

THE RELATION OF CAR OWNERS' OPINIONS TO
CERTAIN CHARACTERISTICS OF THE OWNER
AND HIS CAR

Thesis for the Degree of M. A.
MICHIGAN STATE UNIVERSITY
Peter Wing Hemingway
1957

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**THE RELATION OF CAR OWNERS' OPINIONS TO CERTAIN
CHARACTERISTICS OF THE OWNER AND HIS CAR**

By

Peter Wing Hemingway

A THESIS

**Submitted to the College of Science and Arts
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ABSTRACT

This investigation was designed to study the interrelations between car owners' opinions and certain characteristics of the car owners and their cars.

Two forms of a questionnaire were mailed to a random sample of 800 Ingham County, Michigan, car owners, 400 receiving each form. 122 respondents returned Form A questionnaires. These were analyzed in terms of responses to individual features and to groups of features on the questionnaire.

Opinions were scored on each feature for each respondent. The sum of these scores for each group of features was obtained for each respondent. These sums were used as indices of the respondent's satisfaction with his present car, of his desire for different features in his next car, of approval of trends in automotive design, and of the extent to which certain features and trends contribute to safe operation of a car.

The relationship between certain aspects of response and certain other variables were tested by appropriate non-parametric statistical techniques. The results indicated that the opinion of a particular feature is to some degree a function of the make and model of car owned, the height, weight and age of the respondent, distance driven per year, the age of his car and his intention to buy or not buy a new car. Moreover, the results indicated that satisfaction with the present car was independent of how car owners felt about trends and safety, but there was a small negative relationship between satisfaction with

the present car and the desire for different features on the next car. Satisfaction with the present car was also related to loyalty: respondents planning to buy the same make of car attaining significantly higher satisfaction scores than those planning to buy a different make of car.

The next car score showed significant relationships with the age of the respondent and distance driven per year, as well as a high relationship with the scores on trends and safety.

The trends score showed a high relationship with the age of the respondent and with the model owned, as well as with the safety scores.

The safety score showed a high relationship with the marital status of the respondent: married persons attaining significantly higher scores than unmarried persons.

Certain owner characteristics were also related; age showing a significant relationship with plans to buy a new car and distance driven being significantly related to the sex and the marital status of the respondent, his plans to buy a new car, and the age of his present car.

All four kinds of scores were also related to the way respondents expressed themselves with reference to the statements section of the questionnaire.

However, there was no relationship between various characteristics of the car owner or his car and the way in which he ranked certain features in a paired-comparison section of the questionnaire.

The principle conclusion based on the study is that, on the whole, opinions, with reference to features and groups of features, are related to the characteristics of the car owner and his car.

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INTRODUCTION

The primary purpose of this study was to investigate the relationship between consumers' opinions about a product and certain characteristics of the consumer or of the specific product that he uses. The method proposed for obtaining the data required was a mail questionnaire sent to a sample of consumers of a particular product.

It was assumed that the manner in which a person responds to a question about his satisfaction with a particular feature of a product is a function both of the person and of the product. Thus the degree of satisfaction indicated for a specific feature or characteristic of a product would depend upon the absolute satisfaction value of that feature and upon the ability of that feature to fulfill the particular demands of that person. It was further assumed that the degree of satisfaction with the product is a function both of the degree of satisfaction with the individual features making up the product and the perceived importance of these features.

The product selected for study was the car. The reasons for utilizing this product for the study were many and varied. Primarily, it was felt that the car is of major interest and concern to a large segment of our economy at the present time. Any information about the consumers' opinions, both of the car they presently have and of possible changes in the features of cars they may have in the future should be of interest to both the consumer and the producer of the product.

The automobile industry in the United States has grown from an obscure spare-time activity of a few inventors and doodlers to one of the largest single industries in our country in a period of fifty years.

The dynamic and highly competitive nature of this industry has led to the rapid change (and sometimes improvement) of features and characteristics of the car. Every year each firm brings out new models, with claims of sweeping improvement in this or that feature, and advertising and news sources carry the claims and counter-claims to the eyes and ears of the consumer in a continual stream. The basis for this constant change and claim aspect of the industry is of course competition. The only way to sell is to convince the consumer that what he has is obsolete--what he needs is something better--and this or that company is prepared to sell it to him on time!

What is the effect of this all-out attempt to create a desire for new cars and dissatisfaction with what is within a year an obsolete, out-of-date car? Does the consumer really believe that his car, once it is at least one year old, is unsatisfactory? Does he believe that the changes made or proposed are really improvements over what he has? And what characteristics does the consumer or his present car have which are related to what he believes about any one or all of the features of his present car or of trends in newer cars? These are the questions which this study will attempt to answer.

In order to determine a person's degree of feeling about any particular subject, it is possible to merely ask him how strongly he feels about that subject and how much he likes or dislikes, is satisfied or dissatisfied with, is interested or uninterested in, or values or doesn't value that particular subject. But this is often a poor measure--people don't know, they all say it's "o.k.", there is very little difference between people. But it can be hypothesized that a person's overall opinion on a subject is some sort of composite of his opinion

about each specific item making up that subject. This item opinion may be based upon the importance placed upon that item, how that item compares to similar items previously or subsequently experienced, and the amount of improvement felt possible in that item.

Thus, a driver's opinion about how well his car rides may be based upon how important he considers a comfortable ride, how the ease of ride of his car compares with cars he has ridden in before and other cars he has ridden in since he has had this car, and how well he feels a car should ride to be "ideal". The driver who says that his car rides "like a wagon on a railroad" may base this opinion solely on a comparison with an ideal he wishes for.

The sum of these opinions on the individual items may be considered to represent the person's opinion on the subject made up of those items. That is, the degree of satisfaction with a particular feature combined with the perceived importance of that feature forms a unit of the overall satisfaction with the entire subject.

If one considers the features on which a car owner is asked to give his opinion as a sample of the features making up the characteristics of his present car, it may be assumed that, by weighing each feature in terms of both the expressed satisfaction and the expressed importance, then summing these weighted values, a score expressing the owner's overall opinion of his present car may be obtained. Similar scores may be obtained on the owner's overall desire for different or new features on his next car, his overall liking of current trends or changes in general, and his overall evaluation of such trends or changes as contributors to safety.

It should follow that such scores will show predictable relationships with certain characteristics of either the car owner, the car he owns, or both. This study is designed to examine these relationships.

BACKGROUND

There is available a great body of literature dealing with questionnaire methods and techniques and opinion and attitude research in general. However, only a brief survey of those sources which were particularly relevant to this investigation will be given.

The general area of questionnaire studies includes a great deal on methods and procedures, especially in governmental and educational areas, but there is very little specific material to be found on consumer opinion studies other than general discussions of methods and problems. The only specific reference found on surveys of car owner's opinions was an article by Weaver (23). He discusses the methods and motives of the General Motors Consumer Survey, but specific results are not given. It is certainly reasonable to assume that the automobile manufacturers are regularly conducting consumer research, but, as in other competitive fields, the results are not made public in order to maintain trade secrets.

A great deal of literature is available on questionnaire methods. Blankenship (1) devotes an entire book to the methods of conducting opinion research by questionnaire techniques, and Kornhauser (11) gives explicit directions on the construction of questionnaires, including the content, placement and writing of questions, the use of check lists and the advantages and disadvantages of mail and interview methods of obtaining respondents.

The specific use of mail questionnaires has received a great deal of study, primarily of shortcomings in the method, but recent studies have been more uncritical. The returns to be expected utilizing mail

questionnaires are well discussed by Parten (13), results varying widely depending upon the population sampled, the subject matter of the questionnaire, and the mailing method. If the population is heterogeneous and very large, such as all Americans, the returns are generally quite low, from 5 to 20 percent being the usual result when the other factors are not controlled. However, the subject matter plays a large role, with 10 to 20 percent higher returns on subjects of high general interest, other factors being equal. Stanton (18) has shown that the length of the questionnaire plays a large part in the number of returns. A single question post card form was returned by 50.2 percent of the sample, while a 3 page form on the same subject was returned by only 28.3 percent.

The use of follow-up letters and telephone calls can increase returns to well over 90 percent. Stanton (18) found that the use of 3 follow-up letters, plus a personal call to those still not responding gave a return of 94 percent. Waianen (20) found that a telephone call before mailing the questionnaire increased returns by 12 percent.

The use of various inducements to increase returns have shown interesting results. A study by Watson (22) showed an appreciable increase in returns (from 19 percent to 52 percent) when twenty-five cents was enclosed with the questionnaire, but only a small increase in returns (from 9.6 percent to 17.6 percent) when the same amount was to be sent upon return of the questionnaire. Parten (13) suggests the possibility of using large inducements, such as one thousand dollars, on a lottery or prize basis.

The amount and nature of bias in mail questionnaires has been

widely studied, but the results are somewhat conflicting. Reuss (15) found considerable bias in intelligence, education, background and loyalty to the sponsor of the survey between returnees and non-returnees. Shuttleworth (16) reports a similar result, but notes that the bias shifts with the time waited for returns, earlier returns showing the greatest bias. A recent study by Wallace (21) indicates that bias is a function of the sample and is usually negligible for questionnaires of high interest sent to homogeneous samples. He concludes that bias is most common on matters causing defensive or antagonistic responses on the part of the subject.

Clausen and Ford (4) advocate a dual method for reducing bias, utilizing all methods of increasing returns and making corrections and allowances for existing bias. Good and Scates (7), however, point out that returns of even 90% may contain significant bias which is not detectible from examination of the returns.

The methods available for analyzing questionnaire data range from the simple frequencies and differences reported in many polls and surveys to the elaborate scaling techniques used in more theoretical investigations of attitudes and opinions. While the method used depends largely upon the nature and purpose of the study, there is usually a wide choice of possible alternatives. The more common methods are discussed by Blankenship (1) and others, while information on scaling methods as related to questionnaires are covered by Guttman (9) and Hyman (10). Clark and Kriedt (3) present a study on the advantages of using Guttman's scaling method for opinion questionnaires.

The general subject of opinion measurement, especially with ref-

erence to consumer research, is covered in the book by Churchman and others (2), which is a report of a conference on research methods. Day (5) gives a good summary of the various methods used in the more theoretical research, and the article by McNemar (12) gives a critical survey of the shortcomings of the more common methods. The entire subject is well covered in the books by Renner (14) and Parten (13). The paper by White and White (24) presents a good summary on the uses of the results of opinion research in the improvement of products.

The specific statistical methods used in this investigation were based primarily on Guilford's (8) discussion on paired-comparison and ranking methods, which was also used as a theoretical basis for the format of the questionnaire. The two-way coefficient of concordance technique was adapted from a suggestion by Edwards (6) on its applicability to similar data. The specific computation methods for the other non-parametric tests were obtained from Siegal (17).

HYPOTHESES

Hypothesis I - There will be no relationship between the way in which a car owner responds to a group of features and any of certain characteristics of the car owner or the car he owns.

That is, the scores derived from each section of the questionnaire will be independent of: the height, weight, age, sex, marital status, distance driven per year, loyalty, and plans to buy of the respondent; the make, model, company and age of the respondent's present car; scores and responses to other sections of the questionnaire.

Hypothesis II - There will be no relationship between the way in which a car owner responds to any feature and any of certain characteristics of the car owner or the car he owns, even when any other such characteristic is held constant.

That is, the response to any feature on the questionnaire will be independent of: make when model is held constant; model when make is held constant; company when model is held constant, model when company is held constant; age when yearly distance driven is held constant; distance driven when age is held constant; height when weight is held constant; weight when height is held constant; plans to buy when age of car is held constant.

METHOD AND PROCEDURE

The Questionnaire

The questionnaire used in this study was designed by the investigators to give a maximum amount of information about car owner opinions on various features and trends in the development of cars, with a minimum of effort on the part of the respondent. The features inquired about were drawn from a list obtained by surveying advertisements, articles and other sources of information on recent and proposed trends in automotive construction and design. From this list twenty-four features were drawn which were considered most relevant to cars manufactured between 1946 and 1956. These features were listed on the Present Car section, and the respondent asked to check how satisfied he was with this feature as it appears on his present car, and how important this feature is to him. It was felt that the opinion of a car owner about a feature would be a function of the importance of that feature to him. That is, satisfaction or dissatisfaction with a feature thought to be important would indicate a stronger opinion than with a feature thought to be unimportant.

On the Next Car section, twelve of the features in the Present Car section were listed in terms of changes in that feature, along with twelve features or trends mentioned in the sources as current or proposed changes in cars. The respondent was asked to check whether he wanted each feature on his next car, and how important it was that he have each feature on his next car. The attempt was made to use features on this and the next two sections which would represent changes from the features found on the respondent's present car.

On the Trends section, the same twelve features were again listed in terms of possible changes in that feature, along with twelve new features mentioned in the sources as currently popular trends in automotive construction and design. The respondent was asked to check whether he liked or disliked each trend, and how important the trend was to him.

On the Safety section, the twelve present-car features were again listed in terms of changes from the present, along with twelve additional features or trends from the sources mentioned as contributing to the safety aspect of driving. The respondent was asked to check whether he felt each feature increased or decreased safety, and how important he felt each feature is in terms of safety.

The features were then divided into two forms, A and B, each form containing in each section eight of the twelve features carried through all of these sections and eight of the twelve features unique to each section. This allowed an overlap of four of the features in each of the groups on each section on both forms, so that a comparison of the respondents to each form could be made. Thus, each form contained in each of these sections four features common to both forms and carried through all four sections; four features common to both forms but unique to each section; four features unique to each form but carried through all four sections; and four features unique to each form and each section. This made it possible to trace the consistency of responses to the features appearing on all four sections, and the consistency with which the respondents on the two different forms responded to the common items.

To provide additional checks on the consistency of response, both by groups and by individuals, two additional sections were prepared.

The Features, or paired-comparison section, was composed of two sets of five features each, taken from the Present Car section. Each feature was paired with every other feature in its set, and the respondent was asked to check the member of each pair which he liked the best (Form A) or which he thought was most important (Form B). The same pairs appeared on both forms, so that the order of the features in terms of liking and in terms of importance could be compared between the groups responding to the two forms.

The Statements section was composed of features drawn from the first four sections, and put into statements with which the respondents were asked to indicate how strongly they agreed or disagreed. Twelve of these statements were common to both forms, the remainder unique to each form.

The Questions section was included to provide additional information on the features which were most important to the respondents, and as a source of additional features for revising the questionnaire. This section was the same on both forms.

The first page of the questionnaire was composed of questions concerning those characteristics of the respondent and his present car which were desired for the analysis. Although much more information would have been desirable, it was felt that a minimum of personal questions should be asked, to avoid unduly antagonizing any of the respondents. These questions were the same on both forms.

The Sample

The population chosen for this investigation consisted of the registered car owners of Ingham County, Michigan. The 1956 Motor Vehicle

Registrations list was obtained and a random sample of 800 private passenger car owners was drawn from this list, using a table of random numbers. Two lists of 400 owners each were compiled from this master list. One form of the questionnaire (either Form A or Form B) was sent to each one of the 400 owners on each list. While it was not considered that the population sampled was necessarily representative of car owners in general, it was considered to be reasonably heterogeneous in respect to the characteristics studied. Also, as it was not presumed that the returns would be of sufficient quantity to allow the claim of random sampling in terms of the respondent group, it did not matter too much what differences existed between this population and the total population of car owners. It was felt that getting sufficient heterogeneity for a meaningful analysis would provide enough information to indicate whether or not a more adequate technique of sampling would be worthwhile.

The Analysis

The Form A questionnaires which were returned were scanned upon arrival for completeness and the responses tabulated for each feature and characteristic. A scoring system was set up to give a single value for the responses to each feature on each section of the questionnaire. For example, the set Satisfied-Important was judged to represent the strongest degree of satisfaction with a present car feature, while the set Dissatisfied-Important was judged to represent the strongest feeling of dissatisfaction. The remainder of the response sets to present car features were placed between these extremes in the order judged to be most indicative of a continuum of feeling strength ranging from most satisfied to most dissatisfied. The satisfaction scale was used first,

ordering the responses Satisfied, ?, Dissatisfied. The response on the importance scale was then used to order responses within each satisfaction scale, and numbers assigned to each combination, giving a 9 to the combination Satisfied-Important, 8 to Satisfied-?, 7 to Satisfied-Unimportant, 6 to ?-Important, 5 to ?-?, 4 to ?-Unimportant, 3 to Dissatisfied-Unimportant, 2 to Dissatisfied-?, and 1 to Dissatisfied-Important.

A similar scoring system was used on the three other sections having two scales, ordering first along the right-hand scale and using the importance scale to order within each of these categories. Thus, every respondent had recorded a single number from 1 to 9 for each feature on these sections which told what both of his responses were to the feature and which represented as well a measure of the strength and direction of his opinion, 5 being considered the neutral or no opinion point. These scores were then summed for each of these sections, this total being considered the best estimate of a respondent's overall opinion about his satisfaction with his present car (Present Car score), his wants or needs on his next car (Next Car score), his approval of trends (Trends score), and his concern with safety (Safety score).

On the paired-comparison (Features) section, the number of times each feature was picked over a paired feature was recorded, ordering for each respondent each of the features within each set. There were two such sets of five features each.

For the Statements section, each response was assigned a score from 1 to 5 in such a way as to make 5 mean a favorable and 1 mean an unfavorable response.

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The information available allowed the features on all six sections to be ordered in terms of the opinion of the respondents. That is, a feature could be stated to be more or less satisfactory, wanted, approved or contributing to safety than another feature in the same section. Also, the features in each set in the paired-comparison section could be ordered in terms of being more or less liked than another feature in the same set. Each item on the Statements section could be ordered in a single continuum, and the amount of agreement of the group on any one item could be easily determined.

The total score obtained on each of the first four sections provided a method for ordering the respondents in terms of their overall satisfaction with their present car, their degree of wanting changed features on their next car, their approval of trends in cars and their feeling of the contribution of changed features to safety.

As there was no reason to believe that the arbitrary assignment of numbers to the set of responses provided an equal-interval scale, but was at best a fairly accurate device for ordering the strength of the opinion, it was felt that the total score derived from these numbers would provide only a ranking of the respondents. For this reason, non-parametric tests of the relationship between both total scores and individual feature scores were used.

In order to examine the relationship between the scores and certain characteristics of the car owners and their car, a rank-order coefficient of correlation (r_s) was computed. The relationships examined by this test were those between the total scores on each of the first four sections (Present Car, Next Car, Trends and Safety) and the age, height and weight of the owners, and the yearly distance driven. The inter-

relationships between each of these scores and between each of these characteristics were also examined by this test.

The relationships between these same scores and the sex, marital status, present car age, and car buying plans of the respondent were examined by means of the Mann-Whitney U-test.

The relationships between these same scores and car loyalty, make, model and company of the respondent's present car were examined by the use of the Kruskal-Wallis H-test. (Loyalty is defined as the expressed intention of an owner to buy a new car of the same make--Loyal, or of a different make--Not Loyal).

The relationships between the way in which owners ranked each of two sets of features on the paired-comparison section and certain other characteristics were examined by means of the coefficient of concordance test (W_c) or the rank-order correlation (r_s) as a measure of the degree of agreement between or among groups. The characteristics studied were the age, height, weight, and loyalty of the respondent, yearly distance driven, and the make, model, company, and age of the respondent's car.

The relationships between the responses to each item in the Statements section and each of the scores derived from the first four sections of the questionnaire were examined by a Chi Square test. The responses to each item were combined into agree and disagree categories, with the ? response being combined with the category representing a negative attitude. That is, if the statement was positive, such as "my present car is well designed", ? responses would be combined with D and SD as indicating dissatisfaction with the present car. After combining the responses in this manner, two by two tables (Upper and Lower 27% Score

groups and agree and disagree response groups) were formed and Chi Square computed, using Yates correction for continuity, except that, in those tables where there were expected cell frequencies of less than 5, Fisher's exact test of probability was used.

The relationships between the scores obtained on each feature in each of the six sections of the questionnaire and the characteristics of the car owners or their cars were examined by a two way non-parametric analysis of variance technique suggested by Edwards (6). This allowed the computation of the coefficient of concordance (Wc) as a measure of the relation between a characteristic and a feature holding another characteristic constant. The characteristic groups used for this analysis were make and model, company and model, height and weight, and age and distance. Car age and plan to buy were also used, but since plan to buy only gave two categories, yes and no, a rank-order coefficient was run between the plan to buy groups matched on car age.

As it was not considered feasible to analyze all of the features, it was decided that it would be most advantageous to study features felt to be most likely to show a relationship and which could be compared with other sections and with the other form of the questionnaire. The features chosen were all the features on the paired-comparison, as they were both from other sections and common to both forms, and two features which were carried through all of the first four sections (horsepower and ease of ride). Certain other features (two from each section) felt to be related to certain of the characteristics and which had a reasonable spread of responses for the total respondent group, were also included.

FINDINGS

Table I presents a summary of the results obtained from the single mailing of the 400 Form A questionnaires.

Table II presents a summary of the relationships determined to be significant between the scores derived from the several sections of the questionnaire and certain characteristics of the car owner or his car.

Table III presents a summary of the relationships between the scores derived from four of the sections of the questionnaire and the item by item responses of car owners to the Statements section of the questionnaire.

Table IV presents a summary of the relationships determined to be significant between the responses to certain features and certain characteristics of the car owner or his car with another such characteristic held constant.

TABLE I
SUMMARY OF RETURNS TO MAILING OF
FORM A OF THE QUESTIONNAIRE

Form A Questionnaires	Number	Percent
Mailed	400	100%
Returned undelivered	12	3.0
Returned uncompleted	14	3.5
Returned completed	122	30.5
Total returned	148	37.0

TABLE II

SUMMARY OF SIGNIFICANT RELATIONSHIPS OBTAINED BETWEEN SCORES
DERIVED FROM EACH OF FOUR SECTIONS OF THE QUESTIONNAIRE AND
CERTAIN CHARACTERISTICS OF THE OWNER OR HIS CAR

Score on	Relationship between and Score or Characteristic	Test	Result
Present Car	Owner loyalty	H	11.65**
Present Car	Next car score	r_s	-.21*
Next Car	Owner age	r_s	-.29**
Next Car	Owner age	H	7.16*
Next Car	Distance driven	r_s	.20*
Next Car	Trends score	r_s	.63**
Next Car	Safety score	r_s	.50**
Trends	Owner age	r_s	-.30**
Trends	Owner age	H	6.03*
Trends	Model owned	H	12.08*
Trends	Safety score	r_s	.57**
Safety	Marital status	U	1.93*

* Significant relationship at 5% level.

** Significant relationship at 1% level.

Note: r_s indicates rank-order correlation test.

H indicates Kruskal-Wallis H-test.

U indicates Mann-Whitney U-test.

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TABLE III

SUMMARY OF RELATIONSHIPS BETWEEN UPPER AND LOWER 27% SCORE GROUPS
AND ITEM BY ITEM RESPONSES TO THE STATEMENTS
SECTION OF THE QUESTIONNAIRE

Item	Score Group							
	Present Car		Next Car		Trends		Safety	
	X ²	p	X ²	p	X ²	p	X ²	p
1	.57		.55		.54		.56	
2	2.27		.54		2.17		.55	
3	4.25	.05	.36		.08		2.38	
4	.36		2.71	.10	*	.237	.11	
5	.00		.00		*	.307	*	.355
6	.06		1.51		.96		3.90	.05
7	.33		4.87	.05	7.15	.01	7.73	.01
8	12.52	.01	2.38		.00		.00	
9	1.53		2.17		6.09	.02	.96	
10	.09		6.49	.02	.08		.85	
11	.00		.89		10.15	.01	4.67	.05
12	10.15	.01	*	.074	*	.237	.11	
13	.26		.00		3.61	.10	5.39	.05
14	.08		2.74	.10	4.21	.05	5.26	.05
15	12.81	.01	3.61	.10	.28		.07	
16	1.04		2.44		.06		5.20	.05
17	.00		*	.027	*	.028	*	.130
18	2.97	.10	1.56		1.01		.00	
19	2.17		.00		.24		.24	
20	1.62		2.38		1.62		1.31	
21	1.84		8.92	.01	5.64	.02	.27	
22	.09		1.44		.85		1.62	
23	.07		4.57	.05	8.43	.01	6.80	.01

* Indicates use of Fisher's exact test of probability.

TABLE IV

SUMMARY OF SIGNIFICANT RELATIONSHIPS OBTAINED BETWEEN CERTAIN CHARACTERISTICS AND THE RESPONSE TO CERTAIN FEATURES, HOLDING CONSTANT ANOTHER CHARACTERISTIC

Relationship between Characteristic	Feature	Holding Constant Characteristic	Result Wc =
Make	Acceleration (F)	Model	.765*
Age	Leg room (F)	Distance	.85**
Age	Luggage space (F)	Distance	.65*
Age	Power brakes (F)	Distance	.85**
Age	Smoother riding (T)	Distance	.85**
Age	Smoother riding (S)	Distance	.65*
Distance	Head room (F)	Age	.65*
Distance	Power steering (F)	Age	.65*
Distance	Easier ride (N)	Age	.65*
Distance	Higher horsepower (T)	Age	.85**
Distance	More horsepower (St)	Age	.65*
Company	Head room (F)	Model	.65*
Company	Low purchase price (F)	Model	.85**
Company	Trouble-free operation (F)	Model	.85**
Model	Exterior design (F)	Company	.85**
Model	Acceleration (F)	Company	.65*
Model	Low purchase price (F)	Company	.65*
Height	Head room (F)	Weight	.65*
Height	Trouble-free operation (F)	Weight	.65*
Weight	Low purchase price (F)	Height	.65*
Plans to buy	More horsepower (S)	Age of car	$r_s=1.00$

* Significant at 10% level.

** Significant at 5% level.

Note: The letter in parentheses after each feature indicates the section of the questionnaire listing the feature:

N - Next Car section

T - Trends section

S - Safety section

F - Features section

St - Statements section

11

RESULTS

The analysis of the 100 Form A questionnaires shows the following results in terms of the hypothesis stated.

Hypothesis I. The hypothesis that there would be no relationship between the way in which a car owner responds to a group of features and any of certain characteristics of the car owner or the car he owns, was found to be untenable for the following relationships.

The score derived from the Present Car section was related to: the loyalty of the car owner, those who planned to buy a new car of the same make (loyal) attaining significantly higher satisfaction scores on Present Car than car owners planning to buy a new car of a different make (not loyal); the Next Car score, car owners who attained high scores on the Present Car section attained significantly lower scores on the Next Car section than car owners who attained low scores on the Present Car section; statements 3, 8, 12, 15 and 18 in the Statements section, car owners who attained high scores on the Present Car section responded significantly more often in a manner indicating satisfaction with a present car feature as covered in Statements 3, 8, 12, 15 and 18 than owners who attained low scores on the Present Car section.

The score derived from the Next Car section of the questionnaire was related to: the age of the owner, older owners attaining significantly lower scores than younger owners; the yearly distance driven, owners driving more than 15,000 miles yearly attained significantly higher scores than owners driving less than 15,000 miles yearly; the score on the Trends section, owners who attained high scores on the Next Car section attained significantly higher scores on the Trends section than owners who attained low scores on the Next Car section; statements

4, 7, 10, 12, 14, 15, 17, 21 and 23 in the Statements section, owners who attained high scores on the Next Car section responded significantly more often in a manner indicating desire for a feature on their next car as covered in statements 4, 7, 10, 12, 14, 15, 17, 21 and 23 than owners who attained low scores on the Next Car section.

The score derived from the Trends section of the questionnaire was related to: the age of the owner, older owners attained significantly lower scores than younger owners; the model of car owned, owners of convertible and hardtop models attained significantly higher scores than owners of other models; the score on the Safety section of the questionnaire, owners who attained high scores on the Trends section attained significantly higher scores on the Safety section than owners who attained low scores on the Trends section; statements 7, 9, 11, 13, 14, 17, 21 and 23 on the Statements section, owners who attained high scores on the Trends section responded significantly more often in a manner indicating approval of trends as covered in the foregoing statements than owners who attained low scores on the Trends section.

The score derived from the Safety section was related to: the marital status of the owner, married owners attained significantly higher scores than unmarried owners; statements 6, 7, 11, 13, 14, 16 and 23 in the statements section, owners who attained high scores on the Safety section responded significantly more often in a manner indicating belief in the safety value of a feature as reflected in each of the foregoing statements than owners who attained low scores on the Safety section.

No other significant relationships between the sections and

characteristics were found. Tables II and III present a summary of the significant findings. Tables XVI through XXII, Appendix D, present the results of all the analyses of the data.

Hypothesis II. The hypothesis that there would be no relationship between the way in which a car owner responds to any of certain features and any of certain characteristics of the car owner or the car he owns, even when another such characteristic is held constant, was found to be untenable for the following relationships.

The response to the feature "acceleration" in the paired-comparison section was significantly related to the make of car owned, holding model of car owned constant. The owners of Chevrolets and Mercurys indicated more liking of this feature than owners of Fords and Oldsmobiles.

The responses to the features "leg room", "luggage space" and "power brakes" in the paired-comparison section, "smoother riding" in the Trends section, and "smoother riding" in the Safety section were significantly related to the age of the owner, holding the yearly distance driven constant. Older owners indicated less liking of "leg room" than younger owners. The older owners indicated more liking of "luggage space" and "power brakes" than younger owners. The older owners also indicated more approval of the trend "smoother riding" as well as judging the safety value of "smoother riding" higher than the younger owners.

The responses to the features "head room" and "power steering" on the paired-comparison section, "easier ride" on the Next Car section, "higher horsepower" on the Trends section, and "more horsepower" in item 14 on the Statements section were significantly related to the yearly distance driven by the owner, holding the age of the owner con-

stant. Owners driving greater distances indicated more liking of "head room", more desire for "easier ride" in their next car, less approval of the trend "higher horsepower", and less desire for "more horsepower" on their present car than owners driving a shorter distance. The results on the liking of "power steering" were somewhat different, owners driving between 10 and 15 thousand miles yearly indicated more liking of this feature than owners driving either more or less than this.

The responses to the features "head room", "low purchase price" and "trouble-free operation" in the paired-comparison section were significantly related to the company manufacturing the present car owned, holding the model of the present car constant. Owners of Ford products indicated a greater liking of all these features than owners of either General Motors or Chrysler products. Owners of General Motors products also indicated more liking of "head room" and "low purchase price" than owners of Chrysler products, but owners of Chrysler products indicated greater liking of "trouble-free operation" than owners of General Motors products.

The responses to the features "exterior design", "acceleration" and "low purchase price" on the paired-comparison section were significantly related to the model of car owned, holding the company manufacturing the car constant. Owners of hardtops indicated greater liking of all these features than owners of either two-door or four-door sedans.

The responses to the features "head room" and "trouble-free operation" in the paired-comparison section were significantly related to the height of the owner, holding the weight of the owner constant. The taller owners indicated greater liking of both of these features

than shorter owners.

The response to the feature "low purchase price" on the paired-comparison section was significantly related to the weight of the owner, holding the height of the owner constant. Owners who weighed the least indicated a greater liking of this feature than heavier owners.

The response to the feature "more horsepower" in the Safety section was significantly related to the owner's plans to buy a new car, when matched on the age of the car owned. Owners who planned to buy a new car indicated a higher safety value for this feature as the age of car owned increased, while owners who did not plan to buy indicated a lower safety value for this feature as the age of car owned increased.

There were no other significant relationships obtained between the features examined and these characteristics. Table IV presents a summary of the significant findings under this hypothesis, and Tables XXV through XXIX, Appendix E, present the results of all the analyses of this data.

CONCLUSIONS AND DISCUSSION

The major overall conclusion to be drawn from this study is that most of the opinions of consumers on specific and general features of a product are related to the characteristics of the consumer and to the characteristics of the product used (owned) by the consumer. While such a conclusion is by no means original or startling, the further conclusion that these relationships can be specified and measured, and the results used to improve either (or both) the consumer's opinion or the product itself, should be of more interest to manufacturers and consumers alike.

The specific conclusions to be made on the basis of the results of this investigation may be considered tentative, due to the nature of the sample and the questionnaire, but they do indicate the possibilities of further investigation of these and other relationships with more adequate techniques.

The first conclusion is made on the basis of the responses to the specific features. A visual inspection of the number checking each response allows the conclusion that these car owners are, in general, quite satisfied with practically all features of their present car. The feature indicated as most unsatisfactory is the purchase price, and even this is not too great a source of dissatisfaction.

The desire for features on the next car is primarily a desire for those features increasing the comfort and convenience of the driver, with little desire for novel changes, or increases in power and speed. This is also substantiated by the responses to the Trends section. Again the features most approved are those increasing comfort, while

horsepower and speed, and completely new features, receive little encouragement.

One other finding is obvious from these responses. Any feature directly affecting the consumer's pocketbook such as purchase price, miles per gallon, repair costs, etc., is definitely near the top or bottom of the list on every section, depending upon whether it represents an increase or decrease in cost.

The results based on the relationships between the scores used as measures of overall opinion and other characteristics allow several conclusions. First, satisfaction with the present car is independent of all of the characteristics of the owner and his car, and relatively unrelated to desires for approval of and judged value of change. This indicates that satisfaction is wholly a function of the ability of the present car to fulfill the needs of the owner, and is not based upon any comparison with possible changes in car features. Also, the relation between satisfaction and loyalty indicates that the owners generalize their feelings from satisfaction or dissatisfaction with their particular car to anticipation of satisfaction or dissatisfaction with newer cars of the same make.

The high relationships between the desire for new features and approval of trends and the age of the car owner indicates that the older owners are less interested in and desirous of changes than the younger owners. This may be due to a generally more conservative outlook on the part of older persons, but it may also represent to some extent a more critical attitude toward the claimed benefits of changes, based on longer experience with such changes in cars.

The relationship between the judged safety value of changes and the marital status of the owner indicates a greater concern with safety on the part of married persons. This may also be true of older persons, their desire for safety negating their disapproval of changes in this section. This may account for the lack of relationship between age and safety, which should be present if the safety score represents a judgement on the value of changes.

The results obtained on the analysis of individual features further confirm these conclusions. Older owners tend to like those features adding to comfort and convenience, while younger owners seem to be more concerned with performance and styling.

While no specific analysis was made on the consistency and reliability of responses, a feature by feature comparison of the results on the two forms of the questionnaire indicated that the two respondent groups were quite similar, both in terms of their and their car's characteristics and in terms of the types of responses to the common features. There were no major differences noted in the proportion giving each response to each common feature and the two sets of features on the paired-comparison section were ranked in the same order by both groups. The consistency of individuals was noted by a scan of the questionnaires when received, with few respondents giving any contradictory responses to the same feature on different sections. The consistency of the group in this respect was checked by comparing the total responses to the features carried through all sections of the questionnaire. As can be seen on the Form A Questionnaire in Appendix A, a feature (i.e., horsepower) which was highly satisfactory on the present

car was least wanted changed on the next car (more horsepower), changes in it least approved of as trends (higher horsepower), and changes in it least valued as adding to safety (more horsepower).

The relationships between the scores on the first four sections and the appropriate statements section items indicate further the consistency of the respondents, as those indicating higher satisfaction with their present car also indicated higher satisfaction on items relating to present car features. Thus, it may be concluded that the responses were fairly reliable and valid and allowed measures to be obtained which were also reliable, and to outward appearances reasonably valid, as indicated by their relationships with other measures and characteristics.

The implications of these conclusions in reference to the present structure of the automotive industry are quite complex. The basis of the constant changes in car features is supposedly the thesis that people want changes and won't accept a car that doesn't represent a considerable change from their present car. To make certain that people follow this thesis, the advertising claims are designed to create dissatisfaction on the part of the owner with his present car and create desire for the "new, improved, years ahead", characteristics of the most recent cars produced. But, the finding that satisfaction with the present car is mainly independent of the desires for and interest in changes, seems to indicate that the attempt to create desire by making the owner dissatisfied with what he has doesn't work, or at least any dissatisfaction created is not matched by a corresponding increase in desire for new features. It may be that, if the advertising claims do at least create some dissatisfaction, this complicates the picture even

more. If loyalty to a make or company arises from generalization of the feelings toward the present car owned, increasing dissatisfaction will lead to owner disloyalty. Thus, a company may, by creating dissatisfaction, attract new buyers from the owners of different cars, but at the same time indirectly forces owners of the cars made by that company into the hands of competing manufacturers.

The findings on the relation of the desire for new features and approval of trends with the age of the owner has additional implications. The sales emphasis up to the present time has been directly upon changing design and increased performance, features most attractive to younger consumers and least attractive to the older ones. Thus, the major appeal has been aimed at a limited segment of the consumer market, and this segment is not only limited in terms of numbers, it is even more limited in terms of purchasing power, the younger consumer usually having both a lower income and a greater variety of demands upon that income than will be true when he reaches middle age. This factor may account for the less rapid and less advertised changes in the more expensive cars, which depend more upon traditional prestige and comfort factors for their sales appeal.

That the opinions of the consumer do have an effect upon the sales appeal of certain features is evident by the recent happening in the automobile industry. One of the findings of this study was that these owners were, at least in relation to the other features listed, extremely well satisfied with the horsepower of their present cars, had little desire for higher speed or more horsepower, and did not approve of the trends toward or safety value of higher horsepower and acceleration.

All this after several years of constant increases in these features, and loud claims as to the advantages of such increases, seems to invalidate the claim of creating desire. This finding supports a statement by the Automobile Manufacturers Association announced in May of this year that the manufacturers would no longer use in advertising campaigns direct horsepower and performance claims, or take part in speed races. Although the reason stated for such a decision was that such comparisons and activities had become too excessive, surely this would not have mattered unless they were also affecting sales. It may be presumed that the manufacturers have become aware of a similar lack of interest in these features on the part of the total consumer market.

Thus, it is clear that such opinion questionnaire procedures can contribute to the determination of which changes in features will be acceptable or unacceptable to certain groups of consumers. It would seem clearly worthwhile to find out in advance at least some indication of the opinions to be expected on a contemplated change, rather than going ahead with the change and learning afterward that it is not acceptable. The use of opinion questionnaire data should enable the manufacturer to determine which changes are most desired by the majority of the consumer market and to adjust his product accordingly, at least to the extent of avoiding clearly unpopular changes. This would result in a better market for the manufacturer, and a better product for the consumer.

COMMENTS

The findings of this study point to the possibilities of further studies in this area which would produce more significant and pertinent data on the relationship of opinions to characteristics. Certainly the findings of this study cannot be taken as any final word on such matters. The limitations of the study were many and important, but both the method used and the results obtained have significance in further investigations.

It was unfortunate that the respondent sample was so limited in size, both from considerations of sampling bias, and the resulting limitation on the analysis. The two-way non-parametric analysis of variance is a useful statistical test for such application, but the small number of categories which could be formed with the data available did not allow a fair test of the method. With this limitation, which meant that nearly perfect agreement by all groups would give a significant result, 21 of the 182 tests were significant, which, while possibly accounted for by random factors, are to some extent validated by the findings of Sterling in using Form B of the questionnaire (19). His results on a similar analysis of features substantiated 6 of the 19 significant results on common items. Certainly an analysis based on more extensive data would be desirable in substantiating these findings and in determining relationships which may have been obscured by the limitations of this study.

There are, of course, limitations on any study of opinions or attitudes, especially when questionnaire methods are used to obtain the data. However, these problems and limitations are much better and more

fully discussed by the several authors mentioned in the Background chapter than is appropriate in this paper. The use of scaling techniques and analysis, rather shortly used in this investigation, offers another more widely applicable method for similar investigations on a larger scale.

While the results of this investigation are considered to be the major relevant findings obtainable from the data, they by no means represent an exhaustive analysis. There remain many aspects and problems to be studied. One of the most promising would be a validation study, running an identical analysis on the data available on Form B. Certainly if these findings are tenable and the assumption that the features used are a sample of the population of features is correct, similar results should be forthcoming. Also, a more complete and thorough comparison of the respondents to the two forms should be made, as well as a study of the common features and the features carried through several sections.

It is further proposed that another study in this same area would be advisable. With the information available from the two investigations of the present questionnaire, and the use of the Questions section as a source of additional features of interest to consumers, it should be fairly easy to prepare a revised questionnaire. The use of such a questionnaire with a more adequate sample, or as a tool to investigate the opinions of selected groups, should give additional information on the findings of these investigations, and should reveal additional factors as well.

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APPENDIX

CONSUMER ATTITUDE SURVEY

Department of Psychology

Michigan State University

General Information

Please answer the following questions to the best of your ability.
Thank you,

1. Age____ Sex ____ Married?____ Height____ Weight____
2. Approximately, how far do you drive your car in a year?_____
3. Present car: Make_____, Model_____, Year_____
4. Last car: Make_____, Model_____, Year_____

(e.g., 2-door sedan, etc.)
- 5a. Do you plan to purchase a new car within the next 2 or 3 years?
 Yes____ No____. (If yes, answer 5b)
- 5b. Probable Make _____, Model_____, Year_____

(If you own more than one automobile, consider the one with which you are most familiar when answering this questionnaire.)

Note: The figures entered on the questionnaire indicate the number of respondents selecting each response to each feature.

YOUR PRESENT CAR

Listed below are sixteen features of your present car. These are to be rated by you according to the indicated scales. Rate all of the features on one scale first, then rate them on the other scale.

On this scale indicate the degree to which you are satisfied with each one of the features listed below. Check the column which best indicates how satisfied you are with each of these features of your present car.

On this scale indicate the degree of importance to you of each one of the features listed below. Check the column which best indicates how important you consider each of these features of your present car.

Satisfied	?	Dissatisfied		Important	?	Unimportant
1. <u>114</u>	<u>3</u>	<u>5</u>	horsepower ^{ab}	<u>59</u>	<u>18</u>	<u>45</u>
2. <u>104</u>	<u>0</u>	<u>18</u>	windshield design ^{ab}	<u>101</u>	<u>10</u>	<u>11</u>
3. <u>105</u>	<u>4</u>	<u>15</u>	shifting ^{ab}	<u>88</u>	<u>17</u>	<u>17</u>
4. <u>96</u>	<u>15</u>	<u>15</u>	ease of ride ^{ab}	<u>107</u>	<u>10</u>	<u>5</u>
5. <u>104</u>	<u>4</u>	<u>12</u>	head room ^b	<u>92</u>	<u>14</u>	<u>14</u>
6. <u>99</u>	<u>9</u>	<u>14</u>	acceleration ^b	<u>86</u>	<u>17</u>	<u>19</u>
7. <u>98</u>	<u>8</u>	<u>16</u>	visibility ^b	<u>118</u>	<u>2</u>	<u>2</u>
8. <u>101</u>	<u>9</u>	<u>12</u>	weight of car ^b	<u>61</u>	<u>20</u>	<u>31</u>
9. <u>99</u>	<u>8</u>	<u>15</u>	seat comfort ^a	<u>105</u>	<u>11</u>	<u>6</u>
10. <u>104</u>	<u>5</u>	<u>11</u>	luggage space ^a	<u>75</u>	<u>25</u>	<u>22</u>
11. <u>101</u>	<u>6</u>	<u>15</u>	ease of parking ^a	<u>107</u>	<u>9</u>	<u>6</u>
12. <u>104</u>	<u>6</u>	<u>8</u>	location of spare tire ^a	<u>54</u>	<u>20</u>	<u>46</u>
13. <u>88</u>	<u>20</u>	<u>44</u>	purchase price	<u>106</u>	<u>11</u>	<u>5</u>
14. <u>105</u>	<u>7</u>	<u>12</u>	exterior design	<u>74</u>	<u>25</u>	<u>25</u>
15. <u>107</u>	<u>5</u>	<u>10</u>	interior design	<u>67</u>	<u>27</u>	<u>28</u>
16. <u>96</u>	<u>6</u>	<u>20</u>	heater and defroster	<u>118</u>	<u>4</u>	<u>0</u>

a.- Features which appear on both Form A and Form B of the questionnaire.

b.- Features which are repeated in modified form on the Present Car, Next Car, Trends and Safety sections of the questionnaire.

YOUR NEXT CAR

Listed below are sixteen possible features of your next car. These are to be rated by you according to the indicated scales. Rate all the features on one scale first, then rate them on the other scale.

On this scale indicate whether of not you want each feature on your next car.

On this scale indicate how important it is to you that you have each feature on your next car.

Want	?	Don't Want		Important	?	Unimportant
1. <u>22</u>	<u>20</u>	<u>14</u>	better craftsmanship	<u>83</u>	<u>23</u>	<u>17</u>
2. <u>24</u>	<u>18</u>	<u>80</u>	smaller car	<u>38</u>	<u>28</u>	<u>56</u>
3. <u>5</u>	<u>10</u>	<u>107</u>	higher speeds	<u>11</u>	<u>14</u>	<u>97</u>
4. <u>21</u>	<u>54</u>	<u>47</u>	gas turbine engine	<u>18</u>	<u>50</u>	<u>59</u>
5. <u>21</u>	<u>15</u>	<u>88</u>	power seats a	<u>10</u>	<u>15</u>	<u>97</u>
6. <u>116</u>	<u>5</u>	<u>1</u>	more miles per gallon a	<u>113</u>	<u>7</u>	<u>3</u>
7. <u>17</u>	<u>20</u>	<u>85</u>	automatic windows a	<u>10</u>	<u>16</u>	<u>96</u>
8. <u>25</u>	<u>24</u>	<u>73</u>	manual gearshift a	<u>37</u>	<u>33</u>	<u>52</u>
9. <u>20</u>	<u>26</u>	<u>66</u>	heavier car b	<u>32</u>	<u>32</u>	<u>58</u>
10. <u>67</u>	<u>31</u>	<u>24</u>	more visibility b	<u>78</u>	<u>24</u>	<u>20</u>
11. <u>35</u>	<u>21</u>	<u>66</u>	more acceleration b	<u>39</u>	<u>25</u>	<u>58</u>
12. <u>30</u>	<u>27</u>	<u>65</u>	more head room b	<u>47</u>	<u>21</u>	<u>54</u>
13. <u>70</u>	<u>29</u>	<u>23</u>	easier ride ab	<u>75</u>	<u>22</u>	<u>25</u>
14. <u>35</u>	<u>30</u>	<u>57</u>	push-button shifting ab	<u>35</u>	<u>19</u>	<u>68</u>
15. <u>76</u>	<u>27</u>	<u>19</u>	wraparound windshield ab	<u>70</u>	<u>28</u>	<u>24</u>
16. <u>9</u>	<u>24</u>	<u>89</u>	more horsepower ab	<u>19</u>	<u>23</u>	<u>81</u>

a.- Features which appear on both Form A and Form B of the questionnaire.

b.- Features which are repeated in modified form on the Present Car, Next Car, Trends, and Safety sections of the questionnaire.

TRENDS

We are interested in your opinions about current trends in automotive design. Listed below are sixteen trends which are to be rated by you according to the indicated scales. Rate all the trends on one scale first, then rate them on the other scale.

On this scale indicate how
you feel about each trend.

On this scale indicate the
importance of each trend to you.

Like	?	Dislike		Important	?	Unimportant
a. <u>78</u>	<u>38</u>	<u>6</u>	torsion-bar suspension	<u>58</u>	<u>33</u>	<u>31</u>
b. <u>9</u>	<u>4</u>	<u>110</u>	higher repair costs	<u>106</u>	<u>9</u>	<u>7</u>
b. <u>38</u>	<u>42</u>	<u>42</u>	dual exhaust system	<u>34</u>	<u>29</u>	<u>59</u>
b. <u>30</u>	<u>41</u>	<u>51</u>	fancier interior design	<u>21</u>	<u>17</u>	<u>84</u>
b. <u>110</u>	<u>12</u>	<u>0</u>	smoother riding ab	<u>96</u>	<u>15</u>	<u>11</u>
b. <u>15</u>	<u>55</u>	<u>74</u>	more accessories a	<u>15</u>	<u>20</u>	<u>87</u>
b. <u>38</u>	<u>36</u>	<u>47</u>	push-button shifting ab	<u>31</u>	<u>24</u>	<u>67</u>
b. <u>14</u>	<u>25</u>	<u>83</u>	larger rear fenders a	<u>17</u>	<u>14</u>	<u>91</u>
b. <u>80</u>	<u>24</u>	<u>18</u>	wraparound windshields ab	<u>79</u>	<u>17</u>	<u>26</u>
b. <u>58</u>	<u>30</u>	<u>34</u>	lower cars a	<u>47</u>	<u>27</u>	<u>48</u>
b. <u>18</u>	<u>31</u>	<u>73</u>	higher horsepower ab	<u>30</u>	<u>17</u>	<u>75</u>
b. <u>30</u>	<u>22</u>	<u>80</u>	longer cars a	<u>27</u>	<u>19</u>	<u>76</u>
b. <u>45</u>	<u>33</u>	<u>46</u>	heavier cars b	<u>34</u>	<u>28</u>	<u>60</u>
b. <u>103</u>	<u>16</u>	<u>3</u>	greater visibility b	<u>103</u>	<u>13</u>	<u>6</u>
b. <u>48</u>	<u>32</u>	<u>41</u>	faster acceleration b	<u>48</u>	<u>25</u>	<u>49</u>
b. <u>9</u>	<u>20</u>	<u>93</u>	less head room b	<u>56</u>	<u>27</u>	<u>39</u>

a.- Features which appear on both Form A and Form B of the questionnaire.

b.- Features which are repeated in modified form on the Present Car, Next Car, Trends, and Safety sections of the questionnaire.

SAFETY

Safety in the automobile is important to all of us, and the manufacturers claim many advances in this area. However, we are interested in obtaining your opinions as to the contribution and importance to safety for each of the features listed below. Rate all the features on one scale first, then rate them on the other scale.

On this scale indicate the contribution to safety of each feature.

On this scale indicate the importance of each feature in terms of safety.

Increases Safety	?	Decreases Safety		Important	?	Unimportant
1. <u>68</u>	<u>39</u>	<u>15</u>	pop-out windshields	<u>58</u>	<u>45</u>	<u>21</u>
2. <u>69</u>	<u>39</u>	<u>14</u>	heavier cars ^b	<u>55</u>	<u>58</u>	<u>29</u>
3. <u>120</u>	<u>2</u>	<u>0</u>	turn signals	<u>118</u>	<u>2</u>	<u>2</u>
4. <u>47</u>	<u>34</u>	<u>41</u>	faster acceleration ^b	<u>54</u>	<u>35</u>	<u>33</u>
5. <u>75</u>	<u>43</u>	<u>14</u>	shock-absorbing bumpers	<u>61</u>	<u>39</u>	<u>32</u>
6. <u>115</u>	<u>7</u>	<u>0</u>	increased visibility ^b	<u>111</u>	<u>9</u>	<u>2</u>
7. <u>89</u>	<u>32</u>	<u>1</u>	recessed steering columns	<u>80</u>	<u>36</u>	<u>6</u>
8. <u>8</u>	<u>42</u>	<u>75</u>	less head room ^b	<u>40</u>	<u>42</u>	<u>40</u>
9. <u>21</u>	<u>75</u>	<u>24</u>	smaller wheels ^a	<u>20</u>	<u>64</u>	<u>38</u>
10. <u>67</u>	<u>50</u>	<u>5</u>	smoother riding ^{ab}	<u>61</u>	<u>30</u>	<u>31</u>
11. <u>68</u>	<u>41</u>	<u>13</u>	tinted windshields ^a	<u>60</u>	<u>34</u>	<u>26</u>
12. <u>22</u>	<u>81</u>	<u>19</u>	push-button shifting ^{ab}	<u>19</u>	<u>45</u>	<u>58</u>
13. <u>111</u>	<u>10</u>	<u>1</u>	padded dashboards ^a	<u>100</u>	<u>14</u>	<u>8</u>
14. <u>90</u>	<u>24</u>	<u>6</u>	wraparound windshields ^{ab}	<u>78</u>	<u>51</u>	<u>13</u>
15. <u>101</u>	<u>14</u>	<u>7</u>	seat belts ^a	<u>94</u>	<u>14</u>	<u>14</u>
16. <u>22</u>	<u>39</u>	<u>61</u>	more horsepower ^{ab}	<u>35</u>	<u>54</u>	<u>53</u>

a.- Features which appear on both Form A and Form B of the questionnaire.

b.- Features which are repeated in modified form on the Present Car, Next Car, Trends, and Safety sections of the questionnaire.

FEATURES

For each of the following pairs of features check the one you like the best.
Do this for every pair.

_____ leg room	or	_____ head room	
_____ acceleration	or	_____ low purchase price	
_____ exterior design	or	_____ push-button shifting	
_____ power brakes	or	_____ power steering	
_____ head room	or	_____ exterior design	
_____ trouble-free operation	or	_____ acceleration	
_____ push-button shifting	or	_____ leg room	
_____ low purchase price	or	_____ power brakes	
_____ exterior design	or	_____ luggage space	
_____ power steering	or	_____ acceleration	
_____ head room	or	_____ push-button shifting	
_____ power brakes	or	_____ trouble-free operation	
_____ leg room	or	_____ exterior design	
_____ low purchase price	or	_____ power steering	
_____ push-button shifting	or	_____ luggage space	
_____ acceleration	or	_____ power brakes	
_____ luggage space	or	_____ head room	
_____ power steering	or	_____ trouble-free operation	
_____ luggage space	or	_____ leg room	
_____ trouble-free operation	or	_____ low purchase price	

Note: Tabulation of responses to these items are summarized in Table XV.

Appendix C.

All of these features are common to Forms A and B of the questionnaire.

STATEMENTS

Indicate how strongly you agree or disagree with each of the following statements by encircling the appropriate symbol in front of each statement. The symbols indicate degrees of agreement as listed below

SA - strongly agree
A - agree
? - neither agree nor disagree
D - disagree
SD - strongly disagree

12	37	19	35	19	SA	Adding more safety features has not reduced accident injuries.
18	33	30	25	16	SA	The advantages of smaller cars outweigh their disadvantages
15	32	12	12	1	SA	The interior of my present car is very well designed.
6	15	32	33	16	SA	A car with the engine in the rear would be a great improvement.
9	3	2	35	73	SA	Automatic turn signals do not make driving any safer.
12	34	19	40	17	SA	The newer the car, the more any needed repairs will cost.
5	24	29	52	12	SA	I would like a larger gas tank in my next car.
9	10	6	76	21	SA	It is an effort to get in or out of my present car.
9	42	44	23	4	SA	Experienced drivers would welcome sports-car handling.
16	45	34	22	3	SA	I will demand better craftsmanship in my next car.
38	39	23	14	8	SA	The trend toward longer cars has gone too far.
4	8	9	68	33	SA	My car is just too hard to steer.
5	12	20	49	36	SA	Tinted windshields make driving more dangerous.
2	11	16	60	33	SA	I wish my car had more horsepower.
23	59	13	23	4	SA	The visibility from my car is excellent.
7	23	15	63	14	SA	If it were heavier, my car would be more satisfactory.
52	34	5	7	4	SA	I would not pay extra for power seats in my next car.
10	43	24	33	12	SA	The heater and defroster in my car could be greatly improved.
6	24	34	53	5	SA	My next car has to be easier to park.
10	37	49	15	11	SA	Fiberglass bodies would not make cars any better.
10	25	24	49	13	SA	My next car should make my present car look obsolete.
37	62	9	12	2	SA	I will insist on a complete demonstration before choosing a car.
2	13	22	67	18	SA	The controls and dials on my dashboard could be made less complex.

QUESTIONS

In answering the following questions, do not limit yourself to the features mentioned in the questionnaire. Include anything that you feel is relevant to the question. Be as specific as possible. (Use the back of this page if you need additional space.)

1. Ignoring the cost, what features would you like in your next car?

2. What features of today's cars do you think need the most improvement?

3. What features do you like most in your present car?

4. What features do you like least in your present car?

5. How did you like this questionnaire? Make any comments you wish.

THANK YOU FOR YOUR COOPERATION

MICHIGAN STATE UNIVERSITY

OF AGRICULTURE AND APPLIED SCIENCE • EAST LANSING

DEPARTMENT OF PSYCHOLOGY

April 1, 1957.

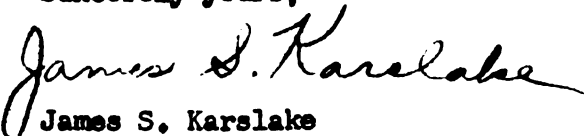
Dear Sir:

The Industrial Section of the Psychology Department at Michigan State University is conducting a survey of the opinions of automobile owners. We think you will enjoy this opportunity to indicate how you feel about some of the features of your automobile.

Please fill out the enclosed questionnaire in accordance with the directions at the top of each page. When completed, please mail it back to us in the enclosed return envelope.

Thank you for your cooperation.

Sincerely yours,


James S. Karslake
Associate Professor

JSK:RS
Enc.

Appendix B

TABLE V

REPORTED PERSONAL CHARACTERISTICS OF THE 122 RESPONDENTS
TO FORM A OF THE QUESTIONNAIRE

Characteristic	N	Characteristic	N
Sex		Height (inches)	
Male	107	78 - 79	1
Female	15	76 - 77	1
		74 - 75	6
Marital Status		72 - 73	13
Single	24	70 - 71	43
Married	98	68 - 69	28
		66 - 67	17
Age (years)		64 - 65	8
80 - 84	1	62 - 63	3
75 - 79	1	60 - 61	2
70 - 74	1		
65 - 69	3	Weight (pounds)	
60 - 64	5	230 - 239	2
55 - 59	10	220 - 229	1
50 - 54	17	210 - 219	2
45 - 49	13	200 - 209	4
40 - 44	13	190 - 199	12
35 - 39	20	180 - 189	18
30 - 34	17	170 - 179	22
25 - 29	14	160 - 169	22
20 - 24	7	150 - 159	16
		140 - 149	10
Distance Driven per Year		130 - 139	4
(thousands)		120 - 129	5
35 - 39	2	110 - 119	-
30 - 34	1	100 - 109	1
25 - 29	7		
20 - 24	8		
15 - 19	29		
10 - 14	49		
5 - 9	23		
0 - 4	3		

TABLE VI

REPORTED MAKE, MODEL, AND YEAR OF MANUFACTURE OF PRESENT
AND PAST CAR OWNED BY THE 122 RESPONDENTS TO
FORM A OF THE QUESTIONNAIRE

<u>Present Car</u>					
<u>Make</u>	<u>N</u>	<u>Model</u>	<u>N</u>	<u>Year of Manufacture</u>	<u>N</u>
Buick	11	2-door Sedan	42	1957	11
Chevrolet	30	4-door Sedan	30	1956	24
Chrysler	2	Hardtop	17	1955	32
DeSoto	4	Coupe	4	1954	13
Dodge	1	Station Wagon	7	1953	18
Ford	29	Convertible	5	1952	9
Kaiser	1	Not Given	17	1951	6
Mercury	7			1950	4
Oldsmobile	17			1949	3
Packard	1			1948	-
Plymouth	7			1947	1
Pontiac	10			1946	1
Studebaker	1				
Volkswagen	1				

<u>Last Car</u>					
<u>Make</u>	<u>N</u>	<u>Model</u>	<u>N</u>	<u>Year of Manufacture</u>	<u>N</u>
Buick	8	2-door Sedan	43	1956	3
Chevrolet	23	4-door Sedan	41	1955	4
Chrysler	2	Hardtop	7	1954	9
DeSoto	3	Coupe	6	1953	18
Dodge	4	Station Wagon	4	1952	18
Ford	26	Convertible	3	1951	19
Hudson	1	Not Given	12	1950	12
Kaiser	2	No Car	6	1949	13
Mercury	3			1948	11
Nash	3			1947	3
Oldsmobile	19			1946	1
Packard	2			1942	2
Plymouth	5			1941	1
Pontiac	11			1940	1
Studebaker	3			1936	1
Willlys	1			1934	1
No Car	6			1933	1

TABLE VII

REPORTED MAKE AND MODEL OF CAR WHICH THE 122 RESPONDENTS
PLAN TO BUY WITHIN THE NEXT 3 YEARS

Make	N	Model	N
Buick	7	2-door Sedan	13
Chevrolet	18	4-door Sedan	25
DeSoto	2	Hardtop	10
Dodge	4	Coupe	1
Ford	10	Station Wagon	12
Mercury	3	Convertible	3
Nash	2	Not Sure	23
Oldsmobile	13	Do not plan to buy	35
Packard	1		
Plymouth	2		
Pontiac	4		
"Foreign"	3		
Not Sure	18		
Do not plan to buy	35		

TABLE VIII

MAKE LOYALTY OF THE RESPONDENTS

Loyalty Classification	N
Loyal - plan to buy same make of car	50
? - do not plan to buy or uncertain of make	48
Not loyal - plan to buy a different make of car	24

Appendix C

TABLE IX

SYSTEM UTILIZED FOR ASSIGNING SCORES TO EACH COMBINATION OF RESPONSES
WITH REFERENCE TO EACH FEATURE ON THE PRESENT CAR, NEXT CAR, TRENDS,
AND SAFETY SECTIONS OF THE QUESTIONNAIRE

<u>Present Car Features Score</u>			
<u>Response checked on the</u> <u>Satisfaction Scale</u>	<u>Response checked on the Importance Scale</u>		
	<u>Important</u>	<u>I</u>	<u>Unimportant</u>
Satisfied	9	8	7
?	6	5	4
Dissatisfied	1	2	3

<u>Next Car Features Score</u>			
<u>Response checked on the</u> <u>Want Scale</u>	<u>Response checked on the Importance Scale</u>		
	<u>Important</u>	<u>I</u>	<u>Unimportant</u>
Want	9	8	7
?	6	5	4
Don't Want	1	2	3

<u>Trends Features Score</u>			
<u>Response checked on the</u> <u>Like Scale</u>	<u>Response checked on the Importance Scale</u>		
	<u>Important</u>	<u>I</u>	<u>Unimportant</u>
Like	9	8	7
?	6	5	4
Dislike	1	2	3

<u>Safety Features Score</u>			
<u>Response checked on the</u> <u>Safety Scale</u>	<u>Response checked on the Importance Scale</u>		
	<u>Important</u>	<u>I</u>	<u>Unimportant</u>
Increase Safety	9	8	7
?	6	5	4
Decreases Safety	1	2	3

TABLE X

NUMBER OF RESPONDENTS ATTAINING EACH SCORE FOR THE
COMBINATION OF RESPONSES CHECKED FOR EACH FEATURE
ON THE PRESENT CAR SECTION OF THE QUESTIONNAIRE

Feature	Score								
	9	8	7	6	5	4	3	2	1
Horsepower	54	17	43	1	1	1	1	0	4
Windshield Design	85	9	10	0	0	0	1	1	16
Shifting	76	14	15	1	2	1	1	1	11
Ease of Ride	84	7	5	11	2	0	0	1	12
Head Room	79	12	15	4	0	0	1	2	9
Acceleration	69	13	17	3	4	2	0	0	14
Visibility	94	2	2	8	0	0	0	0	15
Weight of Car	50	25	26	4	2	3	2	3	7
Seat Comfort	84	9	6	7	1	0	0	1	14
Luggage Space	64	21	21	3	2	0	1	2	8
Ease of Parking	91	5	5	3	3	0	1	1	13
Location of Spare Tire	50	18	40	2	1	3	3	1	4
Purchase Price	48	5	5	16	4	0	0	2	42
Exterior Design	60	18	25	4	3	0	0	2	10
Interior Design	61	24	22	0	3	2	4	0	6
Heater and Defroster	92	4	0	6	0	0	0	0	20

Note: For example, line 1 of the table shows that 54 respondents checked the responses, satisfied-important on horsepower, while 4 respondents checked the responses. Unsatisfied-important, using the scoring system presented in Table IX.

TABLE XI

NUMBER OF RESPONDENTS ATTAINING EACH SCORE FOR THE
COMBINATION OF RESPONSES CHECKED FOR EACH FEATURE
ON THE NEXT CAR SECTION OF THE QUESTIONNAIRE

Feature	Score								
	9	8	7	6	5	4	3	2	1
Better Craftmanship	79	7	4	3	12	4	9	2	1
Smaller Car	17	6	2	0	10	8	46	13	21
Higher Speeds	3	0	2	0	5	5	90	9	8
Gas Turbine Engine	10	4	7	2	41	11	41	5	1
Power Seats	6	7	8	0	4	9	80	4	4
More Miles per Gallon	111	3	2	1	4	0	0	0	1
Automatic Windows	6	1	10	0	12	8	78	3	4
Manual Gearshift	16	7	2	0	16	8	42	10	21
Heavier Car	22	5	6	1	17	8	44	11	11
More Visibility	62	1	4	8	18	5	11	5	8
More Acceleration	28	3	4	2	13	6	48	9	9
More Head Room	26	1	3	6	14	7	44	6	15
Easier Ride	64	3	3	6	16	7	15	3	5
Push-Button Shifting	29	3	3	1	12	17	48	4	5
Wraparound Windshield	66	3	7	0	20	7	10	5	4
More Horsepower	7	0	2	1	16	7	72	6	11

TABLE XII

NUMBER OF RESPONDENTS ATTAINING EACH SCORE FOR THE
COMBINATION OF RESPONSES CHECKED FOR EACH FEATURE
ON THE TRENDS SECTION OF THE QUESTIONNAIRE

Feature	Score								
	9	8	7	6	5	4	3	2	1
Torsion-bar Suspension	57	12	9	1	20	17	5	1	0
Higher Repair Costs	0	0	0	2	2	0	7	7	104
Dual Exhaust System	26	7	5	0	20	22	32	2	8
Fancier Interior Design	14	3	13	3	12	26	45	2	4
Smoother Riding	95	8	7	1	7	4	0	0	0
More Accessories	4	2	9	1	15	17	61	3	10
Push-button Shifting	25	5	9	0	15	21	37	4	6
Larger Rear Fenders	4	2	8	0	10	15	68	2	13
Wraparound Windshields	72	2	6	1	14	9	11	1	6
Lower Cars	38	7	13	0	18	12	23	2	9
Higher Horsepower	13	1	4	3	12	16	55	4	14
Longer Cars	11	3	6	0	11	11	59	5	16
Heavier Cars	24	8	11	2	17	14	35	3	8
Greater Visibility	98	1	4	3	12	1	1	0	2
Faster Acceleration	39	3	7	2	19	11	31	3	7
Less Head Room	1	0	8	1	15	4	27	12	54

TABLE XIII

NUMBER OF RESPONDENTS ATTAINING EACH SCORE FOR THE
COMBINATION OF RESPONSES CHECKED FOR EACH FEATURE
ON THE SAFETY SECTION OF THE QUESTIONNAIRE

Feature	Score								
	9	8	7	6	5	4	3	2	1
Pop-out Windshields	52	12	4	0	30	9	8	1	6
Heavier Cars	49	10	10	0	26	13	6	2	6
Turn Signals	117	1	2	1	1	0	0	0	0
Faster Acceleration	40	4	3	2	27	5	25	4	12
Shock-absorbing Bumpers	59	10	6	2	29	12	14	0	0
Increased Visibility	110	4	1	1	5	1	0	0	0
Recessed Steering Columns	76	8	5	4	28	0	1	0	0
Less Head Room	2	0	3	0	28	14	23	14	38
Smaller Wheels	13	4	4	0	56	19	15	4	7
Smoother Riding	55	4	7	2	26	22	2	0	3
Tinted Windshields	56	8	4	1	26	14	8	2	3
Push-button Shifting	14	3	5	1	40	40	13	2	4
Padded Dashboards	100	6	5	0	7	3	0	1	0
Wraparound Windshields	75	9	6	0	22	4	3	0	3
Seat Belts	93	5	3	0	9	5	6	0	1
More Horsepower	14	4	4	2	25	12	37	5	19

TABLE XIV

TOTAL SCORE DISTRIBUTION OF THE 122 RESPONDENTS TO FORM A
ON FOUR OF THE MEASURES DERIVED FROM THE QUESTIONNAIRE

Total Score	Measure			
	Present 'P'	Next 'N'	Trends 'T'	Safety 'S'
	F	F	F	F
140 - 144	11			
135 - 139	8			1
130 - 134	16			1
125 - 129	15			5
120 - 124	17	1		9
115 - 119	16		1	11
110 - 114	12	2	3	20
105 - 109	10	4	4	23
100 - 104	4	5	5	17
95 - 99	5	8	12	14
90 - 94	2	15	9	7
85 - 89	1	14	15	10
80 - 84	2	18	16	3
75 - 79	1	19	20	
70 - 74	1	14	17	
65 - 69	1	10	5	
60 - 64		8	3	
55 - 59		3	7	
50 - 54		1	1	
45 - 49			3	1
40 - 44				
35 - 39			1	

TABLE XV

RANK OF FEATURES ON PAIRED-COMPARISON (FEATURES) SECTION,
BASED UPON THE NUMBER OF TIMES EACH FEATURE WAS CHOSEN
OVER ANY OTHER FEATURE WITH WHICH IT WAS PAIRED

Feature	Number of First Choices	Rank
Set A		
Leg room	407	1
Head room	282	2
Exterior design	190	4
Push-button shifting	121	5
Luggage space	218	3
Set B		
Acceleration	129	5
Low purchase price	351	2
Power brakes	173	3
Power steering	153	4
Trouble-free operation	451	1

Note: All the features in each of the two sets were paired with every other feature in the same set.

Appendix D

TABLE XVI

TESTS FOR THE PRESENCE OR ABSENCE OF A RELATIONSHIP
BETWEEN THE SCORES ATTAINED ON THE PRESENT CAR, NEXT
CAR, TRENDS, AND SAFETY SECTIONS AND THE INDICATED
CHARACTERISTICS OF THE RESPONDENT

<u>Score on Present Car</u>		
<u>Characteristics</u>	<u>Test</u>	<u>Result</u>
Age of respondents	r_s	$r_s = .114$
Height of respondents	r_s	$-.019$
Weight of respondents	r_s	$-.048$
Distance driven per year	r_s	$.035$
Sex of respondents	U	$z = .15$
Marital status of respondents	U	1.25
Plan to buy new car	U	1.14
Age of present car	U	1.10
Loyalty to present make	H	$H = 11.65^{**}$
Make of present car	H	1.20
Model of present car	H	5.49
Company of present car	H	$.65$
Age of respondents	H	2.00
Distance driven per year	H	$.15$
<u>Score on Next Car</u>		
<u>Characteristics</u>	<u>Test</u>	<u>Result</u>
Age of respondents	r_s	$r_s = -.290^{**}$
Height of respondents	r_s	$-.015$
Weight of respondents	r_s	$-.066$
Distance driven per year	r_s	$.201^*$
Sex of respondents	U	$z = .30$
Marital status of respondents	U	$.56$
Plan to buy new car	U	$.52$
Age of present car	U	$.24$
Loyalty to present car	H	$H = 2.63$
Make of present car	H	7.83
Model of present car	H	2.25
Company of present car	H	7.10
Age of respondents	H	7.16^*
Distance driven per year	H	4.55

TABLE XVI (Continued)

<u>Score on Trends</u>		
<u>Characteristics</u>	<u>Test</u>	<u>Result</u>
Age of respondents	r_s	$r_s = -.300^{**}$
Height of respondents	r_s	-.032
Weight of respondents	r_s	.093
Distance driven per year	r_s	.139
Sex of respondents	U	$Z = .63$
Marital status of respondents	U	.15
Plan to buy new car	U	1.02
Age of present car	U	1.28
Loyalty to present make	H	$H = .97$
Make of present car	H	9.09
Model of present car	H	12.08*
Company of present car	H	2.82
Age of respondents	H	6.03*
Distance driven per year	H	2.20

<u>Score on Safety</u>		
<u>Characteristics</u>	<u>Test</u>	<u>Result</u>
Age of respondents	r_s	$r_s = -.125$
Height of respondents	r_s	.034
Weight of respondents	r_s	-.109
Distance driven per year	r_s	.150
Sex of respondents	U	$Z = .99$
Marital status of respondents	U	1.93*
Plan to buy new car	U	.16
Age of present car	U	1.28
Loyalty to present make	H	$H = .70$
Make of present car	H	6.97
Model of present car	H	1.47
Company of present car	H	2.18
Age of respondents	H	3.14
Distance driven per year	H	1.71

* Significant at 5% level

** Significant at 1% level

Note: r_s indicates rank-order coefficient of correlation test.

U indicates Mann-Whitney U-test of the significance of the difference between the mean ranks of two groups ranked on a common variable.

H indicates Kruskal-Wallis H-test for the significance of the differences among the mean ranks of three or more groups ranked on a common variable.

TABLE XVII

TEST OF THE DEGREE OF AGREEMENT AMONG CERTAIN GROUPS
IN THE WAY IN WHICH THEY RANK THE TWO SETS OF FEATURES
ON THE PAIRED-COMPARISON (FEATURES) SECTION

	Features									
	Set A					Set B				
	Leg Room	Head Room	Exterior Design	Push-button Shifting	Luggage Space	Acceleration	Low Purchase Price	Power Brakes	Power Steering	Trouble-free operation
Respondents who own:										
2-door Sedan	1	2	4	5	3	5	2	3	4	1
4-door Sedan	1	2	4	5	3	5	2	3	4	1
Hardtop	1	3	2	5	4	3	2	4	5	1
Coupe	1	2	3	5	4	5	2	3	4	1
Station Wagon	1	2	5	4	3	5	2	4	3	1
Convertible	1	2	3	5	4	4	2	3	5	1
Model not given	1	2	3	5	4	5	2	4	3	1
Test			Wc = .864**				Wc = .860**			
Respondents who own cars manufactured in:										
1957	1	3	2	5	4	2	4	5	3	1
1956	1	2	3	5	4	3	2	4	5	1
1955	1	2	4	5	3	5	2	3	4	1
1954	1	2	4	5	3	5	2	3	4	1
1953	1	2	4	5	3	5	2	3	4	1
1952	1	2	5	4	3	5	1	3	4	2
1951	1	2	4	5	3	5	1	3	4	2
1950	1	3	4	5	2	5	1	4	3	2
1949	1	2	4	3	5	5	2	3	4	1
1947	1	4	4	2	4	2	4	3	5	1
1946	2	4	3	5	1	5	3	4	1	2
Test			Wc = .651**				Wc = .568**			

TABLE XVII (Continued)

	Set A						Features			
							Set B			
	leg room	Head room	Exterior Design	Push-button Shifting	Luggage Space	Acceleration	Low Purchase Price	Power Brakes	Power Steering	Trouble-free Operation
Respondents who own a:										
Buick	1	3	4	5	2	3	2	4	5	1
Chevrolet	1	2	4	5	3	3	2	4	5	1
Chrysler	1	4	5	2	3	3	2	4	5	1
DeSoto	3	1	5	4	3	5	2	3	4	1
Dodge	1	2	5	4	3	5	3	4	2	1
Ford	1	2	3	5	4	5	2	4	3	1
Kaiser	1	2	3	5	4	5	2	3	4	1
Mercury	1	2	3	5	4	3	1	4	5	2
Oldsmobile	1	2	4	5	3	5	2	3	4	1
Packard	1	2	4	5	3	4	3	1	5	2
Plymouth	1	4	5	2	3	5	2	3	4	1
Pontiac	1	2	4	5	3	4	2	5	3	1
Studebaker	1	2	3	5	4	3	2	5	4	1
Volkswagen	1	4	2	5	3	3	2	4	5	1
Test	Wc = .712**						Wc = .702**			
Respondents who own cars made by:										
General Motors	1	2	4	5	3	5	2	3	4	1
Ford Company	1	2	3	5	4	5	2	3	4	1
Chrysler Company	1	3	5	4	2	5	2	3	4	1
Others	1	2	3	5	4	4	2	3	5	1
Test	Wc = .802**						Wc = .944**			
Respondents whose height is:										
60" - 67"	1	2	4	5	3	5	2	3	4	1
68" - 70"	1	2	4	5	3	3	2	4	5	1
71" - 78"	1	2	4	5	3	4	2	3	5	1
Test	Wc = .967**						Wc = .858**			

TABLE XVII (Continued)

	Features									
	Set A					Set B				
	Leg room	Head room	Exterior Design	Push-button Shifting	Luggage Space	Acceleration	Low Purchase Price	Power Brakes	Power Steering	Trouble-free operation
Respondents whose weight is:										
100 - 155 lbs.	1	2	4	5	3	5	2	3	4	1
156 - 184 lbs.	1	2	4	5	3	3	2	4	5	1
185 - 239 lbs.	1	2	3	5	4	4	2	3	5	1
Test			Wc = .924**					Wc = .858**		
Respondents whose age is:										
20 - 34 yrs.	1	2	3	5	4	5	2	3	4	1
35 - 49 yrs.	1	2	4	5	3	3	2	4	5	1
50 - 89 yrs.	1	2	4	5	3	4	2	3	5	1
Test			Wc = .924**					Wc = .828**		
Respondents whose yearly distance driven is:										
0 - 9,990 miles	1	2	3	5	4	4	2	3	5	1
10,000-14,999 "	1	2	4	5	3	4	2	3	5	1
15,000-39,999 "	1	2	4	5	3	5	2	3	4	1
Test			Wc = .924**					Wc = .924**		
Respondents whose feeling towards their present car is:										
Loyal	1	2	4	5	3	5	2	3	4	1
?	1	2	4	5	3	4	2	3	5	1
Not Loyal	1	2	4	5	3	4	2	3	5	1
Test			Wc = .967**					Wc = .924**		

TABLE XVII (Continued)

	Set A					Set B				
	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	$\bar{Q}_i$	
Respondents who are:										
Married	1	2	4	5	3	5	2	3	4	
Single	1	2	4	5	3	4	2	3	5	
Test		$r_s = 1.00^{**}$					$r_s = .90^*$			
Respondents who:										
Plan to buy	1	2	4	5	3	5	2	4	3	
Do not plan to buy	1	2	4	5	3	4	2	3	5	
Test		$r_s = 1.00^{**}$					$r_s = .70$			
Respondents who are:										
Male	1	2	4	5	3	5	2	3	4	
Female	1	2	3	5	4	5	2	3	4	
Test		$r_s = .90^*$					$r_s = 1.00^{**}$			
Respondents who attained scores in the:										
Upper 27%-Present Car	1	2	4	5	3	5	2	3	4	
Lower 27%-Present Car	1	2	4	5	3	5	2	3	4	
Test		$r_s = 1.00^{**}$					$r_s = 1.00^{**}$			
Upper 27%-Next Car	1	2	4	5	3	5	2	3	4	
Lower 27%-Next Car	1	2	4	5	3	5	2	3	4	
Test		$r_s = **$					$r_s = 1.00^{**}$			
Upper 27%-Trends	1	3	2	5	4	5	2	3	4	
Lower 27%-Trends	1	2	4	5	3	5	2	4	3	
Test		$r_s = .70$					$r_s = .90^*$			

TABLE XVII (Continued)

Respondents who attained scores in the:	Features									
	Set A					Set B				
	L.Q.	± Q.	M.	P.S.	L.S.	A.C.	L.P.P.	P.B.	P.S.	T.O.
Upper 27%- Safety	1	2	3	5	4	5	2	3	4	1
Lower 27%- Safety	1	2	4	5	3	5	2	3	4	1
Test	$r_s = .90^*$					$r_s = 1.00^{**}$				

* Significant at the 5% level.

** Significant at the 1% level.

Note: Wc - indicates the coefficient of concordance; a test of the degree of agreement among the rankings of a set of features, by three or more groups of judges.

r_s - indicates the rank-order coefficient between the ranks assigned a set of features by a group of judges, and the ranks assigned the same set by another group of judges.

TABLE XVIII

DIFFERENCES IN RESPONSE TO ITEMS IN THE STATEMENT SECTION
BETWEEN RESPONDENTS IN THE UPPER AND LOWER 27% ON THE
PRESENT CAR DISTRIBUTION OF SCORES

Number of statement	Upper 27%		Lower 27%		χ^2	p
	Agree	Disagree	Agree	Disagree		
1	22	11	19	14	.57	
2	16	17	10	23	2.27	
3	29	4	22	11	4.25	.05
4	6	27	8	25	.36	
5	5	28	5	28	-	-
6	18	15	17	16	.06	
7	9	24	7	26	.33	
8	1	32	12	21	12.52	.01
9	12	21	17	16	1.53	
10	26	7	27	6	.09	
11	25	8	25	8	-	-
12	1	32	11	22	10.15	.01
13	11	22	13	20	.26	
14	9	24	8	25	.08	
15	28	5	14	19	12.81	.01
16	10	23	14	19	1.04	
17	30	3	30	3	-	
18	14	19	21	12	2.97	.10
19	13	20	19	14	2.17	
20	29	4	25	8	1.64	
21	7	26	12	21	1.84	
22	26	7	27	6	.09	
23	9	24	10	23	.07	

TABLE XIX

DIFFERENCES IN RESPONSE TO ITEMS IN THE STATEMENT SECTION
 BETWEEN RESPONDENTS IN THE UPPER AND LOWER 27% ON THE
 NEXT CAR DISTRIBUTION OF SCORES

Number of statement	Upper 27%		Lower 27%		χ^2	p
	Agree	Disagree	Agree	Disagree		
1	17	16	20	13	.55	
2	14	19	17	16	.54	
3	27	6	25	8	.36	
4	8	25	3	30	2.71	.10
5	2	31	2	31	-	
6	13	20	18	15	1.51	
7	13	20	5	28	4.87	.05
8	9	24	4	29	2.38	
9	19	14	13	20	2.17	
10	31	2	23	10	6.49	.02
11	25	8	28	5	.89	
12	7	26	2	31	*	.074
13	9	24	9	24	-	
14	12	21	6	27	2.74	.10
15	20	13	27	6	3.61	.10
16	14	19	8	25	2.44	
17	28	5	33	0	*	.027
18	22	11	17	16	1.56	
19	18	15	18	15	-	
20	24	9	29	4	2.38	
21	15	18	4	29	8.92	.01
22	28	5	24	9	1.44	
23	14	19	6	27	4.57	.05

* Items with an expected cell frequency of less than five; tested by Fisher's exact test of probability.

TABLE XX

DIFFERENCES IN RESPONSE TO ITEMS IN THE STATEMENT SECTION
 BETWEEN RESPONDENTS IN THE UPPER AND LOWER 27% ON THE
 TRENDS DISTRIBUTION OF SCORES

Number of statement	Upper 27%		Lower 27%		χ^2	p
	Agree	Disagree	Agree	Disagree		
1	18	15	15	18	.54	
2	13	20	19	14	2.17	
3	26	7	25	8	.08	
4	6	27	3	30	*	.237
5	1	32	3	30	*	.307
6	14	19	18	15	.96	
7	15	18	5	28	7.15	.01
8	8	25	8	25	-	
9	20	13	10	23	6.09	.02
10	25	8	24	9	.08	
11	22	11	32	1	10.15	.01
12	6	27	3	30	*	.237
13	6	27	13	20	3.61	.10
14	11	22	4	29	4.21	.05
15	22	11	24	9	.28	
16	12	21	11	22	.06	
17	26	7	32	1	*	.028
18	22	11	18	15	1.01	
19	15	18	17	16	.24	
20	25	8	29	4	1.62	
21	15	18	6	27	5.64	.02
22	25	8	28	5	.85	
23	16	17	5	28	8.43	.01

* Items with an expected cell frequency of less than five; tested by Fisher's exact test of probability.

TABLE XXI

DIFFERENCES IN RESPONSE TO ITEMS IN THE STATEMENT SECTION
BETWEEN RESPONDENTS IN THE UPPER AND LOWER 27% ON THE
SAFETY DISTRIBUTION OF SCORES

Number of statement	Upper 27%		Lower 27%		χ^2	p
	Agree	Disagree	Agree	Disagree		
1	18	15	21	12	.56	
2	13	20	16	17	.55	
3	29	4	24	9	2.38	
4	5	28	6	27	.11	
5	3	30	5	28	*	.355
6	14	19	22	11	3.90	.05
7	11	22	2	31	7.73	.01
8	5	28	5	28	-	
9	18	15	14	19	.96	
10	28	5	25	8	.85	
11	23	10	30	3	4.67	.05
12	6	27	5	28	.11	
13	7	26	16	17	5.39	.05
14	12	21	4	29	5.26	.05
15	23	10	22	11	.07	
16	17	16	8	25	5.20	.05
17	27	6	31	2	*	.130
18	20	13	20	13	-	
19	16	17	18	15	.24	
20	23	10	27	6	1.31	
21	12	21	10	23	.27	
22	25	8	29	4	1.62	
23	16	17	6	27	6.80	

* Items with an expected cell frequency of less than five; tested by Fisher's exact test of probability.

TABLE XXII

RANK-ORDER CORRELATIONS BETWEEN EACH OF THE DISTRIBUTIONS OF
SCORES ON THE PRESENT CAR, NEXT CAR, TRENDS
AND SAFETY SECTIONS OF THE QUESTIONNAIRE

Score	Present Car	Next Car	Trends	Safety
Score				
Present Car	1.00	-.206*	-.016	.110
Next Car		1.00	.627**	.504**
Trends			1.00	.568**
Safety				1.00

* Significant at the 5% level.

** Significant at the 1% level.

TABLE XXIII

RANK-ORDER CORRELATIONS BETWEEN A NUMBER
OF CHARACTERISTICS OF THE RESPONDENTS

Characteristic	Age	Height	Weight	Distance
Characteristic				
Age of respondent	1.00	-.229*	.082	-.153
Height of respondent		1.00	.615**	.185*
Weight of respondent			1.00	.029
Distance driven per year				1.00

* Significant at the 5% level.

** Significant at the 1% level.

TABLE XXIV

Z-VALUES FROM THE MANN-WHITNEY U-TEST OF THE SIGNIFICANCE
OF THE DIFFERENCES BETWEEN THE MEAN RANKS OF TWO GROUPS
OF RESPONDENTS RANKED ON THE INDICATED VARIABLES

Groups	Male vs Female	Married vs Single	Plan to buy vs Don't plan to buy	Owners of new cars vs Owners of old cars
Variables				
Age	1.27	.99	2.49*	1.20
Distance	2.43*	2.09*	2.31*	3.22**

* Significant at the 5% level.

** Significant at the 1% level.

Note: For example, the Z-score of 1.27 in the first column, first line, indicates that males do not differ significantly from females in respect to age; while the Z-score of 2.43 in the first column, second line, indicates that males do differ significantly from females in respect to distance driven.

Appendix E

TABLE XXV

MEAN SCORES ON THE INDICATED ITEMS, RANKED BY COLUMN AND ROW,
FOR A TWO-WAY NON-PARAMETRIC ANALYSIS OF VARIANCE

Paired Comparison (Features) Section							
Set A "leg room"							
Model	2-Door		4-Door		Hardtop		Sum of the
Make	Sedan		Sedan		Hardtop		Row Ranks
Chevrolet	3		3		4		10
	3.33	1	3.00	2	2.29	3	
	2		4		3		9
Ford	3.40	1	2.33	3	2.50	2	
	1		2		1		4
Mercury	4.00	1	3.50	3	3.51	2	
	4		1		2		7
Oldsmobile	3.17	3	3.60	1	3.50	2	
Sum of the							
Column Ranks		6		9		9	
	Wc = .15						Wc = .426
							C

Set A "head room"							
Chevrolet	2		2		4		8
	2.33	2	3.29	1	1.29	3	
	3		3		1		7
Ford	2.07	3	2.33	2	4.00	1	
	4		1		3		8
Mercury	1.00	3	3.50	1	2.50	2	
	1		4		2		7
Oldsmobile	3.00	2	2.00	3	3.50	1	
Sum of the							
Column Ranks		10		7		7	
	Wc = .15						Wc = .000
							C

Note: Tables where a C appears in the lower right-hand corner cover features common to Forms A and B of the questionnaire.

TABLE XXV (Continued)

Model Make	Set A "exterior design"					Sum of the Row Ranks	
	2-Door Sedan		4-Door Sedan		Hardtop		
	4		2		1		7
Chevrolet	1.08	3	1.71	2	3.29	1	
	2		1		2		5
Ford	1.47	3	2.33	2	2.50	1	
	1		4		3		8
Mercury	2.50	1	.50	3	2.00	2	
	3		3		4		10
Oldsmobile	1.33	2	1.20	3	1.50	1	
Sum of the Column Ranks		9		10		5	
	Wc = .38					Wc = .255	
							C

Set A "push-button shifting"							
	3		3		1		7
Chevrolet	.83	3	.86	2	2.14	1	
	1		2		3		6
Ford	1.08	1	1.00	3	1.01	2	
	2		4		2		8
Mercury	1.00	2	.50	3	1.50	1	
	4		1		4		9
Oldsmobile	.67	2	1.40	1	.50	3	
Sum of the Column Ranks		8		9		7	
	Wc = .03					Wc = .085	
							C

Set A "luggage space"							
	1		4		1		6
Chevrolet	2.33	1	1.14	3	1.29	2	
	3		1		2		6
Ford	1.80	2	2.01	1	1.00	3	
	4		2		4		10
Mercury	1.50	2	2.00	1	1.50	3	
	2		3		3		8
Oldsmobile	1.83	1	1.80	2	.99	3	
Sum of the Column Ranks		6		7		11	
	Wc = .38					Wc = .213	
							C

TABLE XXV (Continued)

Set B "acceleration"

Model Make	2-Door Sedan		4-Door Sedan		Hardtop	Sum of the Row Ranks	
Chevrolet	2		1		1	4	
	1.00	3	1.14	2	2.14	1	
Ford	3		3		4	10	
	.87	2	1.00	1	.00	3	
Mercury	1		2		2	5	
	2.00	2	1.01	3	2.01	1	
Oldsmobile	4		4		3	11	
	.50	3	.99	1	.51	2	
Sum of the column ranks		10		7		7	
	Wc = .15					Wc = .765*	
							C

Set B "low purchase price"

Chevrolet	1		3		4	8	
	3.17	2	3.29	1	2.71	3	
Ford	4		2		2	8	
	2.73	3	3.33	2	3.50	1	
Mercury	2		1		1	4	
	8.00	3	3.50	2	4.00	1	
Oldsmobile	3		4		3	10	
	2.83	2	2.40	3	3.49	1	
Sum of the column ranks		10		8		6	
	Wc = .21					Wc = .383	
							C

Set B "power brakes"

Chevrolet	4		2		4	10	
	1.25	2	1.14	1	.86	3	
Ford	3		1		1	5	
	1.47	2	1.33	3	2.50	1	
Mercury	1		4		3	8	
	3.00	1	.50	3	1.50	2	
Oldsmobile	2		3		2	7	
	1.50	2	.80	3	2.00	1	
Sum of the column ranks		7		10		7	
	Wc = .15					Wc = .255	
							C

TABLE XXV (Continued)

Set B "power steering"

Model Make	2-Door Sedan	4-Door Sedan	Hardtop	Sum of the Row Ranks
Chevrolet	3 .92	2 1.01	4 .43	9 3
Ford	2 1.40	3 1.00	1 1.50	6 1
Mercury	4 .00	4 .99	3 .50	11 2
Oldsmobile	1 1.50	1 2.20	2 .51	4 3
Sum of the column ranks	9	6	9	
	Wc = .15			Wc = .596 _C

Set B "trouble-free operation"

Chevrolet	1 3.67	3 3.43	1 3.71	5 1
Ford	3 3.20	4 3.33	3 2.50	10 3
Mercury	4 1.50	2 3.50	4 2.00	10 2
Oldsmobile	2 3.60	1 3.61	2 3.50	5 3
Sum of the column ranks	9	6	9	
	Wc = .15			Wc = .510 _C

Present Car Section
Feature 1 "Horsepower"

Chevrolet	1 8.25	3 6.29	2 8.57	6 1
Ford	3 7.53	1 8.33	4 6.50	8 3
Mercury	4 4.00	4 4.01	1 9.00	9 1
Oldsmobile	2 7.67	2 8.20	3 8.00	7 2
Sum of the column ranks	10	7	7	
	Wc = .15			Wc = .085 _C

TABLE XXV (Continued)

Next Car Section
Feature 16 "More horsepower"

Model Make	2-Door Sedan	4-Door Sedan	Hardtop	Sum of the Row Ranks
	3	1	1	5
Chevrolet	3.50	3	4.00	2
	4	4	2	10
Ford	3.40	2	3.33	3
	1	3	4	8
Mercury	6.00	1	3.50	2
	2	2	3	7
Oldsmobile	3.67	2	3.80	1
Sum of the column ranks		8	8	8
	Wc = .00		Wc = .255	
				C

Trends Section
Feature 11 "Higher horsepower"

	2	2	1	5
Chevrolet	4.08	3	4.43	2
	4	4	4	12
Ford	3.47	1	3.00	2
	1	3	3	7
Mercury	6.00	1	3.01	3
	3	1	2	6
Oldsmobile	3.67	3	5.20	1
			4.50	2
Sum of the column ranks		8	8	8
	Wc = .00		Wc = .596	
				C

Safety Section
Feature 16 "More horsepower"

	1	3	2	6
Chevrolet	4.08	2	3.57	3
	2	2	4	8
Ford	3.53	3	4.33	2
	4	4	1	9
Mercury	2.00	3	3.00	2
	3	1	3	7
Oldsmobile	3.50	3	5.60	1
			5.00	2
Sum of the column ranks		11	8	5
	Wc = .50		Wc = .255	
				C

TABLE XXV (Continued)

Statements Section
Statement 14 "on horsepower"

Model	2-door		4-Door		Hardtop		Sum of the
Make	Sedan		Sedan		Hardtop		Row Ranks
	2		2		2		6
Chevrolet	2.42	3	2.43	2	2.44	1	
	3		3		1		7
Ford	2.00	3	2.33	2	3.00	1	
	1		1		3		5
Mercury	3.00	2	3.50	1	2.00	3	
	4		4		4		12
Oldsmobile	1.33	3	1.80	1	1.50	2	
Sum of column ranks		11		6		7	
	Wc = .38						Wc = .596

Next Car Section
Feature 2 "smaller car"

	3		4		3		10
Chevrolet	3.42	2	2.57	3	3.43	1	
	2		2		2		6
Ford	4.00	3	5.00	2	5.01	1	
	4		1		4		9
Mercury	2.50	3	6.00	1	3.00	2	
	1		3		1		5
Oldsmobile	5.17	2	4.80	3	6.00	1	
Sum of column ranks		10		9		5	
	Wc = .38						Wc = .340

* Significant at the 10% level.

** Significant at the 5% level.

TABLE XXVI

MEAN SCORES ON THE INDICATED ITEMS, RANKED BY COLUMN AND ROW,
FOR A TWO-WAY NON-PARAMETRIC ANALYSIS OF VARIANCE

Paired-Comparison (Features) Section							
Set A "leg room"							
Company	General Motors		Ford		Chrysler		Sum of Row Ranks
Model							
	2		1		3		6
2-Door Sedan	3.38	2	3.47	1	2.50	3	
	1		3		2		6
4-Door Sedan	3.41	1	2.80	3	3.80	2	
	3		2		1		6
Hardtop	2.56	3	3.00	2	4.00	1	
Sum of column ranks		6		6		6	
	Wc = .00					Wc = .00	
							C

Set A "head room"							
	2		3		2		7
2-Door Sedan	2.54	1	1.94	2	1.50	3	
	1		2		1		4
4-Door Sedan	2.74	2	2.80	1	2.12	3	
	3		1		3		7
Hardtop	1.78	2	3.25	1	1.00	3	
Sum of column ranks		5		4		9	
	Wc = .65*					Wc = .25	
							C

Set A "exterior design"							
	3		3		3		9
2-Door Sedan	.96	3	1.59	1	1.00	2	
	2		2		2		6
4-Door Sedan	1.53	2	1.60	1	1.01	3	
	1		1		1		3
Hardtop	2.89	1	1.75	2	1.02	3	
Sum of column ranks		6		4		8	
	Wc = .35					Wc = .85**	
							C

Note: Tables where a C appears in the lower right-hand corner cover features common to Forms A and B of the questionnaire.

TABLE XXVI (Continued)

Set A "push-button shifting"							
Company	General Motors		Ford		Chrysler		Sum of Row Ranks
Model							
2-Door Sedan	2		2		1		5
	.92	3	1.00	2	3.00	1	
4-Door Sedan	3		3		2		8
	.76	3	.80	2	1.88	1	
Hardtop	1		1		3		5
	1.78	1	1.25	2	1.00	3	
Sum of column ranks		7		6		5	
	Wc = .05					Wc = .25	
							C

Set A "luggage space"							
2-Door Sedan	1		2		3		6
	2.17	1	1.76	3	2.00	2	
4-Door Sedan	2		1		2		5
	1.76	3	2.00	2	2.12	1	
Hardtop	3		3		1		7
	1.22	2	.75	3	3.00	1	
Sum of column ranks		6		8		4	
	Wc = .35					Wc = .05	
							C

Set B "acceleration"							
2-Door	3		3		2		8
	.96	3	1.00	2	1.01	1	
4-Door	2		2		3		7
	1.18	1	1.01	2	.62	3	
Hardtop	1		1		1		3
	1.78	1	1.02	3	1.50	2	
Sum of column ranks		5		7		6	
	Wc = .05					Wc = .65*	
							C

TABLE XXVI (Continued)

	Set B "low purchase price"						
Company	General Motors		Ford		Chrysler		Sum of Row Ranks
	3		3		3		9
2-Door Sedan	2.71	2	2.76	1	2.50	3	
	1		2		2		5
4-Door Sedan	2.94	2	3.40	1	2.51	3	
	2		1		1		4
Hardtop	2.89	2	3.75	1	2.52	3	
Sum of column ranks		6		3		9	
	Wc = .85**						Wc = .65* C

Set B "power brakes"							
	1		2		2		5
2-Door Sedan	1.29	3	1.65	1	1.50	2	
	3		3		1		7
4-Door Sedan	.94	3	1.00	2	1.88	1	
	2		1		3		6
Hardtop	1.11	2	2.00	1	1.00	3	
Sum of column ranks		8		4		6	
	Wc = .35						Wc = .65* C

Set B "power steering"							
	2		1		2		5
2-Door Sedan	1.25	1	1.24	2	1.00	3	
	1		2		1		4
4-Door Sedan	1.29	2	1.00	3	1.75	1	
	3		3		3		9
Hardtop	.45	3	.99	1	.98	2	
Sum of column ranks		6		6		6	
	Wc = .00						Wc = .05 C

Set B "trouble-free operation"							
	1		2		1		4
2-Door Sedan	3.71	2	3.00	3	4.00	1	
	3		1		3		7
4-Door Sedan	3.65	2	3.40	3	3.88	1	
	2		3		2		7
Hardtop	3.67	2	2.75	3	3.98	1	
Sum of column ranks		6		9		3	
	Wc = .85**						Wc = .55 C

TABLE XXVI (Continued)

Present Car Section							
Feature 4 "ease of ride"							
Company	General Motors		Ford		Chrysler		Sum of Row Ranks
Model							
2-Door Sedan	3 7.54	2	2 6.47	3	2 8.90	1	7
4-Door Sedan	1 8.29	1	3 5.00	3	3 8.00	2	7
Hardtop	2 7.78	3	1 8.00	2	1 9.00	1	4
Sum of column ranks		6		8		4	
	Wc = .35					Wc = .25	
							C

Next Car Section							
Feature 13 "easier ride"							
2-Door Sedan	1 6.46	2	2 7.47	1	1 6.00	3	5
4-Door Sedan	3 5.47	3	1 9.00	1	1 7.75	2	5
Hardtop	2 5.78	2	3 7.25	1	3 5.00	3	8
Sum of column ranks		7		3		8	
	Wc = .55					Wc = .25	
							C

Trends Section							
Feature 5 "smoother riding"							
2-Door Sedan	1 8.71	2	2 8.53	3	1 9.00	1	4
4-Door Sedan	2 7.88	3	1 8.60	2	3 8.88	1	6
Hardtop	3 7.67	3	3 8.25	2	2 8.98	1	8
Sum of column ranks		8		7		3	
	Wc = .55					Wc = .25	
							C

TABLE XXVI (Continued)

Safety Section							
Feature 10 "smoother riding"							
Company Model	General Motors		Ford		Chrysler		Sum of Row Ranks
2-Door Sedan	1		3		3		7
	6.83	1	6.29	3	6.50	2	
4-Door Sedan	3		1		1		5
	5.53	3	7.80	2	8.38	1	
Hardtop	2		2		1		6
	6.00	3	6.75	1	6.51	2	
Sum of column ranks		7		6		5	
	Wc = .05					Wc = .35 _G	

Next Car Section							
Feature 9 "heavier car"							
2-Door Sedan	2		1		3		6
	4.58	2	5.65	1	2.50	3	
4-Door Sedan	3		2		2		7
	4.47	1	3.00	3	3.38	2	
Hardtop	1		3		1		5
	4.89	2	2.50	3	6.00	1	
Sum of column ranks		5		7		6	
	Wc = .05					Wc = .05	

Statements Section							
Statement 11 "on longer cars"							
2-Door Sedan	1		3		2		6
	4.04	2	3.35	3	4.50	1	
4-Door Sedan	2		1		3		6
	3.53	3	4.80	1	3.88	2	
Hardtop	3		2		1		6
	3.44	3	4.00	2	5.00	1	
Sum of column ranks		8		6		4	
	Wc = .35					Wc = .00	

* Significant at the 10% level.

** Significant at the 5% level.

TABLE XXVII

MEAN SCORES ON THE INDICATED ITEMS, RANKED BY COLUMN AND ROW,
FOR A TWO-WAY NON-PARAMETRIC ANALYSIS OF VARIANCE

Paired-Comparison (Features) Section							
Set A "leg room"							
Height	60"-67"		68"-70"		71"-78"		Sum of
Weight							Row Ranks
185-239	2		2		2		6
	3.25	3	3.56	1	3.53	2	
	1		3		1		5
156-184	3.43	2	3.11	3	3.60	1	
	3		1		3		7
100-155	2.90	3	3.57	1	3.50	2	
Sum of							
column ranks		8		5		5	
	Wc = .25						Wc = .05 C
Set A "head room"							
	1		3		2		6
185-239	2.50	2	2.11	3	2.65	1	
	3		1		3		7
156-184	2.00	3	2.15	2	2.40	1	
	2		2		1		5
100-155	2.30	2	2.12	3	3.50	1	
Sum of							
column ranks		7		8		3	
	Wc = .65*						Wc = .05 C
Set A "exterior design"							
	3		3		1		7
185-239	1.00	3	1.22	2	1.71	1	
	1		2		2		5
156-184	1.86	1	1.59	2	1.55	3	
	2		1		3		6
100-155	1.45	2	1.81	1	.50	3	
Sum of							
column ranks		6		5		7	
	Wc = .05						Wc = .05

Note: Tables where a C appears in the lower right-hand corner cover features common to Forms A and B of the questionnaire.

TABLE XXVII (Continued)

Set A "push-button shifting"

Height Weight	60"-67"		68"-70"		71"-78"		Sum of Row Ranks
	2		1		3		6
185-239	1.00	2	1.44	1	.41	3	
	3		2		2		7
156-184	.86	2	1.22	1	.75	3	
	1		3		1		5
100-155	1.10	2	1.06	3	2.00	1	
Sum of column ranks		6		5		7	
	Wc = .05						Wc = .05 C

Set A "luggage space"

	2		2		1		5
185-239	2.00	1	1.67	3	1.82	2	
	3		1		2		6
156-184	1.71	2	1.96	1	1.70	3	
	1		3		3		7
100-155	2.15	1	1.51	3	1.50	2	
Sum of column ranks		4		7		7	
	Wc = .25						Wc = .05 C

Set B "acceleration"

	2		3		1		6
185-239	1.00	2	.33	3	1.35	1	
	1		1		2		4
156-184	1.71	1	1.44	2	1.00	3	
	3		2		3		8
100-155	.95	2	.44	3	.99	1	
Sum of column ranks		5		8		5	
	Wc = .25						Wc = .35 C

Set B "low purchase price"

	2		2		3		7
185-239	2.50	2	3.11	1	2.29	3	
	3		3		2		8
156-184	2.00	3	2.56	2	2.90	1	
	1		1		1		3
100-155	2.80	3	3.19	1	3.00	2	
Sum of column ranks		8		4		6	
	Wc = .35						Wc = .65* C

TABLE XXVII (Continued)

Set B "power brakes"

Height Weight	60"-67"		68"-70"		71"-78"		Sum of Row Ranks
	3		1		2		6
185-239	1.25	3	2.00	1	1.35	2	
	1		2		3		6
156-184	1.86	1	1.41	2	1.15	3	
	2		3		1		6
100-155	1.45	2	1.51	3	1.50	1	
Sum of column ranks		6		6		6	
	Wc = .05						Wc = .05 c

Set B "power steering"

	1		3		1		5
185-239	2.00	1	1.11	3	1.24	2	
	2		2		2		6
156-184	1.29	2	1.33	1	1.20	3	
	3		1		3		7
100-155	1.00	2	1.50	1	.50	3	
Sum of column ranks		5		5		8	
	Wc = .25						Wc = .05 c

Set B "trouble-free operation"

	3		2		3		8
185-239	3.00	3	3.44	2	3.71	1	
	2		1		2		5
156-184	3.01	3	3.48	2	3.75	1	
	1		3		1		5
100-155	3.60	2	3.43	3	4.00	1	
Sum of column ranks		8		7		3	
	Wc = .65*						Wc = .25 c

Present Car Section
Feature 4 "ease of ride"

	1		3		1		5
185-239	8.00	2	7.56	3	8.65	1	
	2		2		3		7
156-184	7.86	1	7.74	2	7.20	3	
	3		1		2		6
100-155	7.05	3	7.75	1	7.50	2	
Sum of column ranks		6		6		6	
	Wc = .05						Wc = .05 c

TABLE XXVII (Continued)

Next Car Section
Feature 13 "easier ride"

Height Weight	60"-67"		68"-70"		71"-78"		Sum of Row Ranks
	1		3		3		7
185-239	7.50	1	5.78	3	6.76	2	
	3		2		2		7
156-184	6.86	2	6.04	3	7.00	1	
	2		1		1		4
100-155	7.10	3	7.12	2	9.00	1	
Sum of column ranks		6		8		4	
	Wc = .35						Wc = .25 C

Trends Section
Feature 5 "smoother riding"

	3		1		3		7
185-239	7.75	3	8.89	1	7.76	2	
	1		3		2		6
156-184	9.00	1	8.11	3	8.35	2	
	2		2		1		5
100-155	8.65	2	8.75	3	9.00	1	
Sum of column ranks		6		7		5	
	Wc = .05						Wc = .05 C

Safety Section
Feature 10 "smoother riding"

	1		2		1		4
185-239	8.00	1	6.55	3	6.59	2	
	2		3		2		7
156-184	7.57	1	6.41	3	6.50	2	
	3		1		3		7
100-155	6.85	2	6.94	1	4.50	3	
Sum of column ranks		4		7		7	
	Wc = .25						Wc = .25 C

Present Car Section
Feature 5 "head room"

	1		1		3		5
185-239	9.00	1	8.44	2	7.47	3	
	2		3		1		6
156-184	8.99	1	7.74	2	7.70	3	
	3		2		2		7
100-155	7.40	3	7.88	1	7.50	2	
Sum of column ranks		5		5		8	
	Wc = .25						Wc = .05 C

TABLE XXVII (Continued)

Present Car Section
Feature 7 "visibility"

Height	60"-67"		68"-71"		72"-78"		Sum of Row Ranks
Weight							
	3		1		3		7
190-240	7.00	2	9.00	1	6.47	3	
	2		3		2		7
150-189	7.43	3	7.44	2	7.80	1	
	1		2		1		4
100-149	8.30	2	8.00	3	9.00	1	
Sum of column ranks			7		6		5
	Wc = .05						Wc = .25

Statements Section
Statement 8 "on ease of entry"

	3		3		2		8
190-240	2.25	1	1.56	3	2.24	2	
	1		2		1		4
150-189	2.57	1	2.19	3	2.55	2	
	2		1		3		6
100-149	2.30	2	2.31	1	2.00	3	
Sum of column ranks			4		7		7
	Wc = .25						Wc = .35

* Significant at the 10% level.

TABLE XXVIII

MEAN SCORES ON THE INDICATED ITEMS, RANKED BY COLUMN AND ROW,
FOR A TWO-WAY NON-PARAMETRIC ANALYSIS OF VARIANCE

Paired-Comparison (Features) Section							
Set A "leg room"							
Age	20-34		35-49		50-84		Sum of Row Ranks
Distance							
	1		2		2		5
15,000-39,999	3.65	1	3.41	2	3.23	3	
	2		3		3		8
10,000-14,999	3.64	1	3.17	2	2.77	3	
	3		1		1		5
0-9,999	3.62	1	3.50	2	3.25	3	
Sum of column ranks		3		6		9	
	Wc = .85**					Wc = .25 C	
Set A "head room"							
	1		1		1		3
15,000-39,999	2.35	3	2.71	2	2.85	1	
	3		2		2		7
10,000-14,999	1.82	3	2.29	2	2.38	1	
	2		3		3		8
0-9,999	2.12	1	2.00	2	1.75	3	
Sum of column ranks		7		6		5	
	Wc = .05					Wc = .65* C	
Set A "exterior design"							
	2		3		3		8
15,000-39,999	1.94	1	1.29	2	.92	3	
	3		1		1		5
10,000-14,999	1.55	3	1.67	2	1.77	1	
	1		2		2		5
0-9,999	2.00	1	1.50	3	1.51	2	
Sum of column ranks		5		7		6	
	Wc = .05					Wc = .25 C	

Note: Tables where a C appears in the lower right-hand corner cover features common to Forms A and B of the questionnaire.

TABLE XXVIII (Continued)

Next Car Section
Feature 13 "easier ride"

Age Distance	20-34		35-49		50-64		Sum of Row Ranks
	2		1		2		5
15,000-39,999	7.41	2	7.47	1	5.31	3	
	1		2		1		4
10,000-14,999	8.18	1	6.92	3	7.46	2	
	3		3		3		9
0-9,999	6.12	1	5.67	2	5.17	3	
Sum of column ranks		4		6		8	
	Wc = .35					Wc = .65* C	

Trends Section
Feature 5 "smoother riding"

	1		2		3		6
15,000-39,999	8.12	3	8.29	2	8.54	1	
	2		1		2		5
10,000-14,999	8.09	3	8.42	2	8.92	1	
	3		3		1		7
0-9,999	7.62	3	8.00	2	9.00	1	
Sum of column ranks		9		6		3	
	Wc = .85**					Wc = .05 C	

Safety Section
Feature 10 "smoother riding"

	1		1		3		5
15,000-39,999	6.35	3	7.00	1	6.71	2	
	2		2		1		5
10,000-14,999	6.27	3	6.58	2	7.23	1	
	3		3		2		8
0-9,999	5.75	3	6.50	2	7.08	1	
Sum of column ranks		9		5		4	
	Wc = .65*					Wc = .25 C	

Present Car Section
Feature 1 "horsepower"

	1		2		3		6
15,000-39,999	8.06	1	7.59	3	7.69	2	
	2		3		1		6
10,000-14,999	7.73	2	7.58	3	8.31	1	
	3		1		2		6
0-9,999	6.88	3	7.83	2	7.92	1	
Sum of column ranks		6		8		4	
	Wc = .35					Wc = .00 C	

TABLE XXVIII (Continued)

Set B "power brakes"

Age	20-34		35-49		50-84		Sum of Row Ranks
Distance							
	3		2		3		8
15,000-39,999	1.35	2	1.24	3	1.46	1	
	2		1		2		5
10,000-14,999	1.45	2	1.25	3	1.54	1	
	1		3		1		5
0-9,999	1.50	2	1.17	3	2.00	1	
Sum of column ranks	6		9		3		
	Wc = .85**				Wc = .25 C		

Set B "power steering"

	2		2		3		7
15,000-39,999	1.24	1	1.18	2	1.08	3	
	1		1		1		3
10,000-14,999	1.55	2	1.25	3	1.92	1	
	3		3		2		8
0-9,999	.62	3	.67	2	1.17	1	
Sum of column ranks	6		7		5		
	Wc = .05				Wc = .65* C		

Set B "trouble-free operation"

	1		3		2		6
15,000-39,999	3.71	1	3.53	2	3.38	3	
	3		1		1		5
10,000-14,999	3.45	3	3.67	1	3.62	2	
	2		2		3		7
0-9,999	3.62	2	3.66	1	3.00	3	
Sum of column ranks	6		4		8		
	Wc = .35				Wc = .05 C		

Present Car Section
Feature 4 "ease of ride"

	3		2		1		6
15,000-39,999	6.65	3	8.00	2	8.85	1	
	1		1		3		5
10,000-14,999	7.55	2	8.08	1	6.85	3	
	2		3		2		7
0-9,999	6.88	3	7.33	2	8.08	1	
Sum of column ranks	8		5		5		
	Wc = .25				Wc = .05 C		

TABLE XXVIII (Continued)

Set A "push-button shifting"

Age	20-34		35-49		50-84		Sum of Row Ranks
Distance							
	3		2		2		7
15,000-39,999	.35	3	1.06	2	1.15	1	
	1		3		3		7
10,000-14,999	1.18	1	1.00	2	.98	3	
	2		1		1		4
0-9,999	.38	3	1.17	2	1.42	1	
Sum of column ranks	7		6		5		
	Wc = .05				Wc = .25 C		

Set A "luggage space"

	3		2		3		8
15,000-39,999	1.71	2	1.47	3	1.77	1	
	2		1		2		5
10,000-14,999	1.82	3	1.83	2	2.08	1	
	1		3		1		5
0-9,999	1.88	2	1.33	3	2.17	1	
Sum of column ranks	7		8		3		
	Wc = .65*				Wc = .25		

Set B "acceleration"

	1		3		2		6
15,000-39,999	1.18	2	1.12	3	1.23	1	
	3		1		3		7
10,000-14,999	.45	3	1.33	1	.54	2	
	2		2		1		5
0-9,999	1.00	3	1.17	2	1.33	1	
Sum of column ranks	8		6		4		
	Wc = .35				Wc = .05 C		

Set B "low purchase price"

	3		2		1		6
15,000-39,999	2.47	3	2.76	2	2.77	1	
	2		3		2		7
10,000-14,999	3.09	1	2.54	3	2.62	2	
	1		1		3		5
0-9,999	3.12	2	3.33	1	2.42	3	
Sum of column ranks	6		6		6		
	Wc = .00				Wc = .05 C		

TABLE XXVIII (Continued)

Safety Section
Feature 4 "faster acceleration"

Age	20-34		35-49		50-84		Sum of Row Ranks
Distance							
	1		2		2		5
15,000-39,999	6.06	1	5.88	2	5.15	3	
	3		1		3		7
10,000-14,999	4.82	2	6.25	1	4.62	3	
	2		3		1		6
0-9,999	5.00	2	4.50	3	5.67	1	
Sum of column ranks	5		6		7		
	Wc = .05				Wc = .05		

Safety Section
Feature 11 "tinted windshields"

	2		2		1		5
15,000-39,999	7.00	3	7.06	2	7.15	1	
	1		3		2		6
10,000-14,999	7.64	1	5.46	3	7.08	2	
	3		1		3		7
0-9,999	5.75	3	8.00	1	6.75	2	
Sum of column ranks	7		6		5		
	Wc = .05				Wc = .05 _c		

* Significant at the 10% level.

** Significant at the 5% level.

TABLE XXVIII (Continued)

Next Car Section
Feature 16 "more horsepower"

Age Distance	20-34		35-49		50-84		Sum of Row Ranks
	2		1		1		4
15,000-39,999	3.65	3	4.12	1	3.77	2	
	3		2		3		8
10,000-14,999	3.45	2	3.58	1	2.92	3	
	1		3		2		6
0-9,999	4.25	1	2.33	3	3.25	2	
Sum of column ranks		6		5		7	
	Wc = .05					Wc = .35 C	

Trends Section
Feature 11 "higher horsepower"

	2		2		2		6
15,000-39,999	4.18	1	4.06	2	3.85	3	
	3		3		3		9
10,000-14,999	4.09	1	3.92	2	2.77	3	
	1		1		1		3
0-9,999	4.25	3	4.50	2	4.58	1	
Sum of column ranks		5		6		7	
	Wc = .05					Wc = .85* _C	

Safety Section
Feature 16 "more horsepower"

	1		1		3		5
15,000-39,999	4.58	2	4.65	1	3.62	3	
	3		2		2		7
10,000-14,999	3.09	3	4.62	1	3.69	2	
	2		3		1		6
0-9,999	4.25	1	4.00	3	4.17	2	
Sum of column ranks		6		5		7	
	Wc = .05					Wc = .05 C	

Statements Section
Statement 14 "on horsepower"

	1		1		1		3
15,000-39,999	2.53	2	2.18	3	2.54	1	
	3		2		3		8
10,000-14,999	1.91	1	1.88	2	1.77	3	
	2		3		2		7
0-9,999	2.00	2	1.83	3	2.08	1	
Sum of column ranks		5		8		5	
	Wc = .25					Wc = .65*	

TABLE XXVIII (Continued)

Next Car Section
Feature 16 "more horsepower"

Age Distance	20-34		35-49		50-84		Sum of Row Ranks
	2		1		1		4
15,000-39,999	3.65	3	4.12	1	3.77	2	
	3		2		3		8
10,000-14,999	3.45	2	3.58	1	2.92	3	
	1		3		2		6
0-9,999	4.25	1	2.33	3	3.25	2	
Sum of column ranks		6		5		7	
	Wc = .05					Wc = .35 C	

Trends Section
Feature 11 "higher horsepower"

	2		2		2		6
15,000-39,999	4.18	1	4.06	2	3.85	3	
	3		3		3		9
10,000-14,999	4.09	1	3.92	2	2.77	3	
	1		1		1		3
0-9,999	4.25	3	4.50	2	4.58	1	
Sum of column ranks		5		6		7	
	Wc = .05					Wc = .85* _C	

Safety Section
Feature 16 "more horsepower"

	1		1		3		5
15,000-39,999	4.58	2	4.65	1	3.62	3	
	3		2		2		7
10,000-14,999	3.09	3	4.62	1	3.69	2	
	2		3		1		6
0-9,999	4.25	1	4.00	3	4.17	2	
Sum of column ranks		6		5		7	
	Wc = .05					Wc = .05 C	

Statements Section
Statement 14 "on horsepower"

	1		1		1		3
15,000-39,999	2.53	2	2.18	3	2.54	1	
	3		2		3		8
10,000-14,999	1.91	1	1.88	2	1.77	3	
	2		3		2		7
0-9,999	2.00	2	1.83	3	2.08	1	
Sum of column ranks		5		8		5	
	Wc = .25					Wc = .65*	

TABLE XXIX

CORRELATION BETWEEN THE RANKINGS FOR EACH OF A SET OF FEATURES
BY CAR OWNERS WHO PLAN TO BUY VERSUS THOSE WHO DO NOT PLAN
TO BUY, MATCHED ON THE AGE OF THE CAR NOW OWNED

Paired Comparison (Features) Section								
Set A "leg room"								
Year of Manufacture	1952 or before		1953-1954		1955		1956-1957	
Plans to buy								
Yes	3.25	3	3.45	1	3.19	4	3.32	2
No	3.38	2	3.64	1	3.33	3	3.30	4
$r_s = .40$								C
Set A "head room"								
Yes	2.25	3	2.45	1	2.12	4	2.36	2
No	2.62	1	2.00	4	2.50	2	2.40	3
$r_s = -.80$								C
Set A "exterior design"								
Yes	1.31	3	1.10	4	1.69	2	2.16	1
No	1.12	4	1.64	1	1.50	2	1.30	3
$r_s = -.40$								C
Set A "push-button shifting"								
Yes	1.00	2	1.05	1	.96	3	.56	4
No	1.25	3	1.09	4	1.33	1	1.30	2
$r_s = -.80$								C
Set A "luggage space"								
Yes	2.31	1	1.85	3	1.96	2	1.60	4
No	1.50	3	1.73	1	1.33	4	1.60	2
$r_s = -.60$								C
Set B "acceleration"								
Yes	.44	4	.80	3	1.04	2	1.88	1
No	1.00	3	.73	4	1.01	2	1.10	1
$r_s = .80$								C

Note: Tables where a C appears in the lower right-hand corner cover features common to Forms A and B of the questionnaire.

TABLE XXIX (Continued)

Set B "low purchase price"

Year of Manufacture	1952 or before		1953-1954		1955		1956-1957	
Plans to buy								
Yes	3.38	1	2.75	2	2.46	3	2.16	4
No	2.75	4	3.09	2	3.33	1	2.80	3
	$r_s = -.40$							C

Set B "power brakes"

Yes	1.62	1	1.15	3	1.54	2	1.12	4
No	1.75	2	2.00	1	1.17	4	1.30	3
	$r_s = .00$							C

Set B "power steering"

Yes	1.81	1	1.25	4	1.35	2	1.28	3
No	.75	4	1.00	2	.83	3	1.01	1
	$r_s = -.80$							C

Set B "trouble-free operation"

Yes	3.06	4	3.85	1	3.62	2	3.44	3
No	3.75	2	3.18	4	3.67	3	3.80	1
	$r_s = -.80$							C

Present Car Section
Feature 4 "ease of ride"

Yes	6.44	3	8.15	2	6.92	3	8.20	1
No	8.50	2	8.55	1	6.83	4	8.10	3
r _s = .00								C

Next Car Section
Feature 13 "easier ride"

Yes	7.25	1	6.85	3	7.15	2	5.84	4
No	7.38	1	6.18	4	7.00	2	6.20	3
$r_s = .80$								C

Trends Section
Feature 5 "smoother riding"

Yes	8.69	1	8.55	3	8.68	2	7.84	4
No	8.00	3	8.55	2	7.33	4	8.90	1
	$r_s = -.80$							C

Safety Section
Feature 10 "smoother riding"

Present Car Section								
Feature 1 "horsepower"								
Yes	7.12	3	6.90	4	8.27	1	7.96	2
No	7.75	3	8.27	1	7.83	4	7.90	2
$r_s = -.80$								C

Trends Section								
Feature 11 "higher horsepower"								
Yes	3.56	4	4.00	2	3.58	3	4.84	1
No	5.00	1	3.45	4	3.50	3	3.60	2
$r_s = -.40$								C

Statements Section									
Statement 14 "on horsepower"									
Yes	2.19	3	2.25	1	2.08	4	2.24	2	
No	2.38	1	1.64	3	2.00	2	1.70	4	
$r_s = -.60$									

TABLE XXIX (Continued)

Trends Section									
Feature 3 "dual exhaust system"									
Year of Manufacture	1952 or before		1953-1954		1955		1956-1957		
Plans to buy									
Yes	5.31	3	3.75	4	5.54	2	5.56	1	
No	6.00	1	4.27	4	5.33	2	5.10	3	
r _s = .20									

		Trends Section							
		Feature 4 "fancier interior design"							
Yes		4.38	3	3.95	4	4.85	2	5.28	1
No		4.38	3	5.09	1	4.50	2	4.20	4
		$r_s = -.80$							

* Significant at the 5% level.

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