



Advertising as Information

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Advertising as Information

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This haughty youth, He speaks the truth
Whenever he finds it pays;—
And in this case, it all took place
Exactly as he says!
Exactly, exactly, exactly, exactly as he says!

[GILBERT AND SULLIVAN, *The Mikado*]

This paper tries to show how the major features of the behavior of advertising can be explained by advertising's information function. For search qualities advertising provides direct information about the characteristics of a brand. For experience qualities the most important information conveyed by advertising is simply that the brand advertises. This contrast in advertising by these qualities leads to significant differences in its behavior.

How does advertising provide information to the consumer? The producer in his advertising is not interested directly in providing information for consumers. He is interested in selling more of his product. Subject to a few constraints, the advertising message says anything the seller of a brand wishes. A mechanism is required to make the selling job of advertising generate information to the consumer.

The first section of this paper shows how such a mechanism exists and how its operation varies by types of market. The middle three sections of the paper try to put the ideas of the first section to the test. The first of these empirical sections uses the model to predict the way in which adver-

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tising/sales ratios will differ by industry. The second section predicts how media choice will vary by industry; the third explores the impact of alternative sources of information on advertising volume. The last section of this paper examines the consequences of relaxing two assumptions made in the rest of my analysis: that consumers use optimal decision rules and that there are no legal constraints on advertising.

Information is generated by advertising because of consumer power in the product market. The nature of that power will vary significantly by the nature of the product being advertised. In "Information and Consumer Behavior" (Nelson 1970), I make a fundamental distinction between qualities of a brand that the consumer can determine by inspection prior to purchase of the brand—"search qualities"—and qualities that are not determined prior to purchase—"experience qualities." An example of a search quality is the style of a dress; an example of an experience quality is the taste of a brand of canned tuna fish. The impact of the market power of consumers on advertising will operate quite differently for search and experience qualities.

If the advertised properties of the product differ from the actual properties, the consumer will know about that difference prior to purchase in the case of search qualities. This reduces considerably—but not entirely— incentives for misleading advertising. Misleading advertising will still exist. First, consumers pay transportation costs before they spot any disparity between actual and advertised search qualities. By exaggerating the utility of the actual search good by any amount up to the transportation costs of consumers, advertising can result in greater sales to the firm than a less exaggerated advertisement. Second, there can be some search quality of a brand which cannot be successfully conveyed by advertising, for example, the "charm" of an apartment. Under these circumstances it might pay the advertiser to exaggerate some characteristic that can be specified by the advertisement. But there are costs to the advertiser of misleading advertising: he suffers a decline in his credibility for future advertisements and pays the costs of processing nonbuying customers. Because of these costs and the relative unimportance of the sources of misleading advertising, consumers can have some confidence that the advertising of search qualities bears a close relation to the truth. The advertising of search qualities provides information to the consumer, even though he attaches a probability less than one to the truthfulness of these advertisements.

In the case of experience qualities the consumer's power over advertising is much less potent than his power over search qualities. The major control that consumers have over the market for experience qualities is whether they repeat the purchase of a brand or not (Nelson 1970). This power is sufficient to authenticate any statement that has either of the

following characteristics: (1) consumers' belief in the truth of that statement does not increase the profit from initial sales (as opposed to repeat sales either directly or indirectly through the recommendations of relatives and friends) or (2) it is possible for the producer at no cost to himself to make the advertised statement true rather than false. If either (1) or (2) holds, the advertiser maximizes his profits by telling the truth if the consumer believes he is doing so.¹

One of these two requirements will be satisfied by virtually all statements that specify the function of a brand, for example, "Pepto-Bismol is a remedy for upset stomachs." This statement turns customers with athlete's foot away as well as attracting customers with bellyaches. Of course, it is conceivable that there are more of the latter (relative to the available number of brands) than the former, so that there is a net gain of initial sales from this statement. But this is where condition (2) comes into play. If this were the case, it would pay the manufacturer of Pepto-Bismol to produce at the same costs something that resembled a stomach remedy rather than something that could be used for athlete's foot. It is conceivable that at that cost the firm could only produce a second-rate stomach remedy and could produce a first-rate foot balm. But if everybody is buying Pepto-Bismol for upset stomachs rather than for athlete's foot, any virtues of Pepto-Bismol for athlete's foot would be irrelevant in determining Pepto-Bismol sales.

Even when the advertisement of an experience quality correctly relates brand to function—by far the typical case—the consumer has quite incomplete information. He would like to be able to rank stomach remedies by their utility to him. Advertising provides no direct information that will help him do that job. (By direct information I mean information contained in the advertising statement.) After Pepto-Bismol has been correctly identified as a stomach remedy, the statement that Pepto-

¹ This proposition can be seen most clearly in the case of constant average production costs (AC). In that case, profit can be written

$$Pf = (P - AC)I + (P - AC)R - A, \quad (10)$$

where Pf = profits, P = price, I = initial sales, R = repeat sales, A = advertising costs, and $P(R)$ = probability of a repeat purchase given an initial purchase. Advertising costs are assumed constant, since they should be invariant with respect to the truth or falsity of the advertising message. Then false advertising will not increase Pf .

$$Pf = (P - AC)I + (P - AC)I P(R) - A. \quad (11)$$

If $(P - AC)I$ is constant, profits increase with the probability of a repeat purchase, and this probability increases with the truthfulness of an advertisement. $(P - AC)I$ will be a constant over the relevant decision variable whenever either condition (1) or (2) holds. If condition (1) holds, $(P - AC)I$ is a constant varying the truthfulness of the statement but holding the character of the product constant. If condition (2) holds, $(P - AC)I$ is a constant holding the statement constant but varying the character of the product.

Bismol is most soothing is without information content. Its producers have an incentive to say so even if it were the least soothing of stomach remedies.

The miniscule amount of direct information from advertising for experience qualities gives the consumer an incentive to extract any conceivable indirect information that would help. Such indirect information is available from advertising. The consumer can learn that the brand advertises. I contend that this is the useful information that the consumer absorbs from the endorsements of announcers, actors, and others who are paid for their encomiums. These and other advertisements for experience goods have no informational content. Their total informational role—beyond the relation of brand to function—is simply contained in their existence. The consumer believes that the more a brand advertises, the more likely it is to be a better buy. In consequence, the more advertisements of a brand the consumer encounters, the more likely he is to try the brand.

Why are advertised brands better buys? The answer to that question is not self-evident. If advertising were distributed at random among brands for a product, it would indeed be newsworthy that a brand advertised; but that news would decrease the probability of a consumer's trying the advertised brand. Advertised brands would cost more by the cost of the advertising and hence would be worse buys.

It is my contention, however, that advertising is not distributed at random among brands of a product. Heavily advertised brands are likely to provide a lower P^* (price per unit of utility of the brand)² to the average consumer than less heavily advertised brands of the same product. (To give unambiguous meaning to that measure, I assume that consumers all have the same income and utility functions.)

First of all, firms vary in their efficiency in producing the utility that consumers seek. Some firms produce brands that yield more utility to the consumer for a dollar of production cost than do other brands. In general a firm that has lower costs relative to the utility of its brand than other firms will find that it pays to expand its output by both increasing advertising expenditures and decreasing P^* . This behavior of firms by efficiency generates a negative association between advertising and P^* by brands.

Two crucial propositions are contained in the previous paragraph. The proposition—that to sell more the firm will offer a lower P^* —obviously holds for the usual demand curve, which is negatively sloped. More critically, this proposition also holds for the relationship between demand and price when advertising expenditures adjust optimally to

² This definition of P^* is an attempt to obtain a utility adjusted price. For simple additive utility functions, P^* does the job. For other utility functions, different definitions of P^* might be required. For purposes of my analysis this variation in the definition of P^* is not important as long as a utility adjustment of price is possible.

price. Even though this demand curve can have a positively sloped portion (Demsetz 1959), Schmalensee's (1972) analysis implies that even this demand curve will be declining where it counts—in the neighborhood of equilibrium.³ The proposition that there is a reverse association between quantity produced and P^* can be put to the test. If this proposition were true, it would pay a brand to advertise its rank in its product class more, the higher that rank. Do leading firms advertise their significance more than nonleading firms advertise their lack of leadership? To answer that question, I looked at three issues of *Life* magazine for March 1972 (*Life* 1972). I found six brands claiming that they were at largest brands for their respective product classes. I found none advertising a lower rank. There are far fewer brands that are first in their product class than are not first (even confining ourselves to the sample of brands that advertise in three issues of *Life*). If brands advertised their rank in their product class independently of what that rank happened to be, the probability of an advertisement which advertised rank advertising that the rank is first would be far less than .5. In consequence the probability of our observed results occurring by chance is less than one sixty-fourth.⁴

The second proposition—that the firm that wishes to sell more will advertise more—also has a strong a priori defense. Advertising and $-\Delta P^*$ are the two inputs yielding higher quantity demanded. From production theory one anticipates that if the “price” of the two inputs were constant, an increase in the output is usually most profitably achieved by an increase in both inputs. But in this case the “price” of the inputs does not remain constant as one increases quantity. Quantity is the “price” of $-\Delta P^*$, that is, the loss to the firm in lowering price to increase quantity demanded is proportional to that quantity. In consequence, one would expect adver-

³ Using Demsetz's (1959) terminology, the average revenue curve allowing advertising to adjust optimally to a change in price is the *mutatis mutandis* average revenue curve (*MAR*). For *MAR* to be rising or constant $MMR \geq MAR$, where *MMR* = marginal *mutatis mutandis* revenue curve. For firms to have positive or zero profits $MAR \geq AC$, where *AC* = average production and advertising costs and *MC* = marginal production and advertising costs; but $MMR = MC$. Hence, $MC \geq AC$, which implies that *AC* is rising or constant. But Schmalensee (1972) has shown that in equilibrium *AC* must be decreasing. Hence, *MAR* must be decreasing in equilibrium.

⁴ This test would be biased if brands that were not number one advertised themselves as major producers more than those brands which are number one. But this bias is produced by the very proposition I am testing, a proposition that would explain why number one brands choose more explicit rank advertising than others. A more serious problem with this approach is that the data do not support another implication of rational consumer behavior: that firms that advertise the most would advertise that fact. I think the primary reason that the quantity of advertisement is not advertised is that advertising has been so frequently attacked that it is in disrepute. These attacks make it difficult for consumers to understand the ultimate rationalization of their own behavior. (This problem is discussed in more detail in the “Deceptive Advertising” section of this paper.) In consequence, brands do not advertise their advertising rank, though they do advertise that they have advertised, e.g., “As Advertised in *Life*.”

tising expenditures to increase because both output increases and the price of the other factor of production increases. The evidence is overwhelming that advertising increases as sales increase.

There are other reasons for a consumer to respond positively to advertising. What is a high-utility brand for some consumers will be a low-utility brand for others. Advertising has the seemingly magical property that those whose tastes are best served by a given brand are those most likely to see an advertisement for that brand. Advertisers choose the media in which they advertise in part to maximize the repeat-purchase probability for their brand. In consequence the producer distributes his advertisements among media so that his message is seen by those who are most likely to repeat purchase his brand. An esoteric, high-price soup gets advertised in the *New Yorker*, while Campbell's soup displays its wares in *Good Housekeeping*.

A third factor operates to increase the reputability of advertised brands. The full analysis of this factor is consigned to the Appendix, but the essence of the argument is simple enough. Advertising increases the probability of a consumer's remembering the name of a brand. Those brands with the highest probability of repeat purchase have the greatest payoff to improved consumer memory. In consequence, brands which provide the highest utility have the greatest incentive to advertise.

A feature of the previous discussion must be emphasized. Nowhere in that analysis was it necessary to assume that consumers respond positively to advertising because the brands that advertised the more heavily were better buys. The self-interest of consumers to respond to advertising only if it increased their utility produces an additional guarantee that highly advertised products will provide higher utility to the consumer. Suppose there were some products for which firm self-interest dictated a negative relationship between advertising and utility per dollar. Consumer self-interest would make the consumers respond negatively to advertising for these products. In consequence, firms would not advertise such products.

In this analysis of the indirect information contained in advertising, the focus has been on experience qualities. The same analysis can be used to show that advertising increases the reputability of brands which are dominantly search goods. However, reputability will play a much smaller role in the advertising for search qualities, because the consumer can obtain so much direct information about these qualities from advertisements and direct inspection. The possession of this direct information reduces the payoff to both consumers and advertisers of advertisements' increasing the reputability of a brand. In my subsequent analysis I shall assume that this difference between the character of advertising for search and experience qualities is so large that the advertising for experience qualities is dominantly indirect information and the advertising for search qualities is dominantly direct information.

Marginal Revenue of Advertising to the Producer

To maximize profits a producer will advertise to the point where his marginal revenue of advertising is equal to his marginal cost of advertising. One expects differences in the behavior of this marginal revenue for search and experience qualities. This difference in turn will produce a differential effect on the quantity of advertising purchased by producers of search and experience qualities.

To demonstrate this effect one needs a theory to generate the marginal revenue of advertising. For search qualities, advertising will increase sales when and only when it gives the consumer information that he did not have before. I will assume that all the information that advertising conveys about a search brand is contained in any given message. The revenue (R) generated by advertising will, therefore, equal:

$$R = QPNG_1; \quad (1)$$

where N = the number of potential customers, that is, those who would buy the brand if confronted with the appropriate signal (in this case, one or more advertising messages), Q = average quantity purchased per customer, P = price, and G_1 = the proportion of potential customers with one or more advertising messages. Of the four components of R only G_1 varies by advertising intensity. The behavior of G_1 has been examined by Stigler (1961) and Gould (1970), but there is a problem with their analysis that makes reexamination necessary.

As Stigler recognizes, there are three relevant processes at work. Consumers acquire advertising information; they leave and enter the market, that is, they are mobile; they forget advertising information. Stigler asserts that the latter two processes produce identical results in the advertising market, except for possible differences in their intensities. I think he is wrong. In the mobility case, the most reasonable simple assumption is that the probability of leaving the market is independent of the number of advertising messages a consumer knows. In the forgetting case, however, the simplest reasonable assumption is that the number of messages forgotten about a brand is directly proportional to the number of messages known about a brand.

I expect, then, mobility and forgetting to be quite different probability processes. Optimally, one should combine the two processes in the same model. Such a model is easy to construct, but I have not been able to solve the equations that the model generates. Instead I have developed two different models. In one there is mobility, but no forgetting; in the others there is forgetting, but no mobility. Because it is simpler and probably more important, I concentrate on the forgetting model. This is simply a matter of economizing on space. My results do not change when I use the mobility model.⁵

⁵ My analysis of the mobility model is available upon request.

In my forgetting model I assume that the rate at which consumers confront an advertising message (c) is a constant for all consumers. I also assume that the forgetting rate is directly proportional to the number of advertising messages a person knows. The differential matrix of this stochastic process is

$$F = \begin{bmatrix} -c & c & & & \\ a & -(c+a) & & & \\ & 2a & c & & \\ & & -(c+2a) & c & \\ & & 3a & -(c+3a) & c \end{bmatrix}, \quad (2)$$

where the state space is $(0, 1, \dots, n)$ advertising messages about a brand and a is the forgetting rate when one knows one advertising message.

I shall try to abstract out of this stochastic process the relationship between the present value of revenue and advertising intensity. This present value of revenue will change over time as the process unfolds. Of these present values both the simplest and the most useful is the one calculated after the stochastic process has settled down to a steady state. Then the present value will merely be the present value of a constant stream of returns. It is this steady-state condition that I will examine.

As is well known (e.g., Karlin 1966), the steady-state distribution (λ) can be obtained by solving

$$\lambda F = 0. \quad (3)$$

In words, the net movement into any steady state must be zero or it is not a steady state. The solution:

$$\lambda_i = \frac{d^i}{i!} e^{-d} \quad i = (0, 1, \dots, n), \quad (4)$$

where $d = c/a$. In particular the probability of having one or more advertising messages is

$$1 - \lambda_0 = 1 - e^{-d}. \quad (5)$$

Equation (5) is G_1 in equation (1) and hence is relevant in determining the revenue from advertising in the case of search.

However, G_1 will not be relevant in determining the revenue from advertising for experience qualities. I have assumed that the information the consumer obtains from advertising for experience qualities is that the brand is advertised and is, hence, more likely to be a better buy. In the face of experience qualities, a consumer's optimal strategy is to try a fixed number of brands, say r , and then continue to use the best of the set (Nelson 1970). A consumer to whom advertising for experience qualities provides favorable information will limit his sampling to those brands for

which he has received the most advertising messages. Say he has currently received m messages for the r th most advertised brand in his own sample of messages. Assume further that in case of a tie in the number of advertising messages the consumer receives, the consumer prefers the brand whose advertising messages he has most recently received.⁶ Then a consumer will try a brand if he receives m messages about the brand, and any messages beyond m are redundant.

For experience qualities one needs a more general form of equation (1). The revenue generated by advertising is

$$R = QPN G_m \tag{6}$$

where G_m = the proportion of potential customers with m or more advertising messages, where m is the critical number of advertising messages required for a consumer to sample a brand. (To put the revenue in present-value terms, all one need do is multiply the right side of eq. [6] by $1/w$ —where w equals the discount rate.) For the forgetting model, G_m is

$$1 - \sum_{i=0}^{m-1} \lambda_i = 1 - \sum_{i=0}^{m-1} \frac{d^i}{i!} e^{-d}. \tag{7}$$

The amount of advertising can be measured by the rate at which customers acquire advertising information—or c . The marginal revenue to the producer of advertising is, therefore

$$MR_A = QPN \frac{\partial G_m}{\partial c}. \tag{8}$$

Assume that QPN are the same for advertising for search and experience qualities.⁷ The MR_A will differ between search and experience qualities because $\partial G_m/\partial c$ differs by m . (I will assume, for simplicity, that all consumers are faced with the same m in the advertising for any given brand, though this assumption is contrary to fact.)

$$\frac{\partial G_m}{\partial c} = \frac{d^{m-1}}{a(m-1)!} e^{-d}. \tag{9}$$

⁶ A more realistic assumption would be that in a case of a tie at m messages, the probability of the consumer's sampling the brand is the inverse of the number of tied brands. But this more realistic assumption increases considerably the complexity of the presentation without adding any new insight into the process.

⁷ This assumption is contrary to fact, but its conflict with reality should not produce serious problems in this particular case. In Nelson (1970) I showed that there should be more monopoly power in the market for experience goods than in the market for search goods. Assume the same total market size—and there is no reason to assume that this varies systematically between search and experience goods. Then average firm size should be larger for experience goods than for search goods and there should be fewer firms. If marginal production and advertising costs were constant with respect to size, these two differences should cancel one another out, i.e., total advertising expenditures for the industry would not vary through variation in the size of firms within the industry.

For search qualities $m = 1$; for experience qualities $m \geq 1$. It can be easily shown that

$$\frac{\partial G_m}{\partial c} > \frac{\partial G_1}{\partial c},$$

where $m > 1$ and $G_m'' < 0$.⁸ In other words, over the declining portion of $\partial G_m/\partial c$, $\partial G_m/\partial c$ is always greater for experience qualities than for search qualities (or equal when $m = 1$). Since only the declining portion of the marginal revenue curve is relevant for firm decision making when marginal costs are constant or increasing, firms advertising experience qualities will advertise more than firms advertising search qualities when they both advertise.

Can the marginal cost of production and advertising always be above the marginal revenue curve of advertising for experience qualities? This is possible for any given brand of a product (which will then not advertise); it is impossible for the market in general. If for all brands, the marginal cost curve is higher than the marginal revenue curve for an m as low as two, then the market will make the minimum m one. The marginal revenue curve for search and experience will then be the same only in this polar case. Of course the industry's total advertising expenditure are independent of the number of firms as long as marginal costs of production and advertising are constant.

How does one test the proposition that there will be more advertising of experience than of search goods? In "Information and Consumer Behavior" (Nelson 1970), it is shown that goods could be classified successfully by whether the quality variation was ascertained predominantly by search or by experience, and the respective goods were called "search goods" and "experience goods." To take account of some ambiguity in the classification procedure in Nelson (1970), two alternative classifications were used. They are again used here, together with a third classification (Classification II with cameras moved from the search to the experience category). This third classification is motivated by the discussion in Nelson (1970, p. 320 n.). The commodities in these classifications are presented in table 1. The following mean advertising ratios were

$$^8 \quad G_m'' = \frac{1}{a^2} d^{m-2} \frac{1}{(m-2)!} e^{-d} \left(1 - \frac{d}{m-1}\right).$$

Since $d > 0$, $m \geq 2$, then $G_m'' < 0$ implies $\frac{d}{m-1} > 1$, so

$$G_m' - G_1' = \frac{1}{a} e^{-d} \left[\frac{d^{m-1}}{(m-1)!} - 1 \right].$$

But $\frac{d}{m-1} > \frac{d}{m-1}$ for $m-1 > i > 1$. Hence, $\frac{d}{m-1} > 1$ implies that $\frac{d^{m-1}}{(m-1)!} > 1$.

Hence, $G_m' > G_1'$ when $G_m'' < 0$.

TABLE 1
ADVERTISING/SALES RATIOS IN CONSUMER CATEGORY BY INFORMATION CATEGORY*

Good and Information Category	Advertising/Sales Ratio, 1957	Good and Information Category	Advertising/Sales Ratio, 1957
Experience durable:		Experience nondurable:	
Books	2.702	Beer	6.872
Paints†	1.450	Wine	4.395
Tires	1.385	Liquor	2.408
Appliances	3.296	Dairy products	1.885
Motorcycles and bicycles	1.078	Grain mill products	1.695
Motor vehicles	0.907	Cereals	4.845
Motor vehicle parts and accessories	0.700	Bakery	2.803
Professional and scientific instruments‡	2.086	Sugar	0.280
Clocks and watches	5.629	Confectionery	3.543
Communications equipment	2.034	Miscellaneous foods	4.073
Average	2.177	Cigars	2.370
Average total experience	3.427	Other tobacco	5.429
Search goods:		Drugs	10.280
Knit goods	1.075	Soaps	7.938
Carpets	2.052	Perfume	14.723
Hats	2.124	Petroleum refining	0.507
Millinery	0.326	Meats	0.610
Men's clothing	0.928	Periodicals	0.304
Women's clothing	1.263	Average	4.085
Miscellaneous apparel	1.269		
Furniture	1.451		
Footwear	1.326		
Leather goods	1.204		
Jewelry§	2.202		
Costume jewelry§	2.498		
Average	1.395		

*Goods classified by Classification III data from Telser.(1964).

†Search good in Classification I.

‡Search good in Classifications I and II.

§Experience good in Classification I.

obtained:

Classification I: $\bar{X}_e = .0347$, $\bar{X}_s = .0123$, $D = .0234$, $t = 3.67$;

Classification II: $\bar{X}_e = .0348$, $\bar{X}_s = .0137$, $D = .0137$, $t = 3.16$;

Classification III: $\bar{X}_e = .0343$, $\bar{X}_s = .0132$, $D = .0211$, $t = 3.40$;

where \bar{X} = mean advertising sales ratio; e = experience goods; s = search goods; D = difference of the means; t = test result of the hypothesis that $D = 0$. For all these classification procedures the differences are large, and hence are economically as well as statistically significant.

The chief problem with this test and subsequent tests to be made is the possible ambiguity in the classification of goods into the two information categories: search and experience. Alternative classification procedures

do not appear to have a large effect. Of course, random errors in classification bias result toward zero observed differences in the means, so they do not vitiate the procedure. The big problem in classification is an unconscious (or conscious!) tendency for the classifier to produce the results he is seeking. Hopefully, the present classification, which was developed prior to the present tests, will be found to be valid.⁹

In consequence our results support the hypothesis that producers of experience goods advertise more than producers of search goods. This result is important because it in turn supports our fundamental behavioral proposition: that advertising of experience qualities increases sales through increasing the reputability of the seller, while advertising of search qualities increase sales by providing the consumer with "hard" information about the seller's products.

There is another important feature of these results. They are precisely the opposite of what would be anticipated given an obvious alternative theory of the way in which advertising for experience qualities operates. As I discussed in the first section, there is, indeed, some "hard" information conveyed by advertising for experience goods. A consumer is able to relate brand to function. For search goods advertisements can provide far more information than the relation of brand to function.

If advertising were solely concerned with distribution "hard" information, there should be more advertising measured in dollar terms for search goods than experience goods, simply because there is more "hard" information that can be conveyed about search qualities. Think, for example, of an advertisement saying simply, "Bayer is an aspirin." Then think of an advertisement saying, "Jonathan Logan is a dress," and showing a picture of a Jonathan Logan dress. The latter advertisement takes up more space and, hence, is more expensive. As we have seen, however, the data produce results precisely contrary to this prediction. This strongly suggests that the information content of advertising for experience goods goes far beyond the relation of brand to function—another reason for believing that advertising for experience goods provides information about the reputability of brands.

⁹ Obviously, the simple test used in the text makes no attempt to control for other variables. Instead I have tried to present as many simple tests as I can in the belief that the many biases to which any one test is subjected (of which excluded variables is only one example) will not operate consistently in all my tests. One example of a possible bias is the close relationship between search goods and style goods. (This relationship is not accidental but engendered by the search—in contrast to the experience—process). It would appear, however, that the bias induced by the association of search and style runs against the test results reported in the text. The evidence we have (e.g., Telser 1964) suggests a positive association between advertising in an industry and the number of new brands in the industry. The same logic which generates that association would make style changes—a characteristic of style goods—generate additional advertising. That search goods tend to be style goods could hardly explain the low levels of advertising in search goods.

This last paragraph does not imply that the relation of brand to function is a nonexistent activity of advertising for experience goods. The implication is only that the effects of this activity are swamped by the effects of advertising to increase the reputability of experience brands. Why? Simply because most advertising of experience goods occurs with such intensity that most people already know the relation of brand to function.

This explanation is itself open to test. The smaller the advertising intensity of an experience good, the more likely that the advertising conveys new information to the consumer of the relation of brand to function. We have just seen that when advertising for experience goods is providing that kind of information the optimal page size of an advertisement ought to be smaller than the optimal page size for search goods, since the latter advertisements have more information to convey.

When, however, advertising for experience goods is designed primarily to increase the reputability of a brand, two forces will tend to increase the page size of advertisements for experience goods relative to this page size for search goods. First, even with the same amount of "hard information" and even when the consumer sees both, a larger advertisement should increase sales for experience goods more than a smaller advertisement. The larger advertisement enhances the reputation of the advertiser more than does the smaller advertisement. (When consumers select brands by volume of advertising, they will choose in terms of the dollar volume of advertising they see rather than simply the number of advertising messages.) Under these same conditions, the smaller and the larger advertisement for search goods would produce the same increase in sales.

Second, the probability of a consumer seeing an advertisement varies more with page size for experience goods than search goods. As we shall see in the next section, the marginal return to the consumer is small for advertisements whose sole additional information is increases in the reputability of a brand. In consequence, such advertisements must depend much more on catching a disinterested consumer's eye than advertisements that consumers seek out. Large page size tends to accomplish that objective (by way of contrast, classified advertisements have both large marginal returns to the consumer and exceedingly small page sizes).

One can, therefore, predict that as the volume of advertising increases by brand, the difference between the average page size of advertisements for experience and search goods increases. I tested this proposition by examining the national brand advertisements in the *New Yorker* for all of 1965. (This magazine was chosen because it is one of the few that has a lot of advertisements of both search and experience goods.) I measured the volume of advertising by the total pages purchased in the *New Yorker* by brand. I then divided this volume of advertising into four categories. As table 2 shows, there is a perfect rank correlation between the differences in page size of experience and search goods and the volume of

TABLE 2
 AVERAGE PAGE SIZE OF ADVERTISEMENTS IN THE *New Yorker* IN 1965 BY BRAND, BY VOLUME OF ADVERTISING, AND BY
 INFORMATION CATEGORY

	VOLUME*							
	< 2		2 < 5		5 < 10		≥ 10	
	No. Brands	Average Page Size	No. Brands	Average Page Size	No. Brands	Average Page Size	No. Brands	Average Page Size
1. Search	138	.553	123	.786	75	.895	28	.789
2. Experience minus books†	122	.466	141	.730	127	.888	73	1.008
3. Experience	411	.253	146	.752	128	.883	74	1.036
Differences:								
(1) - (2)087		.056		.007		-.219
(1) - (3)300		.034		.012		-.247

*Total pages of advertisements in the *New Yorker* for a brand.

†Books omitted in (2) included in (3) because the behavior of books dominates the < 2 volume category.

advertising. The probability of this perfect ordering being produced by chance is one twenty-fourth. In consequence these results are significant at the 5 percent level.¹⁰

These data yield other striking results. The average page size for the smaller volume advertisers is smaller for experience goods than for search goods, and this result is reversed for large-volume advertisers. In the class of brands that advertised two pages or less in the *New Yorker* in 1965, the difference in average page size between search goods and experience goods was .087. The standard deviation of that difference was .037. Hence this difference is significant at the 5 percent level.¹¹ For big-volume advertisers (10 or more pages in the *New Yorker* in 1965), the difference in average page size between search and experience goods was $-.218$; the standard deviation of that difference was .059. This difference is significant at the .01 percent level.

These results explain a phenomenon inexplicable with the simple information models previously used in the analysis of advertising. It is traditional in advertising to have a particular brand sponsor a network television show. This results in three or more commercials during that period for the same brand. Often the information content of these commercials does not differ. Since the audience is quite stable over the course of the program, this advertising behavior makes no sense if the goal of the firm is to maximize the number of people who have one or more bits of information about the brand. Obviously a random distribution of the brand's commercial does a better job than this bunching procedure. But this bunching makes sense in terms of the goal of most television advertising: to increase the reputability of a brand of an experience good.

Marginal Revenue of Advertising to the Consumer

In the usual analysis of advertising, the consumer plays a rather passive role. Our analysis, on the contrary, visualizes consumer decision in the quest for information as a central determinant of the behavior of advertising. One crucial variable governing consumer decisions is the marginal revenue to the consumer in confronting an advertisement. This marginal revenue has to be greater than the time cost to the consumer in order for him to examine an advertisement. This places a constraint on both the amount and type of advertisement a brand will use.

Our model suggest that there should be a systematic difference between

¹⁰ I ran this test both including and excluding advertisements for books. The reason for this strategy was that book advertisements dominate the small-volume advertisement category for experience goods. The perfect rank correlation was produced by both procedures.

¹¹ If books are included in experience goods, the difference is .247 and its standard error .028. The results are significant at the .01 percent level.

the marginal revenue to the consumer for experience goods and the marginal revenue for search goods. The marginal revenue of information to the consumer for a good is the expected improvement in his utility as a result of using this information in his sampling of brands of this good. This expected improvement can be analyzed as the product (in the mathematical sense) of two components: (1) the standard deviation of the utility distribution of brands (i.e., the distribution of P^*) for that good; (2) the expected improvement in standard deviation units of utility that can be obtained by using that information. The first factor depends on the nature of the market for the good. The second factor depends on the nature of the information available about the good. Since the focus is on information in this analysis, it is not surprising that the second factor is the agent of the expected difference between the marginal revenue of advertising to the consumer for search and experience goods, respectively.

But the first factor cannot be ignored. The nature of the market is also a function of the nature of the information (Nelson 1970). Indeed, the standard deviation of the utility distribution of experience and search goods might well be systematically different. However, the nature of that difference is not at all clear. Two forces operate in opposite directions on the relative magnitude of this standard deviation of search and experience goods. On the one hand, competitive pressure reduces the standard deviation of utilities about which consumers agree more for search goods than for experience goods (Nelson 1970). On the other hand, the greater sample size that consumers use for search goods will increase the standard deviation in utility of characteristics about which consumers disagree for search goods relative to experience goods.¹²

It is impossible to say, *a priori*, which of the two forces analyzed will dominate in determining the relative variance of the utility of search and experience goods for a given consumer. It would be surprising, however, if this mixed effect could outweigh the impact of the difference in the information characteristics of search and experience goods. In analyzing this difference I will assume that the payoff to the same information would be the same for search and experience goods, that is, the utility distribu-

¹² A brand that specializes in satisfying an extreme taste will become the most-preferred brand of those with that taste at the expense of becoming one of the least-preferred brands of those with average taste and tastes at other extremes. The smaller the sample size of brands (assuming that it is greater than one), the smaller the payoff to such specialization. Sample sizes as small as two screen out least-preferred alternatives quite effectively, but do not effectively discriminate between most-preferred brands and brands nearby on a consumer's utility scale. Any increase in sample sizes beyond two increases the payoff to being the most-preferred brands for some people considerably, and only changes the cost of being the least-preferred brand for other people mildly. Hence, greater sample sizes of brands encourage greater variance among brands in the characteristics about which consumers disagree. In a simple model of this process, a sample size of two produces a brand distribution concentrated at the median of the distribution of consumers by their most-preferred quality; an infinite sample size produces a brand distribution that corresponds exactly with that distribution of consumers. (An analysis of this model is available upon request.)

tions by brand for a given customer are the same for search and experience goods.

The big difference in the character of the advertisements of search and experience goods is that advertisements for experience goods are dominantly "soft" or indirect information. Consumers use "soft" information for experience goods because they have no option. The primary information content of advertisements for experience goods is the information that the brand advertises. For search goods, on the other hand, the consumer does have the option of using "hard" or "soft" information. But one of the basic assumptions of our model is that consumers respond to the direct information contained in the advertising message—"hard" information—for search goods. This implies that for search goods this "hard" information has a greater value to the consumer than "soft" information. I predict, therefore, that the marginal revenue of advertisements to the consumer will be greater for search goods than for experience goods.

To test this proposition I look at the distribution by media of advertising for experience and search goods. Consumers will be willing to look at advertisements as long as the marginal revenue to them of so doing is greater than their marginal cost. The marginal cost to the consumer is dominantly a time cost. This time cost will vary by the alternative use of the time used in watching the advertisement.

Many advertising media take advantage of severe restrictions on the alternative time uses of the consumer. Television and radio intersperse advertisements with programs the consumer wants to hear. By listening to the commercials the consumer sacrifices only those activities he can do during the short time period of the commercial. The cost to the consumer of looking at billboards and transit posters are only the activities he can do while confined to a moving vehicle. Only advertisements in newspapers and magazines demand of the consumer the sacrifice of the best of his possible alternative time uses. For newspapers and magazines he can arrange the time saving from not looking at the advertisements any way he chooses.

Newspapers and magazines have the added property that the consumer can look at the advertisements as many times as he wishes. We would expect some positive relationship between the marginal revenue to the consumer of an advertisement and the number of times he will want to look at that advertisement. Hence, we would expect advertisements with a high marginal revenue to the consumer to concentrate in newspapers and magazines relative to the other advertising media; we would expect just the contrary behavior for advertisements with low marginal revenue to the consumer. We, therefore, predict that there will be more advertisements for search goods in newspapers and magazines relative to the other advertising media compared to the same behavior for experience goods.

I test this proposition by comparing the distribution of advertising for

TABLE 3
RATIO OF TELEVISION NETWORK TO MAGAZINE ADVERTISING
BY GOODS, 1966

Goods	Ratio*
Experience:	
Automobiles	1.93
Foods	2.35
Toiletries	2.46
Tobacco	2.61
Drugs	2.58
Search:	
Apparel	1.59
Household furniture	0.84

*Includes only those goods tabulated for both. Alcohol not included because of prohibition on network advertising of hard liquor (U.S. Bureau of the Census 1967).

TABLE 4
RATIO OF LOCAL TO NATIONAL ADVERTISING BY LOCAL MEDIA, 1966

Media	Ratio*
Newspapers	4.1
Radio spot	2.2
Television spot	0.5
Outdoor	0.6
Transit	1.0

*U.S. Bureau of the Census (1967).

magazines against television network advertising for different kinds of consumer goods. The results overwhelmingly support the hypothesis. Look at the ratio of advertising expenditures for television to these expenditures for magazines for 1966 as reported in table 3. Every one of the experience goods has a higher ratio than the search goods. The geometric mean of this ratio for experience goods is 2.45, while for search goods the geometric mean is 1.16. This difference is statistically significant at the 1 percent level, $t = 4.2$.

We can have more than usual confidence in this test, because we can test the test. Using quite different—but highly persuasive—evidence, Ferguson (1963) has established that local advertisements have a higher marginal revenue to the consumer than national advertisements. (Ferguson's result is predicted by our theory. Local advertising provides for the most part information that can be checked prior to purchase: price and where to find things.) If our tests were indeed a test for variation in the marginal revenue to the consumer, we should find the ratio of local to national advertisements higher for newspapers than for all other local media. Look at table 4 for the ratio of local to national advertising by

local media. While there are too few observations to hope for statistical significance, the differences in the order of magnitude involved are huge. This evidence is highly suggestive.

Alternative Sources of Information

Thus far our analysis has concentrated on consumer behavior when faced with two alternatives: to sample (whether by experience or search) at random or with the aid of advertising. Advertising is not the only aid to sampling that the consumer can employ. The most obvious source of assistance that consumers have is the recommendation of relatives and friends and consumer magazines. It seems reasonable to suppose that for experience goods consumers believe these recommendations constitute better information than advertising.¹³ Certainly these recommendations must sometimes provide better information or they would never be used. The consumer is surrounded by a sea of advertising whose information is obtained by the consumer at virtually no cost to himself. The consumer, then, always has the alternative of using advertising as his guide. Instead he sometimes uses the guidance of relatives and friends. Hence, that information must sometimes be better information. The more consumers use relatives and friends, the less they respond to advertising.

I showed in "Information and Consumer Behavior" that guidance was used more for goods for which there is a low frequency of purchase than goods for which there is a high frequency of purchase both for experience and search goods. (For simplicity I will henceforth call low frequency of purchase goods "durables" and high frequency of purchase goods "non-durables," though the essence of their behavioral difference is contained in the frequency of purchase). This leads to the reverse prediction for advertising: greater advertising for nondurables than for durables for both experience and search.¹⁴

However, this relationship should be far stronger for experience goods than for search goods. First, the level of guidance is far less for search goods than for experience goods. In consequence, guidance should have less impact on the demand for advertising for search goods. Second, advertis-

¹³ For search goods the case is not clear at all. A consumer might well regard a picture of a dress contained in an advertisement as better information than a friend telling her that the dress is pretty.

¹⁴ Durables and nondurables will differ by another important characteristic as well. The value of advertising information to the consumer for a given number of advertising messages will be greater for durables than nondurables. However, this consequence will produce ambiguous effects on advertising expenditures. The lower value of advertising information to the consumer for nondurables will reduce the number of advertising messages that consumers receive for nondurables; but the low value of advertising information to the consumer will also increase the expenses to the producer for every message that the consumer does receive.

ing information is better for search goods than it is for experience goods, whereas the information of relatives and friends is worse for search goods than it is for experience goods.¹⁵ Hence, advertising information will compete more effectively with the information of guides in the case of search goods.

I find a significantly higher average advertising sales ratio for nondurable than durable experience goods no matter which of the alternative classification procedures I use for experience goods:

Classification I: $\bar{X}_{DE} = 2.293$, $\bar{X}_{NE} = 4.085$, $t = 1.92$;

Classification II: $\bar{X}_{DE} = 2.187$, $\bar{X}_{NE} = 4.085$, $t = 1.97$;

Classification III: $\bar{X}_{DE} = 2.177$, $\bar{X}_{NE} = 4.085$, $t = 2.028$,

where \bar{X}_{DE} = arithmetic mean advertising/sales ratio for durable experience goods; \bar{X}_{NE} = arithmetic mean advertising/sales ratio for nondurable experience goods; t -values are computed for tests of the difference between two means and are significant at the 5 percent level with a one-tail test procedure. For search goods the sample size is too small for any significance test, but the cursory evidence points to the reverse relationship: higher advertising/sales ratio for durables than for nondurables.

With British data, Doyle (1968) also finds an inverse relationship between durability and advertising/sales ratios. But since Doyle did not make any distinction between search and experience goods, he did not observe that that relationship was confined to experience goods.

Doyle (1968) observes one more relationship that can be explained by advertising's role as information. He finds a significantly negative relationship between advertising/sales ratios by product and the unit price of that product, where the unit is defined roughly as the quantity that is ordinarily purchased at one time, for example, one car, one pound of coffee, etc. A low unit price will mean some combination of the following: high frequency of purchase or low total expenditure on the commodity.

I have already shown why there should be a close relationship between high frequency of purchase and advertising expenditures. Because the classification is so broad, however, the durability measure does not catch all of the effect of frequency of purchase on advertising. So even when durability is explicitly considered in the multiple regression, part of the relationship between unit price and advertising will be attributable to the relationship between price and frequency of purchase.

The relationship between unit price and total expenditures on a product will also yield a negative association between unit price and advertising. The greater the total expenditures of consumers for a product, the greater

¹⁵ It can be demonstrated that the correlation of consumer preferences is lower for search goods than for experience goods.

the anticipated variance of utility to consumers of brands of that product. In consequence, when consumers spend a lot for a commodity they will tend to use better—but more expensive—information than advertising: to wit, the guidance of relatives and friends or consumer magazines. Doyle's evidence, then, provides additional support for my explanation of the impact of durability on the advertising/sales ratio. Of course, this is hardly conclusive evidence. Only the cumulative impact of additional studies can produce evidence that could be even remotely so characterized.

Deceptive Advertising

In the preceding pages I have given scant attention to deceptive advertising, though, obviously, deceptive advertising exists. We have seen that some deception will occur even in the case of search qualities, where the consumer has the most market power over the content of advertisements. But the amount of deceptiveness in advertising can be easily exaggerated if one simply looks at the incentives of advertisers to deceive without considering the incentives of consumers not to be deceived. The circumstances under which advertisers have the greatest incentives to deceive if consumers believed them are precisely the circumstances under which consumers would be least inclined to believe advertising. Deception requires not only a misleading or untrue statement, but somebody ready to be misled by that statement.

One possible source of deceptive advertising is consumer confusion. As long as consumers followed the decision rule: believe an advertisement for experience qualities when it tells about the functions of a brand; do not believe the advertisement when it tells how well a brand performs that function—the consumer will be rarely deceived. But there is no guarantee, of course, that consumers will always use that decision rule.

There is another important source of deceptive advertising: the law. Whenever a law on advertising practices is moderately enforced, deceptive advertising is sure to occur. Take, for example, the law prohibiting the mislabeling of the fabric content of clothing. If that law is sufficiently enforced, consumers will believe that a clothing label is usually correct. This will provide an incentive for some manufacturer to mislabel—unless the law is enforced so vigorously that nobody gains from breaking it—a nonoptimal level of law enforcement (Becker 1968; Stigler 1970). In the absence of the law no one could trust any clothing label that it was not in the self-interest of the producer to specify correctly. Hence these clothing labels, though incorrect, would not deceive many people.

The law increases deceptive advertising in another way. Consumers are unlikely to be legal experts. Some, therefore, are likely to believe that certain forms of deceptive advertising are prevented by law when, in fact, they are not. It is not clear that broadening the definition of fraudulent

advertising would solve this problem. The more the law protects against fraud, the more people think the law protects against fraud. Misinterpretation of the law's domain will exist, no matter how extensive that domain.

Why, then, would the police power of the state ever be invoked against "deceptive" advertising, since it is quite possible that these laws increase rather than decrease deception in advertising? These laws can accomplish something. They can—at a cost—make more information available to the consumer. Consumer market power reduces deception by consumer distrust of any statement about which it is in the self-interest of producers to deceive. As we have seen, for experience qualities this narrows considerably the information available to consumers from advertising. Some people might deem it important that other information be made available from advertising, that consumers, for example, be able to determine the fabric content of their clothing. Laws can achieve this objective at the price of both enforcement costs and costs to the consumer of the elimination of possible memorable sources of indirect information.

These laws will be relevant almost exclusively to the advertising of experience qualities, since, even without laws, advertising for search qualities provides fairly complete information about the properties of the brand being advertised. Deceptive advertising will be concentrated where the laws are concentrated—almost exclusively in the advertising of experience qualities. There is evidence that supports this contention. Though I find it unsatisfactory, let us use for the moment the Federal Trade Commission's criterion of what constitutes deceptive advertising. Whatever its shortcomings, it has developed independently of the desire to generate data that would either support or reject hypotheses of economists. For the first 6 months of 1965 the Federal Trade Commission found 58 advertisements deceptive about the quality of the product (as distinguished from its price).¹⁶ All were advertisements about experience qualities (U.S. Federal Trade Commission 1970).

Clearly, then, there is some deceptive advertising. The only empirical

¹⁶ The Federal Trade Commission did find a number of deceptive advertisements related to price. Ordinarily the price of an article is known prior to purchase. In all cases of deceptive advertising about price, however, the deceptive advertising was about price characteristics that would not be discovered prior to purchase. When payment is postponed, the consumer need not know the price before the purchase. This offers a firm an opportunity to place terms in the contract about which a large proportion of consumers would not be aware prior to purchase. The Federal Trade Commission judged three of these cases in 1965 (U.S. Federal Trade Commission 1970). The other category of deceptive price advertising found by the Federal Trade Commission was the advertisement of a deceptively high regular price (six of these cases in the first 6 months of 1965). In purchasing the good, the consumer usually knows the purchase price but not the regular price. In consequence this deception is not something that would be revealed to the consumer prior to purchase. (The basis for the deception is that consumers often use regular price quotations to economize on search.)

question is one of the magnitude of this phenomenon. My analysis up to now has given little weight to deception in advertising. What changes in this analysis are required if deception is an important rather than an unimportant part of advertising?

Surprisingly, this phenomenon would have little impact on the major conclusion of my analysis. Look again at my demonstration that brands with the lowest P^* s (price/utility) have the greatest incentives to advertise. It does not require intelligent consumer response to advertising—though it provides a basis for such intelligent response. Consumers who actually believe paid-for endorsements are the victims of the most benign form of deception. They are deceived into doing what they should do anyway. In consequence there should not be much difference between the behavior of those who respond to advertising because they are intelligent, and the behavior of the deceived. Under these circumstances it is both exceedingly difficult and not very important to put the deception hypothesis to the test.

This discussion of the deception hypothesis helps explain why economists have been so long deceived about the character of advertising. It does not pay consumers to make very thoughtful decisions about advertising. They can respond to advertising for the most ridiculous explicit reasons and still do what they would have done if they made the most careful judgments about their behavior.

Whatever their explicit reasons, the consumers' ultimate reason for responding to advertising is their self-interest in so doing. That is, it is no mere coincidence that thoughtful and unthoughtful judgments lead to the same behavior. If it were not in consumer self-interest to respond to advertising, then consumers' sloppy thinking about advertising would cost enough that they would reform their ways.

The learning required of consumers in this case is not very complicated. Advertised endorsements have been used for a long time. During this period the consumer, his parents, and his grandparents have consumed countless quantities of advertised and nonadvertised brands. If consumers were losing out by trying advertised products, they would have had an enormous number of opportunities to discover this fact.

Many economists have felt that other consumers think quite imprecisely about advertising—and well they might. But this superficial observation had led economists, but not consumers, astray. Economists have failed to see that consumers' response to advertising persists because of the underlying information role of advertising.

Summary and Conclusion

This paper has attempted to show the way in which advertising as information operates. I have contended that there is a basic difference in the

character of the information conveyed by advertising for search and experience goods. For search goods advertising's information is direct. For experience goods the information conveyed is dominantly indirect—simply that the brand advertised. I have shown that this difference in the character of information leads to greater advertising expenditures for experience goods than search goods and greater marginal revenues to the consumer for search goods than experience goods. These implications were found satisfied by the data.

This analysis has not examined the totality of advertising's operation. I have not looked at the relationship between advertising and frequency of purchase of the advertised good—in contrast to brand. For example, food advertisements often contain recipes which provide information for the use of the good in question. Though this may be an important part of advertising's activity, it is irrelevant with respect to the set of implications examined in this article.

There is another possible function of advertising which I have not analyzed because I do not know how: advertising's impact on a consumer's utility function, holding information constant. The change-in-taste idea cannot be effectively tested because no real theory about taste changes has been developed. Fortunately, one does not need such an idea to explain the major features of advertising behavior.

It should be perfectly obvious to anyone who has read this article that an enormous amount of work on advertising still remains to be done. On the theoretical side I have not provided a general equilibrium solution for the amount of advertising expenditures (in particular I have not solved for m in eq. [7]); on the empirical side I have not explained a substantial portion of the variance of advertising/sales ratios by industry. The focus of this paper has been neither to develop a complete theory of advertising nor to present a complete multiple regression analysis of advertising's empirical behavior. Rather, the emphasis in this paper has been to develop a theory of advertising that is both reasonable and productive. The productivity of this theory does not depend upon its completeness (as partial equilibrium analysis in general attests.) A theory is productive if it can generate implications that are consistent with real-world behavior. The theory developed in this article satisfies that requirement. That this theory makes sense out of a wide range of empirical phenomena suggests that it has caught the essence of advertising behavior, that further theoretical (or empirical) work would not vitiate our results.¹⁷

¹⁷ For example, it has been suggested that the equilibrium that I envision cannot be stable, that all consumers would tend to shift to the better-advertised brand until that brand had all the customers. This contrary-to-fact result can easily be prevented by allowing consumer tastes and income to vary. Nonadvertised brands, then, would specialize in minority consumer taste. (While my analysis has for the most part assumed homogeneous consumers for simplicity, its conclusions do not depend upon this assumption.)

Appendix

Producers of equal efficiency have a choice of making a low-utility brand at high unit profits or a high-utility brand at lower unit profits. It is reasonable to assume that the sales from customers who have no information about the brands' utilities will be the same for the two brands. But consumers will tend to repeat the purchase of higher-utility brands. In consequence, the expected sales of the high-utility brands will be greater. In equilibrium, the total profits of equally efficient firms will be the same whether they make a high- or a low-utility product if firms of this level of efficiency continue to produce both. This implies that the profit generated from the average individual making a purchase without information will be the same for both the high- and low-utility brands. (Since both profits and number of customers with no information are assumed to be the same for both brands, the ratio of the two must be the same.)

Assume, for the moment, that advertising merely increased the probability of a person's making an initial purchase of a brand without any impact on the conditional probability of a repeat purchase given an initial purchase. Then high- and low-utility brands would have equal incentives to advertise, for the marginal probability of a repeat purchase would increase in the same proportion as the probability of an initial purchase.

$$P(R) = P(I) P(R/I), \quad (A1)$$

where I = initial purchase, R = repeat purchase. With $P(R/I)$ constant, $P(R)$ increases proportionately with $P(I)$. This implies that the average new customer generated by advertising would yield the same revenue to the firm as did the average old customer with zero information for both high- and low-utility brands. Unless costs behaved in a very peculiar manner, this would imply that the profits generated by advertising were the same for the two brands, since the average old customer with zero information produces equal profits for the two brands.

Why should this not be the state of affairs if advertising were simply informational? After purchasing (and using) a brand, the consumer does not require advertising as a clue to the hidden qualities of a good. He can assess these hidden qualities directly. Why, then, should advertising have any impact on the conditional probability of a repeat purchase?

A simple mechanism that produces this impact is the process of consumer memory. The average consumer uses a lot of different products. It costs him something to remember the brands of these products that he tries. The cost is smaller the more familiar the name of the brand. Advertising makes brand names familiar. We would expect, therefore, the consumer to remember a higher proportion of advertised brands that he has tried than unadvertised brands. Indeed, there is evidence that this phenomenon does, in fact, operate. The ratio of the recalled sales of advertised brands to recalled total sales of a product is higher than their actual market share (Sudman 1962).

This process should have an impact on the conditional probability of a repeat purchase. A necessary condition for a repeat purchase made deliberately is that the consumer remember the name of the brand of which he wishes to make a repeat purchase. But if he remembers the name of the brand, he will not repeat his purchase by mistake. For sufficiently low-utility brands, a consumer who remembers the name of the brand will have a lower conditional probability of a repeat purchase than if he did not remember the name of the brand. For sufficiently high-utility brands, the reverse will be the case.

For a high-utility brand, advertising will produce a greater percentage increase

in the marginal probability of a repeat purchase than its impact on the probability of initial purchase, since both terms on the right in equation (A1) increase. Since we assume the impact of an equivalent dose of advertising on the probability of initial purchase to be the same for low- and high-utility brands, it follows that the producers of high-utility brands have a greater incentive to advertise than the producers of low-utility brands.

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