparing responses of user and nonuser respondent groups. It was anticipated that the users would perceive price issues differently from nonusers because of their previous purchase experience. This assumption was supported. Use or non-use had a substantial effect on respondents' reference prices. These results suggest that attempts to influence reference price will differentially impact consumers according to their previous use experiences. Differing levels of past experience may create different levels of consumer expectation, knowledge and commitment. Heavy users may require both qualitatively and quantitatively different kinds and amounts of information, in order to change reference prices, than light users.

Continued investigation of consumer perception of prices for public recreation services is likely to lead to a better understanding of consumer response to price changes. Improved understanding of their response will assist in developing pricing policies and taking pricing actions which minimize conflict between a public agency and its myriad of both non-user and user publics.

Information that influences reference prices may also alter price sensitivity for that service (Raman 1985). This notion has implications for any pricing strategy. If the amount demanded of a service is sensitive to price, then price increases could result in decreased demand for publicly provided recreation services. Information which alters the price that consumers expect to pay may decrease price sensitivity. Now that it has been determined
that reference price is amenable to change, it is appropriate that the relationship between reference price, price sensitivity, and subsequent demand be investigated.

References


