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The Ohio State University, Ph.D., 1968
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1969
INNOVATIVE AND DIFFUSIVE CHARACTERISTICS
OF THE EARLIEST ADOPTERS OF
A NEW AUTOMOTIVE SERVICE

DISSertation

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS

Our society is being confronted with an accelerating rate of change in institutions, ideas, technologies, products, and services. Behavior of consumers in relation to the flood of innovations is the particular concern of marketing. In this discipline, however, existing theory and concepts in the area of diffusion of innovations are inadequate to explain or to predict innovative behavior accurately. Research is needed to augment the emerging body of knowledge about the innovative and diffusive characteristics of consumers.

The Problem

There is no doubt that substantial numbers of new products fail, causing annually a multi-billion dollar waste of economic resources. Estimates of the failure rate vary from 50 to 90 percent. The penalties for failure and the rewards for success in innovation give rise to a desire to acquire more reliable information to be used as bases for (1) improvement in prediction of consumer acceptance, (2) improvement in product design, packaging and promotion, (3) improvement in the utilization of communications involved in diffusion of innovations, and (4) increasing the quality of knowledge about the innovative and non-innovative consumer.
The earlier that a new product failure can be predicted, the less the waste; and, the earlier that a new product success can be recognized, the more resources may be confidently allocated to its marketing so as to increase its rate of diffusion and adoption. The explanation of the costly current failure rate among new products is probably not that the consumer is fickle, but rather that marketing managers do not have enough reliable information about the societal processes in which consumers, innovations, and diffusion are involved.

The great progress of sciences such as physics and chemistry is largely attributed to the fact that their subject matter is susceptible to controlled experiment. Variables under study may be altered deliberately while isolating the experimental environment from the influence of other factors.

In the social sciences, laboratory techniques have been used sparingly, because it is difficult to control sufficiently the complete structure of variables involved. Precise replication is impossible. As a result, most of the current collection of knowledge about diffusion of innovations (1) results from observation of segments of the society during its unconstrained operation or (2) is derived from secondary statistical sources.

Control conditions in the study.--In this study, three important conditions were specified conveniently by the nature of the research design and of the innovation itself. These three were (1) the new service studied was undeniably an innovation, (2) the earliest triers of this new service could be accurately defined as innovators by reason
of their trial alone, and (3) it was possible to interview these early 
triers during the trial itself, as well as afterward. These three 
parameters permit a valid comparison with much of the other research 
in this field and establish a sound framework for describing innovative 
and diffusive characteristics.

Importance of the Study

The innovation involved in this study was a new consumer service 
known as an automotive diagnostic center. Interviewing of customers 
commenced on opening day and continued for three months, during which 
three fourths of these earliest triers of the innovation became respon­
dents in the survey. In each case, a follow-up interview was conducted 
by telephone a week after the initial personal interview.

During the same period consumers comprising a probability sample 
of the relevant population were being interviewed. The data for the 
innovators could then be compared directly with concurrent findings for 
the population.

Summary

The special control conditions described above, the immediacy of 
the interviewing and follow-up, the ability to compare innovators 
directly with their own population, and the unusual breadth of the sur­
vey should combine to provide a significant contribution to marketing 
knowledge in the field of diffusion of innovations.
Definition of Terms

It is necessary to define certain primary terms early in the paper. These are: diffusion, innovation, innovator, and adoption.

Diffusion

Cultural Diffusion.—Examples of cultural diffusion are numerous and familiar such as: the Greek influence on the conquering Romans; the spread of weapons innovations from tribe to tribe (continuing today); adoption of horses by nearly every North American Indian nation following their introduction by Spaniards.

Anthropologists have fairly well settled upon a definition of diffusion as that process by which cultural influences and patterns are transferred from one societal group to another.

Figure 1 portrays the progression of the effects of the interstitial contacts between two cultures, first in isolation from each other, then gradually merging.

Over the years anthropologists have stressed the cultural barriers and avenues involved in the diffusion process. Participants in international marketing have been particularly benefited by consulting anthropologists about such critical matters as foreign taboos, favored colors, styles, and local customs.

Other disciplines that have generated research into diffusion of innovations include sociology, rural sociology, education, and marketing. Of these, rural sociology has produced the largest number of studies,
**FIGURE 1**

Cultural Diffusion

<table>
<thead>
<tr>
<th>PHASE 1.</th>
<th>SYSTEM STATES AT REST</th>
<th>distinct culture A</th>
<th>existing apart from</th>
<th>distinct culture B</th>
</tr>
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<tr>
<th>PHASE 2.</th>
<th>PERIODS OF MIGRATION, EXODUS, INVASION</th>
<th>Culture A</th>
<th>interacting with</th>
<th>Culture B</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Social Upheaval</td>
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<table>
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<tr>
<th>PHASE 3.</th>
<th>SYSTEM STATES AT REST</th>
<th>Culture A</th>
<th>Dominates</th>
<th>Remnants of B</th>
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while marketing exhibits the greatest rate of increase in output, based on the writer's current observation.

Physical Diffusion.—Diffusion is, of course, also a physical phenomenon. Diffusion occurs in gases, liquids, and solids. In solids, for example, diffusion has been observed both for impurities as they move in a flux through the medium; and, for atoms of the metal itself. Diffusion speeds up as temperature increases, slows down when heat is withdrawn. In equilibrium there is a uniform distribution of the atoms through the solid, roughly equivalent to complete adoption of an innovation by an entire society.

Two papers in marketing attempt to relate cultural diffusion to that of physical diffusion. One paper is by the author,¹ another is by Berenson.²

Table 1 represents a small sample of the possible terminological correspondences in the two areas (physical and social) of investigation.³ In the mathematical base supporting physical diffusion, there are a number of equations that, when plotted, bear a strong resemblance to the familiar (a) life cycle and saturation curves in marketing, (b) probability distribution in statistics, and (c) accumulative marginal productivity curves in economics.


TABLE 1
CORRESPONDENCE BETWEEN TERMS IN DIFFUSION ANALYSIS IN PHYSICS, AND IN MARKETING

<table>
<thead>
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<th>Physical</th>
<th>Social</th>
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<td>1. concentration gradient</td>
<td>1. share of the market</td>
</tr>
<tr>
<td>2. net flux</td>
<td>2. percent of saturation</td>
</tr>
<tr>
<td>3. jump frequency</td>
<td>3. rate of brand switching</td>
</tr>
<tr>
<td>4. activation energy</td>
<td>4. intensity of marketing effort</td>
</tr>
<tr>
<td>5. potential energy barrier</td>
<td>5. cultural resistance to change</td>
</tr>
<tr>
<td>6. ionic mobility</td>
<td>6. degree of innovativeness</td>
</tr>
<tr>
<td>7. diffusion constant, or diffusion coefficient</td>
<td>7. rate of adoption of an innovation</td>
</tr>
</tbody>
</table>

Summary: Definitions of Diffusion.--Both of the two broad areas of diffusion described in Table 1 above imply an intermingling of previously separate sets.

1. A representative definition selected from literature in the physical sciences is as follows: "Macroscopically, diffusion is a universal process that leads to the elimination of concentration gradients in gases, solids, or liquids".4

2. The definition selected from standard sources in the social sciences is furnished by Everett Rogers, the principal organizer of existing knowledge of information about diffusion of innovations:
   "Diffusion is the spread of a new idea from its source of invention or creation to its ultimate users or adopters".5

---


3. For purposes of this paper a further refinement of these concepts of diffusion employs a more formalized emphasis upon the communications aspects of the process, resulting in the author's working definition: diffusion is the process by which all types of meaningful communications about innovations are exchanged (transmitted-received) among members of the society.

Innovation

Areas of Agreement.--There appears to be general agreement that innovations may be tangible or intangible. Innovations may occur, for example, in products, techniques, services, ideas, fads, fashions, equipment, recreation, entertainment, communication, transportation, and education.

Disagreement.--It is the various possible scales of innovation (or innovational impact) that give rise to considerable disagreement among marketing authorities. Below are listed five representative positions held by reputable leaders in marketing and social thought.

Paul D. Converse takes a most restrictive view of innovations. He would limit the term to a magnitude that actually affects the economy. He specifically cites Beatrice Foods (as an example) in denying that the 100 new products introduced by this company in 1964 were true innovations. A converse type innovation is the steam engine, or the railroad, or the automobile, and nothing less influential.

---

Alderson devotes an entire chapter in his last book to innovations. Predictably, he takes a more flexible look at the term, pointing out the possible variations in relative magnitude. His position is that the bow and arrow may have been a more significant innovation for its day than was the hydrogen bomb in mid-twentieth century. In the last paper that Alderson wrote before his death, he focused on marketing innovations, i.e., new methods or new processes of performing marketing tasks.

Wasson and Rogers both define innovation in a form in which it is frequently used by marketing researchers. An innovation is anything perceived to be new by the potential user. This definition emphasizes perceptual content, and enables an item literally to be an innovation for one individual but not for another. Under this very broad definitional umbrella, it would be logical to classify as innovations, for example, each of the following: (a) a screw driver in a "blist" package (previously sold unpackaged), (b) a new line of nail polish colors, (c) every one of Beatrice Foods' 100 new products in 1964 (see previous paragraph in reference to Paul Converse), (d) Driver


10 Everett M. Rogers, Diffusion of Innovations.
Training Programs for high school students (diffusion time span in the United States: 20 years).

The anthropologist H. G. Barnett, author of the most definitive work on innovation since Gabriel Tarde's *Les Lois d l'Imitation*, defines innovations as "any thought, behavior, or thing that is new because it is qualitatively different from existing forms" (underlining added). In consumer behavior studies, classifying an innovation using this definition focuses upon elements of the product in order to differentiate new products from old ones. Obvious difficulty is encountered in the attempt to decide just what "qualitatively different" means in a criterion sense.

**Operational Usage.** The operational definition of innovation that appears to have been most often used by consumer researchers is any form of a product that has recently become available in a market. Using this definition, an example of an innovation is a brand of coffee that was not previously available in a given geographical area. Other examples are modifications to existing products such as new features in

---


the annual model change of automobiles\textsuperscript{14} or a new package for a food. An innovation can also be, of course, a totally new product such as television, the electric toothbrush or automobile diagnostic centers. It can also be the opening of a new kind of retail store.\textsuperscript{15} Additionally, an innovation in some marketing studies has been defined as any product which has achieved less than $x$ percentage of market penetration independent of time.\textsuperscript{16}

\textbf{Author's Choice of Definition.} The specific innovation under study was the automotive diagnostic center, a new kind of clinic to which an automobile may be brought in order to undergo a comprehensive electronic and mechanical inspection, producing a detailed list of more than 100 specific items that were analyzed. This new consumer service is described in detail in Chapter III.

This innovation has less impact upon society than the steam engine, but considerably more than the newest flavor of chewing gum. It may well alter established patterns of automobile repair. It may cause disruptions in certain marketing systems, perhaps eventually affect the relative position of smaller repair and service establishments. From the consumer's point of view, a decision to spend ten dollars on

\begin{itemize}
\end{itemize}
automotive diagnosis is ordinarily more formalized than is the decision to buy a new brand or type of shave cream.

A definition that operationally fits the present study is the following: an innovation is anything perceived to be new by the potential trier, and whose adoption would tend to alter significantly his existing patterns of behavior. While this definition is a product of the author, it contains familiar components from the literature.

Innovator

Project definition.—The innovator and his characteristics constitute the focal point of this paper, and the definition of an innovator for purposes of the research simply was: anyone who patronized the new automotive diagnostic research center in Columbus, Ohio, between September 19, 1967, (opening day) and December 18, 1967, a period of three months.

The emphasis is on time in this definition not upon degree of potential market penetration, or upon relative percentage of the population represented by these earliest adopters, or in accordance with any criterion other than the trial of this new service within three months following its introduction.

During this specified period, there were a total of 351 triers of this new service, of whom 249 were interviewed (71 percent).

Other Definitions.—The most common definition, the one likely to appear in a standard text, was formulated by Rogers, who assumed that

adopter distributions were normal (in the statistical sense), then par-
titioned the complete distribution into five sectors, each representing
a standard deviation. The area lying to the left of the mean year of
adoption minus two standard deviations includes the first 2.5 percent
of the individuals to adopt the new idea, and represents innovators.

It can be seen that the researcher, under this taxonomical system,
is obliged to wait until there are no more adoptions before being able
to classify the subjects under study. In the case of driver training
programs, the adoption process stretched for twenty years—a long wait
for classification. Such a restriction hardly encourages adoption of
Roger's innovative categorization, yet this definition of innovators is
far more commonly cited than any other.

Other methods used to identify innovators are (1) to ask other
persons' opinions of their acquaintances, (2) to ask subjects to rate
themselves as innovators or later adopters, (3) arbitrary judgment or
stipulation of the researcher.

The author's definition belongs to this last-named class, inasmuch
as it is arbitrary and single-purposed. Nevertheless, it is nearly cer-
tain that the subjects chosen were indeed innovators per se, since the
period chosen was so early in the product life cycle (the life cycle is
expected to be in the introductory stage locally for at least another
year, or to exist at an increasing rate of acceptance for a total
period of eighteen months or more).

---

18 Everett M. Rogers, Diffusion of Innovations, p. 162. The laggard
category, farthest to the right, consists of two standard deviations.
Adoption

Standard definition.—Researchers in the past have ordinarily assumed that innovations are sufficiently divisible so that there can be a trial of a "sample" of the innovation, followed by an evaluation of the trial, then by adoption or rejection. In such a context, adoption is simply the decision to continue to use the innovation on a regular basis.

Exceptions.—In many significant cases, however, the possibility of a trial in advance of adoption is slight. The less divisible, more sizeable, expensive, and complicated the innovation, the less likely is a real trial before adoption. The standard five stages in adoption\(^\text{19}\) (as a process)—awareness, interest, evaluation, trial, adoption—may in these instances be reduced to four. It is up to the individual researcher to decide in his study, whether trial and adoption stages are separate, or tend to merge.

Operational considerations.—In this research, the subjects were asked a week after their initial experience with the automotive diagnostic center, whether they would probably use the service again sometime. Almost all the responses (90 percent) were affirmative. Given that the service would be needed only at unpredictable intervals, and that there was no chance to try "a little sample of diagnosis," the question remains moot, in the author's opinion, whether this initial experience actually constituted trial in the usual sense, or adoption, or elements of both.

\(^{19}\text{Rogers, ibid., page 17.}\)
Accordingly, in this paper, there is seldom any distinction drawn between adoption and trial of this particular innovation. The author sees more value in studying the characteristics of these earliest triers (or adopters), their innovative and diffusive indications, rather than to perfect a measurement that would distinguish between trial and adoption.

Summary

Reports and studies of diffusion have been a part of scholarly research for 300 years. Only recently, however, have academic and business marketing authorities become interested in this field. The particular research reported here concentrates upon the characteristics of innovators of a new consumer automotive service.

The four basic operational definitions specified for the study were:

1. **Diffusion** is the process by which all types of meaningful communications about innovations are exchanged among members of the society.

2. An **innovation** is anything perceived to be new by the potential trier, and whose adoption would tend to alter significantly his patterns of behavior.

3. **Innovators** were patrons of the new automotive diagnostic center during its first three months of operation.

4. **Adoption.** Because of the irregularity of usage following a trial and the indivisibility of the "product," adoption in this study is defined as the trial of the service by the innovator patrons.
CHAPTER I

CHARACTERISTICS OF INNOVATORS: GENERALIZATIONS AND CONCEPTS IN THE LITERATURE

Although the literature of diffusion of innovations is drawn from several disciplines and from studies of a wide variety of unrelated innovations, ranging from toys like superballs to birth control techniques, there is emerging a sufficient coherence among the research results to permit generalizations to be made and concepts to be advanced.

Among the available body of knowledge about diffusion of innovations, the area most related to the present study is composed of the observed characteristics of innovators. These characteristics may be grouped in a variety of classes, and the author has arbitrarily selected these six categories as the most descriptive and pertinent: (1) economic, (2) social status, (3) communications, (4) influences derived from the nature of the product (5) innovativeness, and (6) diffusiveness.

Generalizations and concepts embodying the content of the six categories of characteristics will be examined in this chapter. Later, in Chapter V, Results of the Research, specific comparison will be made between previous findings and those resulting from this particular research.
The most comprehensive collection of data related to diffusion of innovations is maintained at the Michigan State University, which publishes an annual bibliography of documents in their Diffusion Documents Center.¹ Much of the material in this chapter is drawn from a synthesis of these data prepared by Rogers and Stanfield.²

The Purpose of Identifying Characteristics of Innovators

Innovators are thought to be different in significant ways from the average person in the population, and from later adopters.³ Assuming that the variables associated with the innovative difference could be determined, it might be possible to design products, promotion, and channel to be more compatible with the potential innovators. This result would logically reduce the cost of marketing by reducing the failure rate of new products.

¹For example, Everett M. Rogers, Bibliography on the Diffusion of Innovations, East Lansing, Michigan State University, Department of Communication, Diffusion of Innovations Research Report 4, 1966.


Chapter V demonstrates the results of measuring innovators on the basis of household income, value of home owned by the household, number of cars owned, age of principal car owned, rent paid, and whether principal car was purchased new. These variables taken together, provide a much more comprehensive and intracorrelated set of economic measurements than is typical for researchers in innovativeness.

Of these economic variables, income is the most frequently tested correlate of innovativeness. Innovators among consumers, among farmers, and among physicians have been found to be earning more, or to possess more wealth than either the population at large or the later adopters.

There is an income component in social class that also correlates positively with innovativeness. In connection with the early adoption of a new household appliance, income was found to correlate positively.

4 William Bell, ibid., page 88.
8 Relative income was labeled "privilegedness" in the study by Thomas S. Robertson, Determinants of Innovative Behavior, (a summary version of an unpublished doctoral dissertation submitted to Northwestern University, 1966), Table 2, p. 27.
Exceptions to Positive Correlation of Income.--The consistency of the findings tends to break down (1) as the price of the innovation is less significant in the decision, and (2) as the product class involved is more familiar to the entire population. In other words, income is likely to be a relatively insignificant factor in the decision to adopt a new type of coffee or a new brand of detergent. One study showed that unemployed wives tend to more innovative than their more affluent employed counterparts.

Professor John Howard related to the author his opinion that research in progress at Columbia might show that during the child-bearing, child-rearing years, mothers would be less innovative than childless mothers, and less innovative than they themselves would be after the children become less demanding of the mother's time. His feeling was that free time available (as a determinant of innovativeness) might be sufficient to overcome income influences in the lower priced convenience product areas of consumer behavior.


11 Ibid., p. 318.

Summary of Economic Variables.—Previous findings and published conceptual generalizations lend credence to the widespread belief—that in reacting to innovations that involve somewhat formal decision-making, that are priced above the trivial level, and that may lead to changes in behavior patterns—consumers with higher incomes are more likely to be among the earliest adopters.

Since the innovation under study—the automotive diagnostic center—meets the qualifications of the assumptions in the previous paragraph, it should be expected that the innovators identified would enjoy higher than average income.

Relative Social Status of Innovators

For purposes of this study, there are few conclusions drawn from the literature about social status that are useful, primarily because of the lack of definitional consistency. Researchers have measured portions of a status set or have examined social characteristics rather than status. For example, the study by Coleman, Katz and Menzel dealt with the degree of social integration on the part of doctors.¹³ Most of Rogers' conclusions in the social area refer to the relative deviancy of the subject from group norms.¹⁴ Robertson's recent work includes a trio of socially oriented measures: (1) integration, (2) cosmopoliteness, and (3) mobility.¹⁵ From the marketing point of

¹³Coleman, Katz, and Menzel, Medical Innovation, p. 267.
¹⁴Everett M. Rogers, Diffusion of Innovations, pp. 198-205.
view, such descriptions as these are interesting, but not nearly as easy to assess or to employ as would a straightforward evaluative measure of a person's status compared with his innovativeness and/or diffusiveness.

It will be shown in Chapter V that higher status can be associated with innovative behavior when status is measured by these variables: income, education, value of home, and occupation. While status may appear to be an obvious consumer dimension to investigate in connection with innovativeness, there simply has not been any effort in this direction. This research gap is best revealed by the list of 22 generalizations which summarize the findings of 2400 empirical studies in diffusion of innovations. None of the 22 generalizations can be equated with status.

It is hoped therefore that the present study may indicate an area in diffusion that appears to be very inviting for further research.

Communications Characteristics

A great wealth of publications in the areas of media, communications, cybernetics, information theory, decision theory, learning theory, political science, anthropology, sociology, social psychology, marketing, and diffusion offers almost unlimited research findings for use in creating new combinations of communications variables for the measurement of consumer behavior.

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Among the 22 generalizations cited earlier are these related to communications:

(Positively related to innovativeness)

1. literacy
2. mass-media exposure
3. contact with change agencies
4. interpersonal communication exposure
5. opinion leadership

Of the five variables listed, elements of four of these, plus others, will be incorporated in the communications section of the chapter on research results (Chapter V).

Communications defined.—In the context of this research, the title communications is descriptive of the process by which consumers acquire and disseminate information about innovations. Inherent in this process are: planning, learning (within a time frame), information search, media exposure—both deliberate and passive, word-of-mouth transmissions, sources of influence, direct and indirect contact with the sponsoring agency of the innovation, and stages of the information process.

What is communicated.—It should be remembered here that in communication involving innovations, it is the idea that is communicated. One study points up the possibility that it will be experiences that can be transmitted—both successes and failures. It is this kind of communication that basically equates with diffusion. Another authoritative research effort involving an air-drop of leaflets reported that

17 Charles W. King and John O. Summers, "Technology, Innovation and Consumer Decision Making," a working paper, Herman C. Krannert Graduate School of Industrial Administration, Purdue University, 1967, p. 20.
social diffusion accounted for nearly half the resulting total message diffusion under high stimulus conditions, and nearly two-thirds of the message diffusion under low stimulus conditions\(^ {18}\) (in this realm, social diffusion refers to word-of-mouth transmissions). The idea being communicated, it can be concluded, depends for its effectiveness, influence and diffusion on the message content, the stimulus, the source of the transmission, the mechanical components, noise along the circuit, and the predispositions of the receiver.

**Influence, Source and Media.**--Communications vary in influence upon the receiver. This statement is supported by a variety of findings. Personal sources have long been regarded as more influential than formal sources. In the broadest way, Donald F. Cox has distinguished among sources at these levels: marketer-dominated, consumer-dominated, and neutral.\(^ {19}\) Presumably, because of the obvious bias, consumers would consider marketer-dominated sources to be the least persuasive. Yet in some cases, these may offer a variety of kinds of information about the innovation, among which might well be technical data which could have a different (neutral) polarity for the consumer.

Groups exert considerable influence upon their members, depending upon the psychological profile of the individual, the nature of the product, the visibility involved and other variables. Examples are


studies by Venkatesan and by Stafford. Both these research projects involved laboratory situations, complete with naive subjects, artificial group pressures, and confederates. The Venkatesan experiment involved choosing among men's suits, and Stafford's group influenced the naive subject to select a coded loaf of bread, otherwise unmarked. Both found distinct group influence, as did Myers, who studied in another situational scenario the varying effects of offering a new product to subjects by means of a recognized leader, and by a non-leader. Robertson hypothesized that the influence of an individual depends upon his being recognized as an opinion leader, which status depended upon his reflection of group norms. This is a synthesis of the Rogers' conclusions about social deviancy and opinion leadership.


24 Rogers, Diffusion of Innovations, p. 235.
In many cases, the first knowledge of commercial innovations comes to consumers by way of marketer-dominated media. The Rogers and Stanfield synthesis shows that mass media exposure and contact with "change agencies" were both importantly associated with innovativeness. Subsequent inputs of information appear to change (as to origin) as the adoption process proceeds from awareness, to interest, to evaluation. Engel et al found advertising to be effective at the awareness stage for new drug products; King found mass media sources were important to early adopters of new fashions in millinery, but Lazer and Bell turned up some contradictions in their observations, which showed that subjects used mass media to a greater extent in the evaluation stage. Nevertheless, the weight of the evidence available indicates that as the subject moves from the stage of awareness, he turns more to personal communications as he nears the trial stage.


There is a sort of mystique about word-of-mouth communications in the literature. William Whyte made a classic study of a highly visible appliance adoption pattern, then reported the results with an imaginative title "The Web of Word of Mouth." 29

Two years later, Ernest Dichter presented a colorful report on word-of-mouth advertising. 30 Dichter believes the power of word-of-mouth communication lies in the speaker's lack of material or selfish interest. He detected various forms of involvement among the 352 respondents, of which the most prominent was "product-involvement." The listener appears to be interested primarily in whether (1) the person speaking is interested in him, and that (2) the speaker's experience is convincing.

These two writers, and others, imply that word of mouth communications patterns exist or come into being somewhat spontaneously, outside the influence of marketers. In the present study an effort was made, not to trace patterns of social communication, but to detect shifts from one source of information to another.

In one of the few published studies in marketing, Johan Arndt made an interesting study of a compact social group as information about a new product spread through the group, by conversation, and measured


the influence on sales of the various positive and negative word of
mouth expressions. He found that negative communications had greater
influence upon the receiver.

Product Characteristics

It appears from a review of the diffusion literature that product
characteristics often have a decisive influence on the patterns of
adoption, on the rate of adoption, on the effectiveness of certain
promotional appeals, in attracting specific segments of the population,
and in other aspects of the innovative situation.

Classes of new product characteristics.—Some writers, such as
William Bell, use two classes: (1) strategic innovations, which in­
volve little change for either the firm or the consumer, and (2) func­
tional innovations, which offer obvious advantages, such as air
conditioning, or automatic dishwashers. Another classification is
with three types of innovations: (1) continuous (least disruptive,
involving alterations to products); (2) dynamically continuous (more
disruptive, includes new products like the electric toothbrush);
(3) discontinuous innovation (most disruptive; usually causes new
behavior patterns, as did television and computers.

31 Johan Arndt, "Role of Product Related Conversations in the Dif­
fusion of a New Product," Journal of Marketing Research, Vol. 4

32 William E. Bell, "Consumer Innovators: A Unique Market for New­
ness," in Stephen A. Greyser (ed.), Toward Scientific Marketing (Chicago:

33 Thomas S. Robertson, "The Process of Innovation and the Diffusion
19.
It is important to recognize that the anticipated degree of impact upon society to be made by an innovation must become an essential element of the total marketing plan. The question remains whether consumers who exhibit consistent innovative behavior in relation to "low-level product newness" (new flavor ice cream, new brand of razor blade, new detergent, and the like) will also exhibit similar innovativeness in relation to the electric car, the SST, and phonovision shopping.

In the present case, the automotive diagnostic center appears clearly to have the potential of being a functional innovation, and possibly a discontinuous innovation. Adopters of this innovation responded to questions about their behavior in relation to lower-level newness. Their answers, reported in full in Chapter V, lead to the conclusion that there are different sets of innovators, or at least different influences upon innovators, at various levels of product impact.

Visibility.--Products vary widely in the degree of visibility they possess. The newest car, the greenest lawn, the protruding air conditioner, the intercom system in the house, the use of labels to make visible the invisible consumption of products,—all these are examples of the apparent importance of product visibility. The absence of visibility (as in the case of automotive diagnostic center usage)

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34 For example, the use of windshield stickers, luggage labels, and bumper stickers to indicate to viewers where the family had been on their vacation. Another example was the use of special labels on automobiles to indicate to onlookers that the car was airconditioned.
intuitively should lead to more verbal communication (and influence) about the innovation, whereas a high degree of visibility may lead to an emulative effect that could operate with no verbal communication.

**Innovativeness**

Innovativeness is a characteristic associated with a willingness to experiment, to try new products, to consider new ways of doing things. Several researchers have used the term "venturesomeness" to indicate the same quality.

If innovators are correctly identified, it is assumed they have some quality and quantity of venturesomeness or innovativeness. This study will attempt to show that innovators have this characteristic to a significantly higher degree than the population as a whole.

The use of the term innovativeness is an attempt to create a proxy variable which would represent the bulk of the predispositional and perceptual frame within which and because of which the consumer behaves the way he does. This collection of attitudes may be the end result of a large range of socio-economic factors, heritage, experience, drives, and so on. Most modern models of consumer behavior contain a large block devoted to this predispositional set. 35

Consumers who exhibit innovative characteristics should logically be more aware of new product introductions, should be more aggressive...

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in obtaining missing information, and in general should do a more intensive planning job in relation to evaluation and trial (if this is possible) of innovations.

Diffusiveness

This characteristic refers to the relative amount of interpersonal communications about the innovation in which consumers are involved. New products, new ideas, are standard conversational ingredients. They make news. Often the largest advertising in a product's history is allocated to the introductory phase in order to activate the process of diffusion. From every point of view, innovations and diffusion are natural allies in society.

King found that, across four broad, separate product categories, two out of three respondents had been told by someone about a new product, and, two out of three (approximately) had told someone about a new product—in the past six months. 36

Are innovators more or less diffusive than average? Are positive experiences diffused more rapidly than negative experiences? These questions and other aspects of the characteristics of diffusiveness are represented in the subsequent research design for this study.

36 Charles W. King and John O. Summers, "Technology, Innovation, and Consumer Decision Making," a research paper, Herman C. Krannert Graduate School of Industrial Administration, 1967, p. 21. This finding was based on interviews with 983 housewives.
Summary

Six classes of characteristics have been established for a study of the innovators of the automotive diagnostic service. Previous research has indicated that a study of economic characteristics should result in positive correlations between innovators and such variables as income, house valuations, newness of automobiles owned and number of cars owned. Social status has not been measured directly in previous marketing research in innovations, but related findings suggest strongly that this characteristic would be positively associated with innovators. Many disciplines have engaged in research about the relationship of communications to innovation. The findings invariably show that innovators are more frequently involved in a search for and dissemination of innovative information. The "product" in this study is a new consumer service. This service has unique characteristics that presumably attracted a specific segment of the market and which fulfilled felt needs of those consumers. In this particular research project a special effort was made to analyze the degree of influence attributable to the characteristics of the product alone. For example, this product is socially invisible. In order to compensate for this invisibility one might expect a high degree of active word-of-mouth communication following the trial of the innovation.

Innovators are innovative per se. The findings as described in Chapter V are more varied than those of previous researchers who have attempted to devise a measure of innovativeness or the closely allied attribute of venturesomeness. Innovators may not be innovative for all
classes of products and services. Innovators have been found to be more diffusive than others but in this study there is included a definite measurement of this integral portion of the innovator profile.
CHAPTER III

DESCRIPTION OF THE AUTOMOTIVE DIAGNOSTIC CENTER

Several references have already been made to some aspects of the particular innovation studied in this research project. In this chapter the innovation itself will be explained more fully, and there will be presented a description of the situation (environment) in which the innovation was offered to the public, together with a short historical background.

Background

In the years since the automobile has become an inescapable part of American life, there has been a steadily growing list of problems connected with it. On the list are such items as air pollution, highway costs, traffic deaths, shortage of parking space, disposal of junked automobiles, and the increasing dissatisfaction with automobile service.

The automobile has changed from a rather uncomplicated vehicle to a sophisticated, complex assortment of systems which comprise virtually a living room on wheels and include an average of 15,000 moving parts. Facilities for servicing and repair of the new breed of automobiles have not kept pace with the advance of automotive technology. As the gap between the actual level of service and the desired level has widened,
consumer impatience has increased, and a marketing opportunity has inevitably been created. The automotive diagnostic center is a major effort to respond to that opportunity.

History

The first full sized diagnostic center was opened in 1962 in New Jersey, by Mobil Oil Corporation. Since that time, other participants in the auto industry have become interested in the possibilities for sponsorship. For example, equipment manufacturers working under guidelines established by technicians in the service division at the Ford Motor Company, created systems of diagnosis that were blended together by Ford to comprise a "package" they could sell to their dealers. The components are manufactured under the Rotunda brand name (Ford), which gives the dealer a double protection, the implication being that if the equipment needs repair or adjustment, service can be expedited by pressure from both the dealer and Ford Motors. Similar assemblies of equipment, linked together by a comprehensive "clinic design," are being offered to dealers and to service station operators by such sponsors as American Oil, Pure Oil, Humble, Mobil Oil, and Esso. The American Automobile Association has a pilot center in operation in St. Louis.

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1For a review of this situation, see Charles Stevenson and Ken W. Purdy, "New Approach in Automobile Repair," Reader's Digest, January, 1967.
Large TBA\(^2\) operators have begun to add diagnostic centers, particularly to their regional shopping center units. In this trend, Sears, J. C. Penney, and Montgomery Ward have been conspicuous.\(^3\) The private brand of the store usually extends to the diagnostic center, providing the retailer with one common name under which he can promote tires, shock absorbers, tune-ups, batteries, radios, gasoline, oil, brake jobs, wheel balancing and alignment, automobile parts, a large line of accessories (hub caps, steering wheels, mirrors, specialties and novelties), and finally, a complete automobile performance and condition analysis, or diagnosis.

**Points of View**

**The Retail Store.**—For the retailer, ADC's (automotive diagnostic centers) provide an enlargement of their "service offering" to customers. While the center is unlikely to show a profit, it is expected to attract traffic to enlarge the sponsor's image as a professional, trustworthy service center, and to generate increased profits by substantially increasing business at the repair department.

**The Auto Dealer.**—For the automobile dealer, ADC's have similar attractions, plus providing the dealer with the solution to one of his most persistent annoyances—the "lemon"—an automobile he has sold to a customer but which has never performed properly despite continual trips

\(^{2}\) Tire, battery, and automobile accessory centers operated typically as free-standing units or adjacent to the main store.

\(^{3}\) Mr. Lee Moore, vice-president of J. C. Penney's informed the author that every new Penney TBA will include an automotive diagnostic center.
through the repair department. The ADC has revealed and untangled the multivariate nature of many problems in automobile performance, as different components produce combined symptoms at different levels of load and speed.

The Manufacturer.--For the manufacturer, ADC's offer an opportunity to upgrade the service performance of dealers and to increase the satisfaction of their ultimate consumers. Ford, for example, not only assists in the design, installation, and trouble-shooting at ADC's, but also provides dealers with financing. Location of these diagnostic centers helps to counteract charges of indifference to the safety of the public.

Components of the Diagnosis

A typical automobile spends 35 minutes in a full-scale diagnostic center, undergoing more than 100 separate inspections or tests. A description of the major systems follows, using laymen's terminology.

General Inspection.--A sight check is made of battery, belts, hoses, lubrication, oil, power steering fluid, and tires. The systematic check-list methodology employed causes this first step frequently to turn up defective items that most motorists, and most mechanics, take for granted.

Dynamometer Rolls.--Diagnostic centers usually have large steel rollers, on which the automobile wheels rest. As the rolls spin, highway driving conditions are simulated, including loads equal to a full car on a steep hill at full throttle. An ignition oscilloscope
provides a visual record of the ignition system—sparkplugs, plug wires, distributor, and coil.

The chassis dynamometer shows the efficiency of the power systems—the ignition, carburetion, and compression components (valves, rings, pistons), by comparing the horsepower developed under load with factory specification for the car.

**Electronic Alignment Analyzer.**—With the wheels rotating and being steered by remote control, and at different speeds, alignment angles of the wheels are measured. Toe-in, caster angle, camber angle, and wheel centering are measured. During the test the "computer" monitors the readings and the extreme indications are locked in for recording. Headlight aim also is carefully checked.

**Dynamic Brake Analyzer.**—All types of brake operations, from normal slowdowns at slow speeds to panic stops at high speeds, are reproduced in this test of the system. The brakes on one wheel of a pair can be compared at the same time with its mate to see if a "pull" results from a measurement of the actual force resisting the wheel's rotation.

**Under-vehicle Inspection.**—The final series of examinations by the diagnostic center personnel involve a check of the shock absorbers, springs, exhaust system and steering mechanism. Oil spreads are checked to see if they indicate leaks from engine, transmission, or axles.

**Final Conference.**—Centers normally provide a conference room or office where the chief diagnostician explains the results of the complete diagnosis with the operator of the automobile, much as a clinician confers with a medical patient.
The Reports.--Customers usually receive two reports. One is a record of the various tests showing whether the automobile scored in the satisfactory or unsatisfactory class on each one. Headlight aim, battery capacity, brake fluid level, points resistance, tire tread depth, dwell, pressure cap--these are sample items on the report. The Ford report has 128 items; the Penney's report has 210, although the Ford center utilizes more equipment than Penneys.

The second report is a repair estimate. The indicated items are classed by the diagnostician into three sections: (1) immediate attention (safety at stake), (2) to be corrected soon, and (3) deferrable items (rust spots, squeaky door, brakes with 25 percent of the bands remaining).

The dollar cost of each repair is estimated and a general appraisal of the car's condition and performance are given, followed by a low-pressure mention of the repair facilities available to the customer at the same location. The diagnosis is complete. The customer is free to take his car to another shop to have the repairs made, or he is free to ignore the report entirely. Defective or dangerous conditions are not reported to the police or to any other official body.

The Progress of the Idea

In the past six years, more than 100 centers have opened in the United States, including the one used in this study. They are spreading steadily in Europe and Australia. Sylvia Porter believes "auto clinics will boom" because of a widespread need for the uniqueness of their
unbiased opinions and professional competence. Her source of information was Mobil Oil, operators of five large centers where 100,000 automobiles have been diagnosed. These represent a 0.128 percent sample of the 78,000,000 cars on American roads. Table 2, below displays the proportion of cars found to be below standard in 10 categories.

Promotion

There has been no national advertising of diagnostic centers, partly because no single company has sufficient geographical coverage. Locally, advertising is usually intense during the introductory stage, but tapers off within a week or two. Newspapers are the principal medium employed, accompanied by spot radio and spot TV. Direct mail to regular customers is also used.

There has been considerable national publicity. Examples are the Sylvia Porter column and a report in Good Housekeeping. Earlier, articles appeared in special interest magazines directed to hobbyists, car buffs, and sports car enthusiasts. It will be shown later that general awareness of diagnostic centers at the time of this study resulted principally from a full-length article in Reader's Digest.

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4Sylvia Porter, popular syndicated financial columnist, from her daily column, as it appeared in the Dayton Journal, September 28, 1967.


6Stevenson and Purdy, "New Approach."
### TABLE 2

**PERCENT OF AUTOMOBILES** with **UNSATISFACTORY ITEMS**

<table>
<thead>
<tr>
<th>Equipment or Item</th>
<th>Percent Unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Timing/Points/Dwell</td>
<td>69%</td>
</tr>
<tr>
<td>Engine Contact Points/Condenser</td>
<td>59</td>
</tr>
<tr>
<td>Spark Plugs</td>
<td>58</td>
</tr>
<tr>
<td>Headlight Aim</td>
<td>55</td>
</tr>
<tr>
<td>Alignment Suspension System</td>
<td>51</td>
</tr>
<tr>
<td>Wheel Balance</td>
<td>48</td>
</tr>
<tr>
<td>Wheel Bearings/Seals</td>
<td>45</td>
</tr>
<tr>
<td>Carburetor Adjustment</td>
<td>42</td>
</tr>
<tr>
<td>Hoses/Belts/Coolant Protection</td>
<td>41</td>
</tr>
<tr>
<td>Air, Fuel, Oil Filters</td>
<td>40%</td>
</tr>
</tbody>
</table>

*Base: 100,000 automobiles inspected at Mobil Diagnostic Centers, 1962-1967.*

*Source: Mobil Diagnostic Report, 1967*

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**The Local Situation**

The first automotive diagnostic center made available to the automobile operators of metropolitan Columbus, Ohio opened on September 7. There was available locally a lower grade independent diagnostic operation, not considered by experts to be realistically a complete diagnostic "center."
19, 1967 at Medick Ford, Inc., a new location (for a 40-year old company) across the street from Northland (a very large regional shopping center with two major department stores).

The location is accessible by four-lane superhighways and by an effective network of local traffic streets. It is in a fast-growing residential area of the city and a part of an attractive suburban shopping area in central Ohio.

Image.--The diagnostic center idea is cloaked in professional dignity. The diagnosticians wear white coats, the center is kept immaculate and the conference is dignified and sympathetic in tone. The viewing area (customers may watch their cars undergoing the diagnosis) is appropriately modern, comfortable, and institutional in decor.

Medick Ford, home of the first local center, is an old dealership known for integrity, solidity, and strictly conventional, restrained advertising.

Economics.--The equipment in the center cost Medick somewhat less than $100,000. It is not expected to generate its own payout from the $9.95 fee, but to contribute to the entire marketing plan and to lead to increases in billings for Medick's already profitable repair shop.

Management entertains hopes the center will also draw new and used car business away from their local auto dealer competitors by elevating the service image of Medick's.

Price competition has arisen as new Penney Diagnostic Centers promote their diagnosis at $8.88 (a Penney unit opened at a regional shopping center 12 miles from Medick Ford).
Summary

The automotive diagnostic center idea is not a whimsical, transitory innovation. Each unit costs, depending on size, from $80,000 to $300,000. Its direct payout is uncertain. It is a rather technically sophisticated device for meeting a long-felt need on the part of automobile users around the world.

To the consumer it is another piece of evidence that his world is becoming more complicated. He must face one more "expert" with a baffling array of scientific equipment with which there can be no argument. Yet the consumer yearns for the security of the professional, impersonal evaluation of his trouble-making automobile, that most costly symbol of the age.
CHAPTER IV

THE RESEARCH DESIGN

In this chapter a design is developed for conducting research into the field of consumer behavior, as it may be observed in connection with the earliest adopters of an innovative service for automobile operators.

Overview

The purpose of the research design is to provide a vehicle for organizing and implementing the original goals of the researcher; to (1) gain more insight into the innovative and diffusive behavior of consumers and thereby to (2) provide information that should tend to reduce the risk in marketing decisions, which should lead to (3) a reduction in the "cost" of marketing.

The general topic has been determined prior to this stage, but it is necessary to formulate the exact questions to be asked, the techniques needed to handle the data produced by the answers to the questions, and the statistical techniques to be used in analyzing the responses.

The instrument chosen for data collection is the questionnaire, to be administered during a personal interview at the site of the innovation, the local automotive diagnostic center. Questions and inquiries
in the questionnaire are designed to provide data that will test the hypotheses previously constructed.

Beginning on opening day, the customers of the diagnostic center were interviewed as they appeared at the site. Almost all of the interviews were conducted while the respondents' automobiles were undergoing diagnosis.

The author interviewed every one of the first twenty customers and sample groups of respondents thereafter in order to develop training and supervisory information. The author personally trained all interviewers and monitored their performance by means of a supervisor, also trained by the author.

The goal simply was to reduce to a minimum the "interviewer error source," particularly that associated with improper stimulation of response, interviewer expectations and anticipations, and decay in interest on the part of the respondent. Hopefully, by having the same director and supervisor throughout the three-month interview period, the questionnaire response quality was maintained at a uniform level.

**Hypotheses**

A hypothesis is an assertion about the "state of nature" that remains to be tested or proved in the context of the research project at hand. The hypothesis specifies a relationship between the variables involved in this situation, or state. It is in the recognition of

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possible states of nature, and in the choice of specific hypotheses from the usually infinite variety of all possible hypotheses, that art enters research, and joins science in a blend of judgment and craft that may yield optimal results.

From the background of experience and study, the author chose the following categories of hypotheses, from which specific hypotheses were then drawn to be shaped into formal statements suitable for testing (as shown below, in which $H_a$ refers to the hypothesized relationship of variables based on generalizations in the literature or the author's previous observations, while $H_o$ indicates the null hypothesis or a statement of nonrelationship among variables).

**Categories.**—The classification of hypotheses regarding the characteristics of innovators corresponds to the system set forth in Chapter II. The six classes of characteristics lead to the following generalized hypothesis:

(1) $H_a$ = Compared with the population as a whole, innovators are significantly different, as measured on the following bases: (1) economic (2) social status (3) communications (4) product-related (5) innovativeness, and (6) diffusiveness.

(2) $H_o$ = There is no difference of any statistical significance between the two groups, measured on the six bases.

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In the specific hypotheses that follow, it is understood that the statement is made in the direction of association predicted by the researcher (positive or negative), and that the corresponding null hypotheses are assumed to be self-evident.

**Hypotheses: Economic**

**Income.**—The most consistently used economic measure is that of income. As reported in Chapter II, income ordinarily is found to be a positive correlate of innovative adoption; therefore, it is hypothesized that:

(3) \( H_a = \) Innovators will exhibit a higher average annual household income than will the sample representing the population as a whole.\(^3\)

**Other Economic Variables.**—The remainder of the economic variables have not been a part of the bulk of diffusion of innovation studies and therefore represent an exploratory type of research.\(^4\) Since the six variables are intuitively associated positively with income, the group hypothesis can be stated as:

(4) \( H_a = \) Compared with the population, innovators have:

1. a newer principal automobile;

\(^3\)Hereafter, in order to avoid continual repetition of the phrase "sample representing the population as a whole," the single word population will be understood to represent this comparison group. The composition of the sample will be described in Part II of this chapter.

2. greater likelihood of having purchased the principal car new rather than used;

3. a greater number of cars;

4. more likelihood of owning their own home rather than renting quarters;

5. (if they do own their own home) a home with a higher market value;

6. (if renting) paid a higher rent.

By comparing innovators with the population on the primary basis of household income, in addition to the six secondary variables, it was hoped to produce a more comprehensive, insightful appraisal of this general economic characteristic, one that is completely quantitative in nature, relatively available to researchers and to marketers, and suitable for use in comparisons with other subsequent findings in this expanding area of interest.

The relevant section of the questionnaire labeled "Automobile" can be found in the Appendix.

Hypotheses: Social Status

Occupation.—The most acceptable single variable used for measuring or establishing status is occupation. Occupational titles have been ranked and scored for status. In this study the system used was the Reiss index. By using occupation, together with six other supportive variables, a reasonably valid measure of status should be obtained.

\footnote{Technically, the Socioeconomic Index for Occupations as presented in Albert J. Reiss, Jr., Occupations and Social Status (New York: Free Press of Glencoe, Inc., 1961).}
The measurement is again intentionally straightforward, since in this study it was decided to concentrate on reliable proxy data, in order to cover more ground in less time at less cost than would have been the case with alternative "real" criteria, such as values, beliefs, attitudes, opinions of acquaintances, group membership, social communication, social contacts, and the like.

There is general agreement that social status does broadly affect consumer behavior, but its association with innovative behavior has not been clearly established.

Income and Value of the House.—In the multivariate hypothesis #5 (see next page) the reader will note that two economic variables—income and house value—are repeated. The justification is that, while income is not an absolute qualification for a given status rank, it is in the long run associated positively with status. Similarly, there is a common assumption that occupying an expensive home indicates higher status than occupying a low-priced home. Furthermore, higher-priced homes are more likely to be found in higher status locations of the community.

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Education. -- Many authorities rank educational attainment on a par with occupation as a proxy for social status. It should be recognized that there is normally a direct relationship between income and education, each affecting the other, and both influencing status rank.

Other Lower-grade Measurements. -- In an exploratory effort, using a dichotomous answer frame, three possible indicators of, or associates of, certain status positions were tested. Respondents were asked whether they

1. had central airconditioning in their homes
2. had a second house
3. belonged to any kind of "private club."

The intention was to add a sort of external expression to the basic variables. If one of these three proved to have a very high level of association with innovators and a very low association with the population, it would provide encouragement for further research in order to establish that variable as a quick and easy proxy for status.

In summary, it was hypothesized that social status is associated positively with innovators, and that specifically:

(5) \( H_a \) = Compared with the population, innovators:

1. score higher on occupation;
2. have attained a higher level of education;
3. have higher annual incomes (a repeat);
4. live in houses with higher values (a repeat);

5. more frequently live in homes with central air conditioning;
6. more often own a second home;
7. more often are members of private clubs.

The section of the questionnaire which related to social status contained questions 20 through 25 (see Appendix).

Hypotheses: Communications Characteristics

In Chapter II it was pointed out that communications was at the heart of diffusion and that communicativeness is associated positively with innovators in various forms. It was desired to procure a strong indication about the information gathering process which furnishes innovators their early knowledge of the new idea. At the same time, it is necessary to find out if innovators do learn of new things earlier than the population. Are innovators sources of information to others? Do innovators actively diffuse information about innovations? Do innovators act on impulse, or do they employ a planned, orderly, decision making process in deciding to try a new product?

The author felt that in the instance of the diagnostic center, there was a chance to get reliable answers to some of these questions. 9

Hard Data and Soft Data.—It is patently difficult to acquire "hard" information, in one interview with a new respondent in an unfamiliar setting, about some of his social habits and patterns of

9The details of the questionnaire are shown in the Appendix.
behavior regarding communications. Researchers are continually seeking quantitative ("hard") data, and are attempting to quantify the qualitative ("soft") data they sometimes are forced to accept as a substitute.

In order to determine if there was a difference between innovators and the population on the basis of communications, the author devised the seven probes, as embodied in the following generalized hypotheses:

(6) \( H_a \) = Compared with the population, innovators:

1. more frequently are subscribers to five or more magazines;
2. make a more extensive search for information;
3. use different sources of information;
4. to a greater extent, have heard of the innovation before it became available locally;
5. rate themselves as earlier learners of innovations;
6. less often act without planning;
7. are more likely to plan things out before taking action.

At this juncture, it should be pointed out that in order to encompass the broadest scope of the term communications, it would be necessary to combine the variables specified here, with those listed for a measurement of diffusiveness later in the chapter.

Sources of Innovative Information.—In addition to the research design for comparison between-groups measurements of communications characteristics, it seemed desirable to make a special effort to see if
the innovator-respondents in this study appeared to have sequences of information-gathering activity that would even roughly coincide with Rogers' suggested stages of adoption: awareness, interest, evaluation, trial, adoption. In particular, it would be interesting to attempt to test the generalization Rogers makes about sources of information by stages:

"... impersonal information sources are most important at the awareness stage, and personal sources are most important at the evaluation stage in the adoption process."^11

By asking respondents a series of questions (see later section) about when and how they learned about the automotive diagnostic center, it should be possible to provide the desired test.

Influence--There is a need in this field not only to collect more data about sources of raw information about innovations, but also about sources of influential information leading to trial of the innovation. In the situation here, where innovators were being interviewed at the time of their trying the innovation, there was a fortuitous opportunity to acquire this kind of information before any great amount of erosion in recall had occurred. This contrasts with the usual research in the field in which interviews are conducted months, even years, following the trial or adoption.

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^11 Ibid., p. 99.
Questionnaire Items: Communications.--The questions asked of respondents which contribute to between-groups comparisons are in the self-rating section entitled "How I Describe Myself" which appears in the Appendix as part of the questionnaire. The same exhibit also contains the questions (#25b thru 31) which provide data for sources of information utilized by innovators.

Product-related Aspects

This section of the general inquiry represents a change from a concentration on inter-group comparison to a consideration of how the product is perceived by the group of earliest adopters.

The automotive diagnostic service obviously has offered the adopter an anticipation of satisfaction for the $9.95 fee it required. What was the nature of this attraction? Was it simple newness, novelty, or curiosity? Was it practical in the sense that the innovator saw the ADC as fulfilling a felt need of his? In order to put these questions into perspective another aspect of the situation must be taken into account. This factor is the image of the firm.

Image.--In this case image is measured by assessing the pre-trial abstract relationship between the innovator and the specific environment of the innovation. The purveyor of the innovation has a variable effect upon the perception of the innovation by the innovator-customer.

As a measurement, it was decided to confront the respondent with two statements about the sponsor by "anonymous third parties." The
second statement was intended to be somewhat the inverse of the first in order to check the reliability of the instrument by means of the polarities of the two responses. These two statements are shown in the Appendix as they appear in the questionnaire as Card #5 and Card #6.

The hypothesis is that:

(7) \( H_a \) - Image of sponsor held by innovators will be positive.

Conversely, it is not anticipated that the innovators (who by definition have a positive orientation toward the innovation) would have a negative attitude toward the sponsor of that innovation.

**Post-trial Investigation.**—No marketing study known to the author has provided a measurement of pre-trial and near-term post-trial attitudes on the part of innovators. Because of the fact that interviewing began during the trial itself, the respondent was able to relate his expectations at the peak of sensitivity. One week later, each respondent was telephoned and questioned about his reaction to the experience at the automotive diagnostic center and his post-trial behavior. The pre-trial questions are #28 through 34 and employing Card #1 (see Appendix). The post-trial questions are embodied in the single sheet telephone questionnaire (also in the Appendix).

**Summary.**—The questions comprising this section of the research design are intended to reveal these critical aspects of the adoption experience:
1. pre-trial attitude toward sponsor of innovation;
2. pre-trial expectations regarding the diagnostic service (innovation);

ATTITUDES
3. post-trial intention to "to adopt;"
4. post-trial attitude toward price;
5. degree of satisfaction experienced;

DECISION COMPONENTS
6. reasons for trying this innovation;
7. influential information received.

Innovativeness

Innovators were operationally defined as those who patronized the diagnostic center in its first three months of operation. For purposes of this construct, the act of patronage exhibited innovativeness per se. In this separate section on innovativeness a group of variables will be examined by means of self-ratings, using scales ranging from dichotomies to six-point types. The results of these scores should provide a relatively broad profile of the innovative type found in this study.

Learning about and trying new things earlier.--The first group of variables are those pointing to a sensitivity toward new product information. The relevant questionnaire items are questions #35, 36, and 38 using Card #2, together with #5, 10, and 19 in the "How I Describe Myself" self-rating section of the questionnaire (see Appendix).

This section is exploratory. It attempts to see whether the innovators in this study see themselves as learning about everything new and
trying everything new, or do they see themselves as more selective, more product specific? If the latter is confirmed, do the innovators nevertheless see themselves as prone to experimentation in the abstract or in general? How broadly innovative are innovators? How do they compare with the general population based on these variables? The following group hypothesis is advanced:

(8) $H_a$ = Compared with the population, innovators

1. hear earlier about new things (in general);
2. try new things (in general) earlier;
3. are more often described as leaders;
4. are more willing to experiment with new ideas;
5. more frequently try new razor blades, or hair cream or hair-dos;
6. disagree more strongly about waiting for other people to try new things first;
7. more likely to try new brands of familiar products the first time they see them in a store.

Planning and Risk.--A great deal of planning is undertaken for the purpose of reducing the risk of a particular course of action. Do innovators see themselves as more prone to take risks than the average person? Do they do more or less planning before acting than does the remainder of the population? Do innovators appear to take greater risks than the average person? Are they more careless, more impulsive? In this area of behavior are innovators different from other people?

The search for answers resulted in the formulation of statements #1, 3, 6, 7, 8, and 9 in the questionnaire section entitled "How I Describe Myself" in which self-rating scores are obtained (see
Appendix). In another part of the questionnaire, respondents were asked to make a choice between two alternative risk-reward situations described on Cards #7 and 8 (see Appendix). In the first example (Card #7) the expected monetary value (EMV) of the option (a) is $500 (certain) while in option (b) the EMV is $1,000. The mathematically oriented gambler would invariably choose option (b), but in this one-time situation will the innovator be more inclined toward the greater risk greater reward option (b) than the population? Will the certainty of the $500 be more attractive? In the second example, the EMV of option (a) is $5,000 while the EMV of option (b) is $100,000. There is no option of certainty here, but degrees of risk and reward.

In formulating the group hypothesis for this section one must consider such statements as their generalization by Rogers that

"The major value of the innovator is venturesomeness. He must desire the hazardous, the rash, the daring, and the risking."¹²

At the more specific empirical level, this recent statement was made by King and Summers

"Perceived risk of unsatisfactory product performance and the seriousness of poor product performance were universally low across packaged food products, household cleansers and detergents and cosmetics and personal grooming aids. In women's clothing fashions,

¹²Everett M. Rogers, Diffusion of Innovation, p. 169.
perceived risk was significantly higher relative to the other product categories studied."13

This problem of the innovator (or any consumer) in facing uncertainty has been characterized by Bauer as "perceived risk,"14 and in marketing literature on diffusion of innovations Cunningham has concentrated on the same variable.15

**Summary.**--The group hypothesis for this section is:

(9) $H_a$ = Compared with the population, innovators

1. less frequently think things out in detail before acting;
2. are more careless in practical matters;
3. do less planning before acting;
4. favor less life insurance for the husband;
5. usually act on the spur of the moment;
6. display impulsive shopping behavior;
7. prefer greater risk situations with larger EMV's.

The hypothesized behavior of the innovator deliberately matches the Rogers description.

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13 Charles W. King and John O. Summers, "Technology, Innovation and Consumer Decision Making," special research paper, Herman C. Krannert Graduate School of Industrial Administration, Purdue University, 1967, p. 29.


General Personality Variables

The final class of variables to be used in connection with innovativeness comprises a mixed group, the first two of which deal with how much influence price appears to have in the shopping behavior of innovators relative to the population.

Using the previously cited six-point scale, respondents were asked to express agreement or disagreement with statements in the self-rating section of the questionnaire dealing with a hypothetical tendency to search for lowest prices (#2 and #20 in the list—see Appendix). The implied marketing questions are:
Are innovators oriented to bargain shopping or low prices especially?
Will a lower price be effective in speeding up the acceptance of a new product?

Rationality, Caution, Control.—Next innovators were asked to judge themselves in relation to six other statements (six-point scale) in the same self-rating section of the questionnaire. These were #14, 15, 17, 18, 21, and 22 and referred to scores for rationality, practicality, caution, emotionality, precautionary behavior, and self-control (see Appendix).

Ownership of New Kinds of Products.—In order to determine if innovators for diagnostic centers were more likely to have new and nearly new products, a list of items was compiled to produce a yes or no response: (1) "mature" products—color tv, electric toothbrush, electric blanket, sports car, motorboat or sailboat, and (2) innovations—water pic toothbrush, gas-fired barbecue, whole house airconditioning.
Summary.—Following from the traditional rationale, it would be necessary to hypothesize that innovators were less cautious, less practical. Regarding the influence of price it appears that innovators are not primarily either attracted or repelled by price alone. In consideration of these generalities the group hypothesis is:

(10) \( H_a \) = Compared with the population, innovators

1. less frequently shop for lowest prices;
2. less frequently switch brands because of price alone;
3. are less rational, less logical;
4. are less practical;
5. less cautious;
6. more emotional;
7. less often fasten seatbelts;
8. have less self-control;
9. possess more new kinds of products.

The relationships specified in the hypothesis refer, of course, not to a completely structured quantitative measurement, but to self-ratings in which respondents rate their degree of positive or negative reaction (except for the "possessions" variables).

Diffusiveness

Previously in this chapter there was a discussion of communicativeness. There is a very close tie between that section and this, and in order to describe in a macrosynthesis the entire scope of diffusion it would be necessary at the very least to combine the two
sections. In the process of diffusion—the communication of an innovation through society—the individual usually has a dual role acting as both transmitter and receiver. Therefore it is appropriate to mention again a variable related to whether innovators hear about new things earlier than other people.

Output of Innovative Opinion.—The problem here is to discover whether relatively more people inquire of innovators about new products. The question was represented by Card #3 in the questionnaire (see Appendix) together with the related question concerning transmission of information about new things on the initiative of the innovator (see Card #4 and question #39).

Post-trial Transmissions.—In the follow-up interview conducted by telephone a week after the trial of the new service, respondents were asked: (1) if they had told anyone else about their experiences at Medick Diagnostic Center, and (2) who these recipients were. If the innovators were diffusive, they could have been expected to tell someone about their experiences at the automotive diagnostic center within a few days of their trial.

By combining the post-trial satisfied customer with their record of diffusion and the displeased customers with their diffusion, it should be easy to see which group is the more active diffuser. Is negative diffusion relatively more frequently energized than is positive?

Hypothesis.—As a summary of this section, the group hypothesis:
(11) $H_a = \text{Compared with the population, innovators}$
1. are more frequently asked for their opinion about new things;

2. more frequently relate unprompted experiences about innovations to other people;

3. exhibit a higher rate of negative diffusion than positive (this last characteristic is not, of course, dependent upon a comparison with the population).

The Questionnaire

The elements of the questionnaire as well as the purposes of each section have been explained. The form and length of the questionnaire were influenced by such considerations as

(1) the environment of the interview,

(2) the time available to the interviewer,

(3) the predicted limit of the active interest and patience of the respondent.

Environment.--There were many significant advantages (enumerated previously) to an interview situation in which an innovator could be questioned during the first trial of the innovation. On the other hand the setting had these disadvantages: (1) there was continual foot traffic in the area; (2) there was an intermittent need for the chief diagnostician to explain some of the operations of the center to the respondent; (3) there was a strong possibility that inquisitive bystanders might interrupt the interview.

To compensate for these situational hazards it was decided to construct the questionnaire in short sections which usually would permit the interviewer to complete a sequence between disturbances. The
questions were kept short and direct. Cards were prepared to assist the respondent in remembering the answer categories. During pretesting, the final form of the questionnaire was rearranged as to incorporate the sectional design and to clear up ambiguity.

**Time Available and Respondent Interest.** These twin constraints meant that the questionnaire must be constructed in such a way that (1) the objectives of the research design are met, (2) a trained interviewer can complete the interview within the available on-site time period, and (3) the interest of the respondent in the interview does not wane appreciably.

It was determined by dry runs and talks with experienced technicians that the diagnosis would consume an average of 40 minutes. Time allotments were made to the registration period, the opening talk by the chief diagnostician, introduction to the interviewer, warm-up period for establishing rapport, the interview itself, interruptions, and the closing conference between the diagnostician and the customer. The resulting estimate for an average interview time range was 20 to 25 minutes. Pretest runs caused further pruning of the questionnaire so that the final average time achieved was 17 minutes.

**Results.** In only a few unusual cases was it necessary to continue the interview after the diagnosis had ended. The length of the questionnaire was almost precisely optimal.

There were seven outright refusals to be interviewed, five interviews judged to be of sufficiently dubious quality that they were deleted from the study, and ten interviews terminated at various points
short of completion. Viewed as a whole, the efficiency of the inter-
view process was very high.

Samples: Population and Innovators

In most studies it is impossible to talk with every person in a
given community. A substantial body of theory and empirical research
has demonstrated that well designed sample of a population can pro-
vide the researchers with a good approximation of the characteristics
of all the people.

Definitions.--The population in this case was arbitrarily defined
as automobile owners or users in metropolitan Columbus, Ohio, as repre-
sented in the fall of 1967 by the Columbus telephone directory. Innov-
ators in this case were confined to the patrons of the Medick Ford
Automobile Diagnostic Center for a three-month period beginning
September 19, 1967, (opening day).

Population.--Names and addresses resulting in a total of 173 inter-
viewees were randomly generated from the Columbus metropolitan phone
directory by reference to a standard table of random numbers. The
following table illustrates the correspondence of the sample to the
United States population on five bases.

Acknowledgment.--The population sample data were provided by
means of interviews conducted by a graduate marketing research class
at The Ohio State University under the direction of Dr. Roger Blackwell.
As a class project the members collected the data, and performed the
tasks of editing, coding, keypunching, preliminary tabulation and
analysis.
## TABLE 3

PERCENTAGE DISTRIBUTION OF POPULATION FACTORS: COLUMBUS SAMPLE AND THE UNITED STATES

<table>
<thead>
<tr>
<th>Factor</th>
<th>Columbus Sample</th>
<th>United States (1967 Data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home ownership</td>
<td>60%</td>
<td>62%</td>
</tr>
<tr>
<td>One-car owners</td>
<td>66</td>
<td>67</td>
</tr>
<tr>
<td>Ford Motors automobiles owned</td>
<td>28</td>
<td>26</td>
</tr>
<tr>
<td>General Motors automobiles owned</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Chrysler Corporation automobiles owned</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>

Sources: original research: Columbus sample. Statistical Abstract of the United States (1968).

Innovators.—During the innovative period of three months there were 366 customers at the Medick Ford Automotive Diagnostic Center of whom only 350 were qualified candidates for interviewing, the other 16 being composed of (1) commercial customers (2) complimentary cases, and (3) internal cases, trouble-shooting Medick repair customers.

Of the 350 candidates a total of 249 were interviewed, or 71.1 percent. The missed interviews were unintentional, having occurred through an assortment of random causes: (1) illness of interviewer, (2) weather, (3) mismatched time periods, or (4) other unexplained misses. Inasmuch as there was no regularity or pattern involved in the
missed interviews, the sample is taken to be completely representative of all innovators in this case.

The author constructed the research design and the questionnaire, trained interviewers and a supervisor, conducted 15 percent of the interviews, edited the completed questionnaires, trained and supervised the coders, supervised the key punching, participated in the design of the computer programs involved, and conducted the data analysis.

Statistical Techniques

Aside from classification, tabulation, and frequency distribution, the two principal statistical techniques employed in this study were chi-square and multiple discriminant analysis.

Chi-Square.--The basic arrangement of the data was in the form of frequency distributions which display the number of observations (respondents) for each answer category (cell) for each question. It is possible to test any null hypothesis that will yield an expected number for each of these categories.

The null hypothesis may be tested in terms of the $X^2$ distribution by

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16 The author acknowledges his gratitude to Don Grabner, systems supervisor, Computer Center of Clippinger Laboratories, Ohio University, for his competent and generous assistance.

17 Details are found in any standard statistical text, such as Allen L. Edwards, Statistical Methods for the Behavioral Sciences (New York: Holt, Rinehart and Winston, 1961), pp. 366-398.
(1) taking the difference between each observed and expected numbers,

(2) squaring the discrepancies,

(3) dividing the squared discrepancy by the corresponding expected numbers, and

(4) summing, the result of which is a value of $\chi^2$ (chi-square).

The appropriate expression is:

$$\chi^2 = \sum_{i=1}^{k} \frac{(n_i - n'_i)^2}{n'_i}$$

where $n_i$ = the observed number of observations in the $i$th category

$n'_i$ = the expected number of observations in the $i$th category

$k$ = indication (over the summation sign) that we sum over all $k$ categories.

In this case the expected frequencies are proportionately supplied by the population, enabling the comparison to be made directly with population data. The value for $\chi^2$ is used together with the degrees of freedom in the matrix as an entry into a table of $\chi^2$ from which a level of significance (or $p_{10}$) may be obtained for the difference calculated.

In this study frequent use was made of a 2 x 2 matrix which represents dichotomous cases or instances in which cells were collapsed in order to highlight a basic point or in which the responses were heavily clustered at one pole. This form permits a simplification of the conventional $\chi^2$ computation. In addition a continuity correction

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18 See for example, James F. Engel and Lawrence Light, A Manual for Business Research, (privately printed: Columbus, Ohio, 1966), Part III, p. 30.
may be utilized which permits a better approximation of the $\chi^2$ distribution.

$$\chi^2 = \frac{N (AD - BC - \frac{1}{2} N)^2}{(A + B) (C + D) (A + C) (B + D)}$$

where $A$, $B$, $C$, and $D$ represent cells in a matrix

<table>
<thead>
<tr>
<th>Variable I</th>
<th>Variable II</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$A$</td>
<td>$A + B$</td>
</tr>
<tr>
<td>2</td>
<td>$C$</td>
<td>$C + D$</td>
</tr>
<tr>
<td>Total</td>
<td>$A + C$</td>
<td>$B + D$</td>
</tr>
</tbody>
</table>

and the quantity $\frac{1}{2} N$ is the correction inserted in the numerator of (13) above.

**Multiple Discriminant Analysis.**--The present case was one in which the dependent (or criterion) variable was categorical (that is, either innovator or population class) rather than continuous, but in which the predictor (or independent) variables involve measurement data. The computational techniques underlying discriminant analysis involve extremely intricate and repetitious manipulations which would be, as Cooley and Lohnes assert, quite impractical for large group analysis unless a high-capacity computer is available. For a reasonably close approximation to a plain language description, see Paul E. Green and Donald S. Tull, *Research for Marketing Decisions* (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1966), pp. 346-352.

by Anderson and many others. Stated as simply as possible, matrix algebra and differential calculus are the basic tools, and the calculations are done in the following sequence: means of the variables are determined by group, and the mean differences are obtained; construction of a matrix of the sum of the crossproducts of the deviations from the means; the preceding matrix is inverted, and discriminant coefficients obtained (for each variable) which together comprise the discriminant function.

**Computer Program.**—With the assistance of the Ohio University Computer Center Staff, the BMD 04M program (Discriminant Analysis for Two Groups) was adapted to the IBM 360 Model 44 Computer in order to treat sets of innovative-diffusive characteristics as indices of discrimination between the groups.

This optimal discrimination is accomplished by computationally assigning to the respective variables those weights which when applied to the scores for the variables will result in a maximization of the "distance" between the two groups based upon their treated mean scores, with a built-in compensation for the within-groups variance. The object is to set weights which will push the two group scores farther apart than they were in raw form.

Using the treated mean score the individual respondents may be ranked (while preserving their original group identification) so as to make visible the amount of overlap between the groups. A perfect linear

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discriminate function would result in no overlap at all, whereas the null hypothesis would state that half of each group lies on either side of the two-group combined mean, or that the overlap was maximized.

The primary reason for constructing a discriminant function for a given set of variables is prediction. In the next chapter, the data in this study are used to illustrate both the classificatory function and the predictive function of the program.
CHAPTER V

RESULTS OF THE RESEARCH

The objectives of the research design were to identify those variables which characterized and distinguished innovators and to analyze those product characteristics which were influential in the adoption process.

In this chapter the variables are arranged in six categories: economic, status, communications characteristics, innovativeness, diffusiveness, and product characteristics. This classification becomes the framework for analyzing the innovative-diffusive consumer and for describing his process of adoption of new products and services.

The variables are first treated individually, with the aid of tabular presentations of frequency distributions, ratio comparisons, and chi-square analysis. Later in the chapter, the variables are assembled into sets for multiple discriminant analysis, using a Biomedical computer program designed at the University of California, Los Angeles.
Individual Variables

Economic Indicators

Data were gathered in order to describe the consumer on several economic bases, such as household income, market value of the home, number of cars owned, rent paid, newness of the principal car owned, and others listed below in Table 4.

**TABLE 4**

DIFFERENTIATION BETWEEN INNOVATORS AND ALL CONSUMERS IN THE COLUMBUS AREA, USING ECONOMIC INDICATORS

<table>
<thead>
<tr>
<th>Variable Measured</th>
<th>Within-Group Percentage Distribution</th>
<th>Chi-Square Value</th>
<th>Probability Null Hypothesis Is True</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newness of Car Owned:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 years old or less</td>
<td>55%</td>
<td>10.90</td>
<td>.001</td>
</tr>
<tr>
<td>Two or more cars owned</td>
<td>51%</td>
<td>13.20</td>
<td>.0005</td>
</tr>
<tr>
<td>Household Income of more than $10,000</td>
<td>51%</td>
<td>14.27</td>
<td>.0005</td>
</tr>
<tr>
<td>Value of Home Owned of $25,000 or more</td>
<td>43%</td>
<td>6.04</td>
<td>.025</td>
</tr>
<tr>
<td>Own Home</td>
<td>60%</td>
<td>----</td>
<td>--</td>
</tr>
<tr>
<td>Purchased Car New</td>
<td>55%</td>
<td>2.03</td>
<td>.20</td>
</tr>
<tr>
<td>Rent Paid is $100 or more per month</td>
<td>51%</td>
<td>2.64</td>
<td>.20</td>
</tr>
</tbody>
</table>

*As determined by chi-square analysis using actual frequency distribution (see Appendix).*
Year of Car Owned.—Automobiles owned by a majority of innovators were three years old or less, while a majority of the population had cars that were four years old, or older. The average age of the innovators' automobiles was 3.7 years, compared with 4.7 years for the population.

Based upon the cell frequencies, a chi-square value of 10.90 was calculated, indicating statistically that the difference between innovators and the general population was significant at a level of .001; or, that there is a probability of only 1 in 1,000 that this difference would result from chance alone.

The newness of the principal car owned attains additional stature as a measurement when linked with other variables much as the following three.

Number of Cars Owned.—If innovators have higher incomes than non-innovators, it would be anticipated that on the average they own more automobiles as well. Innovators were in fact found to have an average of 1.6 cars per household, compared with 1.4 for the typical household in the statistical universe. The data are more sharply defined by noting that 51 percent of the innovators have more than one car, compared with 33 percent for the population.

Chi-square analysis of the frequencies produced a value of 13.2, meaning that there was a significant difference between the two classes, at the .0005 level.

Household Income.—The primary information needed for an economic discrimination between classes was household income.
The innovative earliest adopters of the diagnostic service were shown to have significantly higher incomes than the average household in their metro area. Data were obtained from 214 households, of which 51 percent had annual incomes of more than $10,000. In the population at large, only 32 percent had incomes in this range. Twenty percent of the innovators had incomes of more than $15,000 compared with 11 percent for non-innovators as shown in Table 5.

### Table 5

**Percentage Distribution by Ranges of Annual Household Incomes for Innovators and the Population (1967)**

<table>
<thead>
<tr>
<th>Annual Income</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below $3,000</td>
<td>---</td>
<td>6%</td>
</tr>
<tr>
<td>$3,000 - 5,999</td>
<td>12%</td>
<td>23%</td>
</tr>
<tr>
<td>6,000 - 7,999</td>
<td>19%</td>
<td>22%</td>
</tr>
<tr>
<td>8,000 - 9,999</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>10,000 - 14,999</td>
<td>31%</td>
<td>20%</td>
</tr>
<tr>
<td>15,000 and above</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The difference between the two classes on the basis of income proved to be statistically significant at the .0005 level. This finding substantiates one of the most generally accepted notions among innovation researchers, namely, that income is positively correlated with
innovativeness. Everett M. Rogers, in a listing of consumer characteristics related to innovativeness, notes that income was found to be positively related in this fashion in 90 of 112 published reports.1

Market Value of Home Owned.--Respondents, both among innovators and in the probability sample of the population, were asked to estimate the current market value of their homes.

Homes of innovators were valued at an average of $24,448; and, 43 percent of these homes were valued at $25,000 and above. The corresponding average value for the population was $20,360 with only 28 percent valued at $25,000 or more. The value most frequently estimated by innovators was $25,000, compared with a mode of $15,000 for the population sample.

The noticeable difference between the house values (see Table 4 above) for innovators and the statistical universe was significant at a level of .05, according to the chi-square statistical test.

Home Ownership.--Every respondent was asked whether he owned or rented his residential quarters.

Table 6 indicates clearly the relative lack of any difference between innovators, and their neighbors on the basis of home ownership. This is the first of several indications that in some aspects, innovators are indistinguishable from other consumers, while in other characteristics, the difference is very marked.

TABLE 6

PERCENTAGE OF HOME OWNERSHIP: THREE CLASSES

<table>
<thead>
<tr>
<th></th>
<th>Innovators</th>
<th>Columbus Area</th>
<th>United States(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own</td>
<td>60%</td>
<td>60%</td>
<td>62%</td>
</tr>
<tr>
<td>Rent</td>
<td>40%</td>
<td>40%</td>
<td>38%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>


Purchase of New Car.--Since this survey, whose results are reported here, was conducted in connection with a new automotive service, it was considered necessary to collect data regarding automobile purchase and ownership. Earlier it was noted that innovators owned more cars and newer cars, on the average, than did the general population.

On the basis of whether the principal automobile owned was used or new when purchased, however, the difference between the classes was not sufficiently statistically significant. Fifty-five percent of the innovators bought their automobiles new, compared with 48 percent for the Columbus area, and 39 percent for the United States. In nearly one case in five, such a difference could have occurred by chance. If this were the only variable available to researchers, it would encourage further research; however, there are other indicators (supra) with superior discrimination.
Amount of Rent Payment.--Innovators who rented paid an average of $101.00 per month, while the area sample of renters paid $94.00. In Table 4 it is shown that the chi-square test for significance indicated a value of only 2.64 (using the frequency distribution) which is just under the value of 2.076, minimum for the .10 level. Higher than average rental payments might be safely considered as an economic indicator supporting an innovative tendency, only if other indicators are in strong support.

Summary of Economic Indicators.--Of the seven basically economic variables among the data studied, only one--home ownership--shows no visible promise of differentiating between innovators and the area population. Two of the remaining six--rent payments, and car purchased new or used--are too weak to be recommended without confirming measurements.

The remaining four variables exhibit discrimination at the .05 level of significance or better: household income, number of cars owned, newness of car owned, and value of home owned.

Social Status

Reports of marketing studies about innovations and innovators have been concerned most often with new products rather than new services. Furthermore these products were often highly visible--window airconditioners, the Mustang, new farm equipment, to name three which are in contrast to the "invisible" product offered by the automotive-diagnostic center. There appears to be no incremental gain in status from trying
this innovation. The construct for measurement of the status of the innovator relative to that of the general population consisted of these variables: household income, value of home owned, occupation, and educational attainment. The first two of these were described in the previous section and were shown to be positively associated with the innovators at the .0005 and .05 levels respectively.

Occupation.--Occupation is ordinarily closely linked, sometimes equated, with social class. For marketing researchers, a landmark treatment of this area was the Study of Consumer Expenditures, Income and Saving. Lower social status is often thought to be accompanied by relatively little experimentation in consumption and by a lack of self-confidence in the role of consumer. Therefore, it is almost necessary for the researcher to investigate occupation in relation to innovative behavior in order to measure social status involvement.

In this study it was found that innovators, on the average, had a significantly higher occupational status score than did the corresponding population (.001 level) as shown in Table 7. A more detailed report of scores appears in the Appendix. These scores were based on the Reiss index (see footnote, Table 7) which rates numerically the status of nearly 500 occupations on a scale from 1 to 100. Sample occupations with their scores are: chemical engineer, 90, librarian, 60, tenant farmer, 14, stevedore 11, practical nurse, 22.

---

TABLE 7
INDEX SCORE FOR OCCUPATIONS*: INNOVATORS AND THE POPULATION

<table>
<thead>
<tr>
<th>Measure</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>61</td>
<td>47</td>
</tr>
<tr>
<td>Median</td>
<td>64</td>
<td>47</td>
</tr>
<tr>
<td>Scores 50 or below</td>
<td>26%</td>
<td>56%</td>
</tr>
<tr>
<td>Scores 51 or above</td>
<td>74%</td>
<td>44%</td>
</tr>
<tr>
<td>Scores above 75</td>
<td>34%</td>
<td>14%</td>
</tr>
</tbody>
</table>


The chi-square value for the comparison of the frequency of scores of 50 or above for the two groups was 34.93, indicating that the difference is significant beyond the .0005 level. Additional tabular information about these scores may be found in the Appendix.

Perhaps the most striking comparison is that, among the earliest adopters, slightly more than one in three has an occupational index higher than 75, compared with a ratio for the population at large of only one in seven. The 75 point level of the socioeconomic index consists only of the highest status professions—architects, scientists, lawyers, doctors, engineers, auditors and the like—and top management positions.
Educational Attainment.--The four measures of social status used here are intended to support or to denigrate a generalization about social status and innovative and diffusive behavior. These four variables should not theoretically be additive, however, for to use them in this manner would indicate falsely that they were each exclusive rather than interdependent.

This point should be made especially in connection with educational attainment, since it is self-evident that to be a physician, for example, one must possess education beyond the Bachelor degree level. Furthermore, it is normally discovered that physicians have relatively high incomes and houses of relatively high value.

Therefore, it is not surprising to find, as shown in Table 8, that educational attainment is associated positively with the innovator group; because we already know that income is distributed in the same direction.

It can be seen that the percentage distribution of the population comes much closer to a normal distribution than does the innovator set.

Table 9 points up the innovative skewness, based on a division among the two classes at the high school graduate level.

The next table (10) shows the same type of dichotomy based on a dividing line at the level of the college graduate.

In each of the comparisons, chi-square analysis yielded a value considerably greater than 10.827, indicating the difference between the classes based on educational attainment was beyond the .001 level.
### TABLE 8
EDUCATIONAL ATTAINMENT BY INNOVATORS AND THE POPULATION

<table>
<thead>
<tr>
<th>Level</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below High School</td>
<td>4.5%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Some High School</td>
<td>5.7</td>
<td>14.1</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>17.6</td>
<td>29.4</td>
</tr>
<tr>
<td>Some College</td>
<td>27.5</td>
<td>25.3</td>
</tr>
<tr>
<td>College Graduate</td>
<td>22.6</td>
<td>14.1</td>
</tr>
<tr>
<td>Post Graduate Work</td>
<td>22.1</td>
<td>11.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### TABLE 9
PERCENT OF RESPONDENTS WITH A HIGH SCHOOL EDUCATION OR LESS

<table>
<thead>
<tr>
<th>Range</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to High School Graduate</td>
<td>28%</td>
<td>50%</td>
</tr>
<tr>
<td>Education beyond High School</td>
<td>72</td>
<td>50</td>
</tr>
</tbody>
</table>
TABLE 10
PERCENT OF RESPONDENTS WITH A COLLEGE DEGREE

<table>
<thead>
<tr>
<th>Range</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to College Graduate</td>
<td>55%</td>
<td>75%</td>
</tr>
<tr>
<td>College Graduate and Beyond</td>
<td>45%</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Secondary Indicators.**—In addition to the foregoing status variables, three other possible indicators were explored: whole house air-conditioning, ownership of a second house, and membership in a private club. Whole house airconditioning is statistically significant (.10 level) in its differentiation between the two groups (earliest adopters, and the general population). A complete study of the circumstances which accompany acquisition of central airconditioning would be required to determine whether this one variable could be relied upon to differentiate consistently between innovators and others.

It is possible that airconditioning, like color TV, would prove to be more associated with overprivileged income classes than with status itself.

Despite these reservations, this variable does deserve additional attention, because it was the only one in an array of eleven "possession-type" characteristics which displayed a difference of measurable significance (see Table 11 below).
TABLE 11
NONDISTINCTIVE VARIABLES USED IN DIAGNOSTIC CENTER RESEARCH SURVEY

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent of Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Innovators</td>
</tr>
<tr>
<td>1. Own color TV</td>
<td>33%</td>
</tr>
<tr>
<td>2. Own electric toothbrush</td>
<td>35</td>
</tr>
<tr>
<td>3. Sports car</td>
<td>17</td>
</tr>
<tr>
<td>4. Electric blanket</td>
<td>50</td>
</tr>
<tr>
<td>5. Water pic&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>6. Gas fired grill&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>7. Central airconditioning&lt;sup&gt;b&lt;/sup&gt;</td>
<td>27</td>
</tr>
<tr>
<td>8. Motor or sail boat</td>
<td>15</td>
</tr>
<tr>
<td>9. Second house</td>
<td>9</td>
</tr>
<tr>
<td>10. Private club</td>
<td>21</td>
</tr>
<tr>
<td>11. Radial tires</td>
<td>2</td>
</tr>
</tbody>
</table>

<sup>a</sup>Relative difference is large but cell frequencies were too small to furnish reliable discrimination.

<sup>b</sup>Statistically significant, at .10 level.

Summary of the Status Findings and Comparison with Previous Studies.--Each of the four primary variables used to measure status indicates that innovators differed significantly in status from the general population.
Studies by Coleman, Howard, and Engel, Blackwell and Kollat are representative of the large collection of reports indicating that social class is important in a description of, and in building theories of, consumer behavior.

The more limited literature of diffusion of innovations incorporates the results of research in several kinds of social relationships. Robertson and Kennedy, for example, attempted to relate to innovativeness such variables as social mobility, social integration, and status concern. Questionnaire items which probed at the respondent's level of satisfaction with his present neighborhood and the desire to move to a different area served to measure mobility. Continuity or change in friendship patterns also were part of the generalized label of social mobility, which was found to correlate significantly with innovativeness, while cosmopolitanism was found to correlate negatively. Cosmopolitanism indicates the degree to which consumers look beyond their locality for information and influence. This societal characteristic had previously been accepted as a positive correlate among innovators.


Rogers and Burdage, for example, reported that cosmopolitiveness, as well as education and size of business, correlated positively with innovativeness.\(^7\)

Bell found that innovators were different from other consumers on the basis of income, education, occupation as well as four other variables.\(^8\) These three named variables displayed a difference that was significant at the .05 level, and compare with the results of this present study, for the same characteristics of status.

In summary, this study lends definite support to the hypothesis that innovators are significantly different from the remainder of the population on the basis of social status, when status is defined by means of household income, educational attainment, and occupation.

**Communications Characteristics**

This generalized title is descriptive of that portion of the research which studied the information-gathering process, the sources of information, the knowledge of the innovation before it became available locally, whether purchases are usually planned ahead of time, and other variables described below. This set of characteristics offers an unusual insight into additional differences between innovators and the population at large.

---

\(^7\)Everett M. Rogers, and Rabel J. Burdage, "Community Norms, Ohio Leadership and Innovativeness Among Truck Growers," Wooster, Ohio, Ohio Agricultural Experiment Station Research Bulletin 912, June, 1952.

Magazine Exposure.--Admitting at the outset that any measure of communications which relied upon magazines alone would hardly be conclusive, it was nevertheless believed that this simple device offered a clue to the environment of the respondent and an indication of the amount of positive bias towards communications.

Respondents were asked if they subscribed to more than five magazines, and replies were recorded for 244 innovators, and 172 from the population. Table 12 shows that more than half the innovators receive more than five magazines whereas the population average is only one in three.

**TABLE 12**

**SUBSCRIBERS TO MORE THAN FIVE MAGAZINES AMONG INNOVATORS AND THE POPULATION**

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent of Innovators</th>
<th>Percent of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>52%</td>
<td>33%</td>
</tr>
<tr>
<td>No</td>
<td>48%</td>
<td>67%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Chi Square Value: 14.72 (using frequencies)

Level of Significance: .0005

The difference between the two classes based on this one variable is significant at the .0005 level. The conclusion is that innovators
are more inclined to have information available than is the population, a statement that was strongly supported by other findings in the study.

Knowledge about the Innovation before it became available locally.--The question concerning foreknowledge of the innovation before it becomes available for purchase, trial, or adoption is relevant, since in our society innovations seldom burst unexpectedly upon a surprised public. Innovations often make news long before they become commercially feasible or widely available.

The automobile diagnostic center techniques and operations were the subject of many articles and short reports during the two years prior to the Columbus opening in such publications as the Reader's Digest. Did the innovators in this study--the earliest adopters of the automobile diagnostic service--have more knowledge about this innovation before it was available to them than did the remainder of the population? The answer is affirmative.

Of the innovators, four out of five had already heard of diagnostic centers before any announcement was made of the local center. This 80 percent ratio contrasts dramatically with 46 percent for the population. Frequencies are shown in Table 13.

Because of the way the question was put to the population, it was not possible to discriminate between those respondents who had heard of diagnostic centers before any news of the local center was available, from those who had heard only of the local center. Therefore, the

---

advance knowledge sector of the general population is actually smaller than the conservative figure used in Table 13.

TABLE 13

INNOVATORS AND POPULATION SAMPLE WITH ADVANCE KNOWLEDGE OF DIAGNOSTIC CENTERS

<table>
<thead>
<tr>
<th>Response</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>188</td>
<td>81</td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>237</td>
<td>173</td>
</tr>
</tbody>
</table>

Chi Square value: 45.25
Level of Significance: .0005

The percent of the population (46%) who were even vaguely aware of any automotive diagnostic service could be more properly compared with the innovators (100%) who knew of the local center. These innovators, by definition, knew the name, location, and some of the characteristics of the local center, while 80 percent of them had heard of this innovation in advance of the local availability.

Innovators Learn of Innovations Earlier.--In an attempt to discover if the earliest adopters of the local automobile diagnostic center service were also earlier receivers than others in the population of information about innovations in general, all respondents were asked if they believed that they usually heard "about new things sooner than most of
the people you know." Half the respondents comprising the population sample said they heard of new things earlier than their acquaintances, and half said they heard later.

This ratio is in very marked contrast to the response to the same question by the innovator group. These respondents (earliest adopters of the automotive diagnostic service) exhibited a much higher proportion of persons who heard about new things earlier than the "people they knew."

**TABLE 14**

<table>
<thead>
<tr>
<th>Comparative Learning in Time</th>
<th>Innovators</th>
<th>Population Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learn of new things before acquaintances do</td>
<td>77%</td>
<td>50%</td>
</tr>
<tr>
<td>Learn of new things after acquaintances do</td>
<td>23%</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Chi square value for the distribution: 30.808

Level of Significance: .0005

The innovators in this study thus portray themselves as occupying an earlier position than their acquaintances, friends, neighbors and the like along the time continuum of learning about new things of all kinds.

Planning by Innovators.--Innovators hypothetically could be pictured as a group of reckless, impulsive, carefree consumers who are
predisposed to try anything new, with little regard for rational planning or prudent comparisons.

In order to probe this possibility, the innovators in this study, as well as the population sample, were asked to indicate their agreement or disagreement (on a six-point scale) with each of the following two statements:

1. I rarely think things out in detail before I act.
2. I enjoy planning work carefully before carrying it out.

The respondents were urged to rate themselves as accurately and frankly as possible without considering their image held by others.

It can be seen that the second statement is virtually the inverse of the first, and to be consistent one would need to respond to the two statements by placing scores at correspondingly opposite points on the scale. This double inquiry was made in order to achieve a more reliable measurement of this interesting variable. The two groups—innovators and the population—handled the problem with reassuring consistency, as can be seen in Table 15.

Each of the two groups appropriately tended to reverse the polarity of their responses to the two statements, and each group demonstrated less polarity in relation to the second statement. The critical comparison between the two groups is at the poles. More than 80 percent of the innovators occupy the top two cells of disagreement with statement #1, that they rarely think things out in detail before they act. More than half (55.6 percent) of the innovators cluster at the
extreme position in disagreement, compared with only 40.3 percent for the general population.

Stated another way, there is a 40 percent greater concentration of innovators at the polar position than is the case with the population sample, although it is the modal cell for both groups.

The relative concentration is even more conspicuous in response to the second statement in Table 14. In this section, nearly half (48.6 percent) of the innovators are clustered at the extreme position of agreement, compared with only 31.3 percent for the population. This demonstrates a nearly 60 percent greater concentration of innovators at this modal position than for the population.

Using the response frequencies themselves, a chi square value of 7.968 was calculated for the first, or negatively oriented statement, indicating a statistically significant difference between the two groups (.01 level). A chi square calculation for the second statement resulted in a value of 11.69, also confirming the significance of the obvious differentiation between groups (.001 level).

It can safely be concluded that innovators do not regard themselves as being unconcerned with planning nor are they attracted to impulsive actions. While this conclusion is interesting, it is even more significant to see that innovators actually appear to plan their actions far more carefully and deliberately than does the average person.

Thus, innovators may very well be the most careful consumer group in the entire market. More support for this statement is established in the sections that follow. The implication for this section on
### TABLE 15

**DISTRIBUTION OF RESPONSES TO PLANNING STATEMENTS**

<table>
<thead>
<tr>
<th>Planning Statement</th>
<th>Response</th>
<th>Percentage of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Innovators</td>
</tr>
<tr>
<td></td>
<td>Definitely disagree</td>
<td>55.6%</td>
</tr>
<tr>
<td></td>
<td>Generally disagree</td>
<td>25.1%</td>
</tr>
<tr>
<td>1. Rarely plan before acting</td>
<td>Moderately disagree</td>
<td>5.7%</td>
</tr>
<tr>
<td></td>
<td>Moderately agree</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Generally agree</td>
<td>4.4%</td>
</tr>
<tr>
<td></td>
<td>Definitely agree</td>
<td>4.4%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td></td>
<td>Definitely disagree</td>
<td>3.1%</td>
</tr>
<tr>
<td></td>
<td>Generally disagree</td>
<td>4.8%</td>
</tr>
<tr>
<td>2. Enjoy planning before acting</td>
<td>Moderately disagree</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Moderately agree</td>
<td>18.0%</td>
</tr>
<tr>
<td></td>
<td>Generally agree</td>
<td>20.7%</td>
</tr>
<tr>
<td></td>
<td>Definitely agree</td>
<td>48.6%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Communications is that innovators, as more serious planners than average, should be expected to make more of a search for information than do consumers in the general population.
Search for Information.—It has already been observed that, in general, innovators learn of new things earlier than others do (see Table 14, page 89). Innovators in this study knew about automobile diagnostic centers before the people at large learned of this innovation.

The question here is whether, once an innovation is known, innovators seek additional information more often than do others. Replies to the question were obtained from 238 innovators and 172 representatives of the general population. The results are summarized in Table 16.

The responses of the two groups are remarkably disparate. More than one in three innovators got more information following his first knowledge of the diagnostic center innovation, while an average of only one in fourteen among the general population made such a search. The difference is statistically significant (.001 level).

Sources of Original Information.—There are three categories of information sources based upon sequential or a time continuum concept: (1) source of original information about diagnostic centers in general, (2) source of information about the first local diagnostic center, and (3) the source of additional information for which a search of any type was deliberately made.

Because of problems involved in interviewing respondents representing the population, it is not possible to make each of the between-groups comparisons for the three time stages. The only direct compar-
TABLE 16

INDICATIONS OF SEARCH FOR ADDITIONAL INFORMATION BEYOND INITIAL CONTACT WITH INNOVATION: PERCENTAGE DISTRIBUTION, TWO GROUPS

<table>
<thead>
<tr>
<th>After first learning of innovation</th>
<th>Innovators</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional information was collected</td>
<td>36%</td>
<td>7%</td>
</tr>
<tr>
<td>No further search was made</td>
<td>64%</td>
<td>93%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Comparison that can reliably be made is shown in Table 17. Chi square calculations yield a level of statistical significance of 0.10.

Of far greater interest is the shift in sources that occurred when innovators made a search for additional information about diagnostic centers (only seven percent of the population sample made this type of search, preventing a comparison between groups). Table 18 shows the shift among innovator sources of information in the three stages mentioned above. Table 18, in its simplified structure, shows clearly the progression from formal media sources in the first stage to almost complete reliance on word-of-mouth in the final stage.

In conversation with the earliest adopters at the site of the diagnostic center, the author learned that many (64 percent) of the group by-passed stage three of the information process because they had already decided to try the new service. No need was felt for additional information.
TABLE 17

SOURCE OF INFORMATION FOR TWO GROUPS ABOUT LOCAL INNOVATIVE AUTOMOBILE DIAGNOSTIC CENTER BY PERCENT OF RESPONSES

<table>
<thead>
<tr>
<th>Source</th>
<th>Innovators</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal, word-of-mouth</td>
<td>34%</td>
<td>25%</td>
</tr>
<tr>
<td>Other sources</td>
<td>66%</td>
<td>75%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

TABLE 18

SOUrCES OF INFORMATION USED BY INNOVATORS:
THREE STAGES

<table>
<thead>
<tr>
<th>Stage</th>
<th>Word-of-Mouth</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Diagnostic centers in general</td>
<td>25%</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>2. Local diagnostic center</td>
<td>34</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>3. Further information source</td>
<td>85%</td>
<td>15%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Using the classic description of the adoption process developed by Everett Rogers,\(^\text{10}\) this point in the process would be characterized as the evaluation stage. The five stages may all be accompanied by information inputs, but the first three are usually considered to be

\(^{10}\)Everett Rogers, *Diffusion of Innovations*, p. 306.
primarily devoted to information gathering and processing. These stages (from Rogers) are shown in Table 18, aligned with the informational stages developed earlier in this chapter.

In Stage III, evaluation, some innovators-to-be reached a decision about trying the new service, while others (36 percent) were making their last acquisition of information.

The results of considerable research over the past few years lead one to the contention that the informational search is designed to reduce the risk of trial and adoption. In this case, the risk might be the wasting of the ten dollar fee on a fruitless auto examination, or the risk of embarrassment if one's car proved to break all records for total repairs needed, or the risk of later discovery that diagnostic centers were just a clever device to increase the revenues of the sponsor's repair department.

Paul Green and co-workers at Pennsylvania found experimental subjects willing to pay for risk-reducing information.\(^\text{11}\) Bauer,\(^\text{12}\) and his followers, such as Cunningham, have fairly well documented the influence of attempting to reduce uncertainty and/or risk upon the behavior of


TABLE 19
INFORMATION AND ADOPTION STAGES RELATED TO EARLIEST ADOPTERS OF LOCAL DIAGNOSTIC CENTER

<table>
<thead>
<tr>
<th>Stages In Adoption Process</th>
<th>Information Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Awareness</td>
<td>I. Earliest knowledge of diagnostic centers in general</td>
</tr>
<tr>
<td>II. Interest</td>
<td>II. Information about local availability of the innovation</td>
</tr>
<tr>
<td>III. Evaluation</td>
<td>III. Reinforcement and final information search usually employing personal, informal sources</td>
</tr>
<tr>
<td>IV. Trial</td>
<td>IV. Conversation with diagnostic center employees while automobile is in diagnosis</td>
</tr>
<tr>
<td>V. Adoption</td>
<td>V. Structured conference with manager of center following diagnosis</td>
</tr>
</tbody>
</table>

consumers. Another researcher, Barach, is attempting to extend the notion of risk reduction to include persuasibility. This idea


developed from conceptualizing risk style as a personality trait, which in turn was derived from psychological research in the field of category breadth.\footnote{For a synthesis of category breadth research, see D. Kretch, R.S. Crutchfield, and E. L. Ballackey, \textit{Individual in Society} (New York: McGraw Hill Book Co. Inc., 1962).}

In Table 17, above, a simple bivariate division among sources of information was presented, comparing word-of-mouth with all other types. Sources may also be trichotomized as marketer dominated, consumer dominated, and neutral, as suggested by Cox.\footnote{Donald F. Cox, "The Audience as Communicators," in Stephen A. Greyser (ed.), \textit{Toward Scientific Marketing} (Chicago: American Marketing Association, 1964), pp. 58-72.} The observations of Cox indicate consumers today take more initiative in securing information in contrast to the early findings of Katz and Lazarsfeld\footnote{Elihu Katz and Paul F. Lazarsfeld, \textit{Personal Influence} (New York: The Free Press, 1955).} in which the classic "two-step flow of communication" was developed. This concept describes active opinion leaders who gather information, digest it, and re-transmit it to passive audiences. They show, at one point in their study, that personal influence of this character was seven times more influential than certain impersonal sources in cases of household brand switching. In other instances, where consumers are active information-seekers, personal influence may be diminished, as is the case in this present study of innovative adopters of the new automotive service. R. A. Bauer strongly asserts that the recipient of communications is an
active participant in the whole process, rather than passive.  

Apparently he would agree that there are few cases in which a marketer could treat the public as a "mass audience" with no segmentation.

Cox suggests that the opinion leader, in order to compete with today's mass media and television in particular, must become very selective in her choice of information which she passes on to her "audience." Reciprocally, the audience may come to depend less on opinion leaders for general information.

Diffusion theory, of course, encompasses the total flow of information and influence, regardless of diminution in importance of a single communications component in the social system. It is critically important, however, for the marketer to be alert for shifts in influence and it is certainly wise to attempt to identify the type of information which best fits each information channel component. If personal, or word-of-mouth, transmission is found to be highly active for a particular product or service, the advertiser may profitably concentrate on brand awareness, rather than on later stages in the adoption process.

Sources of Advance Information.--Having already observed, in the present study, that innovative persons in the Columbus area were actively or passively collecting information about diagnostic centers well

---


19Donald Cox, "The Audience as Communicators."
before the innovation became available to them locally, it is inter-
esting to note the sources of this early information.

TABLE 20

SOC RE S OF ADVANCE INFORMATION
REPORTED BY LOCAL INNOVATORS

<table>
<thead>
<tr>
<th>Source</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Magazines, popular and technical</td>
<td>41.9%</td>
</tr>
<tr>
<td>2. Newspaper articles (not ads)</td>
<td>9.5</td>
</tr>
<tr>
<td>3. Radio, news items or editorial mention</td>
<td>4.8</td>
</tr>
<tr>
<td>4. Television, news or non-commercial</td>
<td>1.1</td>
</tr>
<tr>
<td>5. Newspaper advertisements</td>
<td>1.1</td>
</tr>
<tr>
<td>6. Friends, relatives, associates, others</td>
<td>20.7</td>
</tr>
<tr>
<td>7. Personal knowledge of diagnostic center</td>
<td></td>
</tr>
<tr>
<td>located elsewhere</td>
<td></td>
</tr>
<tr>
<td>8. Local &quot;experts&quot;: mechanics, attendants, etc.</td>
<td></td>
</tr>
<tr>
<td>9. Don't remember</td>
<td>5.0</td>
</tr>
</tbody>
</table>

With this information at hand, it can be seen clearly that in the
awareness and interest stages, or early in the adoption process for this
particular innovation, impersonal or neutral sources were used most fre-
quently. Articles appearing in magazines may have been encouraged by
sponsors of diagnostic centers and diagnostic equipment manufacturers,
but these reports were perceived by the readers to be relatively free
from marketer-domination.
The most frequently quoted individual article was the report by Stevenson and Purdy which appeared in *Reader's Digest*, cited earlier in this chapter. This one reference alone accounted for 12.7 percent of the advance information procured by the earliest adopters of the service. In addition to *Reader's Digest*, other periodicals mentioned by respondents were: *Consumer Reports, Motor Trend, Popular Science, Ford Times, Popular Mechanics, Changing Times*, and *Better Homes & Gardens*.

Another arrangement of the same data is helpful in ranking sources at this early stage. In Table 21 it can be seen that personal contacts plus personal knowledge gained from other diagnostic centers, account for about 37 percent of the information sources reported at this stage. In this table, combining "Friends" with "Local Experts" produces a mixed category which would approximate word-of-mouth sources at this stage (25 percent). Undoubtedly, there is also a word-of-mouth component in the "personal knowledge" category, which could not be feasibly segregated in the context of the interview.

**Stage II Information Sources.**—The next table sets out the second stage of information acquisition, in which the innovation is identified as being available locally. In Table 22 as in Table 18 on page 95, it can be observed that word-of-mouth sources constitute 34 percent of the total for innovators, and 25 percent for the population. The latter thus display precisely the same percentage for this source as did the innovators in their earlier stage.

---

20 Stevenson and Purdy, "New Approaches in Automobile Repair."
TABLE 21

SOURCES OF ADVANCE INFORMATION REPORTED
BY LOCAL INNOVATORS, BY TYPE

<table>
<thead>
<tr>
<th>Source Type</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal Media</td>
<td>58.4%</td>
</tr>
<tr>
<td>Informal Sources:</td>
<td></td>
</tr>
<tr>
<td>Friends, et al</td>
<td>20.7</td>
</tr>
<tr>
<td>Contact with local &quot;experts&quot;</td>
<td>4.2</td>
</tr>
<tr>
<td>Sub-total, word-of-mouth</td>
<td>25.1</td>
</tr>
<tr>
<td>Personal knowledge</td>
<td>11.7</td>
</tr>
<tr>
<td>SUB-TOTAL, informal</td>
<td>36.6</td>
</tr>
<tr>
<td>Other, don't remember</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The marketer-domination of sources at this stage appears weaker than might have been anticipated. This segment (advertisements plus exposure to the new plant) constitutes only 45 percent for innovators, and 47 percent for the general population.

This amount of promotion effort at the introductory stage locally was, in fact, less than had been originally anticipated, a fact that reflected a strike at the manufacturing end of the channel of distribution. The diagnostic center opened as an integral part of a new automotive sales and service plant, and when management faced a shortage of new cars to sell in the newly opened location, the advertising budget was reduced for a period of several weeks.
## TABLE 22

**SOURCES OF FIRST INFORMATION ABOUT INNOVATION AVAILABLE LOCALLY: FOR INNOVATORS AND POPULATION**

<table>
<thead>
<tr>
<th>Source</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magazines</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Newspaper articles</td>
<td>14.9</td>
<td>14.0</td>
</tr>
<tr>
<td>Radio publicity</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Television publicity</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Advertisements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspaper</td>
<td>4.6</td>
<td>11.0</td>
</tr>
<tr>
<td>Radio</td>
<td>27.4</td>
<td>14.0</td>
</tr>
<tr>
<td>Television</td>
<td>2.1</td>
<td>6.0</td>
</tr>
<tr>
<td>Direct Mail</td>
<td>2.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Word-of-Mouth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends, relatives, et al</td>
<td>19.9</td>
<td>20.0</td>
</tr>
<tr>
<td>Local &quot;experts&quot;</td>
<td>1.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Other contacts</td>
<td>2.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Inquiries at local firm</td>
<td>10.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Personal Exposure = new building</td>
<td>9.1</td>
<td>15.0</td>
</tr>
<tr>
<td>Other, don't remember</td>
<td>5.3</td>
<td>14.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
TABLE 23

SOURCES OF INFORMATION ABOUT DIAGNOSTIC CENTERS REPORTED BY INNOVATORS AT THREE STAGES

<table>
<thead>
<tr>
<th>Source</th>
<th>Stage of Adoption -- Information Process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stage 1 N=189</td>
</tr>
<tr>
<td>Magazines</td>
<td>41.9%</td>
</tr>
<tr>
<td>Newspaper publicity</td>
<td>9.5</td>
</tr>
<tr>
<td>Radio publicity</td>
<td>4.8</td>
</tr>
<tr>
<td>Television publicity</td>
<td>1.1</td>
</tr>
<tr>
<td>Newspaper advertisements</td>
<td>1.1</td>
</tr>
<tr>
<td>Radio commercials</td>
<td>0.0</td>
</tr>
<tr>
<td>Television Commercials</td>
<td>0.0</td>
</tr>
<tr>
<td>Direct mail by local firm</td>
<td>0.0</td>
</tr>
<tr>
<td>Word-of-Mouth</td>
<td></td>
</tr>
<tr>
<td>Friends, relatives, et al</td>
<td>20.7</td>
</tr>
<tr>
<td>Local &quot;experts&quot;</td>
<td>4.2</td>
</tr>
<tr>
<td>Other Word-of-mouth contacts</td>
<td>0.0</td>
</tr>
<tr>
<td>Personal exposure</td>
<td></td>
</tr>
<tr>
<td>Other locations</td>
<td>11.7</td>
</tr>
<tr>
<td>Saw new building</td>
<td>0.0</td>
</tr>
<tr>
<td>Inquired at firm</td>
<td>0.0</td>
</tr>
<tr>
<td>Other, don't remember, etc.</td>
<td>5.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Information Sources in Stage III.--Nearly four out of every ten innovators extended their information acquisition process into the third stage, in which they sought still more knowledge of the automotive diagnostic service. Table 23 shows the dramatic shift in sources at this last pre-trial stage. Here we see that most of the innovators directly inquired at the local firm for this final information. By interviewing a sample of these respondents together with interviews of the personnel at the local diagnostic center, the author was able to categorize informally these direct inquiries as follows:

Direct Inquiries Ranked
By Frequency

1. Operating details: hours of operation, how long for a diagnosis, reservations, etc.
2. Cost and extent of the service; completeness.
3. Similarity of the local center to diagnostic services previously learned about; type of equipment, trained operators, etc.
4. General conversation about the value of the service.
5. Make of cars accepted.

These inquiries constituted nearly 60 percent of the third stage in Table 23. They were a personal, word-of-mouth confrontation at the initiative of the consumer. The consumer at this stage, actively interested, is no longer a passive receptor for information.
This finding lends direct support to observations of Engel et al in their study of self-medication.\textsuperscript{21} Engel found that the information flow was energized most frequently by the person seeking information, not by those who gave the advice. In part, conclusions of Arndt in his recent study of the influence of word-of-mouth communications, are also supported by these data.\textsuperscript{22}

On the other hand, there is no evidence here to support the "good-friend" link in communicative influences espoused by Arndt, whose study was of a quite different product (food) and in a much more integrated milieu (apartment complex).

Furthermore, the innovators' obvious tendency to initiate communication with the seller at this third stage certainly appears to conflict directly with Dichter's premise that the power of word-of-mouth communication lies in the transmitter's (the seller in this case) lack of material interest.\textsuperscript{23} It is plain that these inquiring innovators were not uneasy about making this direct inquiry.


In an attempt to probe this apparent acceptance of communications with the seller, two image measurement were constructed. Respondents were asked to indicate the scale of their agreement with a positive image of the new local diagnostic center, viewed as a part of the local auto sales and service complex. Nearly 85 percent of the responses indicated that the seller's image was good, that he had achieved credibility (see Appendix).

Then respondents were asked similarly to indicate the scale of their agreement or disagreement with a negativistic, cynical statement about the seller. Here the replies split in moderately even distribution along the scale. Respondents complained about the wording of the statement and interviewers were doubtful of the validity of many responses. The author feels justified in concluding that the innovators had (1) sufficient confidence in the seller's integrity in this case, to make inquiries directly to him, and (2) sufficient confidence in their own judgment so that they could detect and allow for any bias in the replies to their inquiry.

In addition to this largest category of sources used at this stage (59.4 percent of inquiries were to the seller), another 25 percent of more normal word-of-mouth contacts were made, similar to those of the previous two stages.

It is noteworthy that the formal media have all but disappeared as sources in this final stage prior to the trial of the new service. Exposure to the new plant, prominent in stage two, has dwindled in stage three.
Source of Principal Influence.—Respondents were asked what they had heard about this new automotive service that made them want to try it (replies are analyzed below in the Product Characteristics Section), and then were asked where they had heard this.

These latter replies are summarized in Table 24 below. When personal contact with the seller is included, word-of-mouth sources constitute almost 60 percent of the influence on innovative adopters of this service who remembered where they had heard the influential statement. Those who remembered comprised 57 percent of the total of the earliest adopters. It is possible that the proportions of sources of influence for those 43 percent who did not remember precisely actually vary widely from the results in Table 24 below. Nonetheless, the findings are so predominantly weighted toward word-of-mouth influence that the conclusion becomes inescapable that marketers must take this source into account in forming effective marketing strategies for new products.
TABLE 24

SOURCES OF MOST INFLUENTIAL
COMMUNICATION LEADING TO
TRIAL OF INNOVATION

<table>
<thead>
<tr>
<th>Source</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends, relatives, neighbors, associates</td>
<td>42.9%</td>
</tr>
<tr>
<td>Direct personal contact with seller</td>
<td>16.3</td>
</tr>
<tr>
<td>Newspapers</td>
<td>7.4</td>
</tr>
<tr>
<td>Radio</td>
<td>13.3</td>
</tr>
<tr>
<td>Television</td>
<td>1.5</td>
</tr>
<tr>
<td>Magazines, all types</td>
<td>14.8</td>
</tr>
<tr>
<td>Other</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Characteristics of the Firm and Its Product

Influence of the Image of the Sponsor.—In the circumstances of a local automobile diagnostic center, it is self-evident that the sponsoring agency will affect the risk perception of potential triers. If this innovational service is offered by a reputable, well-established local dealer, the perceived risk of trying the new service is reduced substantially. The image of the sponsor transfers in part to the new service. Conversely, combining a new service with an unknown operator, in an unfamiliar location, serves to compound the perceived risk.
In the present instance, the former perceptual set is in operation. The diagnostic center is an integral part of a new, expanded plant operated by an automobile agency with forty years of experience and an excellent local reputation. One additional risk-reducing element is present. This diagnostic service carries the brand name of Ford motors, is a part of a Ford agency, and the personnel are described as Ford trained and supervised.

Subjects were asked to respond to two separate, reversed statements about the new local diagnostic center, in order to establish their original pretrial expectational level (these statements are exhibited in the Appendix). This measurement can be compared with the level of satisfaction following the trial. In this manner, a new kind of observation can be made of the innovator, based upon a simplified scheme, shown in Figure 2.

FIGURE 2

| ATTITUDE | EXPECTATION | CONFIDENCE | TRIAL | ATTITUDE | SATISFACTION | DIFFUSION |

Results of the Pre-Trial Test

Almost 85 percent of the earliest adopters of the local diagnostic service were observed to have an opinion that the diagnostic center was professional in character and fair in treatment, before their own cars underwent the diagnosis.

In Table 25 below, the five response categories are shown together with the percentages, for two image statements.
TABLE 25
REACTIONS BY EARLIEST ADOPTERS TO STATEMENTS ABOUT THE DIAGNOSTIC CENTER BEFORE TRIAL

<table>
<thead>
<tr>
<th>Response Category</th>
<th>Positive, Complimentary Statement</th>
<th>Negative, Cynical Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolutely True</td>
<td>32.1%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Probably True</td>
<td>51.2%</td>
<td>34.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>14.5%</td>
<td>27.8</td>
</tr>
<tr>
<td>Probably not True</td>
<td>1.2%</td>
<td>21.4</td>
</tr>
<tr>
<td>Undoubtedly False</td>
<td>1.0%</td>
<td>8.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

The "complimentary" statement elicited a positive response indicating clearly that these earliest adopters perceived the diagnostic center to be trustworthy.

The second "cynical" statement flatly proposed that the "real reason" for this new service was to increase the repair business of the sponsor. This statement was found by the interviewers to result in confusion and ambivalence on the part of the respondents. Many subjects being interviewed insisted upon expanding their responses. The theme of these spontaneous explanations was that the automotive service operation was expected to be profit-making; therefore, this new service could be properly construed to a part of the total effort to increase business.
At the same time, these respondents felt that this innovation was professionally and fairly operated. As a result, the replies to the second statement are closely clustered about neutral zone. The author, therefore, is constrained to regard the responses to the first statement as a reliable gauge of the composite attitudes of the earliest adopters regarding the sponsor and his new service.

Results of the Post-trial Tests.—A week following the interview at the diagnostic center, the innovators were telephoned for a follow-up interview. They were asked to place their evaluation of their post-trial attitudes toward the innovation in one of five response categories, as set forth in Table 26.

The bulk of the early triers (40.7 percent) are shown to have found the innovation to be about what they had anticipated. Another 38.3 percent were more pleased with the innovation than they had expected, while the remaining 19 percent found that their expectations were not completely realized.

Triers and Adopters.—Another question asked in the follow-up interview was whether the respondent expected to use the service again sometime. The responses indicated that 85 percent of the early triers intended to repeat their use of the diagnostic service as the need arose and, therefore, clearly may be classified as adopters (Table 26 below).

Earlier, in Chapter III, a section was devoted to some of the classificatory problems involved in distinguishing between triers and adopters of certain types of products or services.
TABLE 26
POST-TRIAL ATTITUDES OF EARLIEST ADOPTERS

<table>
<thead>
<tr>
<th>Response Categories</th>
<th>Percentage of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much more pleased than expected</td>
<td>15.3%</td>
</tr>
<tr>
<td>Somewhat more pleased than expected</td>
<td>25.0</td>
</tr>
<tr>
<td>About as expected</td>
<td>40.7</td>
</tr>
<tr>
<td>Somewhat disappointed</td>
<td>13.4</td>
</tr>
<tr>
<td>Very much disappointed</td>
<td>5.6</td>
</tr>
<tr>
<td>Intend to use ADC again</td>
<td>84.3</td>
</tr>
<tr>
<td>Will not re-use ADC, or unsure</td>
<td>15.7</td>
</tr>
<tr>
<td>Price of service is &quot;about right&quot;</td>
<td>77.3</td>
</tr>
<tr>
<td>Service is underpriced</td>
<td>15.6</td>
</tr>
<tr>
<td>Service is overpriced</td>
<td>7.1</td>
</tr>
<tr>
<td>Totals</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Post-purchase Evaluation of Price.—Another measurement was made of post-purchase satisfaction by asking the respondents to indicate their comparison of the value of the service with its price. Three of every four responding (211 responses) said that the service was worth about what it was priced ($9.95), while 15.6 percent said it was under-priced, that is, its actual value was greater than the price. Seven percent of the respondents, following the trial, decided that the service was overpriced (Table 26). It is particularly interesting to note
that although 15.7 percent of the triers apparently do not intend to
use the service again, and a total of 19 percent were disappointed in
the trial results, only 7 percent feel that the service is overpriced.

Table 26 does show that this innovation was successful in main-
taining a high level of support in each of the three post-purchase
measurements.

Product Characteristics

Rogers and Stanfield, as noted earlier, report that in the pub-
lished findings they have studied, a group of influential product
characteristics have emerged.24 These are: relative advantage, ful-
fillment of felt needs, immediacy of benefit, communicability, complex-
ity, availability, compatibility, and divisibility.

In Chapter III these aspects of the product portion of the inno-
vational experience were analyzed. In this section, these two product
characteristics—relative advantage, and fulfillment of felt needs—are
related to the results of this research project.

The respondents were asked, in an open-ended format, to tell the
interviewer the most influential statement they had heard regarding the
diagnostic center in advance of their trying the new service. Later in
the interview, they were asked for the specific reasons why they were
trying the new service.

The responses to the two different but related inquiries display
a rather reasonable, rational, practical nature. Under the label of

24 Rogers and Stanfield, "Adoption and Diffusion," Table 7.
relative advantage, the pre-trial statements quoted most frequently as being influential were (1) more complete (2) more scientific or accurate, and (3) better than regular mechanics. These three constituted 76 percent of these responses.

In the fulfillment of need category, a similarly practical set of answers was obtained. Performance problems, safety concerns, completeness of the diagnoses, and decision inputs—these four eminently rational, pragmatic considerations comprised 81 percent of the reasons given. Another 16 percent of the responses were divided among several other practical reasons, while only 3.8 percent (nine persons) of the answers were replies such as "curiosity."

Innovativeness

In this section, results of seventeen separate indicators are reported. Of these, more than half revealed a significant difference between the scores for innovators and those for the general population.

It is difficult to segregate rigidly each of the variables, to designate some of them, for example, as indicating only innovativeness and not communications characteristics or diffusiveness. The taxonomy of diffusion of innovations has not become so stylized that the variables are exactly categorized and precisely described.

The method here was to state that those who have been the earliest triers of the local automobile diagnostic center have, by definition, exhibited innovativeness. Nearly fifty measurements were made of various characteristics of both these earliest triers and of a comparison
### TABLE 27

**INFLUENCES REPORTED BY EARLIEST ADOPTERS**

<table>
<thead>
<tr>
<th>Reply</th>
<th>Relative Advantage</th>
<th>Fulfillment of Need</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Most Influential Statement</td>
<td>Percent of Response</td>
</tr>
<tr>
<td>1. New service is a more complete automotive examination than available elsewhere</td>
<td>31.8%</td>
<td>11.3%</td>
</tr>
<tr>
<td>2. Superior, more accurate, more scientific equipment available here</td>
<td>33.1</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Better than (human) mechanics</td>
<td>10.8</td>
<td>07.5</td>
</tr>
<tr>
<td>4. Influence of sponsoring agency</td>
<td>04.7</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Perceived as best preventive maintenance available: safety factors</td>
<td>09.5</td>
<td>23.3</td>
</tr>
<tr>
<td>6. Recommendations by friends, not specified</td>
<td>04.7</td>
<td>0.0</td>
</tr>
<tr>
<td>7. Newest available techniques</td>
<td>02.0</td>
<td>0.0</td>
</tr>
<tr>
<td>8. Good value</td>
<td>03.4</td>
<td>0.0</td>
</tr>
<tr>
<td>9. Warranty on car: check-up</td>
<td>0.0</td>
<td>03.8</td>
</tr>
<tr>
<td>10. Decision input: sell, trade, keep, junk</td>
<td>0.0</td>
<td>13.4</td>
</tr>
<tr>
<td>11. Having car troubles: performance problems</td>
<td>0.0</td>
<td>33.0</td>
</tr>
<tr>
<td>12. Curiosity about the new service</td>
<td>0.0</td>
<td>03.8</td>
</tr>
<tr>
<td>13. Other</td>
<td>0.0</td>
<td>03.9</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
group representing the relevant population. Some of the results were
described in the four previous sections of this chapter. The point to
be made is that in this section additional variables are examined with
the understanding that, in a general sense, all of the discussion in
the earlier part of the chapter also related to innovativeness.

**Learning about New Things Earlier.**—Among the variables intuitively
related very intimately with innovativeness is the tendency to
learn about new things before the general population, the average per-
son does. In the section on communications characteristics it was seen
that there was a highly significant difference (.001 level) between the
two groups based on this early learning characteristic. It is worth
repeating here (see Table 14 page 89).

**Willingness to Experiment with New Ideas.**—Another inevitable
hypothesis one would make about innovators is that they would be more
willing than the average to experiment, to try new things. Other re-
searchers, such as King and Summers, use the term "venturesomeness" to
measure this quality in consumers. In the manner described earlier
(see Table 15 page 92) the respondents were asked to choose a position
on a six-point scale that represented their self-rating on the basis of
willingness to experiment with new ideas. As seen in Table 28, nearly
half the innovators rated themselves as being definitely described by
this characteristic, compared with a 32 percent population in this cell

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25 Charles W. King and John O. Summers, "Technology, Innovation and
Consumer Decision Making," special paper, Institute for Research in the
Behavioral Economics, and Management Science, Herman C. Krannert
Graduate School of Industrial Administration, Purdue University, 1967.
for the other group. In other words, the concentration of responses in the polar position was 50 percent greater for innovators than for the general population. There is only once chance in a thousand that the null hypothesis for this characteristic is true.

<table>
<thead>
<tr>
<th>Position</th>
<th>Innovators</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme position in definite agreement</td>
<td>48.3%</td>
<td>32.0%</td>
</tr>
<tr>
<td>All other positions (5)</td>
<td>51.7%</td>
<td>68.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Chi square value: 11.28

Self-rating: New Product Purchases. In a different format, and in another section of the questionnaire, respondents in both groups were asked how they compared themselves with other people in buying new products or buying new things (see Table 29 below).

The responses showed 38 percent of the innovators rating themselves as earlier triers or buyers than average, compared with 28 percent for the population, indicating a difference significance at the .05 level, using chi square analysis.

While the difference here is not as statistically incontrovertible as was the case in the preceding finding, the result is supportive.
PERCENT OF RESPONSES, SELF-RATING
AS EARLIER TRIERS

<table>
<thead>
<tr>
<th>Position</th>
<th>Innovators</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Try new products (in general) earlier than average person</td>
<td>38%</td>
<td>28%</td>
</tr>
<tr>
<td>About average or later than average in trying new products</td>
<td>62%</td>
<td>72%</td>
</tr>
</tbody>
</table>

Chi Square Value: 5.219

It is important to note the shift in the variable being measured.
The preceding question was very general, being concerned with "experimenting" and "new ideas," whereas this question covered buying a new product.

Early Trial of Specific Product.—This question was put to respondents: "Do you often try the latest razor blade (or hair cream) when it comes out?" The results represent an apparent turnaround from the data of the previous two measurements. Innovators disagreed with this proposition significantly more frequently than did the average person. The greatest difference, once again, occurred at the extreme position where innovators disagreed as strongly as possible with a frequency of 40 percent, compared with 28 percent for the other group (see Table 30, below).
Influence of Price on Brand Switching.—Another aspect of innovative consumer behavior was probed with a question which asked if the respondent was likely to switch from his favorite brand to another brand because of a five cent price reduction.

In a response pattern similar to that described immediately above, the greatest difference between groups occurred again at the polar position of disagreement. Both groups disagreed with the proposition but the innovators disagreed more strongly 35 percent locating at the extreme position compared with 25 percent for the other group (see Table 30).

Immediacy of Trial.—In a further attempt to reveal the dimensions of innovative purchase characteristics, respondents were asked if they like to try new brands of products they used, the first time they saw them in a store.

On this question, the two groups gave virtually identical responses. Innovators disagreed with the proposition with a 63 percent frequency, compared with 64 percent for the population sample. Even at the poles, the distributions were within two percentage points of each other. There was, of course, no difference of any statistical significance whatever between the groups (see Table 30).

Impulsiveness.—All respondents were asked to describe their tendency to shop impulsively. Innovators denied this description more firmly than did the general population. The innovators' largest cell frequency (37.8 percent) was at the polar position, rejecting the impulsive shopper label, while 29 percent of the population sample was in the same polar location.
Chi square analysis indicated the difference between the two groups to be significant at the 0.10 level, showing that the null hypothesis could be true one time in ten on the basis of chance alone (Table 30).

**Wait for Others to Try New Brands First.** Another statement was put to both groups to allow them to rate themselves in relation to it. This proposition was: "I usually like to wait and see how others like new brands before I try them."

In this instance, the groups were virtually indistinguishable, as 57 percent of the innovators disagreed, and 55 percent of the population disagreed. The responses for both groups were spread rather evenly over the six categories, and there was no indication of a statistically significant inter-group difference.

**Look for Lowest Prices when Shopping.** The final question, in the set of innovative shopping behavior probes scattered through the questionnaire, consists of this statement: "I usually look for the lowest possible prices when I shop."

The majority (56 percent) of the innovators disagreed with the statement as a description of their behavior, while among the population as a whole, 54 percent agreed with the same statement (Table 30). The principal cell difference occurred at the extreme, where the concentration of responses was 50 percent heavier for innovators than for the other group.
### TABLE 30

**PERCENT OF RESPONSES IN VARIOUS SELF-RATED POSITIONS**

<table>
<thead>
<tr>
<th>Statement of Position</th>
<th>Percent of Group at position indicated</th>
<th>Chi Square Value</th>
<th>Indicated Level of Significance</th>
</tr>
</thead>
</table>
| 1. Strongest possible disagreement with: "often try latest razor blade." | Innovators: 40%  
Population: 28% | 6.10 | .05 |
| 2. Strongest possible disagreement with: "small price reduction causes me to switch brands." | Innovators: 35%  
Population: 25% | 4.65 | .05 |
| 3. Disagree with: "Like to try new brands first time I see them." | Innovators: 63%  
Population: 64% | 0.0 | -- |
| 4. Strongest possible disagreement with: "I'm an impulsive shopper." | Innovators: 38%  
Population: 29% | 3.19 | .10 |
| 5. Disagree with: "I usually wait to see how other people like new brands before I try them." | Innovators: 57%  
Population: 55% | 0.09 | -- |
| 6. Disagree with: "I usually look for the lowest possible prices when I shop." | Innovators: 56%  
Population: 46% | 3.90 | .05 |
Based on the frequency data, a chi square value of 3.9 was calculated, indicating the difference between the two groups to be significant (.05 level).

Earlier in this chapter, it was shown (see Table 14, page 89) that innovators are the best informed segment of the population regarding new products, and that they very likely do more planning before purchase (Table 15, page 92). Certainly the results displayed in Table 30 serve to confirm this conclusion.

Although innovators are willing to experiment with new ideas and usually buy new products (in general) before others do, they are not willing as a group to be classified as hasty purchasers of any particular product merely because that product is new. It may be concluded that newness per se is a contributory but not sufficient condition for early purchase by innovators.

This conclusion is similar to that reached by Engel, Kollat, and Blackwell. They make the point that it is too early in the development of knowledge about innovative consumer characteristics to apply any generalizations to specific product situations.

Self-Ratings on Other Bases

A total of nine other specific measurements were undertaken, to gather additional data that might be used to describe innovator behavior

\[26\] Engel, Kollat, and Blackwell, Consumer Behavior, Chapter 25.
in such categories as emotional, practical, cautious, careless, rational, and the like. The results of this search were mixed. The individual characteristics are listed below in Table 31, following a descriptive examination of each.

Rational, logical.--Respondents were asked to agree or disagree with a description of themselves as rational or logical persons. Once again, innovators clustered more heavily at the polar position, as 38 percent of them occupied this cell in strong agreement with this self-description. The corresponding frequency for the population was 25 percent. Taking all three possible levels of agreement, the distinction between groups is less convincing, as 94 percent of innovators agree, compared with 90 percent for the other group. It is in the intensity of their self-rating rather than in its direction, that innovators can most clearly be discriminated. A chi square value indicating a statistically significant difference, between groups, was calculated (.01 level).

Careless.--A description of one who is careless in practical matters was posed as a comparative device for the respondents. Consonant with the position established by other measures, both groups disagreed with this categorization of themselves. While innovators were nearly unanimous in their self-rating (nine out of ten), the population sample was somewhat less sure (77 percent). The polar frequencies for disagreement were 55 percent for innovators, 40 percent for the others. The inter-group difference is quite significant (.01 level).
Fasten seat belts.--Respondents were asked to indicate how hard they try to remember to fasten their automobile seat belts. Compared with the two previous questions, this was an attempt to apply any generalized behavior notion to a particular situation. In the process, a loss was detected in the degree of differentiation between groups, similar to that which took place in the previous section, shopping behavior.

The only noticeable difference occurred at the extreme (agreement) scale position (of six) where 45.4 percent of innovators located themselves compared with 35.4 percent for the other group, a difference calculated to be significant (.05 level).

Leader, Follower.--In a more restrictive question, respondents were faced with a dichotomous choice situation in which they were asked to label themselves either as a leader or a follower, as viewed by the people they knew. Ten percentage points separated the two leader groups, 68 percent innovators, 58 percent others.

The chi square calculation for this 2 x 2 matrix developed a value of 3.137, indicating $P, \text{H}_0 < .10$. The implication is that there are better measures than this for identifying innovators.

Other Variables.--Five additional comparative statements were used to produce scaled responses for the two groups. None of these resulted in a significant inter-group difference. These make up the lower segment of the table below.
<table>
<thead>
<tr>
<th>Characteristic: (abbreviated description)</th>
<th>Position of Innovators</th>
<th>Relative to Population</th>
<th>Chi-Square Value</th>
<th>Difference, Level of Significance ($P, H_0$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rational, logical</td>
<td>Agree more strongly</td>
<td></td>
<td>8.45</td>
<td>.01</td>
</tr>
<tr>
<td>Careless in practical matters</td>
<td>Disagree more strongly</td>
<td></td>
<td>7.90</td>
<td>.01</td>
</tr>
<tr>
<td>Fasten seat belts</td>
<td>Try harder to remember</td>
<td></td>
<td>5.70</td>
<td>.05</td>
</tr>
<tr>
<td>Leader-follower</td>
<td>More frequently indicated leader rating</td>
<td></td>
<td>3.10</td>
<td>.10</td>
</tr>
</tbody>
</table>

Nonsignificant group

| Lots of self-control                    | Both groups agreed     |                       | ----             | ---                                      |
| Emotionality                            | Evenly distributed in general agreement |                       | ----             | ---                                      |
| Cautious (as a driver)                  | Both groups strongly agreed |                       | ----             | ---                                      |
| Practical, careful                      | 90 percent agree in both groups<sup>a</sup> |                       | ----<sup>a</sup> | ---<sup>a</sup>                          |
| Act on spur of moment                   | Disagreement, by 56 percent of innovators 55 percent of others |                       | ----             | ---                                      |

<sup>a</sup> In this category, there is a nonmodal polar cluster of 29.5 percent for innovators, 20.1 percent for the other group, which, if used as the design for a 2 x 2 matrix, will produce a chi-square value of 4.98, or a $P, H_0 < .05$. The author is, however, prejudiced against utilizing nonmodal cell frequencies, in a biased design, to force a chi-square value.

<sup>b</sup> Raw data are shown in the Appendix.
Summary of Innovative Variables

With the help of the seventeen specific inquiries, innovators may be described (in comparison with the relevant population) as:

1. much more willing to experiment with new ideas,
2. likely to buy new products (in general) earlier,
3. more rational, logical,
4. less careless,
5. less likely to switch brands for reasons of price,
6. less interested in low prices per se,
7. less impulsive as shoppers.

Seven of the seventeen variables yielded no discriminatory power, yet this particular result served to firm up the emerging picture of the innovator as a consumer who plans ahead, exercises care, and uses good judgment in his purchase behavior.

Diffusiveness

The meaning of diffusion was examined at some length in Chapter III. At this point it is sufficient to repeat that diffusion is the communication of an innovation through a society. Another classificatory problem arises in attempting to separate communications characteristics of innovators from their diffusive characteristics.

The author makes this separation arbitrarily for purposes of easier analysis and greater interest. In order to encompass the whole substance of diffusion, the two sections--communications, and diffusion--would summarily be combined.
In this section, four new sets of responses are examined.

Requests from Innovators for New Product Opinions.--Respondents were asked how often their opinion about new things was requested. Responses were restricted to a five-point scale shown below. Well over half the innovators (59 percent) were asked their opinion of new products more often than average, compared with well under half of the population sample (32 percent), as shown in Table 32.

At the other end of the scale, only 7.5 percent of innovators feel their opinion is asked less often than average, compared with 19 percent for the population.

These differences are obviously significant. There is a considerably smaller chance than one in a thousand that the null hypothesis, for this factor, is actually true.

Output of New Product Opinions.--In a considerably more difficult context, respondents were asked if they, after trying a new product, told other people about it more often or less often than average, using a five-point scale. A positive response here requires somewhat more poise or courage than does the previous inquiry, which relates to a passive-receptor situation.

Despite this unmeasured dampening effect, responses were received that indicated the same directional characteristic as recorded above. In Table 33 below, the comparison is made between innovators and the population in their frequency of response to the five categories.

Note that 15 out of every 100 in the population sample exhibit less than average frequency of transmission, compared with only 5 in
TABLE 32

RELATIVE FREQUENCY OF REQUESTS FOR PERSONAL OPINION ABOUT NEW THINGS
TWO GROUPS

<table>
<thead>
<tr>
<th>Response Scale</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Responses</td>
<td>Percent Responses</td>
</tr>
<tr>
<td>Much more often than average</td>
<td>24.9%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Slightly more often than average</td>
<td>34.0</td>
<td>21.8</td>
</tr>
<tr>
<td>About average</td>
<td>33.6</td>
<td>49.4</td>
</tr>
<tr>
<td>Slightly less often than average</td>
<td>4.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Practically never</td>
<td>3.3</td>
<td>7.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Chi square value: 28.28

Individual level of significance: .0005

every 100 innovators. Conversely, about half the population sees itself as initiating this kind of diffusion more often than average, but 67 percent of innovators place themselves in this class.

The inter-group difference for this characteristic (Table 33) is highly significant (.005 level).

Note also that in both Table 32 and Table 33, the modal class for the population is "average," while the modal class for innovators in each table is above average. Another interesting facet of the difference
### TABLE 33

**RELATIVE FREQUENCY OF TRANSMISSION OF PERSONAL OPINIONS ABOUT NEW THINGS:**

**TWO GROUPS**

<table>
<thead>
<tr>
<th>Response Scale</th>
<th>Innovators Percent Responses</th>
<th>Population Percent Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much more often than average</td>
<td>34.5%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Slightly more often than average</td>
<td>32.3</td>
<td>30.0</td>
</tr>
<tr>
<td>About average</td>
<td>28.1</td>
<td>32.9</td>
</tr>
<tr>
<td>Slightly less often than average</td>
<td>3.4</td>
<td>7.6</td>
</tr>
<tr>
<td>Practically never</td>
<td>1.7</td>
<td>7.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

**Chi Square Value:** 8.098

**Indicated level of significance:** .005

In response patterns from the two groups for the two factors is shown below in Table 34.

For innovators, the maximum shift between characteristic categories was eight percentage points, occurring in the above-average cell. However, for the population there was a shift of 20 points in the same cell, or an increase of more than 50 percent in the concentration.

The depth of this survey is inadequate to make definite generalizations from this evidence of an interesting difference between (1) how often people are asked for an opinion, and (2) how often they gratuitously deliver or transmit an opinion about new things. Innovators
TABLE 34

CHANGES IN RESPONSES BETWEEN ACTIVE AND PASSIVE TRANSMISSION CHARACTERISTICS: TWO GROUPS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency of Response</th>
<th>People ask their opinions</th>
<th>They tell their opinions to others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent Identification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INNOVATORS</td>
<td>Above average</td>
<td>59%</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>34</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Below average</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>POPULATION</td>
<td>Above average</td>
<td>32</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>49</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Below average</td>
<td>19%</td>
<td>15%</td>
</tr>
</tbody>
</table>

certainly see themselves as much more evenly balanced between active and passive roles in diffusion of innovations than do the members of the general population.

Post-trial Information Transmissions.--In this study, respondents were asked in a follow-up survey a week after their trial of the automotive diagnostic center, whether they had told anyone of this experience. The results are impressive. Within a few days after their trial and/or adoption of this new automotive service, 90 percent of the innovators had told someone about the experience, and 40 percent had told two or more persons about it.

Types of Persons Told.--The four categories of recipients of the innovative information diffused by the innovators are shown in Table 36 below.
### TABLE 35

**POST-TRIAL INFORMATION TRANSMISSIONS BY INNOVATORS**

<table>
<thead>
<tr>
<th>Number of persons told</th>
<th>Percent of Innovators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four or more</td>
<td>2.8</td>
</tr>
<tr>
<td>Three or more</td>
<td>9.4</td>
</tr>
<tr>
<td>Two or more</td>
<td>28.7</td>
</tr>
<tr>
<td>At least one</td>
<td>49.1</td>
</tr>
<tr>
<td>None</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

### TABLE 36

**TYPES OF RECIPIENTS OF DIFFUSIVE INFORMATION**

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend</td>
<td>45.8%</td>
</tr>
<tr>
<td>Relative</td>
<td>38.1%</td>
</tr>
<tr>
<td>Business related</td>
<td>14.2%</td>
</tr>
<tr>
<td>Other</td>
<td>1.9%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Positive and Negative Diffusion.--The percentage of all innovators, who had made a diffusive transmission within the first few days, was quite high (90 percent). Moreover, this study revealed that the same high percentage of the 40 dissatisfied innovators had told someone of their disappointment. The importance of innovators as diffusive agents can hardly be challenged. For marketers, this finding highlights the fact that very efficient practices should be employed to (1) reduce the number of dissatisfied innovators and (2) to reduce the intensity of their feeling, so as to (3) reduce the amount of negative diffusion.

Summary.--Innovators can accurately be described, on the basis of this research, as highly diffusive in character. They are asked for their opinion about new things much more often than others, and they initiate new product information transmissions much oftener than the average person does. Furthermore, in the actual case at hand, nearly all the innovators told someone about this new experience within a very few days after its occurrence.
Discriminant Analysis

Description of the Technique

In discriminant analysis a linear function is computed which incorporates a number of variables measured on each individual of two groups. This function then serves as an index for discrimination between the groups. Discriminant analysis basically does two things: (1) it separates the means of the two groups—innovators and the population—and (2) it concentrates the items in each group about their respective means in order to maximize the probability of correct classification.

Treatment of the Variables.—The variables may be grouped into classes for the analysis or used as one large set, depending upon the limitations of the program capacity. Previously in this chapter the variables were arranged for coherency into six groups, but they were examined and tested for significance one by one. In this section the variables are assigned individual weights but their discriminatory effectiveness is measured on the basis of the class to which they are arbitrarily assigned.

The difference between the total score means for the two groups, which is intended to be maximized, must be considered relative to the within-groups variability, otherwise, as McNemar points out, we could
easily produce a large numerical difference by the simple operation of

**Purpose**

The real purpose is to produce score distributions with the least
amount of overlap for the two groups. The difference should be at a
maximum relative to the spread of scores within the groups. A perfect
discrimination in the current study would, for example, create a verti-
cal array of all 250 innovators (in a scalar listing) followed by the
172 members of the population sample with no intermingling of the two
groups. In small groups this perfection can sometimes be achieved but
it is simply out of the question for relatively large groups of individ-
ual consumers, such as we are dealing with in this study.

Assuming for the moment that there had been perfect discrimina-
tion, then it follows that the discriminant function would \textit{predict}
perfectly, since a new subject-score could be classified into one of the
two groups with no chance of error, based on whether this new score was
on one side or the other of the obvious break-point.\footnote{William F. Massy, "Discriminant Analysis of Audience Characteristics," \textit{Journal of Advertising Research}, Vol. 5, No. 1 (March, 1965), pp. 39-48.} The point is
pursued further in Chapter IV, supra. In this section a function is
defined in each of the different discriminant analyses that efficiently
discriminated between members of our innovator group and the population
sample.
Discriminant Analysis with 25 Independent Variables

In this introductory analysis, using the BMD 04M program, adapted to the Ohio University IBM 360 Model 44 Computer, twenty-five independent variables (maximum capacity of the program) were used in conjunction with the dichotomized dependent variable.

Among other output, this program produces (1) discriminant function coefficients, and the F statistic.

Results of Analysis.--This particular discriminant function was of the form

\[ Z = 0.00324X_1 + 0.00951X_2 + 0.00002X_3 + 0.00011X_4 + \ldots + 0.00163X_{24} + 0.00004X_{25} \]

using the first six actual coefficients and the final two as samples to indicate the function for the scores of 25 variables, indicated by X's.

The innovator group mean Z is 0.08768, and the population mean Z is -0.01085. The function is used to classify a "new" score by applying the formula above, then comparing the result to the combined two-group mean of 0.038415:

if \[ Z_k \geq 0.038415 \], assign to innovator group

if \[ Z_k < 0.038415 \], assign to general population

The 25 variables, for which the discriminant function was calculated, are listed below:
Degree of Discrimination.—This function achieved nearly perfect discriminatory power, accounting for virtually all of the between groups differences. This effect results from the use of some double inputs, such as pairing of the planning characteristics (#16 and #20 in the list above) and the low price effect (#17 and #23). Even more critical in its influence is the inclusion of #9, "heard of Diagnostic Center" which represents by definition a perfect score for the innovator group. Weighting this kind of score produces an unrealistically efficient discrimination.

Nevertheless, it was quite useful to begin the discriminant analysis with this set of variables because it (1) set a standard of comparison, (2) tested the validity of the computer program for this particular piece of research, and (3) confirmed the test for significance of the function.

Summary of Analysis #1.—This initial analysis accomplished its purpose of validating the chosen procedures for the present application, but this particular discriminant function is not intended for use as an end-all discriminant for innovators.
Analysis #2 with One Variable

In order to determine if discrimination could be accomplished with only one variable by using discriminant analysis, occupation was selected as an experimental independent variable. The results were that this particular univariate analysis produced moderate discrimination. The function was specified as:

\[ Z = 0.00004X_j \]

F statistic = 17.4999 (Significant, at .001 level)

and the mean Z's are:

- Innovator Group: Mean Z = 0.00201
- Population Group: Mean Z = 0.00159
- Combined Mean Z: = 0.00180

Using the combined mean as the dividing line, it is possible to compute the efficiency of the function. In Figure 3 the concept is portrayed as a probability that a given score after treatment will fall in one group or the other. A score \( Z_k \) which matched the break-point value \( Z \) would have a 50-50 chance of falling in either group. As the distance of the \( Z_k \) score from \( Z \) increases, the probability increases that it will fall in a certain group. In this case, as the positive value \( Z_k - Z \) increases, the probability increases that the scorer is an innovator.
Predictive Probability. As a further illustration of this concept Table 37 displays the end value of the total array of scores for the 418 subjects together with selected points and distributions along the continuum of Z values.

Kegerreis Concentration Index

It can be seen that as one moves away from the composite mean for the two groups, the discrimination improves. This becomes cleaner by using a concentration index devised by the author, which is simply:

(3) \( C = \frac{(I_f / I_T)}{(P_f / P_T)} \)

Where  
- \( C \) = Concentration index  
- \( I \) = Innovator Group  
- \( P \) = Population Group  
- \( f \) = Frequency at selected point and beyond  
- \( T \) = total group frequency
TABLE 37
Z SCORE GROUP IDENTITIES SELECTED POINTS:
ANALYSIS #2

<table>
<thead>
<tr>
<th>Z Score&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Percent of Total Both Groups Beyond This Point</th>
<th>Percent of Innovators Beyond This Point</th>
<th>Percent of Population Group Beyond This Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>352&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
</tr>
<tr>
<td>300</td>
<td>15%</td>
<td>21%</td>
<td>6%</td>
</tr>
<tr>
<td>225</td>
<td>41%</td>
<td>50%</td>
<td>29%</td>
</tr>
<tr>
<td>180&lt;sup&gt;c&lt;/sup&gt;</td>
<td>57%</td>
<td>67%</td>
<td>43%</td>
</tr>
</tbody>
</table>

<sup>a</sup>To avoid using the decimal, each Z score was, for purposes of this table, multiplied by a constant, 10<sup>5</sup>.  
<sup>b</sup>This was the maximum Z value recorded.  
<sup>c</sup>This is the break-point Z score equivalent.

In the table above, the Concentration Index values for the Z score selected points are (these are Innovator indices):

- at Max. Z score 352, \( C = 0 \)
- at Z score of 300, \( C = 21/6 = 3.5 \)
- at Z score of 225, \( C = 50/29 = 1.8 \)
- at Z score of 180, \( C = 67/43 = 1.6 \)

Finally, another technique for pointing out the degree of discrimination is simply to display the frequencies of successes and failures at various Z-score points. Thus, at the Z score of 300, there were 61 scores beyond this value, of which 50 were innovators (successes) and 11
from the population sample (failures). This technique works best, of course, when the two groups are equal in size.

Analysis #3, Using Four Status Variables

After using 25 variables somewhat grossly, and using only one variable, we now turn to a more normal utilization of multiple discriminant analysis, as four independent variables are chosen to comprise a social status set: #3 occupation, #4 income, #5 value of home, and #7 education (numbers refer to the list of 25 variables arrayed above).

The function was calculated to be:

\[ Z = 0.000002X_3 + 0.00014X_4 - 0.000002X_5 + 0.000066X_7 \]

Results of Analysis #3 with Status Base.--The relevant F-statistic was calculated at 9.23248, and with \( n_1 \) of 4, \( n_2 \) of 413, \( n - n_1 - 1 \), the discrimination proves to be significant (.001 level).

The table below sets forth the data in a form for which a rationale was developed in Analysis #2, page 138.

The Innovator group mean Z score was 0.00476, and the population sample group mean was 0.00388, producing a combined two-group mean of 0.00432. In the Table below the scores were converted to integers to improve the readability of the data.

A careful comparison of Table 37 and 38 reveals an improvement of the distribution and of the discrimination.
TABLE 38
Z SCORE GROUP CHARACTERISTICS
BASED ON ANALYSIS #3

<table>
<thead>
<tr>
<th>Z Score Point&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Percent of Total</th>
<th>Percent of Innovators</th>
<th>Percent of Population</th>
<th>Concentration Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>577</td>
<td>19%</td>
<td>27%</td>
<td>8%</td>
<td>3.4(I)</td>
</tr>
<tr>
<td>432&lt;sup&gt;b&lt;/sup&gt; (B-P)</td>
<td>51</td>
<td>63</td>
<td>34</td>
<td>2.8(I)</td>
</tr>
<tr>
<td>342</td>
<td>25</td>
<td>16</td>
<td>37</td>
<td>2.3(P)</td>
</tr>
<tr>
<td>300</td>
<td>17%</td>
<td>11%</td>
<td>27%</td>
<td>2.5(P)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Original scores were converted to integers.

<sup>b</sup>432 is the Break-point score, or composite mean.

Analysis #4, Using Six Innovativeness Variables

The final multiple discriminant analysis was performed utilizing these variables: #11 self-rating new product trials, #12 leader-follower, #13 your opinion requested, #14 hear of new thing earlier, #15 tell others of innovational experiences, and #21, willingness to experiment.

Results of Analysis #4.--This discriminant set produced the following function:

(5) \[ Z = 0.00023X_{11} + 0.00024X_{12} - 0.00087X_{13} - 0.00226X_{14} - 0.00043X_{15} + 0.00009X_{21} \]
Test for Significance.—The result of the calculation for Snedecor's F was

\[ F(6, 411) = 10.21634, \quad 3.74, \quad \text{and } \phi_0 < .001 \]

which represents less than one chance in a thousand that the null hypothesis is true (that there is no significant difference between the two groups based on the six measures).

Mean Z's.—Note that in the discriminant function for Analysis #4 half the coefficients are negative and that these three negative numbers are of larger values than the remaining three, a factor that results in a negative mean Z for each group:

- Innovator Group mean Z = -0.00415
- Population Group mean Z = -0.00562
- Composite Group mean Z = -0.00489

The resulting array of cases proceeds in only an apparent reversal from normal, as the values become larger, but further to the right of zero as the list progresses from innovator concentration to population clustering.

It should be remembered that multiple discriminant analysis is intended in the present case to isolate innovators from the population, not the reverse. Another column has been added in the next table (below) which helps to show the success of this attempt at discrimination.
TABLE 39
Z SCORE GROUP CHARACTERISTICS
BASED ON ANALYSIS #4

<table>
<thead>
<tr>
<th>Z Score Point</th>
<th>Percent of Total</th>
<th>Percent of Innovators</th>
<th>Percent of Population</th>
<th>Concentration Index</th>
<th>Equalized Group Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>252</td>
<td>13%</td>
<td>19%</td>
<td>5%</td>
<td>3.8</td>
<td>73%</td>
</tr>
<tr>
<td>360</td>
<td>35</td>
<td>46</td>
<td>19</td>
<td>2.4</td>
<td>71</td>
</tr>
<tr>
<td>415^</td>
<td>45</td>
<td>56</td>
<td>29</td>
<td>2.0</td>
<td>66</td>
</tr>
<tr>
<td>489^</td>
<td>61%</td>
<td>77%</td>
<td>38%</td>
<td>2.0</td>
<td>66%</td>
</tr>
</tbody>
</table>

^Scores have been transformed into positive integers, although the inclination has been retained.

^ Represents the Innovator group mean.

^ Represents the composite group mean.

In this special column, "Innovator Percentage, Equalized Group Concentration," the percents are determined by this formula devised by the author (see #7)

\[(7) \quad \text{IEGC} = \frac{I_f}{P_f} + \frac{I_f}{I_T} \cdot \frac{I_f}{(I_T - I_f)}\]

where I = Innovator
P = Population Sample
f = Frequencies at the selected Z scope point
T = Group total

and IEGC = Innovator percent of Equalized Group Concentration
which (1) reduces the two groups, \( L_T \) and \( P_T \) to equal size, (2) computes the percentage of total frequency accounted for by the dominant innovator group at the points in the array selected for Table 39 above, and (3) indicates the probability of a particular score being allocated to the innovator group, as

\[
(8) \quad pZ_K, I \quad \text{when} \quad Z_K > Z_S = \text{IECC}
\]

where

\[
\text{where} \quad p = \text{probability}
\]

\[
k = k^{th} \text{ individual score}
\]

\[
s = \text{Z score selected point in the total array of Z scores and the remaining notations are those of (7) above.}
\]

**Prediction.**--This can be interpreted in the present case to indicate that a raw Z score of -0.00488, incoming for evaluation and allocation, would be compared with the composite group mean, with the rule being

\[
(9) \quad Z_K > -0.00489 = I_K
\]

where "greater than" (\( > \)) is intended to be interpreted as "less negative." The allocation rule has a probability of .66 of correctly allocating the incoming \( Z_k \) score at this selected point. The equivalent odds are two to one, as implied by the concentration Index in the same table.

The farther that an incoming score is from the composite mean Z score, the more the predictive quality of the discriminant function improves. The identification of an incoming \( Z_k \) score of -0.00252 as an innovator has a 75 percent probability of being correct. The corresponding odds are three to one.
The classic purpose of multivariable analysis, particularly that of multiple discriminant analysis, is prediction. It has been shown in this case that the discriminant function offers a considerable improvement of nearly 20 percentage points over mere chance in predicting group membership between innovators and others.

The coefficients are also useful by themselves for showing the relative importance for discrimination of each of the variables chosen, a point made emphatically by Green and Tull. In analysis #4 (equation #5) for example, six variables were employed. According to the weights assigned to the variables by the mechanism of the coefficients, it can be seen that variable #14 is of foremost importance (the characteristic of hearing about new things earlier than average). Second and third ranks go to the pair of diffusive indicators--#13 frequency of request for opinion; and #15 frequency of telling others of innovative experiences.

It may be recalled that the level of significance of each of these three heaviest weighted factors had previously been established (.01 level) by chi square analysis in the first part of this chapter.

Summary, Discriminant Analysis

Multiple discriminant analysis has weaknesses, such as its assumption of linearity as the basic mathematical relationship between the independent and dependent variables. Most marketers realize that

purely linear associations are rare. This analysis also has built-in assumptions that the data are measured on interval scales and that the two populations are distributed normally with normal variances and covariances.

Despite the uneasiness engendered by these assumptions, the use of multiple discriminant analysis is steadily growing in marketing research because it is the best available computer-based technique to use when the criterion variable is expressed categorically, as in the present case where the subject may be only an innovator, or a member of the population sample.

We have achieved practical descriptive discrimination with both a social status set of predictor variables and an innovative-diffusive set. In each case the significance of the differentiation between groups tested at the .001 level.

Conclusion

It can be concluded that it is possible to predict the innovative and diffusive behavior of consumers by means of multiple discriminant analysis that incorporates the variables described in this paper.
CHAPTER VI

SUMMARY

In the first two chapters, a conceptual base was established for this study of the adopters of an innovation. Six classes of characteristics were selected for investigation: (1) economic, (2) social status, (3) communications, (4) product-related, (5) innovativeness, and (6) diffusiveness. The next three chapters contained a description of the innovation under study, an exposition of the research design, and a report of the results of the research. This chapter consists of a six-part summary that follows the classification of characteristics mentioned above.

Economic

One result of the research was a convincing confirmation of the positive correlation of income with innovators. Other findings in related areas supported the basic hypothesis. Innovators were found to have newer automobiles, a larger number of automobiles, to live in higher-priced homes, or to pay higher rents. On the other hand no correlation with innovators was found for home ownership or purchasing automobiles new (rather than used).
Status

It must be recalled that the aspect of social status to be judged was status held by the innovator, not status sought. The author did not attempt to measure the incremental status gained by the act of trying the new automotive service. The interest was in the pre-trial status of the innovator compared with the average status of the population.

In the section on status seven variables were considered in the general hypothesis. Two of these variables were repeated from the economic set because they are generally recognized as status components (income and value of house).

Innovators were found to have substantially higher status occupations and to have obtained a much higher educational level. These two findings when combined with the clear correlation with income comprise a definitive indication that the innovators in this study occupied a conspicuously higher status position than others in the population.

Among other variables measured, whole-house airconditioning showed a positive association with innovators, but ownership of a second house, and membership in private clubs did not provide any discrimination between the two groups.

Communications Characteristics

Other research has established the concept that innovators are more likely than others to be involved with communication about
innovations. The type of activity would include formal and informal sources or other categories described in Chapter IV.

The findings in this study firmly substantiate two generalizations about innovators which appear in other reports. These two are (1) innovators learn of new things earlier than others, and (2) innovators make a more intensive search for information. A complementary finding is that innovators tend to have more magazines (on a subscription basis) than do others.

Planning.--Inquiry into planning behavior represented a new approach to research about innovators. There were two separate and antithetical statements made to the respondents as a part of a self-rating section of the questionnaire with the objective of determining whether there would be more planning activity on the part of innovators than for the general population. The data show definitely that innovators do engage in planning as a usual part of their behavior to a much greater extent than does the population. These findings were included in the communications section because most of the planning process involves communication and information.

Sources.--For this specific automotive service innovation the advance information was obtained by innovators from magazines of various types (42 percent), from personal contacts and direct observations (37 percent) with the remaining 26 percent scattered among other sources.

A noticeable shift in sources of information occurred as innovators moved closer to the day when they tried the new service. In the early stage formal sources such as magazines were used, but later word-
of-mouth (taken together with personal inquiries made to the local firm) came to the fore. The pattern makes sense in this particular case because of the number of articles about diagnostic centers which appeared in popular magazines well in advance of the local opening.

_Influence._--Although innovators report a shift from formal sources to informal sources as the actual trial approaches, the full significance of this shift for marketers was not revealed until respondents were asked about influential communications. In 43 percent of the cases the most influential communication leading the innovator to try the new service originated with friends, relatives and acquaintances. The sensitivity to this influence on the part of innovators appears to have been created by the innovators' greater exposure to media, by their more complete search for information, and by their tendency toward more complete planning.

**Product-Related Characteristics**

While there are concepts which appear to apply broadly to innovations there is always a "product specific" factor to account for. By definition there must be in every innovation unique characteristics which set it apart from other products or services. The uniqueness embodied in the idea of an automotive diagnostic center conveys to the potential adopter some special appeal or attraction. In this study the innovative service was found to have very practical kinds of appeals which can be classed relative advantage and fulfillment of felt needs. When innovators were asked what statements they felt were most
influential in causing them to become interested in diagnostic centers, the two responses given most frequently were: (1) the new service is more complete than can be obtained elsewhere, and (2) the equipment is more scientific and accurate than at other types of repair service establishments. These two reasons constitute the perceived relative advantage of the new service.

When asked later for a specific reason for trying the new service innovators most often cited their desire for these two want fulfillments: (1) hope for solution of their current operating problems with their automobiles and (2) need for preventive maintenance. The third most frequently mentioned reason was the need for decision inputs in three specific situations: (1) whether to sell the car in question or to keep it based on a diagnosis of its condition; (2) whether to trade-in the car on a new automobile; (3) to keep the car or to junk it depending on whether necessary repairs indicated by the diagnostic service exceeded the value of the car.

Note how logically these pragmatic concerns fit into the emerging picture of the innovator. He deliberately searches for information, subscribes to more magazines, engages in more planning than the average person, does not act impulsively, and perceives the innovation as a sensible solution for some long-standing problems rather than as a curiosity, fad, amusement, or status symbol.

Attitudes.--The results of inquiries into the attitudes of the innovator during his trial of the service showed that he trusted the professionalism and neutrality of the diagnostic center. Attitudes
were measured again a week following this initial trial and the results were that 79 percent expressed satisfaction with their experience and that 85 percent expected to try the service (or to adopt the innovation) again. Another finding showed that 93 percent approved of the price paid for the service.

**Innovativeness**

Many different variables were tested which relate to innovativeness or venturesomeness. Much of this section was an exploratory search for new indicators of this characteristic. The underlying hypothetical implication for a summary of this category is that innovators are expected to exhibit innovativeness and that signs of innovativeness tend to identify innovators. In the present study there is a positive identification of innovators against which hypotheses about behavioral variables may be tested.

**Inclination to be the first to try.**—A group of five of the variables has been assembled in order to analyze what could appear at first glance to be a cluster of contradictions. First, it can confidently be reported that innovators clearly see themselves as far more willing to experiment with new ideas and as more likely to try new products earlier than others.

However, innovators' self-ratings indicate they are less likely to try the newest razor blade than others in the population. Furthermore there was no distinction between the two groups in their unwillingness to try new brands of familiar products at first sight, and no
difference in their degree of willingness to let "other people" try new things first.

The first group of findings constitute a very interesting observation of innovators. They see themselves as quite innovative in the abstract, somewhat less venturesome toward "products" in general, and in relation to the specific new version of a familiar product innovators appear to be less innovative than others. The explanation is that innovators do not apparently perceive the new razor blade to be an innovation in the same sense as they have viewed other new ideas such as the diagnostic center. They do not have a problem or a felt need in the area of shaving that is sufficiently strong to cause them to seek relief in the form of trying every new blade as it appears on the market. They do not appear to have any desire to be first just for the satisfaction of being innovative.

Purchase Behavior.--Another general question for which this research project sought answers related to shopping behavior. There were no reports available which described the innovator on the basis of his typical purchase behavior or as a shopper. With this second group, an exploratory attempt was made to detect those characteristics that would discriminate between innovative shoppers and others.

Knowledge about the influence of price is always beneficial to marketers. In this instance, innovators were found to be less influenced by price than are others. In a hypothetical brand-switching context, innovators displayed greater resistance to changing brands when a competing product lowered its price. Furthermore innovators displayed
a significant difference based upon their self-rated position in regard to looking for the lowest prices during their normal shopping. They are simply not as much interested in nor as influenced by price differentials as are other people.

Another finding served to dispel any notion of impulsiveness associated with the shopping behavior of innovators. Although both the general population and innovators reject the general label of impulse shoppers innovators disagree with this description even more strongly.

Other findings revealed further insight into the kind of people who comprise the innovator group in this study. Using the technique of self-rating characteristics of several types were measured and compared with those for the population. Innovators were found to be more rational and logical, less careless in practical matters, more frequently in leadership roles, and more inclined to fasten their seat belts regularly.

On some other bases there was little or no discrimination between the two groups. These variables were self-ratings for self control, emotionality, caution as an automobile driver, tendencies to be careful, practical, and to act on the spur of the moment.

As a final subset of this section an attempt was made to associate the possession of other innovations with the innovators in this study, the hypothesis being that innovators were more likely to own a relatively larger number of innovations than the rest of the population. Six products were used in the set: color TV, water pic toothbrush, electric
toothbrush, electric blanket, gas-fired grill, and radial tires. It was found that almost equal proportions of both groups (one-third) owned color TV, electric blankets (one-half), and electric toothbrushes (one-third). These well known products are of course well past the innovative stage and were used as a base for comparison with the other three products which are currently regarded as innovations. The difficulty in summarizing the findings arises from the fact that the ownership cell frequencies were so small for both groups. As an example nine innovators and one in the population group were found to own water pic toothbrushes. The percentage ratio is seven to one, which would be quite convincing if a larger sample were employed. The other two ratios are 4 to 1 for gas-fired grills and 1 to 1 for radial tires, both based on small quantities. There does appear to be a tendency for innovators of automotive diagnostic centers to be likely owners of other products that are perceived to be innovations.

**Diffusiveness**

Innovators exhibit significantly more diffusiveness than the population as a whole based both upon a voluntary dissemination of innovative information and upon the frequency with which innovators are asked for their opinions regarding innovations. These self-ratings were borne out by the actual behavior of the innovators in this situation. Within a week following their first trial of the diagnostic center nine out of every ten had told someone about it.
Conclusions

The goal of this research was to study the innovative and diffusive characteristics of the earliest adopters of a new consumer service in order to determine if descriptive and predictive information could be obtained. This effort was successful. A number of variables were found to be effective in discriminating significantly between innovators and the general population.

The research was unique in several dimensions: (1) innovators are compared with the population rather than with later classes of adopters, a construct that enables the researcher to make meaningful studies early in a product life cycle and to give marketers information in time for it to be predictively useful; (2) many aspects of innovative consumer behavior were observed for the first time, such as elements of planning, comparison of informational sources, and status levels; (3) this was the first study which gathered its primary data at the time of and on the site of the actual trial.

This study also has revealed additional areas where promising gains in knowledge may be achieved through further research. It is hoped that the results of this research will be of assistance in a general understanding of the innovative consumer and in the advancement of marketing knowledge.
APPENDIX A

The Questionnaire
THE QUESTIONNAIRE

--- Respondent ---

1. Name: 
2. Sex:  3. Age: 
4. Street; and Number: 
5. City: 
6. Telephone #: 
7. Section: 
8. Distance to Diag. Ctr. 

--- Automobile ---

9. Make: 
10. Model year: 
11. Mileage (odometer): 
12. New or used, when purchased: 
13. Price paid: 
14. When last tuned or checked (mos. ago): 
15. Factory warranty remaining (months): 
16. Total number of cars owned now: 
17. Customer estimate of car's condition: 
18. Live alone or in family group: 
19. If in family group, who decided to try the diagnostic center: (relationship) 

--- If decision-maker was OTHER than the initial respondent, record here the: 
Name: 
Sex: Age: 

--- If address is other than respondent's (see 4 thru 8 above), record here the: 
Street; and number: 
City: 
Telep. #: 
Section: Distance to Diag. Ctr.: 

Date: Time: Interviewer: 
20. Occupation of decision maker: ____________________________
21. Total annual family income last year: ______________________
22. Own home ____, or Rent ________, or monthly rental ________
23. Fair market value of home ________, or rental ________
24. Have you or your family ever owned any of the following items:
   Color TV ____ Electric toothbrush ____ Sports Car ____ Electric blanket
   Water pick ____ Gas-fired barbecue grill ________
   Whole-house air-conditioning ____ Motorboat or sailboat ______
   Second house or vacation house ______ Subscribe to more than 5 magazines
   Belong to a country club, or private club ______
25. Education of the decision-maker:

<table>
<thead>
<tr>
<th>less than high school</th>
<th>some H. S. grad</th>
<th>some college</th>
<th>coll. grad</th>
<th>beyond coll. grad</th>
</tr>
</thead>
</table>

26a. Had you heard about Diagnostic Centers in general, before you heard about this one?
26b. (If "YES") Where did you hear about them (or how)? ____________
26c. How did you first hear about the Diagnostic Center (specific)

27. After you first knew about the Diagnostic Center, did you get any further information? No____. Yes____ (if yes, ask: Where or how did you get this information?)

28. What did you hear about the center that made you want to try it?

29. Where did you hear that?

30. What have you heard about the center that was critical of it?

31. Where did you hear that?
--- Expectations ---

31. What was the outstanding or specific reason why you decided to Diagnostic Center?

32. Do you expect the diagnosis to show there is something seriously with your car? No__ Yes__ (if yes, ask: "Where do you think the trouble is?

33. The diagnostic report you will receive will show what repairs or adjustments are recommended for your car; and, there will be an of the total cost to have these repairs made. How much do you think total will probably be? $

34. If the diagnostic report shows there is practically nothing wrong your car, what would your reaction be? Please look at this card, and me which of the terms comes closest to describing what your reaction would be. (write chosen term here:)

   using only the designating letter: a, b, c, d, e, or f).

--- Innovativeness ---

35. In buying new products, or in trying new things, how would you compare with other people? Please look at this card, and tell me which of the terms comes closest to describing how you compare.

   (use only the designating letter for the term chosen: a, b, c, d, e)

36. Would the people you know describe you as a leader__ or follower

37. When people hear about something new, they sometimes try to get information. Do the people you know ask your opinion about new product or new ideas? Please look at this card, and tell me which term seems apply the best. (use letter designation here)

38. Do you seem to hear about new things sooner than most of the you know?

39. After you have tried a new product or service, do you comment to friends or acquaintances? Let's use this card to pick out which term applies best to you. (use designating letter):
40. Here is a card with a statement about the Diagnostic Center. Please take your time, read the statement, then select from the list of terms that one that seems to come closest to your own reaction to the statement. (record only the letter designation here:)

41. Here is another statement about the Diagnostic Center. Please do the same thing again, pick the term that best describes how you feel about this statement. (put the letter designation here:)

42. Now here is an interesting but imaginary situation where you have the chance to choose between cash in hand or taking a chance at getting a larger amount with odds of 50 - 50. Just read the card, and let me know which choice you make. (Cash now) (Take chance)

43. Here is another situation somewhat different from the last one. Please read this card, and let me know your decision.
   (50% chance-$10,000) (10% chance-$1 million)

44. Now here is the last part of my interview. This is a list of statements or situations, with a choice to be made for each. Just take your time, and circle an answer for each statement. Here is a pencil.
   (Note: let the respondent administer this section himself, but stand by to assist. When respondent hands you the sheet, please check for completion)
"HOW I DESCRIBE MYSELF"

Please answer each question or statement by circling one of the numbers on the right. THERE ARE NO BEST ANSWERS. Just describe yourself and state your opinions as accurately as possible. We are interested in how you see yourself, not how you feel others may see you.

(in the questionnaire, the six-point scale shown below actually was alongside the statements)

<table>
<thead>
<tr>
<th>Definitely Disagree</th>
<th>Generally Disagree</th>
<th>Moderately Disagree</th>
<th>Moderately Agree</th>
<th>Generally Agree</th>
<th>Definitely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

1. I rarely think things out in detail before I act.
2. I usually look for the lowest possible prices when I shop.
3. I'm rather careless of practical matters.
4. I eat some foods because they have special health benefits.
5. (FEMALE) I often try the latest hairdo-styles when they change.
6. (MALE) I often try the latest razor blade when they come out. (users of electric razors).
7. Nearly every husband should carry life insurance to make his family more secure.
8. I usually act on the spur of the moment.
9. I'm an impulsive shopper.
10. I usually like to wait and see how other people like new brands before I try them.
11. Most of the furniture and other belongings in our house are insured against fire, theft, etc.
12. I believe everyone should take walks, bicycle, or otherwise exercise several times a week.
13. I'm willing to experiment with new ideas.
14. I'm rational and logical.
15. I'm a practical, careful person.
16. I'm careful about what I eat in order to keep my weight under control.
17. I'm a very cautious driver.
18. I'm emotional.
19. I like to try new Brands of products I use, the first time I see them in the store.
20. When a brand (NOT my favorite brand) is being sold at 5¢ or more below its regular price, I usually buy the brand with the reduced price.
21. I try to remember to fasten my seatbelt when riding in a car that has seatbelts.
22. I've a great deal of self-control.
CARD #1
Your reaction if diagnosis shows practically nothing wrong with your car:
(a) Disgusted
(b) somewhat disappointed
(c) Don't Care
(d) Somewhat relieved
(e) Very much relieved

CARD #2
In buying new products, or in trying new things, how do you compare with other people: would you say you are?
(a) Among the first to try new things
(b) slightly before the average in trying new things
(c) about average
(d) slightly later than average
(e) among the last

CARD #3
Do people ask your opinion about new things? How would you say you compare with others?
(a) People ask for my opinion much more often than average.
(b) My opinion is requested slightly more often than the average person's.
(c) about average.
(d) My opinion is requested slightly less often than average.
(e) People practically never ask for my opinion about new things.
CARD #4

After you have tried a new product or service, do you comment about it to friends or acquaintances? How would you say you compare with others?

(a) I tell about new products much more often than the average person.
(b) slightly more often than the average.
(c) about average.
(d) not quite as often as the average.
(e) I very seldom tell anyone else about new products I have tried.

CARD #5

Here is the statement:

"Medick Ford Diagnostic Center is completely professional and gives every car equal treatment regardless of make, model, price, or age."

Which of these is most like your own reaction to the statement ——
(a) the statement is absolutely true.  (b) It is probably true.
(c) could be true or false.  (d) probably not true.
(e) the statement is undoubtedly false.

CARD #6

Here is the statement:

"The real reason for the Medick Ford Diagnostic Center is to get more repair business for Medick."

Which of these is most like your own reaction ——
(a) the statement is absolutely true.  (b) It is probably true.
(c) could be true or false.  (d) probably not true.
(e) the statement is undoubtedly false.
CARD # 7

Imagine yourself in a situation where you must choose between these two possible decisions:

(used with Question #42)

(a) you may have $500 in cash, at once.
- or -
(b) you may have a ticket which gives you the chance to win $2,000 in cash today, with the odds on your winning being 50 - 50; that you would have an equal chance of winning or of losing the $2,000.

CARD # 8  (used with Question #43)

In this imaginary situation, you are offered a choice between one ticket which gives you an even chance (50-50 odds) to win $10,000 cash; or, you may have instead another ticket which gives you a one-in-ten chance to win $1 million... in other words, you are choosing between a 50% chance winning $10,000, or a 10% chance of winning a million dollars.

Which would you choose -- the 50% chance to get $10,000; or, the 10% chance to get $1,000,000?
TELEPHONE QUESTIONNAIRE

(follows one week after Phase I)

Remembering your car diagnosis at Medick's, which of the following five different phrases would come closest to describing your attitude about the Diagnostic Center? I'll go through the list of phrases once, and then repeat them for you.

1. I was much more pleased that I had expected to be. "in what ways?" (record--)
2. The experience was somewhat better than I had expected. "in what ways?" (record--)
3. It was about what I had expected. "in what ways?" (record--)
4. I was somewhat disappointed. "in what ways?" (record--)
5. I was very much disappointed.

Did you tell anyone else about your experiences at Medick Diagnostic Center? NO YES If "YES", whom did you tell (check one) friend business relative OTHERS (identify)

Did you expect to use the Diagnostic Center again sometime? (if "NO", say: "I see, why is that?" and record the answer--)

Regard the ten dollar fee you paid, how do you feel about that -- do you think that the service was worth more than $10; or, was it worth less than $10; or was it worth just about $10?

Thanks very much again for your cooperation! Goodbye.
APPENDIX B

FREQUENCY DISTRIBUTION
OF THE DATA
# TABLE 40

**FREQUENCY DISTRIBUTION OF COMBINED ECONOMIC VARIABLES FOR INNOVATORS AND THE POPULATION**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Innovators (N = 214)</th>
<th>Population (N = 165)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Household Annual Incomes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $ 3,000</td>
<td>-0-</td>
<td>9</td>
</tr>
<tr>
<td>$ 3,000 - 5,999</td>
<td>26</td>
<td>37</td>
</tr>
<tr>
<td>6,000 - 7,999</td>
<td>39</td>
<td>36</td>
</tr>
<tr>
<td>8,000 - 9,999</td>
<td>36</td>
<td>30</td>
</tr>
<tr>
<td>10,000 - 14,999</td>
<td>66</td>
<td>34</td>
</tr>
<tr>
<td>15,000 - 25,000</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>Above 25,000</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td><strong>Home Ownership</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own home</td>
<td>141 (60%)</td>
<td>103 (60%)</td>
</tr>
<tr>
<td>Rent quarters</td>
<td>93</td>
<td>66</td>
</tr>
<tr>
<td><strong>Value of Home Owned</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(using values to nearest 000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 0 to $ 9</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10 to 12</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>13 to 15</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>16 to 18</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>19 to 21</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>22 to 24</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>25 to 27</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>28 to 30</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>31 to 40</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>More than 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monthly Rent Paid</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 0 to $ 50</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>51 to 70</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>71 to 80</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>81 to 90</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>91 to 100</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>101 to 110</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>120</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>130</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>140</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>150</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>More than 150</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>
TABLE 41

FREQUENCY DISTRIBUTION OF COMBINED AUTOMOBILE
OWNERSHIP CHARACTERISTICS FOR INNOVATORS
AND THE POPULATION

<table>
<thead>
<tr>
<th>Variable</th>
<th>Innovators (n = 247)</th>
<th>Population (n = 172)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Year of Principal Car Owned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1968</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1967</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>1966</td>
<td>56</td>
<td>24</td>
</tr>
<tr>
<td>1965</td>
<td>50</td>
<td>21</td>
</tr>
<tr>
<td>1964</td>
<td>32</td>
<td>22</td>
</tr>
<tr>
<td>1963</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>1962</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>1961</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>1960 or earlier</td>
<td>21</td>
<td>39</td>
</tr>
<tr>
<td>Purchased car New</td>
<td>133 (55%)</td>
<td>83 (48%)</td>
</tr>
<tr>
<td>Purchased car Used</td>
<td>105 (45%)</td>
<td>89 (52%)</td>
</tr>
<tr>
<td>Own one car only</td>
<td>115 (49%)</td>
<td>114 (67%)</td>
</tr>
<tr>
<td>Own two cars</td>
<td>105 (45%)</td>
<td>46 (27%)</td>
</tr>
<tr>
<td>Own three or more cars</td>
<td>14 (6%)</td>
<td>11 (7%)</td>
</tr>
</tbody>
</table>
TABLE 42

FREQUENCY DISTRIBUTION OF TWO STATUS VARIABLES FOR INNOVATORS AND THE POPULATION

<table>
<thead>
<tr>
<th>Variable</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brackets of Reiss Scores for</td>
<td>(N = 217)</td>
<td>(N = 160)</td>
</tr>
<tr>
<td>Occupations Held</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 20</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>21 to 40</td>
<td>28</td>
<td>37</td>
</tr>
<tr>
<td>41 to 50</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>51 to 60</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>61 to 70</td>
<td>55</td>
<td>25</td>
</tr>
<tr>
<td>71 to 80</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td>81 to 90</td>
<td>44</td>
<td>7</td>
</tr>
<tr>
<td>91 to 99</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Education Attainment by</td>
<td>(N = 244)</td>
<td>(N = 170)</td>
</tr>
<tr>
<td>Head of Household</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Some High School</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>43</td>
<td>50</td>
</tr>
<tr>
<td>Some College</td>
<td>67</td>
<td>43</td>
</tr>
<tr>
<td>College Graduate</td>
<td>55</td>
<td>24</td>
</tr>
<tr>
<td>Work beyond Bachelor Degree</td>
<td>54</td>
<td>19</td>
</tr>
</tbody>
</table>
### TABLE 43

FREQUENCY DISTRIBUTION OF INFORMATION VARIABLES FOR INNOVATORS AND THE POPULATION

<table>
<thead>
<tr>
<th>Variable</th>
<th>Innovators (N)</th>
<th>Population (N=171)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Diagnostic Centers prior to local opening: all sources</td>
<td>188 80%</td>
<td>Not Available</td>
</tr>
<tr>
<td></td>
<td>(N=235)</td>
<td></td>
</tr>
<tr>
<td>Awareness of Diagnostic Centers after local center had opened (first two months)</td>
<td>149 100%</td>
<td>79 46%</td>
</tr>
<tr>
<td>Sought more information after initial awareness</td>
<td>86 36%</td>
<td>12 7%</td>
</tr>
<tr>
<td></td>
<td>(N=239)</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 44

**SOURCES OF INFORMATION AND INFLUENCE ABOUT AUTOMOTIVE DIAGNOSTIC CENTERS REPORTED BY INNOVATORS**

<table>
<thead>
<tr>
<th>Source</th>
<th>During Period Prior to Local Opening</th>
<th>Regarding Local Diagnostic Center</th>
<th>Search For Further Information</th>
<th>Influence To Try Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend or relative</td>
<td>24</td>
<td>45</td>
<td>16</td>
<td>43</td>
</tr>
<tr>
<td>Acquaintance or associate</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Unspecified word of mouth</td>
<td>8</td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Marketer-dominated word-of-mouth</td>
<td>0</td>
<td>18</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Innovator-originated word-of-mouth contrasts with local dealer</td>
<td>0</td>
<td>0</td>
<td>44</td>
<td>12</td>
</tr>
<tr>
<td>Word of mouth contact with local experts (e.g., mechanics)</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total word of mouth</td>
<td>43</td>
<td>75</td>
<td>74</td>
<td>80</td>
</tr>
<tr>
<td>Newspaper articles</td>
<td>18</td>
<td>36</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Newspaper advertisements</td>
<td>2</td>
<td>11</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Radio news and commercials</td>
<td>9</td>
<td>66</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>TV News and comm.</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Readers Digest art.</td>
<td>24</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Motor Trend</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Popular Science</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Popular Mechanics</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Changing Times, Ford</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Consumer Reports</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Better Homes &amp; Gard.</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Unidentified Mag.</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Unidentified Books</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Direct Mail, loc. deal.</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Tele. yellow pages</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Media</td>
<td>114</td>
<td>124</td>
<td>9</td>
<td>.53</td>
</tr>
<tr>
<td>Personal Knowledge of other centers</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Visited new local plant or saw outdoor sign</td>
<td>0</td>
<td>30</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
TABLE 45

FREQUENCY DISTRIBUTIONS OF OWNERSHIP OF ELEVEN CONSUMER ITEMS BY INNOVATORS AND THE POPULATION

<table>
<thead>
<tr>
<th>Item</th>
<th>Innovators Frequency</th>
<th>Population Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do Own</td>
<td>Not Own</td>
</tr>
<tr>
<td>Color TV</td>
<td>79</td>
<td>163</td>
</tr>
<tr>
<td>Electric Toothbrush</td>
<td>84</td>
<td>158</td>
</tr>
<tr>
<td>Sports car</td>
<td>40</td>
<td>202</td>
</tr>
<tr>
<td>Electric Blanket</td>
<td>120</td>
<td>122</td>
</tr>
<tr>
<td>Water Pic Toothbrush</td>
<td>9</td>
<td>233</td>
</tr>
<tr>
<td>Gas-Fired Barbecue grill</td>
<td>10</td>
<td>232</td>
</tr>
<tr>
<td>Whole House Air-conditioning</td>
<td>65</td>
<td>177</td>
</tr>
<tr>
<td>Motor or sailboat</td>
<td>34</td>
<td>210</td>
</tr>
<tr>
<td>Second House</td>
<td>22</td>
<td>220</td>
</tr>
<tr>
<td>Subscribe to more than five magazines</td>
<td>127</td>
<td>117</td>
</tr>
<tr>
<td>Radial automobile tires</td>
<td>5</td>
<td>237</td>
</tr>
<tr>
<td>Member Private Club</td>
<td>51</td>
<td>191</td>
</tr>
</tbody>
</table>
## TABLE 46
### IMAGE OF SPONSOR OF LOCAL DIAGNOSTIC CENTER HELD BY INNOVATORS

<table>
<thead>
<tr>
<th>Category of Response</th>
<th>Image as Completely Professional and Fair</th>
<th>Image as Purely Business (sales) Oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N) %</td>
<td>(N) %</td>
</tr>
<tr>
<td>Absolutely True</td>
<td>75 32%</td>
<td>20 9%</td>
</tr>
<tr>
<td>Probably True</td>
<td>120 51</td>
<td>80 34</td>
</tr>
<tr>
<td>Could be True or False</td>
<td>34 15</td>
<td>65 28</td>
</tr>
<tr>
<td>Probably not True</td>
<td>3 1</td>
<td>50 20</td>
</tr>
<tr>
<td>False</td>
<td>2 1</td>
<td>20 9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>234 100%</strong></td>
<td><strong>235 100%</strong></td>
</tr>
</tbody>
</table>
### TABLE 47
FREQUENCY DISTRIBUTION OF SELF-RATED RESPONSES BY INNOVATORS AND POPULATION

<table>
<thead>
<tr>
<th>Self-Rated Characteristic</th>
<th>Scale of Responses</th>
<th>Innovators</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>In trying new products, are you...</td>
<td>Among the First</td>
<td>Among the Last</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slightly Before Average</td>
<td>Later Than Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N) %</td>
<td>(N) %</td>
<td>(N) %</td>
</tr>
<tr>
<td>Innovators</td>
<td>31   13</td>
<td>101  42</td>
<td>26   11</td>
</tr>
<tr>
<td>Population</td>
<td>13   .8</td>
<td>32   20</td>
<td>85    50</td>
</tr>
<tr>
<td>Do others ask for your opinion about new things?</td>
<td>Much More Often Than Aver.</td>
<td>Slightly Less Often Practically</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N) %</td>
<td>(N) %</td>
<td>(N) %</td>
</tr>
<tr>
<td>Innovators</td>
<td>60   25</td>
<td>82    34</td>
<td>81    34</td>
</tr>
<tr>
<td>Population</td>
<td>17   10</td>
<td>37    22</td>
<td>84    49</td>
</tr>
<tr>
<td>Do you comment about new things after you try them...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovators</td>
<td>82   35</td>
<td>77    32</td>
<td>67    28</td>
</tr>
<tr>
<td>Population</td>
<td>38   23</td>
<td>51    30</td>
<td>56    32</td>
</tr>
<tr>
<td>Are you a leader or a follower (in other peoples' opinion)?</td>
<td>Leader</td>
<td>Follower</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N) %</td>
<td>(N) %</td>
<td></td>
</tr>
<tr>
<td>Innovators</td>
<td>154  68</td>
<td>95   58</td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>74   32</td>
<td>68   42</td>
<td></td>
</tr>
<tr>
<td>Do you hear of new things earlier than other people?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N) %</td>
<td>(N) %</td>
<td></td>
</tr>
<tr>
<td>Innovators</td>
<td>180  77</td>
<td>54   23</td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>79   50</td>
<td>81   50</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 48
RESPONSES TO RISK PROPOSITIONS BY INNOVATORS AND POPULATION

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chose Certain Reward</th>
<th>Chose 50% Gamble</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Innovators (N)  %</td>
<td>Innovators (N) %</td>
</tr>
<tr>
<td>Forced choice between certainty of $500 reward</td>
<td>140  60</td>
<td>99  40</td>
</tr>
<tr>
<td>and 50% chance of reward of $2000 (EMV=1000)</td>
<td>111  64</td>
<td>58  36</td>
</tr>
<tr>
<td></td>
<td>Population (N) %</td>
<td>Population (N) %</td>
</tr>
<tr>
<td>Forced choice between 50% chance (EMV=$5,000)</td>
<td>171  71</td>
<td>29  60</td>
</tr>
<tr>
<td>and 10% chance (EMV=$100,000)</td>
<td>110  64</td>
<td>36</td>
</tr>
</tbody>
</table>
TABLE 49
FREQUENCY DISTRIBUTION OF SELF-RATINGS ON
SELECTED BASES BY INNOVATORS
AND THE POPULATION

<table>
<thead>
<tr>
<th>Characteristic and 6-Point Scale of Responses</th>
<th>Innovators (N)</th>
<th>Population (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely think things out in detail before acting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree 125 55.4 67 40.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Generally disagree 57 25.2 40 24.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Moderately disagree 13 5.8 13 7.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Moderately agree 11 4.9 18 10.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Generally agree 10 4.5 14 8.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Definitely agree 10 4.5 14 8.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 226 100.0 166 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rather careless in practical matters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree 125 55.4 67 40.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Generally disagree 56 24.9 45 27.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 21 9.6 16 9.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 13 5.9 20 12.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 7 3.2 14 8.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Definitely agree 2 1.0 2 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 224 100.0 164 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoy planning work carefully before carrying it out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree 7 3.1 9 5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 11 4.8 13 7.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 11 4.8 10 6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 41 18.0 32 19.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 47 20.8 49 29.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Definitely agree 110 48.5 53 31.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 227 100.0 166 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristic and 6-Point Scale of Responses</td>
<td>Innovators (N)</td>
<td>Population (N)</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Usually act on the spur of the moment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree</td>
<td>70 (30.8%)</td>
<td>44 (26.8%)</td>
</tr>
<tr>
<td>2. Generally disagree</td>
<td>58 (25.5)</td>
<td>47 (28.3)</td>
</tr>
<tr>
<td>3. Moderately disagree</td>
<td>44 (19.4)</td>
<td>23 (13.9)</td>
</tr>
<tr>
<td>4. Moderately agree</td>
<td>33 (14.5)</td>
<td>29 (17.6)</td>
</tr>
<tr>
<td>5. Generally agree</td>
<td>15 (6.4)</td>
<td>12 (7.3)</td>
</tr>
<tr>
<td>6. Definitely agree</td>
<td>8 (3.4)</td>
<td>10 (6.0)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>228 (100.0%)</strong></td>
<td><strong>165 (100.0%)</strong></td>
</tr>
</tbody>
</table>

| I'm an impulsive shopper                    |                |                |
| 1. Definitely disagree                      | 86 (38.0%)     | 48 (29.3%)     |
| 2.                                          | 46 (20.4)      | 40 (24.4)      |
| 3.                                          | 33 (14.6)      | 17 (10.4)      |
| 4.                                          | 30 (13.3)      | 37 (22.6)      |
| 5.                                          | 15 (6.7)       | 8 (4.0)        |
| 6. Definitely agree                         | 16 (7.0)       | 14 (8.4)       |
| **Total**                                   | **226 (100.0%)** | **164 (100.0%)** |

| Usually like to wait and see how other people like new brands before I try them. |                |                |
| 1. Definitely disagree                      | 55 (23.9%)     | 34 (20.6%)     |
| 2.                                          | 34 (14.8)      | 31 (18.8)      |
| 3.                                          | 43 (18.7)      | 25 (15.2)      |
| 4.                                          | 44 (19.1)      | 32 (19.3)      |
| 5.                                          | 29 (12.6)      | 26 (15.8)      |
| 6. Definitely agree                         | 25 (10.9)      | 17 (10.3)      |
| **Total**                                   | **230 (100.0%)** | **165 (100.0%)** |
### TABLE 49—Continued

<table>
<thead>
<tr>
<th>Characteristic and 6-Point Scale of Responses</th>
<th>Innovators (N)</th>
<th>Innovators (%)</th>
<th>Population (N)</th>
<th>Population (%)</th>
</tr>
</thead>
</table>

**Usually look for the lowest possible prices when I shop**

1. Definitely disagree 48 21.2% 20 12.0%
2. Generally disagree 44 19.4 32 19.3
3. Moderately disagree 36 15.8 24 14.4
4. Moderately agree 32 14.1 24 14.4
5. Generally agree 39 17.2 34 20.6
6. Definitely agree 28 12.3 32 19.3

Total 227 100.0 166 100.0

**Small price differential (5¢) can cause me to switch brands**

1. Definitely disagree 81 35.5% 43 25.8%
2. 57 25.0 39 23.4
3. 29 12.7 29 17.4
4. 24 10.5 25 15.0
5. 18 7.9 16 9.4
6. Definitely agree 19 8.4 15 9.0

Total 228 100.0 167 100.0

**Like to try new brands at first sight**

1. Definitely disagree 61 26.8% 41 24.7%
2. 44 19.5 33 19.9
3. 38 16.7 32 19.3
4. 49 21.6 34 20.5
5. 19 8.4 15 9.0
6. Definitely agree 16 7.0 11 6.6

Total 227 100.0 166 100.0

**I have a great deal of self-control**

1. Definitely disagree 2 0.9% 7 4.2%
2. 5 2.2 3 1.8
3. 17 7.4 10 6.0
4. 58 25.3 44 26.5
5. 82 35.8 62 37.4
6. Definitely agree 65 28.4 40 24.1

Total 229 100.0 166 100.0
<table>
<thead>
<tr>
<th>Characteristic and 6-Point Scale of Responses</th>
<th>Innovators (N)</th>
<th>Population (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I try to remember to fasten my seat belt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree</td>
<td>26</td>
<td>21</td>
</tr>
<tr>
<td>2. Generally disagree</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>3. Moderately disagree</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>4. Moderately agree</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>5. Generally agree</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>6. Definitely agree</td>
<td>103</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>226</td>
<td>164</td>
</tr>
<tr>
<td>I often try the latest razor blades or hair cream when they appear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree</td>
<td>90</td>
<td>45</td>
</tr>
<tr>
<td>2.</td>
<td>42</td>
<td>27</td>
</tr>
<tr>
<td>3.</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>4.</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>5.</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>6. Definitely agree</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>162</td>
</tr>
<tr>
<td>I am willing to experiment with new ideas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>37</td>
<td>40</td>
</tr>
<tr>
<td>5.</td>
<td>69</td>
<td>53</td>
</tr>
<tr>
<td>6. Definitely agree</td>
<td>111</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>166</td>
</tr>
<tr>
<td>I am rational and logical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Definitely disagree</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>4.</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>5.</td>
<td>90</td>
<td>67</td>
</tr>
<tr>
<td>6. Definitely agree</td>
<td>87</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>162</td>
</tr>
</tbody>
</table>
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BIBLIOGRAPHY

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