

**NEW AND USED CARS AS CONSUMER ALTERNATIVES**

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by

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## BACKGROUND OF THIS PAPER

This article is based on research done at the Bureau of Business Research, Graduate School of Business Administration, University of Michigan, under a grant from the Automobile Manufacturers' Association to support the project on Evolving Competitive Aspects in Major Industries.

## ABSTRACT

This paper deals with the competition between new and used cars when such competition is defined on the basis of consumers' perceptions of the products as alternatives. Aggregate forecasting studies and segmentation analyses of demand in the automobile market are examined. The author concludes that such studies have failed to speak directly to the issue of competition between new and used cars. He proposes a collection of new data designed to measure the extent to which these two product categories are viewed as alternatives in the purchase decision and the factors which predict whether or not an individual will be in such a behavioral market segment.

## Introduction

In a recent working paper, Root and Sylvester argued that a more market-oriented approach should be taken in defining the nature and extent of competition in the automobile industry. <sup>1/</sup> This approach uses the consumer's perception of the choice and alternatives available to him in the purchase decision process as the major determinant in isolating the competitive configuration of the market. In so doing, it tends to avoid the application of structural benchmarks such as industry concentration ratios -- benchmarks which industry spokesmen, in particular, claim do not measure the breadth of the competitive challenge which firms in the industry face.

In the earlier paper we confined our discussion to the application of this approach to the purchase decision process for new cars in which the buyer is assumed to be weighing the benefits of one new car against other new cars. No attempt was made to discuss elements of interindustry competition (car versus noncar expenditures) or the possible competition of new cars and used cars. Using the same conceptualization of competition which was employed in the earlier study, this paper addresses the latter question.

It can be argued that manufacturers are well aware of the possibility of competition between new and used cars. General Motors Corporation, in speaking to the issue of measuring competition in the industry, contends:

The sellers of new cars are subjected to further competitive pressure from the presence of used cars in highly active markets. This requires continuing product improvements by new car manufacturers and effectively limits new car prices. . . .

The availability of used cars increases the range of product choice for the customer and influences the entire structure of car prices. There is a substantial area of price overlap between new and used cars. . . .

While every used car is not an acceptable alternative to the purchase of every new car, nevertheless, the competitive interaction between new and used cars is continuing and pervasive. This interaction is an important part of the business that has generally been ignored in "concentration" measures which purport to show a direct relationship between number of suppliers and competition. 2/

While this view stresses the belief that behavior of firms in the industry is formulated primarily as a response to consumers' choice processes, it offers nothing in the way of empirical proof that buyers consider the new and used products viable alternatives. Such a conceptualization on the buyer's part is the keystone to the definition of competition offered by this study, and it is my contention that empirical evidence for its existence has not been forthcoming from past analytical

work. Therefore, an immediate objective of this paper will be to make the case for a new collection of data geared specifically to this issue.

The question of the interface between the new and used car markets has been discussed by a number of analysts. The fact remains, however, that very little work has been directly concerned with the issue of competition between new and used cars. What little has been done has come rather indirectly from studies with different objectives. Consequently, we have a fairly limited body of knowledge about this question -- especially knowledge which is anchored on an empirical base.

It is easiest to categorize the contributions of past research to the study of competition between new and used cars into two separate areas. These may be titled demand studies and segmentation studies. This separation is not intended to imply an independence between these areas; segmentation studies are, after all, a specific type of demand analysis. Instead, the categorization is based primarily on the differing objectives of the analysts involved.

In this paper I have included under demand studies those in which the dominant interest of the researchers is the prediction of the overall level of demand for automobiles, either for a given year or over time. Segmentation studies include those in which researchers have taken a more microanalytical view and have as their major objective the prediction of automobile purchases by individual spending units.

## Demand Studies

A number of very thorough analyses of demand for automobiles have been made by various researchers. While each analyst had a somewhat unique approach, it is possible to make generalizations about certain basic approaches which they employed. <sup>3/</sup> One avenue of investigation, employed by Roos and von Szeliski, <sup>4/</sup> Chow, <sup>5/</sup> and Suits, <sup>6/</sup> uses aggregative economic time series to predict aggregate stock demand for automobiles or demand for new purchases. Other studies, frequently referred to as population analyses, postulate that the long-run trend of automobile output may be studied via examination of the automobile population itself, especially of the structural parameters of stock growth rate and useful life. <sup>7/</sup>

It is not my intent to explore the predictive accuracy of the analytical approaches used in the studies referred to above. What is of interest is what they add to our understanding of the competition between new and used cars and, on this subject, they offer little. I do not mean to imply that, because the great majority of these studies involve the estimation of demand for new cars, the used car market is not discussed. On the contrary -- used cars are included in all these analyses. Donald Moore, in citing the study made of demand by Roos and von Szeliski in 1938, indicated that of 28 nonprice variables influencing the demand for new cars, 7 relate to the used car market. In his words, "the number, age, price, condition, maintenance cost, scrapping rate, and dealer evaluation of the used cars in existence will affect the number of new car sales possible at a given price." <sup>8/</sup>

One reason these studies do not meet our purposes is that they approach the used car market as if it were a facilitating market. That is, the used car market is viewed as an organized market which functions in a way that makes the new car market more viable. From this standpoint, used car prices are significant only to the extent that they relate to trade-ins on new car purchases; the purchase of a used car is treated as a short-run stock adjustment and the possibility of continuing competitive interplay between new and used cars is not treated as a central point of discussion.

Another real difficulty with these studies, from this point of view, is that they do not adequately cover buyer behavior, particularly the consumer's choice process. David Huang, in commenting on studies which employed aggregative economic time series, made the observation that "while investigators in these studies were interested in consumer behavior, it would seem likely that the aggregation problem thwarted their efforts to learn much about it." <sup>9/</sup> Since our approach to the definition of competition is contingent on an examination of the consumer choice process on a microanalytical basis, this shortcoming proves very serious.

In some studies there are statements which come closer to recognizing new and used cars as competitive alternatives, but their logic is fairly general and indirect. A frequent point of reference in demand studies is the volatility of the new car market relative to general economic conditions. While some of this might well be the manifestation



of buyers' ability to defer demand for a durable good, it may also imply that some buyers substitute used cars for new cars.

In 1938 S. L. Horner stated this proposition as follows:

Thus, when national income turns down, dealers usually have too many used cars in stock which have to be liquidated. The public buys used cars on balance, and consequently sharply decreases its purchases of new cars. And when national income turns up after a prolonged decline, consumers start selling used cars on balance, thus obtaining additional purchasing power for new cars. <sup>10/</sup>

The 1968 statement by General Motors makes the same point. <sup>11/</sup>

It cites the type of data found in Figure 1, noting specifically the effect of an uncertain economic outlook in 1958 and 1961 on new car sales and the ratio of used to new cars. Once again, the implication is that some buyers are substituting used cars for new cars in the purchase decision.

This substitution is also noted in other demand studies, most notably that of M.J. Farrell. <sup>12/</sup> In a unique departure from other demand analyses, Farrell stressed the fact that the market for automobiles is not homogeneous, but consists of a set of interrelated markets for a series of close substitutes. His submarkets are delineated by age groups of automobiles. In discussing the substitution of cars from different age groups in the market following World War II, he states:

Fixing an unduly low price for new cars will also have the effect of forcing up the prices of used cars, for many people with quite low values of  $\eta$  will buy new cars, and the people they displace, having higher

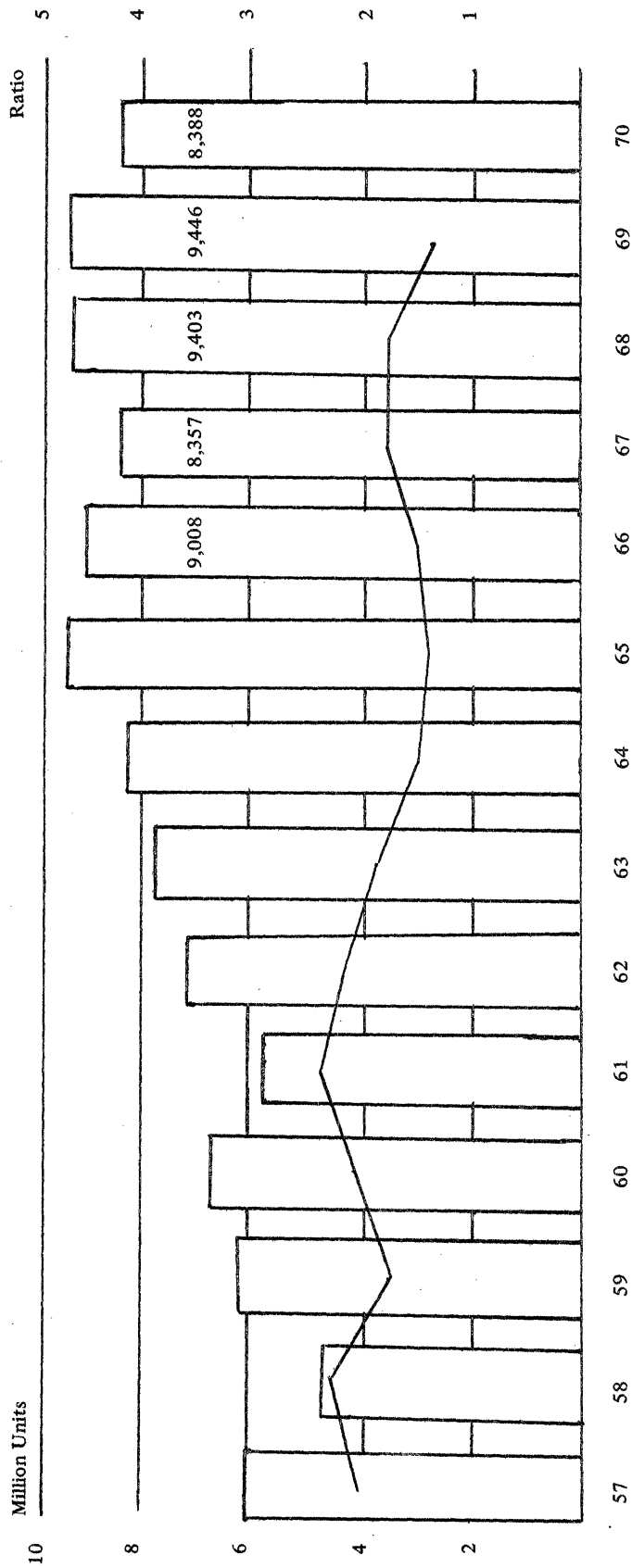


Fig. 1. Industry new car retail sales in the United States and ratio of used to new car sales, 1957-70. (Source: Automotive News 1971 Almanac and the University of Michigan Survey Research Center.)

values of  $\eta$  will bid up the price of two-year-old cars above the equilibrium level, and so on. <sup>13/</sup>

The  $\eta$  which Farrell refers to is a continuous variable which is the product of an individual's income and a constant which represents his taste. That this taste factor is dynamic over time is recognized by Farrell in statements such as, "there was, in the immediate post-war period, a marked increase in the social acceptability of very old cars. . . ." <sup>14/</sup> Farrell also underscored the point that this taste factor included many elements such as family size, social class, and education.

Why are these contributions indirect and insufficient? Those studies which draw attention to the potential substitutability of used cars for new under adverse economic conditions rarely discuss who these buyers are likely to be other than implying that they are in a group whose demand for new cars is highly income elastic. More importantly, in restricting substitution to periods of economic downturn, they ignore the possibility that there might be a significant number of buyers in this overlap group at all times and that disposable income is not the only major influential variable.

What I propose to do is elaborate on Farrell's  $\eta$  on a micro level. His conceptualization of the market is most useful. To some extent, the proposed study is designed to investigate the effect of some of the components of the taste factor which he employs. Thus the study will involve a search for factors which might identify those individuals who sensitively consider the appeals of both new and used cars in their purchase decision. Additionally,

this study will use cross-section analysis rather than Farrell's time series analysis.

### Segmentation Studies

As noted previously, segmentation studies are legitimately regarded as demand studies. They have been isolated here because they have objectives more limited than those of the demand studies referred to earlier and they make more specific contributions to the issue of competition between new and used cars.

There have been a number of segmentation studies of the automobile market with a wide variety of goals. However, the common thread which connects them to as well as differentiates them from aggregate demand studies is that their ultimate goal is to derive a conditional probability of purchase for specific economic units with certain well-defined characteristics.

Within this broad framework, we can see how many different types of studies are possible. While they all predict behavior, the nature and scope of the dependent and independent variables change considerably from study to study. De Janosi, in his doctoral dissertation, attempted to predict new car purchases using demographic, socio-economic, and attitudinal variables. <sup>15/</sup> His results indicated that attitudinal variables have the strongest predictive power, the best variable for predicting actual purchase being the expressed intention of buying. Kreinen used socioeconomic variables such as liquid assets and income as well as attitudinal variables to attempt to define used car buyers. <sup>16/</sup>

Peters, using demographic and socioeconomic variables, attempted to predict the behavior of economic units in terms of whether they would purchase no car, a used car, a compact car, an intermediate-sized car, a medium-sized car, a large car, or a foreign economy car. 17/

The type of segmentation study done by de Janosi, in which the ultimate segments are buyers or nonbuyers, perhaps has the closest relation to the demand studies referred to earlier. Again, the primary difference is that de Janosi offers a demand forecast for specific economic units rather than for the aggregate market. The type of segmentation study done by Peters is more commonly associated with this type of research. For this reason, I will rely on it heavily in my discussion.

The market segmentation which Peters refers to -- that is, segmenting the market into groups of buyers of different product offerings -- is considered highly significant in the automobile market. It may be used to explain the rationale of manufacturers' decisions regarding product policy. It has also been advanced as the logic underlying the ability of buyers to cope with the proliferation of makes and models on the market. When used as a guide to product policies, it allows manufacturers to assume that the heterogeneous market is composed of homogeneous subgroups. Each subgroup or segment is assumed to have a relatively distinct demand function in terms of the weight it assigns to product attributes, such functions being determined by a

combination of factors relating to the characteristics of buyers and other circumstances such as income, age, attitudes, need for innovation, and so on.

Using this logic to attempt to explain buyer choice behavior is also fairly straightforward. Given that an individual has assigned certain weights to product attributes when he begins the purchase process, he is frequently able to rule out entire classes of automobiles from consideration very early in the decision process. This exclusion may result from his experience, his image of the product, or some combination of such factors. In any event, rather than being faced with a choice among new and used cars covering the total array of makes and models, the buyer is able to isolate a relatively small number of cars on which he gathers information and from which he makes his final choice. This coping behavior can be considered highly rational in light of the efficient matching of purchase behavior with the buyer's demand function and the decrease in search time and activity which it entails. <sup>18/</sup>

Such logic was illustrated and questioned in the paper by Root and Sylvester. <sup>19/</sup> In that work, the discussion was directed at the question of whether buyers, in fact, limit their alternatives to a single class of new cars in making a decision to purchase a new car. We referred to General Motors data which indicated that this relatively simplistic view of buyer choice was not the case. <sup>20/</sup> We directed specific criticism at two major faults of existing buyer surveys which we used to attempt to answer this question. First, the product classes employed in survey

analyses were not always consistent over various studies or well defined in terms of specific product attributes. Second, the concept of buyers' consideration was not adequately defined in these surveys in terms of whether it was an internal activity only or also involved overt action. It was concluded that new data would be required in order to test the extent of competition between new cars in different product classes. This paper will argue the same point in considering competition between new and used cars. First, however, I will examine some of the results of segmentation studies in order to show the need for and nature of the new empirical data required.

Peters, among others, concludes that it is impossible to attain a high level of predictive accuracy in assigning conditional probabilities which indicate that individual economic units will purchase one new product class as opposed to others. <sup>21/</sup> This failure is not greatly relevant here. One attempt to explain it has centered on criticizing the use of individual rather than group data. <sup>22/</sup> In other cases, the inability to predict behavior can always be blamed on the possibility that the wrong independent variables were used as predictors. <sup>23/</sup> In other words, the fact that membership in segments is not predicted, although unfortunate from the point of view of marketing strategy, does not prove that the segments are not there. Indeed, manufacturers' policies as well as the work of some market analysts still seems predicated on the existence of sharply delineated market subgroups. In spite of difficulties encountered in empirical studies, the remarks of Purnell Benson in 1963

still convey the thoughts of a great number of practitioners and analysts:

Automobile companies have long recognized that the cars and models which they manufacture serve distinctive segments of the market. This product differentiation in the automobile industry has been on the basis of income levels necessary to purchase more powerful cars and upon the basis of usage. . . . 24/

Two exceptions to the general inability of segmentation studies to achieve predictive accuracy have been cited by analysts such as Peters.

He states:

The two exceptions to the above answer are the used-car market and the no-car families. In both time periods the variables taken simply allow one to do a very fine job of distinguishing the no-car families from those who own automobiles. They do not do as complete a job with the used-car market but they do a good job of segmenting off this market in both time periods. [Emphasis added. ] 25/

In the same vein, Akers has found that income, education, and age are statistically significant predictor variables in differentiating buyers of new cars from buyers of used cars. 26/

De Janosi uses market experience as the overall, critical explanatory factor behind this phenomenon. In his view, buyers new to the market tend to purchase older used cars. They progress to newer used cars until, in their third or fourth purchase experience, they become part of the new car purchaser group. 27/ Whether this implies that they have learned the reduced risks of buying a new car, that their financial position has improved, that they have experienced a change in life cycle, or some combination of factors, is not discussed in his work. His view



is, however, generally consistent with the view shared by most analysts that the status connected with car ownership has a positive effect on new car purchases. 28/

This latter point has been discussed by Huang under the general heading of a "taste effect." In his words:

How the taste affects the automobile purchase may be said to work roughly in the following way. An owner of a recent model car which was bought new may not look at the used-car market at all. His taste may be such that he prefers to trade only in the new-car market and frequently does so. However, there may be persons who do not wish to buy new cars even though they can afford them. Instead, they prefer to buy good used cars, possibly cars two or three years old, and they buy infrequently. It is possible, then, that the ownership of a car purchased new may be correlated with the purchase of a new car, and the ownership of a car purchased used may be correlated with the purchase of a used car. These aspects of person-to-person differences may be regarded as due to the differences in taste. 29/

It is my belief that the results reported by Peters and Akers and the interpretations offered by de Janosi and Huang are not particularly germane to the discussion of the extent of competition between new and used cars when such competition is defined on the basis of buyers' perceptions and considerations. If the segmentation studies definitively showed that a high conditional probability that a buyer would purchase either a new or used car accurately categorized buyers into groups considering only new or only used cars, then a lack of direct competition between the two products could be conceded. How-

ever, since the studies deal only with the ultimate choice made by a buyer rather than the totality of the behavior leading to that choice, these studies are not acceptable as indicative of a lack of competition as we have defined it.

Obviously an individual, if he buys an automobile at all, will buy either a new or a used car. This ultimate choice is, however, only one facet of the total purchase decision process -- that facet which represents the culmination or result of the buyer's search process, information seeking, trade-offs, and so on. Ultimate buyer choice is the dependent variable on which previous segmentation studies have been based. But this study, in attempting to measure the competition between new and used cars, seeks to determine the buyer's conceptualization of these two products during the purchase decision process. Such an approach to segmentation is thus more consistent with the ideas presented by Dommermuth when he argues for a method of market delineation based on differences in buyers' search activities. <sup>30/</sup> Specifically, we are heeding the advice of George Brown, who states, "For the future, research on decision making with respect to automobile purchasing should be directed toward the decision process rather than toward the outcome of the process." <sup>31/</sup>

The important market segments, then, are not groups of spending units with a specific conditional probability of purchasing a given type of product, but are rather groups of spending units which exhibit a particular pattern in considering product alternatives in the purchase

decision. The most important question is whether or not a market segment of buyers exists who consider new and used cars as alternatives in the decision to purchase an automobile.

Questions included in the 1970 Survey of Consumer Finances<sup>32/</sup> were a first attempt to explore the issue of competition between new and used cars. These questions concerned the alternatives considered by recent automobile purchasers (both new and used) and the alternatives to be considered by those who expected to purchase in the next twelve months (both new and used). Some of the data returned are presented in Tables 1 and 2, where spending units are categorized by income.

Table 1 indicates that approximately 20 per cent of recent buyers (105 of 513) looked at both new and used cars in their most recent purchase. Table 2 indicates that approximately 28 per cent of those who expected to buy (70 of 245) in the next twelve months would consider both new and used cars in their purchase decision. It can be noted that in each case the largest proportion of those considering both kinds of cars occurred in income classes in the \$10,000-14,999 range.

These tables are presented primarily for illustrative purposes. Data such as these were collected in order to ascertain whether a behavioral market segment such as I have described is large enough to warrant further investigation. The data were not meant to provide the basis for subsequent analysis. To begin with, the concept of buyers' considerations was not adequately defined in the survey. Moreover, other

TABLE 1

Number of Recent Purchasers (by Income Class) Who Have Considered Various Alternatives  
in Buying a Car within the Last 12 Months

Alternatives	Total Family Income										Totals
	Less than \$3, 000*	\$3, 000 - 4, 999	\$5, 000 - 7, 499	\$7, 500 - 9, 999	\$10, 000 - 14, 999	\$15, 000 - 19, 999	\$20, 000 - 24, 999	\$25, 000 or more			
Bought new, only looked at new	1 (0.5)	6 (3.3)	16 (8.7)	22 (12.0)	67 (36.6)	40 (21.9)	16 (8.7)	15 (8.2)	183 (100.0)		
Bought used, only looked at used	14 (6.2)	23 (10.2)	50 (22.2)	40 (17.8)	49 (21.8)	36 (16.0)	5 (2.2)	8 (3.6)	225 (100.0)		
Bought new, looked at used	1 (2.9)	2 (5.7)	2 (5.7)	4 (11.4)	16 (45.7)	6 (17.1)	3 (8.6)	1 (2.9)	35 (100.0)		
Bought used, looked at new	7 (10.0)	3 (4.3)	11 (15.7)	9 (12.9)	20 (28.6)	14 (20.0)	3 (4.3)	3 (4.3)	70 (100.0)		
Totals	23	34	79	75	152	96	27	27	513		

\* Including zero and negative.

Source: 1970 Survey of Consumer Finances (Ann Arbor, Mich.: Institute for  
Social Research, University of Michigan).

TABLE 2

Number of Purchasers (by Income Class) Who are Expected to Consider Various Alternatives in Buying a Car within the Next 12 Months

Alternatives	Total Family Income							Totals	
	Less than \$3,000*	\$3,000 - 4,999	\$5,000 - 7,499	\$7,500 - 9,999	\$10,000 - 14,999	\$15,000 - 19,999	\$20,000 - 24,999		\$25,000 or more
Expected to consider new only	0	3	15	17	29	19	4	7	94
Expected to consider used only	8	11	13	15	15	15	1	3	81
Expected to consider both new and used	3	3	9	13	20	13	5	4	70
Totals	11	17	37	45	64	47	10	14	245

\* Including zero and negative.

Source: 1970 Survey of Consumer Finances (Ann Arbor, Mich.: Institute for Social Research, University of Michigan).

necessary and pertinent information was not collected in the survey. Finally, since the survey sample included a large number of non-buyers, the ultimate size of some data cells is too small for meaningful analysis. Thus, while this surface examination provides an impetus to our study, a more purposeful collection of data is still necessary.

### Implications of the Study

A relevant question which can be raised here concerns the reasons why such a segment -- one made up of individuals who view new and used cars as viable alternatives -- would exist in the market. At this point, we are only able to offer educated guesses on this subject. It is possible that individuals in this group represent a critical factor in the body of opinion about manufacturers' style changes. Rather than accepting new styles as inherently important (as the buyer who considers only new cars might) or rejecting them as patently superficial (as the buyer who considers only used cars might), perhaps this group takes a much more balanced view of style and performance. <sup>33/</sup>

In this same vein, a number of variables might be good predictors of membership in this market segment and might also offer insights into the rationale of such buyer behavior. Perhaps economic constraints imposed by the general economic climate are of major importance, as was implied by the data in Figure 1. Income might be a powerful explanatory variable. Stage in life cycle could also be

important. Experience in purchasing automobiles, the idea suggested by de Janosi's continuum of buyer behavior, might be a critical factor. In the context of the demand studies, perhaps buyers in this segment are in some "gray area" where the existing stock of automobiles may be raised to optimal by purchasing either a new or a used car. This segment might also be delineated on the basis of whether the economic units are multiple car owners or not.

While we can only conjecture about the logic behind the existence of this market segment, we are on firmer ground in discussing the implications which its existence has for the automobile industry. To the extent that there is such a segment, there is support for manufacturers' contentions that concentration ratios do not adequately measure competition in the market. In providing an alternative to the buyer, the used car market would put pressure on manufacturers to style and price their new cars with careful attention to buyers' wants and needs. This would again help to establish the manufacturers' contention that the market is controlling rather than controlled.

The results of the study could have strategy implications for manufacturers and dealers and could also facilitate the social evaluation of strategies pursued by manufacturers. If buyers in this segment exhibited strong loyalty to certain makes and appeared to move through this buying phase on their way to becoming "new car only" purchasers, perhaps manufacturers should become more interested in promoting sales of their used cars as a means of expanding future markets rather than

promoting used cars merely to facilitate present sales. If these buyers are less oriented to style than buyers who consider only new cars, perhaps a manufacturer can compete more effectively by using a different promotion strategy for this group. Dealers might also be able to compete more effectively by integrating their new and used operations to a greater extent, and thus better match buyers' concepts of alternatives. This latter point is a good illustration of the "performance" orientation of this view of competition.

Finally, there is a possibility that segmentation research of this nature might make a significant contribution to increasing the predictive power of independent variables in segmentation research which uses the ultimate buyer choice as the dependent variable. If, in fact, there is a sizeable group of buyers who seriously consider both new and used cars in the purchase decision, their presence in a sample of purchasers could produce enough "noise" in the data to reduce the predictive power of independent variables in delineating new versus used car buyers. Thus, research of the type described in this paper might well lead to the suggestion that such a group should be dropped from a sample being used to predict market segment membership in terms of ultimate buyer choice.



## FOOTNOTES

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