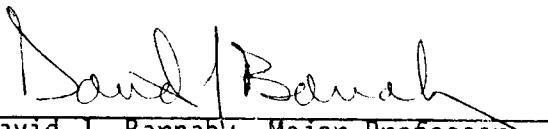
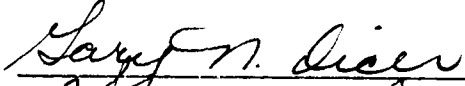
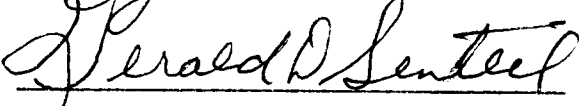
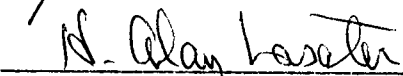


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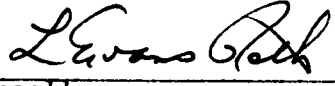
I am submitting herewith a dissertation written by Wan Soo Lee entitled "The Investigation of the Consumer Adoption of Automatic Teller Machine Usage." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Business Administration.

  
David J. Barnaby, Major Professor

We have read this dissertation  
and recommend its acceptance:

Accepted for the Council:

  
Vice Chancellor  
Graduate Studies and Research

THE INVESTIGATION OF THE CONSUMER ADOPTION  
OF AUTOMATIC TELLER MACHINE USAGE

A Dissertation  
Presented for the  
Doctor of Business Administration  
Degree  
The University of Tennessee, Knoxville

Wan Soo Lee

August 1981

**3053724**

DEDICATION

To my beloved mother, Mrs. Kwi Yeon Lee,  
whose reminiscences I shall cherish  
till the end of my days

## ACKNOWLEDGMENTS

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## ABSTRACT

The purpose of this study was to examine (1) the consumer adoption process of Automatic Teller Machines, (2) the differences among early adopters, late adopters, and nonadopters in personal characteristics, personality, and Automatic Teller Machines and bank service-related experience, information, perceptions and attitudes, and (3) the basic underlying dimensions of innovativeness which are characteristic of early adopters, of late adopters, and of nonadopters.

Automatic Teller Machines offer consumers new ways of banking that require radical departure from the deeply entrenched banking habits and old attitudes toward conventional bank services. Automatic Teller Machines are an innovation, specifically a service oriented innovation. However, empirical research investigating the process of adoption and diffusion of Automatic Teller Machines on a full scale from the theoretical perspective of the adoption and diffusion process is virtually nonexistent.

The study presents a general model of the innovation adoption process in the form of comprehensive exploratory research in order to ascertain empirically basic constructs underlying the innovativeness in the adoption of Automatic Teller Machines. The fundamental conceptualization of the model is based on the theories of general consumer behavior, innovation adoption process, and perceived risk in consumer decision making.

Data for the study was obtained through a mail survey from 453 customers of Valley Fidelity Bank in Knoxville, Tennessee. Of these 453

respondents, 102 individuals were classified as early adopters, 68 as late adopters, and 283 as nonadopters on the basis of their relative time of adoption of Automatic Teller Machine usage.

One bivariate and three different multivariate statistical procedures were employed to sequentially analyze the data. Two-way cross tabulation analyses were used to acquire preliminary insight into the general nature of innovativeness in Automatic Teller Machine usage, Hotelling's  $T^2$  to further probe and/or reinterpret at a higher level of abstraction the information resultant from the cross tabulation analyses, factor analyses to explore the domain of innovativeness in Automatic Teller Machine usage and to derive Z sum factor scores, and multiple discriminant analyses to identify major underlying discriminant dimensions and to ascertain their order of importance in their ability to discriminate among three adopter groups.

The results of the analyses indicate that significant differences exist among the three adopter groups in personal characteristics, personality, and bank services and Automatic Teller Machine related experience, information, perceptions, and attitudes. However, in terms of their potentialities to discriminate among the three adopter groups, the following variables were found to significantly contribute to group differentiation: perceived Automatic Teller Machine characteristics, Automatic Teller Machine checking account usage and frequency of the general usage factor, risk factor, complaints and problems in Automatic Teller Machine usage (mechanical nature), information sources relied on most for Automatic Teller Machine adoption decision making (employees), proclivity to comply with perceived prevailing social influences, cultured cosmopolitan factor, knowledge on liability, and date of first

awareness of Automatic Teller Machines (J77D78 and J79080). The discriminant dimensions along which maximum group differentiation occurs were determined to be "general perceptions of Automatic Teller Machine attributes and frequency in its usage" and "late awareness of Automatic Teller Machines."

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## CHAPTER I

### THE PROBLEM

#### Introduction

The study of the diffusion of innovations differs from that of ordinary consumer buying behavior in general in that (1) it involves a learning process of new inputs to the social system rather than making a rational choice among existing products, (2) the subjects involved in the study are focused on the segments of population who have actually or intentionally purchased innovations, and (3) the adoption decision of an innovation is not an act, but rather a result of a process (Engel, Kollat, and Blackwell, 1968).

The continuous introduction of new or improved products or services is essential for a firm to survive, grow and perpetuate in the long run due to intense competition, shorter product life cycles, and rapidly developing modern technology (Kotler, 1972; Robertson, 1971). Historically successful U.S. companies have introduced new or improved products to increase or maintain market share, or to develop a new market.

Profit margins usually decline continuously after the latter stage of the product life cycle. As the life cycle of products continues to shorten, the latter stage of the cycle takes place in a shorter time period, and thus, it becomes inevitable to continuously introduce new or improved products to sustain and increase profit margins (Kollat, Blackwell, and Robertson, 1972).

The problems related to the introduction of new or improved products are its frequent failures in the market and thus economic waste, which is eventually passed on to the consumers in one form or another. The study by Booz-Allen and Hamilton (1965) reported the success ratio of one out of each 58 ideas. The study by Ross Federal Research Corporation of the products introduced by 200 leading packaged-goods manufacturers reported the failure rate as high as 80% (O'Meara, 1961). The United States Department of Commerce stated that 90% of all new products failed within four years of their introduction (Shaw, 1965). Estimates of new products failure vary widely but in general, Angelus (1969) suggested that the cost of a single product failure could range from \$75,000 to \$20,000,000.

Through literature search in the adoption and diffusion of innovations appears to indicate that innovation failures in the consumer product market are more than often attributed to two fundamental reasons. Researchers associated with the field of marketing have shown their interest in research on the adoption and diffusion of innovations relatively later in time than those associated with other disciplines such as anthropology, sociology, education and rural sociology, most marketing research being conducted since the mid-1960s. Only about 8% of the 1800 empirical research studies on the adoption and diffusion of innovations were authored by marketing researchers (Rogers, 1977). Numerous articles published in various marketing journals evidence that marketing researchers have frequently utilized the findings and theoretical framework derived from the research on the adoption and diffusion of innovations carried out by those associated

with disciplines other than marketing, and that most of the studies dealt only with a very small part of the total process.

It is not at all improper or illogical for marketing researchers to base their research on findings of the studies related to other disciplines except in that consumer product innovations and situations studied in the consumer market often differ widely in characteristics from those faced by researchers in other disciplines. Firms in the market place develop and modify their offerings and marketing strategies in response to those of competitors in order to be at a competitive advantage. The decision process in purchasing some consumer products often involves more than one individual.

To add to the above mentioned problems of the somewhat confused and immature nature of the marketing research tradition in this area, marketing researchers have more than often utilized what Nicosia (1966) has called reduced form models. The problem related to the use of reduced models is that it explains only a part of a total process influenced by a multitude of variables. Explanations derived in this manner may often obscure and exaggerate the relationship among constructs due to the omission of some correlated variables or to the analytical procedure of a certain statistical technique utilized in research.

The second reason that may be of importance in explaining failures of innovations in the consumer product market is that marketing managers do not properly understand the process of adoption of innovations (Shaw, 1965) and are in lack of reliable information regarding the process (Kegerreis, 1968). The utility and reliability

of information that marketing managers can utilize in developing marketing strategies to facilitate the speed of consumer adoption of innovations can only be as good as the quality of research findings regarding the adoption process in concern. Much of the economic waste caused by new products failures due to consumer's rejection of innovations can be minimized and/or avoided if marketing managers appreciate the values of knowledge of the consumer adoption process in terms of how it can help them market new products successfully.

Unlike the ordinary consumer decision making process, the adoption process requires a learning process involving new stimuli on the part of potential adopters. It is therefore imperative for marketing managers to facilitate the learning process by educating consumers. The Stowe Indiana Model suggests that the first of four tasks required in educating the subjects is to examine the subject's needs, prior knowledge and unique characteristics. The Gerlach Fly Model (1971) states that the first task in educating the subjects is to precisely define the content and objectives of the subject to be taught. Thus, an understanding of consumers and innovations is a primary consideration on the part of marketing managers.

The consumer is a widely recognized key factor determining the success of innovations but is often taken for granted. This is more so in the case of the adoption of the use of Automatic Teller Machines, the adoption process of which is the central focus of this dissertation.

### The Problem

The Electronic Fund Transfer Systems (hereafter referred to as EFT) have been with us now for about 11 years. The major objective



behind the introduction of EFT was to replace checks, but instead, its developments have been convenience oriented without reducing the check volume in any noticeable amount (Reistad, 1978). The EFT systems presently in operation are in the forms of automatic teller machines, on-line transactions, preauthorized payments, bank-at-home arrangements, corporate EFT systems, point of sales terminals, and automatic clearing houses (Marguente Zientara, 1978).

There are many reasons that EFT should be implemented to a greater extent: (1) thirty-one to thirty-five billion checks are transacted every year and the number increases at the rate of 7% a year (Humes, 1978), (2) labor costs have increased by approximately 8¢ each year and the cost of technology has been decreasing at the rate of 6% per year (Kaplan, 1978), (3) the pressure to extend banking hours and the demand to provide new financial services (Marguente Zientara, 1978), (4) EFT technologies enable people in the lower socioeconomic status to utilize financial services as the risks of check bouncing do not exist (Humes, 1978), and (5) above all, EFT systems are more convenient and efficient, significantly reducing costs at a high transaction rate in the long run (Adcock et al., 1977).

Despite all these benefits, EFT has not made much progress in terms of its adoption by consumers. The generally accepted forecasts suggested that by the end of 1979, the number of automatic teller machines (ATM) installations might reach 30,000, which has proved to be drastically over the estimated present number, 9,750 (Bennett, 1979). Since 1974, sales of only 1,200 to 1,300 ATM out of an expected ATM market of 6,000 has been taking place each year (Bennett, 1979).

Citibank has spent an estimated \$150 million for EFT, but it has not made a dent in the volume of checks transacted (Humes, 1978). In an extreme case ATM handled as low as 40 transactions per month (Bennett and Strang, 1978).

A study by Marple and Schick (1977) of EFT systems from the consumer perspective suggests that the levels of participation required to achieve break-even operation for ATM should be 5,000 monthly transactions as a minimal figure and 8,000 to 10,000 transactions as a more comfortable level. Most financial institutions except a few, e.g., First National Bank of Atlanta ("Tillie the Teller"), San Diego Trust & Savings Bank ("7/24"), and University Hills National Bank ("Pocket Teller"), have not been able to justify the expense of their ATMs. An extensive search of the literature on EFT systems appears to indicate that the major problem associated with the unsuccessful marketing of ATMs is consumers' resistance to the adoption of ATMs.

The first version of ATMs called "Cash Dispenser" was first installed by Docatel Corporation for Chemical Bank in New York in 1969. Two years later, the company had introduced the first full functioning ATMs called "Total Teller 300" which is very similar to the present ATMs.

Compared to other EFT systems in terms of numbers installed and of the time elapsed from the introduction into the market, ATMs represent the most widely known EFT system operated entirely by the consumer himself. Thus, it serves as the most ideal automated banking innovation for the purposes of (1) exploring the consumer adoption process of ATMs and (2) establishing the groundwork for future studies on the adoption process of other EFT systems.

Given the considerable time elapsed since the introduction of ATMs and interest in the adoption of ATMs by consumers, one might expect considerable research work to have been done relating ATMs to the theory of the adoption and diffusion of innovations. Yet very little is known on the consumer adoption process of ATMs.

There have been substantial research publications on the degree of consumer acceptance. However, most of the research publications have dealt with EFT systems in general and are nonempirical with their scope most often being limited to assessing the degree of consumer acceptance or resistance and without relying on the theories underlying the process of adoption and diffusion of innovations. Research investigating the process of adoption and diffusion of ATMs on a full scale from the perspective of diffusion theory is virtually nonexistent.

ATMs offer consumers new ways of banking that require radical departure from the deeply entrenched banking habits and old attitudes toward conventional bank services. Thus, the logical approaches to studying consumers' adoption behavior of ATMs are (1) to investigate potential adopters in terms of their needs, wants, concerns, and attitudes toward ATMs and (2) to categorize them into different innovative groups on the basis of personality traits, socioeconomic status, communication behavior, and perception of ATMs attributes, and determine the significance and role play of each group of variables as they relate to innovativeness.

Basic questions to be raised are what are the fundamental constructs that allow logical explanation of different levels of innovativeness, and whether or not those constructs can indeed

discriminate among different adopter groups—early adopters, late adopters and nonadopters.

### Objectives

The scarcity of comprehensive empirical research publications in the area of the adoption and diffusion of ATMs makes it imperative to carry out this dissertation in the form of comprehensive exploratory research. Thus, the study is intended to empirically ascertain basic constructs underlying the innovativeness in the adoption of ATMs.

The purposes of this study are to examine (1) the consumer adoption process of ATMs, (2) the differences among early adopters, late adopters and nonadopters in personal characteristics, personality, and ATM and bank service related experience, information, perceptions and attitudes, and (3) basic underlying dimensions of innovativeness which are characteristic of early adopters, of late adopters, and of nonadopters.

Specifically, the study is addressed to the following questions:

(1) Consumer adoption process

(A) How did early adopters, late adopters and nonadopters

(hereafter referred to as EA, LA, and NA) view bank services and bank business hours in terms of their wants and concerns before the introduction of ATMs? What are the patterns of EA's, LA's, and NA's usage of various bank services?

(B) What were the major sources of information that led EA, LA, and NA to be aware of the existence and functions of ATMs?

(C) What were the levels of participation in ATMs by the members of the reference groups that were perceived by individuals?

- (D) How was the information to which EA, LA, and NA were exposed viewed in terms of its utility in improving their situation then?
  - (E) How favorably or unfavorably were various attributes of ATMs such as relative advantage, complexity, compatibility, trialability, observability, and risks in usage perceived by EA, LA, and NA? What are the general attitudes of EAs, LAs, and NAs toward computers?
  - (F) What were the first impressions of EA and of LA on the first few trials with ATMs?
  - (G) How favorable or unfavorable were the general experiences with ATMs of EA, LA, and NA? What are the patterns of EA's and LA's usage of ATMs?
- (2) Demographics, social interactions, communication behavior, normative compliance, and personality of EA, of LA, and of NA
- (A) Is it feasible that EA, LA, and NA be discriminated among one another on the basis of the above mentioned characteristics?
- (3) Fundamental constructs (dimensions) underlying the innovativeness of EA, LA, and NA of ATMs
- (A) Does there exist such fundamental properties of innovativeness that may help explain or influence the adoption process EA, LA, and NA employ to make a decision whether or not to adopt and when to adopt? If such properties do exist, is one property more important than another in its ability to explain or predict innovativeness and to discriminate among EA, LA, and NA?

Data from the study may help explain (1) who adopts or does not adopt ATMs, (2) why they adopt or do not adopt ATMs, (3) how they go about making a decision to adopt or not to adopt, and (4) what factors are related to the time of adoption of ATMs.

Findings from the study may possibly be utilized to assist (1) the government in that the present legal and consumer issues concerning ATM and EFT may be approached through foresighted legislation to protect consumers and foster a healthy environment for the financial community, (2) marketing scholars in that the comprehensive exploratory nature of this study might provide an opportunity to realistically assess the dynamics of a complex S-R (Stimulus-Response) organism (the consumer) going through the adoption process of ATMs rather than those derived from the "reduced form models" (Nicosia, 1966), (3) consumers in that they may be better served by the marketing programs of financial institutions designed to meet their needs, wants and concerns, and that economies of scale realized at the high rate of usage may be passed on to the consumers in the forms of more efficient and convenient banking services, and (4) marketing managers in that insights gained from the study may enable them to facilitate the diffusion process of ATM through effective marketing activities reflecting the needs, wants and concerns of potential adopters.

#### Significance of the Study

Knowledge derived from the research probing the nature and components of the adoption process and information concerning the factors that function as catalysts or impediments are essential for

developing and implementing marketing programs that may help to speed up the diffusion process.

ATMs are an innovation, specifically a service oriented innovation, and thus differ from conventional bank services with which consumers are familiar. The virtue of this fact requires consumers to go through the adoption process other than ordinary consumer decision making processes and entails radical departure from deeply entrenched habits and attitudes associated with conventional services of financial institutions.

Substantial nonempirical research exists concerning consumer acceptance of EFT in general, but almost all have failed to analyze the problem of consumer resistance to the adoption of ATMs from the theoretical perspective of the adoption and diffusion process. Thus the importance of this study lies in ascertaining fundamental constructs underlying the innovativeness in the adoption process of EA, LA, and NA of ATMs within the framework of the theory of the adoption and diffusion of innovation.

Most consumerists and marketing practitioners appear to view widespread EFT as being inevitable (Adcock, Moore, and Crooks, 1977), considering the potential benefits EFT can offer to the consumers and the rapidly increasing, already burdensome workload of financial institutions. Knowledge gained from this dissertation may be beneficial to the marketing managers for developing and implementing promotion and communication campaigns to speed up not only the diffusion process of ATMs but, also, that of other EFT systems as essential properties underlying the ATM adoption behavior of consumers may be applied to the adoption process of other EFT systems. Significant economies of scale

exist when various EFT systems such as Point of Sales Terminals, Cash Dispensers, and ATMs are interconnected to financial institutions and Automatic Clearing Houses (Rhoades, 1978). In addition to the marketing implications just mentioned, the knowledge may possibly prepare financial institutions to better meet the need for a smooth transition from a paper-based economy.

Numerous marketing research publications on the adoption process of innovations and the innovativeness of individual consumers have dealt with new products rather than new services and have heavily utilized "reduced form models." For example, innovativeness is conceptualized as a function of personality traits, of demographics and socioeconomics, of perceived product characteristics, or of communication behavior. The model of innovativeness observed most frequently in various marketing journals is innovativeness viewed as a function of personality trait. While this model of innovativeness has helped to ascertain the characteristics related to innovativeness, it also has produced numerous controversies (Midgley and Dowling, 1978). Kassarian's (1971) thorough article reviews on the relationship between consumer behavior and personality stated that the relationship between personality and aspects of consumer behavior is so weak to be questionable or perhaps meaningless.

This study provides an opportunity to determine (1) whether knowledge gained from the significant body of research that dealt with product orientated innovations can be equally useful (or applicable) to the study of the adoption process of service oriented innovations and (2) to evaluate the significance and functions of each construct underlying the consumer adoption process of ATMs on a realistic base rather than on reduced form models.



### Definition of Terms

The following terms which will be frequently referenced throughout this study are defined in the context in which they are used in the study. More detailed descriptions of terms and logics for such descriptions are found in Chapter II. Brief descriptions of them are provided in this section:

Early adopters. Those who adopted V-24 (ATM) in the first three months after the issuance of the first V-24 card.

Late adopters. Those who adopted V-24 between two years and three months after the issuance of the first V-24 card and up to the time this research was initiated (September, 1980).

Nonadopters. Those who are aware of the existence of V-24 but who have never used it or have discontinued using it.

Adoption. A decision to make regular or full use of an innovation.

Trial. The first few time uses of an innovation in an attempt to determine its utility in one's own situation.

Innovation. An idea, practice, or object perceived as new by an individual (Rogers and Shoemaker, 1971). For an idea, practice, or object to be an innovation, it has to be subjectively perceived as new regardless of objective newness as measured by the lapse of time since its first use or discovery.

Innovativeness. The degree to which an individual is relatively earlier in actual time of adopting an innovation than other members of his system (Rogers and Shoemaker, 1971). Innovativeness is thus measured not by an individual's perception of his earliness in adopting

an innovation as compared to others in his society, but by the actual time of his adoption of an innovation.

Adoption process (see Figure I-1). The mental process through which an individual passes from first knowledge of an innovation to a decision to adopt or reject and to confirmation of this decision (Rogers and Shoemaker, 1971). The adoption process takes place within an individual's mind and basically consists of such ascending mental stages as learning stage, evaluation stage, decision stage, and confirmation stage (see Table I-1). The adoption process may not always end at the confirmation stage. A strong possibility exists for an individual to stop at any stage and reject an innovation or to skip some mental stages.

Diffusion. The process by which innovations spread to the members of a social system (Rogers and Shoemaker, 1971). The diffusion process differs from the adoption process in that diffusion occurs among the units in a social system.

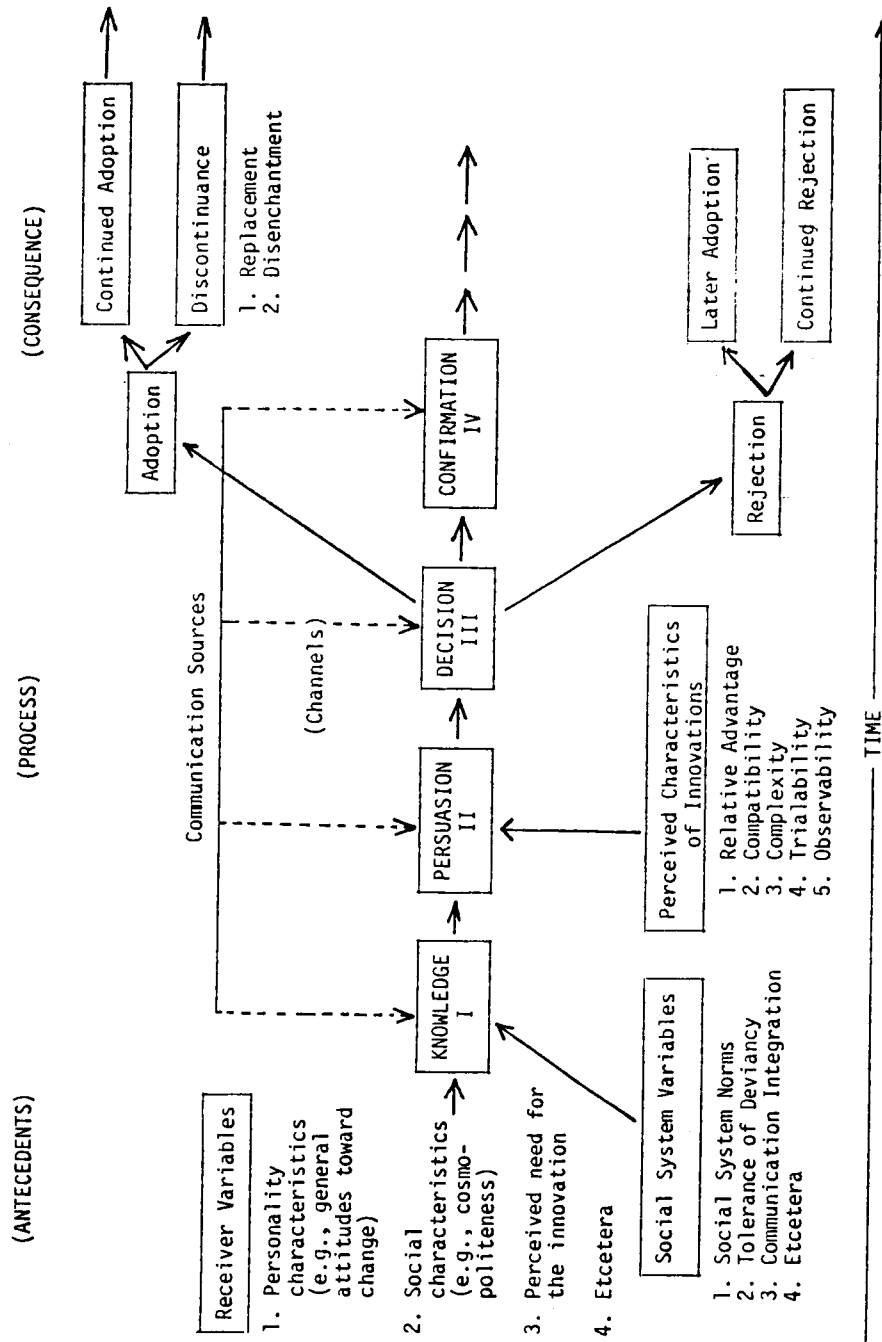


Figure I-1. Paradigm of the innovation-decision process.

Source: Rogers and Shoemaker, 1971.

TABLE I-1  
ALTERNATE MODELS OF THE ADOPTION DECISION PROCESS

|                   | Hierarchy of Effects Model | AIDA Model | Adoption Process Model |
|-------------------|----------------------------|------------|------------------------|
|                   | Purchase                   | Action     | Adoption               |
| Behavioral level  | ↑                          | ↑          | ↑<br>Trial             |
|                   | Conviction                 | ↑          | ↑                      |
|                   | ↑                          | Desire     | ↑                      |
| Attitude level    | Preference                 | ↑          | Evaluation             |
|                   | ↑                          | ↑          | ↑                      |
|                   | Liking                     | Interest   | Interest               |
|                   | ↑                          | ↑          | ↑                      |
| Information level | Knowledge                  | ↑          | ↑                      |
|                   | ↑                          | Attention  | ↑                      |
|                   | Awareness                  |            | Awareness              |

Source: Robertson, 1971.

## CHAPTER II

### BACKGROUND AND LITERATURE REVIEW

This chapter presents and discusses findings of numerous, relevant past studies and the major conceptualizations and hypotheses developed in the area of the adoption and diffusion of innovations as they relate to general consumer behavior in the adoption of automatic teller machines. Considerable attention is given to the formulation of the model of innovation adoption process which serves as the theoretical framework of this study.

The chapter consists of five major subsections. The first section presents briefly diffusion research tradition. The second section is concerned with innovation adoption process, specifically with each of the four stages of adoption process—knowledge, persuasion, decision, and confirmation. The third section illustrates various definitions of an innovation utilized in the previous studies. The fourth section is concerned with basic concepts and theoretical models of innovativeness and discusses the findings of previous studies on consumer innovativeness. In the final section, the findings of previous studies on consumer acceptance of automatic teller machines are discussed.

#### Diffusion Research Tradition

Economist Joseph A. Schumpeter (1939), who viewed innovation as discontinuous events, founded the groundwork from which most theories of innovation in business have stemmed. The origins of the research trace from the German-Austrian and the British School of diffusionism in

anthropology (Robert, 1937; Gaebner, 1905; Goldenweiser, 1925) and the French sociologist Gabriel Tarde (1903); the two schools of diffusionism have focused their study on the global diffusion of culture; and Gabriel Tarde has pioneered in proposing the S-shaped diffusion curve.

In the early 1940s, Bryce Ryan and Neal Gross (1943), through their publication, "The diffusion of hybrid seed corn in two Iowa communities," published the "revolutionary paradigm" for diffusion research which provided a new way of looking at some phenomena in diffusion research. The findings of their study indicated the significant implications of such characteristics as information transmission patterns from salesmen to early adopters and from early adopters to late adopters, cosmopolitanness, age, social integration, and information source differences in farmers' innovativeness. Since then the amount of research in the area has increased at an exponential rate (see Figure II-1). By the end of 1975, there were more than 2700 publications (Rogers and Thomas, 1975).

Diffusion research began to be integrated from 1960 as the researchers from many different disciplines began to realize that they were studying "the same basic type of human behavior" (Rogers, 1971). In the field of marketing, researchers have been very active with adoption and diffusion research since the early 1960s, although various marketing journals evidence that the interest by marketing researchers in the area appear to have lost its momentum since the mid 70s.

### Adoption Process

The understanding of the innovation adoption process provides rich insight into why and how some individuals differ from others during

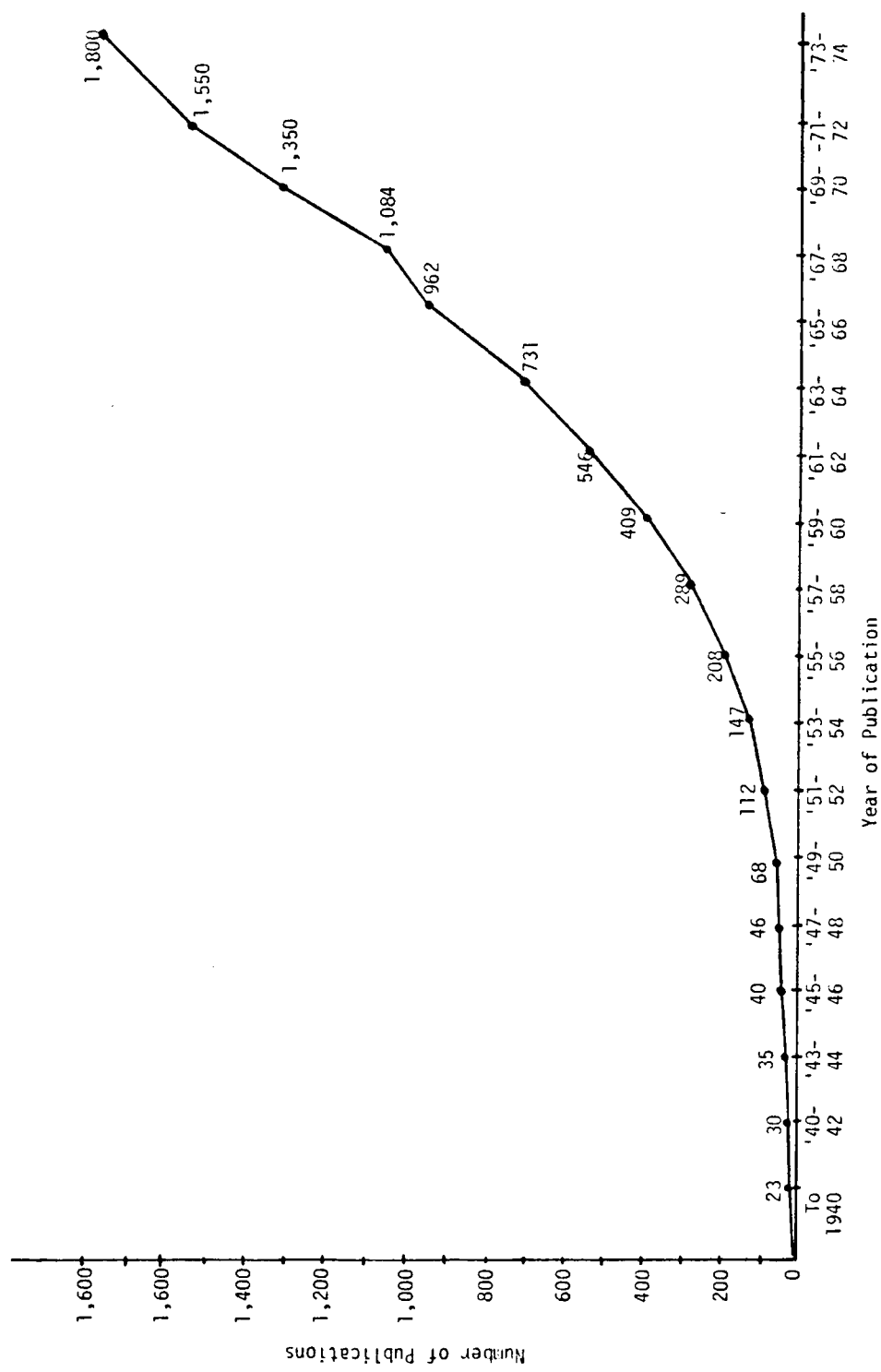


Figure II-1. Cumulative number of empirical diffusion research publications, by year of publication.

Source: Rogers, National Science Foundation, RA 77- 0013.

the innovation process and thus, the probability of success or failure of innovations (Rogers, 1962; Rogers and Shoemaker, 1971).

The innovation adoption process differs from the diffusion process in that the former takes place within the mind of an individual (at the micro level) whereas the latter occurs among members in a social system (at the macro level). The innovation adoption process also differs from the general consumer buying behavior. In the majority of general consumer purchases, most often, a past solution to the recognized problem is remembered and implemented (Katona, 1951) and thus, search for information to reduce uncertainty does not usually precede by relying on routine response behavior (Engel, Blackwell and Kollat, 1978, p. 238). The innovation adoption process involves a learning process of new inputs and risk reducing activities through active information seeking (Bauer, 1960).

The studies of the innovation adoption are conceptually centered on investigating the behavioral, social structural, information search, and cognitive process in which the individual engages as he mentally passes from first knowledge of an innovation to a decision to adopt or reject and then to confirmation of this decision. The innovation adoption process is generally conceptualized to consist of sequentially distinct but interrelated mental stages through which the consumer passes in arriving at a decision to adopt or reject.

To date, various models of the innovation adoption process exist: Tosdal (1925) conceptualized the innovation adoption process as stages of attention, interest, desire, and action; Palda (1966) as awareness, knowledge, liking, preference, conviction, and purchase; Robertson



(1971) as problem recognition, awareness, comprehension, attitude, legitimation, trial, adoption, and dissonance; Roger (1962) as awareness, interest, evaluation, trial, and adoption; and Rogers and Shoemaker (1971) as knowledge, persuasion, decision, and confirmation (see Table I-1, p. 16).

The original Rogers model underlies much of the consumer research in this area and has subsequently been revised to be consistent with the learning process, theories of attitude change, and general ideas about decision making, and to account for the major criticisms on the original model that the process does not always end in adoption process, that the five stages of the model do not always occur in the specified order, and that further information seeking may take place after adoption to reinforce the decision (Rogers and Shoemaker, 1971, pp. 101, 103).

The Rogers revised model (hereafter referred to as Rogers' paradigm) is certainly considered a landmark conceptualization and stimulant to research in this area, but it is not without flaws. Rogers' paradigm is more suitable for the research that deals with discontinuous innovations whereas many of the various new products studied in the marketing literature are minor product modifications. The question of whether a new product is a discontinuous innovation depends on an individual's subjective perception of the product. Engel, Blackwell, and Kollat (1978, p. 318; hereafter referred to as EKB) suggested a solution for this discrepancy that "it is probably helpful to use a general model of consumer behavior which permits analysis of all types of products."

Secondly, the Rogers' paradigm lacks the articulate elaboration of the functions, interrelationships, and influence of personal and situational variables in conjunction with the innovation adoption process. Basically, consumer behavior can be viewed a stimulus-organism-response. The components that function as stimulus include not only objects (products) but also situational variables (see Figure II-2). The importance of situational variables as a major behavioral determinant has been well established in the literature (Coney and Harmon, 1978; Ward and Robertson, 1973; Lavidge, 1966; Belk, 1975; and EKB, 1969).

Finally, Rogers' paradigm does not extend enough to adequately account for the concept of perceived risk involved in consumer decision making, although five dimensions of innovations are incorporated in the model.

Perceived risk which has been generally conceptualized as a function of uncertainty and consequences (or importance) and multi-dimensional phenomenon (Taylor, 1974; Cunningham, 1967; Bonoma and Johnston, 1979; Cox, 1967; and Jacoby and Kaplan, 1972) was found as a major behavioral determinant (Cox and Rich, 1967; Bettman, 1973; Popielarz, 1967; Schiffman, 1972; and Cunningham, 1967, 1967b). Although there exists no consensus on the number of major dimensions and nature of perceived risk which consumers are assumed to consider in their decision making, Jacoby and Kaplan (1972) identified the various dimensions of perceived risk utilized in the literature and six dimensions were found: financial, performance, physical, psychological, social, and time risks.

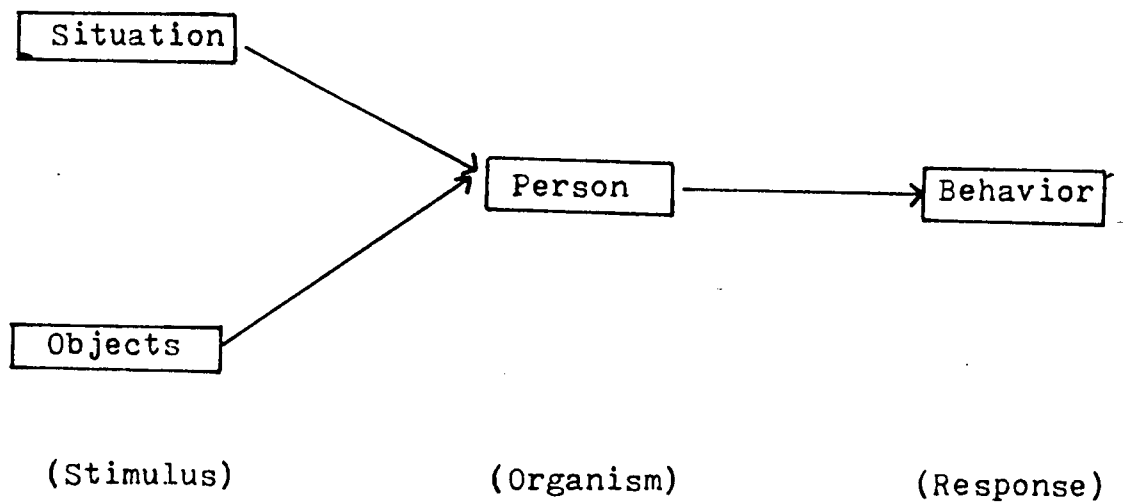


Figure II-2. A revised S-O-R paradigm.

Source: Belk, 1975.

To incorporate into the innovation adoption process the above-mentioned conceptualizations that Rogers' paradigm lacks and for the objectives of this dissertation, the author has "slightly" revised Rogers' paradigm by superimposing EKB's model of consumer behavior (1978) over the Rogers' paradigm and by adding six dimensions of perceived risk to the five dimensions of innovations: relative advantage, compatibility, complexity, trialability, and observability, conceptualized by Rogers (see Figure II-3).

Although the Rogers' paradigm is slightly revised, the fundamental conceptualization of the innovation adoption process is mostly based on the theories of the Rogers' paradigm. This revised model of the innovation adoption process serves as the theoretical framework of this study.

In the following sections, each of the four stages of the revised model—knowledge, persuasion, decision, and confirmation—is explained in detail in order to better understand the functions of and behaviors taking place in each stage. Unless specifically mentioned, much of the explanations provided for each stage is adapted from EKB's (1978) "Consumer Behavior" and Rogers' (1971) "Communication of Innovations."

Knowledge. Tarde (1903, p. 93) contends that awareness-knowledge occurs due to nonpurposive activities by individuals based on the notion that one cannot conceive of an object before the invention. However, Hassinger (1959) takes the opposite position based on the notion of "selective exposure" that individuals are inclined to expose themselves to those ideas consistent with their beliefs, attitudes, needs, or interests, and avoid those in conflict with their predispositions. Thus,

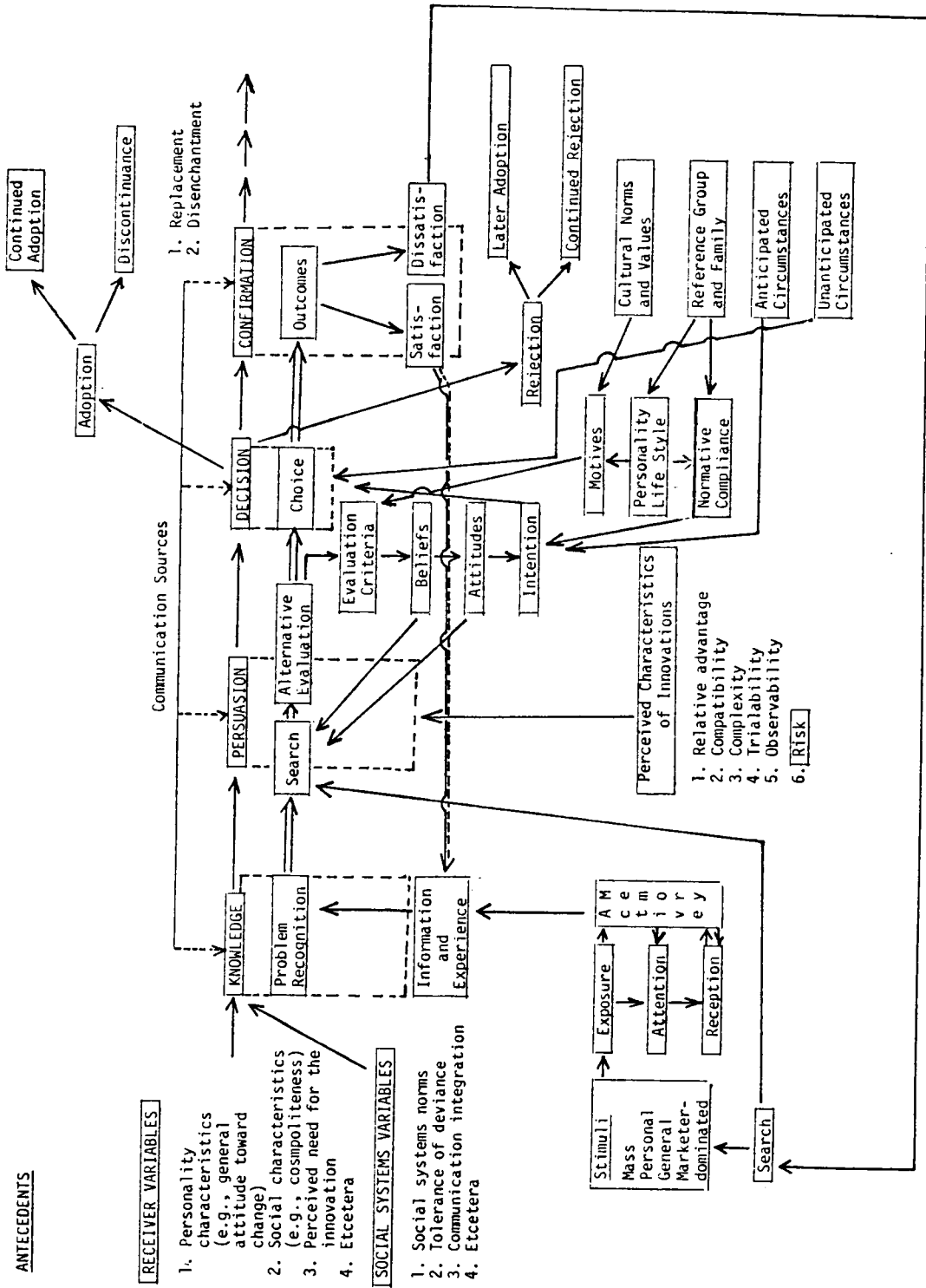


Figure II-3. Revised paradigm of the innovation adoption process.

even if an individual is exposed to new stimuli, it is less likely to be retained in the long term memory (or information and experience in the model).

In the case of innovation messages, it is more so since it is less probable for an individual to have favorable predisposition toward them because of unfamiliarity. Based on this reasoning it seems logical to take the position that in the case of innovations, needs usually precede awareness-knowledge.

Behavior begins when an individual recognizes a problem. A problem is recognized when there exists a perceived intolerable difference between the ideal state of affairs and the actual situation. Problem recognition may occur due to the following factors: (1) normative social influence by reference groups, (2) the desire to engender new atmosphere, (3) marketing appeals by arousing dominant motives, or (4) perception of the present state as inadequate. EKB (1978) suggests that motives, which are conceptualized as being derived from personality and purposive, serve as the primary determinant of the ideal state.

In the knowledge stage, the individual is exposed to the innovation's existence and gains some understanding of how it functions. The major function of this stage is mainly "cognitive."

Rogers' extensive review of the studies in this area has summarized the results of findings on the discrepancy between early and late knowers of an innovation and provided the generalization that relative to late knowers, earlier knowers have more education, higher social status, more exposure to mass media channels of communication

and to interpersonal channels of communication, more change agent contact, and more social participation, and are more cosmopolite.

Persuasion. Mere awareness-knowledge about an innovation does not establish a sufficient ground for persuasion to take place. An individual needs to conceive an innovation as relevant to his situation and have sufficient information in order to form his attitudes about an innovation.

In the persuasion stage, an individual forms a favorable or unfavorable attitude toward an innovation. An individual forms an attitude toward an innovation by evaluating the innovation in terms of desired perceived product attributes which are largely formed by the individual's personality, life style, and motives. Rogers (1971) proposed five characteristics of innovations to describe the perceived attributes of innovations, which are presumed to mediate the likelihood and rate of acceptance of innovations: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability.

Bauer (1960, p. 24) noted that "consumer behavior involves risk in the sense that any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty." Therefore, he is forced to deal with uncertainty (or risk). Whenever uncertainty is visualized by an individual, anxiety is potentially present (May, 1950). The nature and amount of perceived risk an individual perceives in an innovation may also affect his attitude formation as does his perception of the perceived attributes of an innovation.

In this stage, an individual actively engages in seeking information. Information search is a major way of reducing risk to tolerable levels (Bauer, 1960). Types of communicational channels utilized search for information, and how the information received is interpreted vary from individual to individual and from one situation to the next. In the following section, perceived risks, Rogers' five perceived characteristics of innovations, and information search are described in detail respectively as they relate to the persuasion stage of the innovation adoption process.

Risk.<sup>1</sup> Bauer (1960) has first introduced the concept of risk to consumer behavior and proposed that consumer behavior be viewed as risk taking. Taylor (1974) has developed one of the most comprehensive theories of risk taking in consumer behavior (see Figure II-4).

The theory postulates that the consumer is not sure of the outcome of a choice and thus, is forced to deal with uncertainty (or risk) which creates some level of anxiety. Numerous research in this area evidences that consumers do perceive risk (or uncertainty) in choice situations. Arndt (1967), in his study dealing with a new brand of coffee with 449 housewives as respondents, found that consumers do perceive the different levels of uncertainty in a choice situation and that perceived risk is multidimensional: lower risk perceivers

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<sup>1</sup>Unless otherwise specified, much of this section, risk, is adopted from James W. Taylor, "The Role of Risk in Consumer Behavior," Journal of Marketing, vol. 38 (April 1974), pp. 54-60.



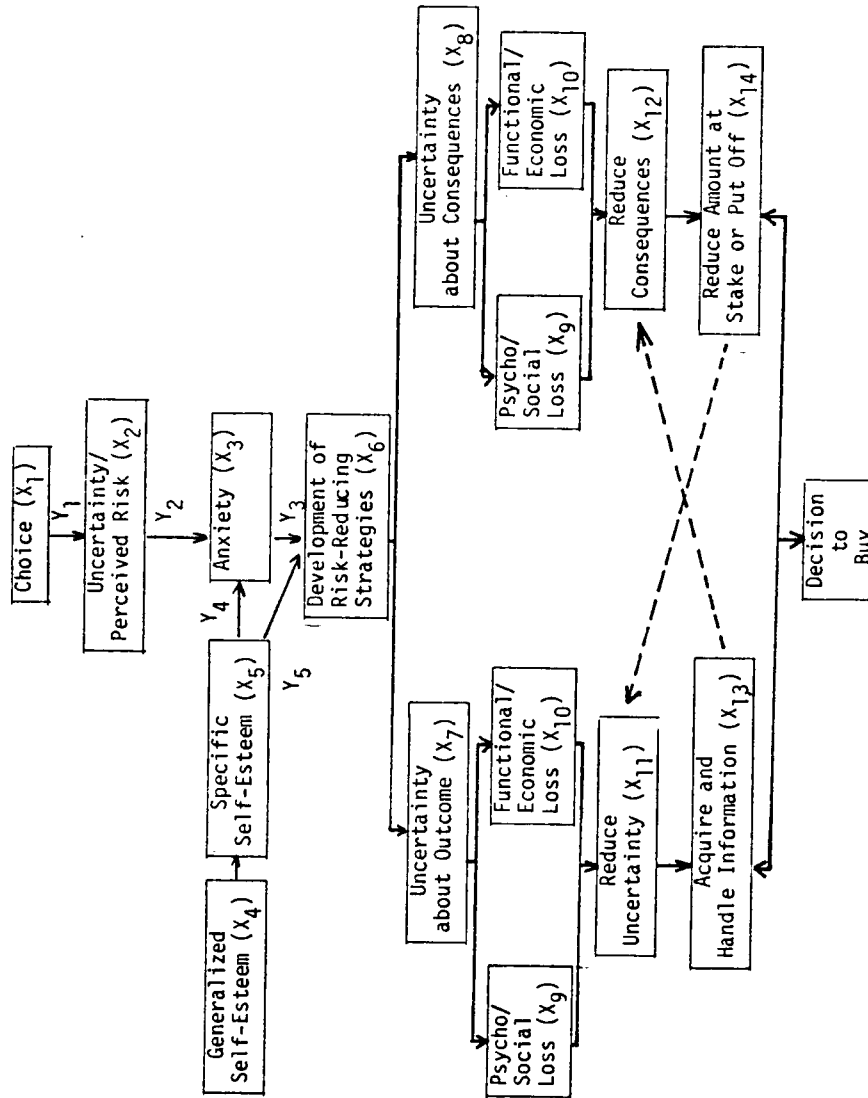


Figure II-4. Risk taking in consumer behavior.

mentioned inconvenience and higher risk perceivers, waste of money and husband's reaction as risk factors. Spence, Engel, and Blackwell (1970), in their study investigating perceived risk in mail-order and retail store buying, reported that consumers perceived more risk in buying by mail than in buying at retail stores. Cox and Rich (1967), in their study using personal interviews of over 3,000 women, found that perceived risk was a major behavioral determinant and that it was related to mode of shopping as well as product class.

Perceived risk (or uncertainty) creates some levels of anxiety which create tensions that are "intolerable or at least, unpleasurable" (Fisher, 1970). To reduce anxieties, consumers are thought to develop risk reduction strategies. Cunningham (1967b) in his study investigating the relationship between perceived risk and brand commitment reported that consumers commonly used brand loyalty as a method to reduce risk. Sheth and Venkatesan (1968), in their study examining risk reduction process, found that as brand loyalty increased, information seeking activities declined. Roselius investigated 11 risk reduction methods (brand loyalty, moneyback guarantees, free samples, word-of-mouth, and the like) for four kinds of risk: time loss, ego loss, money loss, and hazard loss. He found that consumers utilize different risk reduction strategies for different types of loss, with brand loyalty and the purchase of a major name brand being the major risk reduction methods. He also found that high risk perceivers tended to have different preferences for risk reduction methods than did lower risk perceivers.

The amount of risk perceived in a choice situation and types of risk reduction strategies utilized to deal with the risk varies depending on self-esteem (confidence). "Self-esteem" may vary across

different areas of experience and according to sex, age, and other role-defining conditions (Coopersmith, 1967, p. 6). Self-esteem refers to the evaluation which the individual makes and customarily maintains with regard to himself (Coopersmith, 1967, p. 4). Specific self-confidence refers to an individual's assessment of his confidence in handling a specific task or solving a specific problem (Cunningham, 1967).

Based on Fischer's theory of anxiety (Fischer, 1970) and on Coopersmith's conceptualization of self-esteem, Taylor (1974) states that "self-esteem contributes to the amount of anxiety that results from perceptions of the situation" and that self-esteem is "instrumental in selecting appropriate risk reduction strategies." Cunningham (1967a), in his study dealing with frequently purchased items usually sold through supermarkets with some 1,200 housewives as subjects, found that specific self-confidence was related to perceived risk. He also suggested that "the perception of risk is unique to each individual." Cox and Bauer (1964) asked subjects to indicate how confident they were in rating the durability of a brand of nylon stocking after they have evaluated them on specific characteristics. They found that the degree of confidence on the new information varied depending upon an individual's specific self-confidence and her ability to judge the information source.

Cox (1967) has developed the hypothesis that perceived risk involves two aspects of risk and that perceived risks are multi-dimensional. The conceptualization that any choice situation involves uncertainty about the outcome and uncertainty about consequence has

been commonly accepted and/or utilized by many researchers in their studies dealing with consumer risk behavior (Taylor, 1974; Cunningham, 1967; Bonoma and Johnston, 1979; Cox, 1967; and Jacoby and Kaplan, 1972). The concept, uncertainty, refers to the certainty of an event happening. The concept, consequence, refers to the consequences of making a mistake, for example, "How important is the possible loss?" Arndt (1967), in his study dealing with the introduction of a new brand of coffee, has considered the relationship between uncertainty and consequences as multiplicative.

The conceptualization that perceived risk is a multidimensional phenomenon has also been widely accepted and/or utilized by many researchers in their studies dealing with consumer risk behavior. Taylor (1974) has conceptualized perceived risk as two-dimensional, psycho/social loss, and functional/economic loss, and Roselius (1971), as four-dimensional: time loss, hazard loss, ego loss, and money loss. The operational definitions of the four dimensions of risk in the Roselius study (Roselius, 1971, p. 58) were as follows:

1. Time loss: When some products fail, we waste time, convenience, and effort getting it adjusted, repaired, or replaced.
2. Hazard loss: Some products are dangerous to our health or safety when they fail.
3. Ego loss: Sometimes when we buy a product that turns out to be defective, we feel foolish, or other people make us feel foolish.

4. Money loss: When some products fail, our loss is the money it takes to make the product work properly, or to replace it with a satisfactory product.

Jacoby and Kaplan (1972) identified the various types of risk utilized in the literature and found six types: financial, performance, physical, psychological, social, and time risks. They contended that the six dimensions of risk could be viewed as functionally independent. The operational definitions of the dimensions of risk identified were as follows:

1. Financial risk: What are the chances that you stand to lose money if you try an unfamiliar brand of \_\_\_\_ (either because it won't work at all, or because it costs more than it should to keep it in good shape)?
2. Performance risk: What is the likelihood that there will be something wrong with unfamiliar brand of \_\_\_\_ or that it will not work properly?
3. Physical risk: What are the chances that an unfamiliar brand of \_\_\_\_ may not be safe; i.e., may be (or become) harmful or injurious to your health?
4. Psychological risk: What are the chances that an unfamiliar brand of \_\_\_\_ will not fit in well with your self-image or self-concept (i.e., the way you think about yourself)?
5. Social risk: What are the chances that an unfamiliar brand of \_\_\_\_ will affect the way others think of you?

They have suggested as a measurement method a nine-point semantic differential scale using such adjectives as high and low.

The Taylor's risk theory further postulates that to reduce uncertainty about the outcome, consumers search and interpret information, and that to reduce uncertainty about the consequences, consumers reduce the amount of consequences at stake or put off the choice. Consumers' information searching behavior is described in detail in the following section.

Search. Much of the research in the adoption of innovations have focused on identifying opinion leaders with the purpose to facilitate the innovation diffusion process based on the traditionally defined concept of the two-step flow of communication. The terminology, "opinion leaders," was first introduced by Lazarsfeld, Berelson and Gandlet (1948) in their study investigating the communication patterns affecting the 1940 presidential election. The origin of this concept is based on an empirical rather than a theoretical ground.

Ryan and Gross (1943), in their classical study of the adoption of hybrid seed corn among farmers in two Iowa communities, found that the information concerning the seed was first transmitted to farmers by company salesmen, but in deciding whether or not to adopt it, farmers relied on the opinions of certain members in their communities. Another classical study, by Coleman, Katz, and Herbert (1957) investigating the adoption of a new drug among physicians, has established the relationship between opinion leaders and innovativeness. They observed a phenomenon that the number of physicians adopting the new drug each month had increased in proportion to those who had already adopted the drug.

However, Arndt (1967b, 1967c), in his study of a new brand of coffee and in his survey of the literature, suggested that the concept

of opinion leaders based on the two-step follow communication conceptualization tended to reflect "exchanges of opinion more than attempts to control the purchasing actions of the receivers of word of mouth." He further noted that "the word of mouth . . . may be best explained as seeking social support for adoption or nonadoption and risk reduction by group action."

The basic concepts of the theory of the communication process are that there exist different channels of information, that different channels are viewed differently in terms of the prepotency to reduce different types of risk, and that consumers use different channels for different problems. How an individual utilizes the communication process in a problem situation is very complex. Specifically, the questions are: What types of communication channels does an individual utilize in a specific problem situation? Does he use only one channel or a combination of channels? How does he evaluate and/or interpret one channel against another in terms of its prepotency and/or credibility to reduce different types of risk? How much information does he seek? Are the patterns of communication process behavior a product-specific and/or a person-specific?

Much of the research in this area appears to suggest that information search takes place when an individual perceives risk in a problem situation due to the insufficiency and/or the irrelevancy of the information required to make a rational decision, rational at least from his own subjective perspective. Katona and Mueller (1955) suggested that more search would take place if the product is new, if formerly acquired experience is no longer relevant because of changed

requirements, and if an individual has little or no relevant experience bearing on the purchase situation. Bucklin (1966) contended that an individual would search more when he initially knows little about the product. Bucklin (1965) suggested that the longer the interpurchase interval, the higher the probability that search will occur as the amount of time that elapses between purchases affects the appropriateness of stored information. Katona (1975) indicated that the greater the rate of change in the brand mix, the higher the probability that search will occur. May (1969) and Swan (1969) indicated that the more the present purchase problem was perceived to be dissimilar over time, the greater the probability that search will occur. William (1961) suggested that consumers' communication process behavior was a function of their awareness. Bauer (1960) suggested that consumers' communication behavior is a function of risk perceived in a particular purchase.

Much of the research in the area evidences that consumers have proclivities to engage in an extensive search for information when social and psychological risk are perceived in a particular purchase situation, that is, "What other people think of me?" Katona (1975) suggested that even in the case of a purchase requiring small expenditures such as a dress, or a present for a special occasion, consumers would engage in active search if social risk is perceived in a particular purchase situation. Marklin (1974) indicated that when an individual perceives a discrepancy between his intended behavior and that his regular or normal reference group would perceive as appropriate behavior, he is more likely to engage in an extensive search. Howard and Sheth (1969) suggested that an individual is more



likely to engage in active search when the purchase is perceived psychologically or socially important.

Researchers in this area also have established that post choice dissonance is a factor that motivates an individual to engage in active search. Katona (1975) and Howard and Sheth (1969) suggested that an individual was more likely to engage in extensive search when past experience or information had subsequently proved to be inadequate or unsatisfactory. Newman and Staelin (1971) found that satisfied customers with broken products spend less decision time.

Numerous research in this area also appear to indicate that consumers' communication process behavior is also related to their caution oriented behavior, that is, a safety oriented behavior in which he desires to minimize perceived risk by one strategy or another, or at least to maintain status quo in dealing with perceived risk in a purchase situation. Carman (1970) reported that working wives tended to be more brand loyal than nonworking wives and spend less time grocery shopping. Roselius (1971) indicated that brand commitment and purchasing major national brands are related to consumers' desire to reduce perceived risk of time loss. Markin (1974) suggested that consumers would engage in a greater degree of information processing when "the consumer's feelings and expectations about future are clouded or uncertain." Myers (1967) reported that working wives were less inclined to adopt new brands. Howard and Sheth (1969) suggested that buyers under time pressure were less apt to adopt new brands. One possible explanation underlying this phenomena might be that an individual's situational constraints, specifically time in this case,

do not allow him to engage in active search that may help reduce perceived risk to a level he is comfortable with to make a decision. Therefore, by relying on his habitual or routine response behavior, he can at least minimize perceived risk or maintain status quo in that aspect. Kuehn (1962) found that the lower the probability of repeat purchase, the greater the probability that search would occur. Katona and Mueller (1975) indicated that when consumers felt an urgent need for a product, the extent of search decreased.

It has so far been numerated that the major factors that may motivate search are: (1) the quantity and quality of existing information, (2) different types of perceived risk, and (3) situational elements. The second question to raise is now then how consumers make use of different channels of communication. Katz and Lazarsfeld (1955), in their study investigating the roles of alternative sources of information and influence, suggested that in the purchase of food items and household products, new fashion items, and in movie attendance, personal sources tended to be more important than any other single medium of influence. Newman and Staelin (1973), in their study investigating information sources used in the purchase of automobiles and six major appliances, concluded that "several types of sources play important and complementary roles" and that "the number and kinds of sources vary according to the buyer's perceived need for information and the ability to meet his need through search." Arndt (1968), in his study of a new brand of coffee, found that the amount of perceived risk was closely related to the use of word of mouth communication. Cunningham (1967c), in his study of headache remedies, fabric softeners,

and dry spaghetti, reported similar findings. These findings appear to suggest that consumers utilize different channels of information for different products. Woodruff (1972) found that different channels of information produce different effects on the nature and structure of consumer uncertainty.

It is now rather evident that consumers' communication process behavior is product-specific. The final question to raise is now then whether consumers' communication process is person-specific. Substantial research in this area appears to support that the process is person-specific. Rogers and Shoemaker (1971), through their extensive survey of the literature in the area, reports that innovators tend to rely more heavily on impersonal sources of information whereas non-innovators rely more often on personal sources of information for decision making. Research in this area shows that consumers who have higher proclivities to engage in search have the following characteristics: higher confidence (Green, 1966), open minded (Green, 1966), independent (Brim et al., 1962), "mother" type women (Bucklin, 1969), under 35 years of age, and in the middle-income category (Katona and Mueller, 1955), and education beyond high school (Newman and Staelin, 1972).

Based on the theory of perceived risk and numerous research findings so far illustrated, the author presents a model of the conceptualization of information seeking (see Figure II-5), which will serve as the second theoretical framework of this study.

"Behavior begins with the triggering of problem recognition" (EKB, 1978). Problem recognition basically arises when an individual

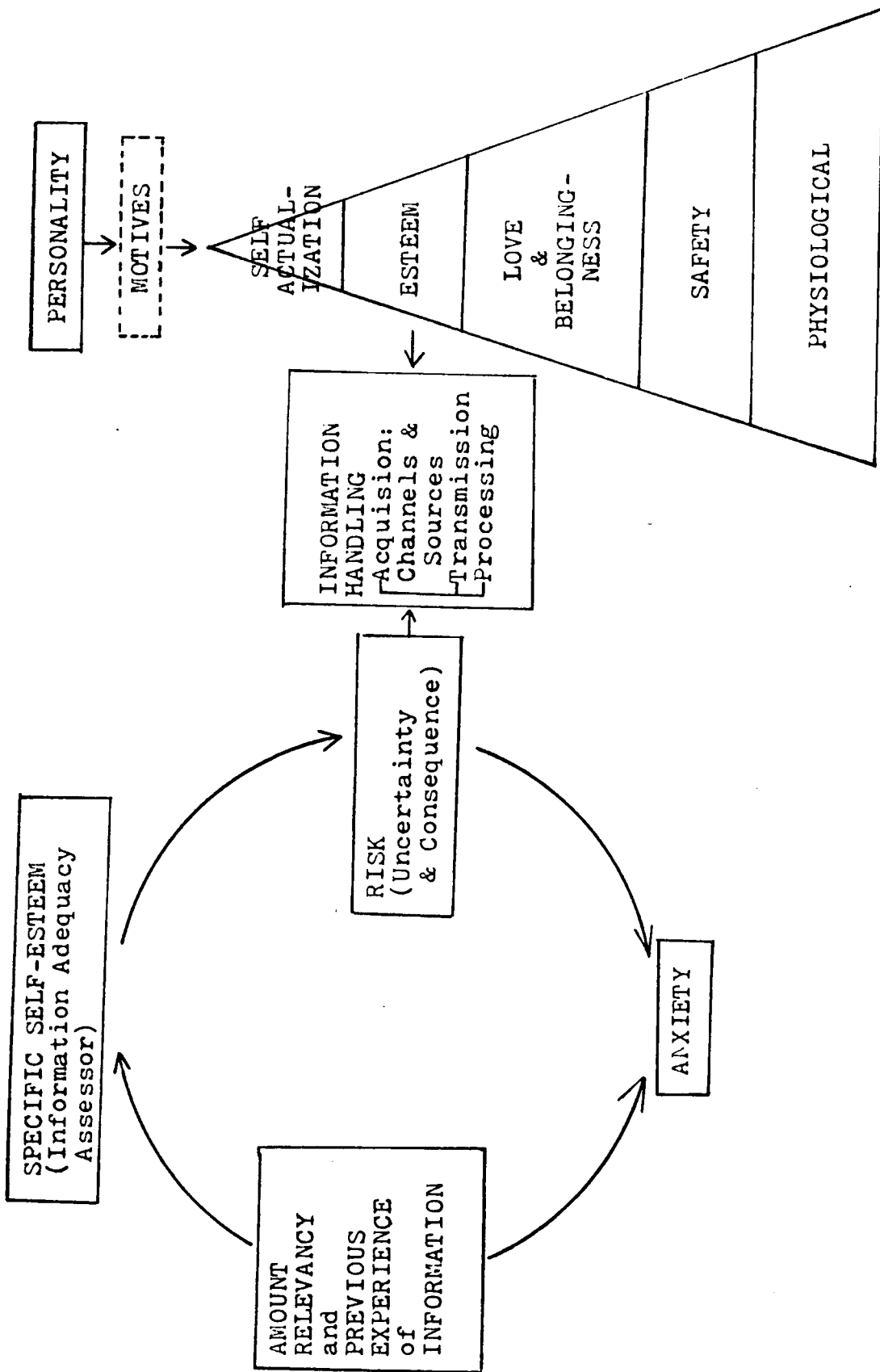


Figure II-5. Conceptualization of information seeking.

perceives certain needs to be fulfilled, which is basically derived from the motives aroused. Motives are deeply imbedded in basic personality and thus are person-specific. Motives are also purposive and goal directed, and thus, specifies the types of needs to be fulfilled.

Maslow (1954) stresses that individuals are motivated to satisfy several different kinds of needs and has conceptualized the following five classes of needs in order of their prepotence: (1) physiological, (2) safety, (3) belongingness and love, (4) esteem, and (5) self-actualization. He views human behavior in dynamic and holistic terms, and therefore, his conceptual framework should not be interpreted as that only one class of needs exists for a person at any given time and that a need satisfied completely disappears giving way to the next higher need. All levels of needs may exist to some degree for the individual most of the time. Due to personal differences, the relative degree of prepotency indicated by Maslow for each of five needs may differ from person to person although lower levels of needs are generally more prepotent than higher levels of needs.

An individual's information handling behavior will vary depending on the types of needs to be fulfilled, which is specified by the motives aroused. The manner in which he seeks information also varies depending upon the quality and quantity of information one has over a particular purchase situation, which is assessed through the mechanism of specific self-esteem. The manner in which he seeks information also varies according to his personality. Perceived risk is positively related to anxiety and is negatively related to self-esteem and risk taking (Schaninger, 1976).

Perceived Characteristics of Innovation. Some innovations are more readily adopted and diffused than others among the members of a social system due to certain perceived product attributes. Yet, most of the research investigating the rate of adoption of innovations has been concerned primarily with studying such factors as personality characteristics, demographics, communication or influence flows, or social or cultural norms within the social system (Pizano, 1972; Bell, 1963; Midgley, 1974; Robertson and Kennedy, 1968). Almost 4,000 of 6,811 studies collected by the Michigan State University Diffusion Center have related innovativeness to such variables as personality characteristics, system norms and other system variables, or communication channel usage whereas only 82 of the 6,811 studies have dealt with perceived innovation attributes (Rogers and Shoemaker, 1971, pp. 72-73).

One of the tenable reasons for the disproportional research efforts on one type of research appears to be related to the implicit assumptions that most of the innovations are the same in terms of their perceived attributes and thus interchangeable, and that perceived innovation differences have little or no influence on an individual's innovativeness. These implicit assumptions are not only dangerous but also illogical from a commonly accepted theoretical perspective of general consumer behavior.

An individual forms a favorable or unfavorable attitude toward an innovation based on the perceived attributes of the innovation assessed by certain evaluative criteria important to the individual. The properties of an innovation are not necessarily perceived equally among different individuals. Furthermore, perceived attributes of an

innovation deemed to be important in the adoption of an innovation may differ from one innovation to another and from one individual to another. Thus, an individual's relative time of adoption of an innovation can be, to a considerable extent, influenced by his perception of an innovation's attributes.

Rogers and Shoemaker (1971, pp. 143-157) have proposed in their model of the innovation decision process five perceived attributes of innovations that are supposed to provide the framework for the evaluation of an innovation by the potential adopters. The five perceived attributes of innovations are: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability. Rogers and Shoemaker defined and conceptualized each of the five perceived attributes, their functioning and subdimensions as follows.

**Relative Advantage:** Relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. In a general sense, it implies the intensity of the reward or punishment resulting from adoption of an innovation. Although there may exist various subdimensions of relative advantage, Rogers listed such examples as the degree of economic profitability, low initial cost, lower perceived risk, a decrease in discomfort, a savings in time and effort, and the immediacy of the reward. The specific type of relative advantage deemed important to adopters may vary depending on the nature of the innovation (Wilkening and Johnson, 1961).

**Compatibility:** Compatibility is the degree to which an innovation is perceived as consistent with the existing values, past

experience, and needs of the receivers. Compatibility, in one sense, provides a basis with which an individual assesses an innovation in terms that are meaningful, important and/or familiar to him. Rogers suggested for subdimensions of compatibility such examples as compatibility in terms of sociocultural values and beliefs, of previously introduced ideas, or of client needs for innovations. As in the case of relative advantage, the specific type of the subdimensions of compatibility considered important may vary depending on the nature of the innovations and may vary across product categories.

**Complexity:** Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use.

**Trialability:** Trialability is the degree to which an innovation may be experimented with on a limited basis. An innovation that can be tried on a limited basis is less risky for the adopters and has a better chance to be adopted more rapidly than innovations that are not divisible.

Rogers and Shoemaker (1971, p. 155) suggested, based on evidence from several studies in this area, that early adopters might perceive trialability as more important than late adopters since early adopters had no precedent to follow at the time of their adoption.

**Observability:** Observability is the degree to which the results of an innovation are visible to others. Some innovations, especially conspicuous innovations, are readily observed and communicated whereas others are difficult in communicability. Rogers (1971, p. 157) suggests that differences in observability from innovation to innovation are an important factor mediating the rate of adoption of an innovation.



The Rogers' five perceived attributes of innovations are basically derived from the studies of rural sociologists investigating the adoption of farm related innovations by farmers. It is thus somewhat questionable whether the five attributes are also the most generalized and relevant for the innovations other than farm related innovations. At this point of the research development, it seems to be a more logical approach for innovation studies to also explore the perceived attributes other than the five attributes, utilizing the five attributes as a subset of the composite attributes.

Table II-1 presents the findings of eight different investigations showing the relationships between perceived product attributes and innovativeness. These studies have been successful in explaining from 49% to 87% of the variance in the rate of adoption and generally confirm the importance of the Rogers' five perceived innovation attributes in relation to the rate of adoption.

Rogers and Shoemaker (1971, pp. 135-169) suggested, based on the available research evidence, the following generalizations on the relationships between the five perceived attributes and innovativeness: (1) the relative advantage of a new idea, as perceived by members of a social system, is positively related to its rate of adoption, (2) the compatibility of a new idea, as perceived by members of a social system, is positively related to its rate of adoption, (3) the complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption, (4) the trialability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption, and (5) the observability of an

TABLE II-1  
PERCEIVED ATTRIBUTES OF INNOVATIONS AND THEIR RATE OF ADOPTION

| Author(s) of Investigations                                              | Type of Respondents                                               | Number of Innovations Studied | Number of Attributes of Innovations Measured | Percentage of Variance in Rate of Adoption Explained | Attributes of Innovations Found to Be Significant Related to Rate of Adoption                                                                 |
|--------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------|----------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Kivlin (1960); Fliegel and Kivlin (1962a); Fliegel and Kivlin (1962b) | 229 Pennsylvania farmers                                          | 43                            | 11                                           | 51                                                   | 1. Relative advantage<br>2. Compatibility<br>3. Complexity                                                                                    |
| 2. Tucker (1961)                                                         | 88 Ohio farmers                                                   | 13                            | 6                                            | --                                                   | None                                                                                                                                          |
| 3. Mansfield (1961)                                                      | Coal, steel, brewing, and railroad firms                          | 12                            | 2                                            | 50                                                   | 1. Relative advantage (profit ability)<br>2. Observability (rate of interaction about the innovation among the adopters)                      |
| 4. Fliegel and Kivlin (1966a)                                            | 229 Pennsylvania farmers                                          | 33                            | 15                                           | 51                                                   | 1. Trialability<br>2. Relative advantage (initial cost)                                                                                       |
| 5. Petrini (1966a)                                                       | 1,845 Swedish farmers                                             | 14                            | 2                                            | 71                                                   | 1. Relative advantage<br>2. Complexity                                                                                                        |
| 6. Singh (1966a)                                                         | 130 Canadian farmers                                              | 22                            | 10                                           | 87                                                   | 1. Relative advantage (rate of cost recovery, financial return, and low initial cost)<br>2. Complexity<br>3. Trialability<br>4. Observability |
| 7. Kivlin and Fliegel (1967a); Kivlin and Fliegel (1967b)                | 80 Small-scale Pennsylvania farmers (and 229 large-scale farmers) | 33                            | 15                                           | 51                                                   | 1. Relative advantage (savings and discomfort)                                                                                                |

TABLE II-1 (continued)

| Author(s) of<br>Investigations  | Type of<br>Respondents                  | Number of<br>Innovations<br>Studied | Number of<br>Attributes of<br>Innovations<br>Measured | Percentage of<br>Variance in<br>Rate of Adoption<br>Explained | Attributes of Innovations<br>Found to Be Significant<br>Related to Rate of Adoption                                               |
|---------------------------------|-----------------------------------------|-------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 8. Fliege] and others<br>(1968) | 387 Indian peasants                     | 50                                  | 12                                                    | 58                                                            | 1. Relative advantage<br>(social approval, con-<br>tinuing cost, and time-<br>saving)<br>2. Observability (clarity of<br>results) |
|                                 | 80 Small-scale<br>Pennsylvania farmers  | 33                                  | 12                                                    | 62                                                            | 1. Relative advantage<br>(savings of discomfort,<br>payoff, and time-saving)                                                      |
|                                 | 229 Large-scale<br>Pennsylvania farmers | 33                                  | 12                                                    | 49                                                            | 1. Trialability<br>2. Relative advantage<br>(initial cost)                                                                        |

Source: Rogers and Shoemaker, 1971.

innovation, as perceived by members of a social system, is positively related to its rate of adoption.

In the field of marketing, very few studies exist that have focused on the attributes of innovations as perceived by potential adopters. The few relevant studies which exist appear to indicate that perceived innovation attributes are important predictor variables, as in the case of the research studies on farm related innovations.

Ostlund (1974) in his two studies wherein the Rogers' five perceived innovation attributes were used to predict the innovativeness of housewives reported that the perceptions of innovations by potential adopters could be very effective predictors of innovativeness, far more so than commonly used personal characteristics. Donnelly and Etzel (1975) in their study investigating 250 housewives' purchases of twenty new supermarket products also reported findings somewhat similar to Ostlund's. Their study further suggests that different groups of individuals may be early adopters for different products depending on the product attributes, and that the attributes of the product may be as important as behavioral and demographic factors in identifying early triers.

In general, the findings of few available marketing studies in this area appear to indicate that perceived innovation attributes are as important predictors of innovativeness as personal characteristics, however we are far from reaching a clear understanding of what types and how many perceived innovation attributes we need to conceptualize.

Decision. In the decision stage, the individual engages in activities that lead to a choice to adopt or reject the innovation. The

individual makes a choice based on his buying intentions (the subjective probability that a specified alternative will be chosen) and unanticipated circumstances (an expected change in status of income levels, available alternatives, time pressure, social and organization setting, and other environmental influences at the time of choice).

Most individuals are not apt to adopt an innovation without trying it on a small scale. This small-scale trial may involve not only actual trial but also vicarious trial by observing the trials of others.

The probationary trial provides an opportunity to determine the utility of an innovation in their own situation, and to a degree, to verify the beliefs held concerning the certain attributes of an innovation. The probationary trial is often part of the decision to adopt, and provides a means to minimize the perceived risk of the innovation for the adopters. Innovations which can be divided for trial are generally adopted more rapidly. The trial of innovations can sometimes be facilitated by the distribution of free samples.

As indicated in Figure II-3 (p. 25), the outcome of the decision can lead to either rejection or adoption. Adoption can be continuous or may lead to later discontinuance. Likewise, rejection can be continuous or may be reversed for later adoption.

Rogers and Shoemaker (1971, p. 116) suggest that there are at least two types of discontinuances: replacement and disenchantment. A replacement discontinuance is a decision to discontinue using an innovation in order to adopt a better innovation which supersedes it. A disenchantment discontinuance is a decision to discontinue using an innovation as a result of dissatisfaction with its performance.

The dissatisfaction may be brought about because of the innovation's inappropriateness for the individual, or from the misuse of an innovation due to his improper understanding of the functions of the innovation. Rogers (1971, p. 177) suggests that the latter type of disenchantment is more likely among late adopters than early adopters.

Confirmation. In the confirmation stage, the individual seeks reinforcement for an innovation decision he has made. Several research studies (Mason, 1962a; Francis and Rogers, 1960) indicate that an individual seeks information after deciding to adopt as well as before.

The input of information after deciding to adopt serves to either confirm or not confirm a decision already made. If confirmed, the decision becomes a part of a long-term memory, and used as a solution to similar future problems. If not confirmed, the individual may reverse his previous decision by discontinuing the innovation. In case the individual cannot reverse his previous decision due to the particular nature of an innovation, he tries to avoid or reduce a state of dissonance by seeking only that information which he expects will support a decision already made. Throughout the confirmation stage, the individual seeks to eliminate a state of internal disequilibrium or to reduce it if it occurs.

### Innovation

Throughout the literature in the diffusion and adoption of innovation, an innovation has been defined in numerous ways. In a search of the literature, Kroeber and Kluckhohn (1952) reported that there were at least 45 definitions of innovations.

In the field of marketing, the following definitions of innovations have been often cited:

1. An innovation is an idea, practice, or object perceived as new by an individual (Rogers and Shoemaker, 1971, p. 19).
2. An innovation is any form of a product or service that has recently become available in the market for the first time (Kelly, 1966; Frank et al., 1964).
3. An innovation is any product that has achieved less than x percentage of marketing penetration (Lazer and Bell, 1966).
4. Robertson's (1971, p. 4) four definitional criteria of innovation. (1) newness from existing products, (2) newness in time, (3) newness in terms of sales penetration level, and (4) consumer newness to the product.

Different definitions of an innovation obviously reflects different forms and/or ranges of newness, and thus, may lead to the measurement of different constructs of innovativeness when operationalized; all new products are not equally new. Therefore, innovator characteristics found to exist for certain types of innovations using a particular definition of an innovation should not be generalized to all types of innovations.

For the purpose of this research, the most commonly accepted definition of an innovation (first definition listed above) is employed. In this definition, for an idea, practice, or object to be an innovation, it has to be subjectively perceived as new regardless of objective newness as measured by the lapse of time since its first use or discovery. It is the subjective newness that determines an

individual's reaction to an innovation. If an idea, practice, or object seems new to the individual, it is an innovation.

### Innovativeness

The fundamental tenet of the diffusion process is that acceptance of a new idea does not come all at once in a social system. Rather, individuals in a social system adopt in an ordered time sequence and may be classified into adopter categories based on their relative time of adoption.

A number of studies has generally shown that the adoption of an innovation follows a normal distribution curve when plotted overtime on a frequency basis (Mansfield, 1961; Coleman, Katz, and Menzel, 1957). Aside from the empirical evidence, a normality property in adopter distribution can be supported by the theory of a learning process and diffusion effect, defined as the cumulatively increasing degree of influence upon an individual within a social system to adopt or reject an innovation.

Figure II-6 presents the most commonly accepted adoption curve, the one proposed by Rogers. The curve assumes normal adopter distributions and classifies individuals' innovativeness in five categories by use of standard deviations from the average time of adoption.

Relative time of adoption is one of the two main techniques most prevalently used in the marketing literature to measure innovativeness. The other technique is the cross sectional method.

In the first technique, early adopters are defined as those who purchase in a certain time period after product launch or those who constitute the first x percent of a given market to purchase. For



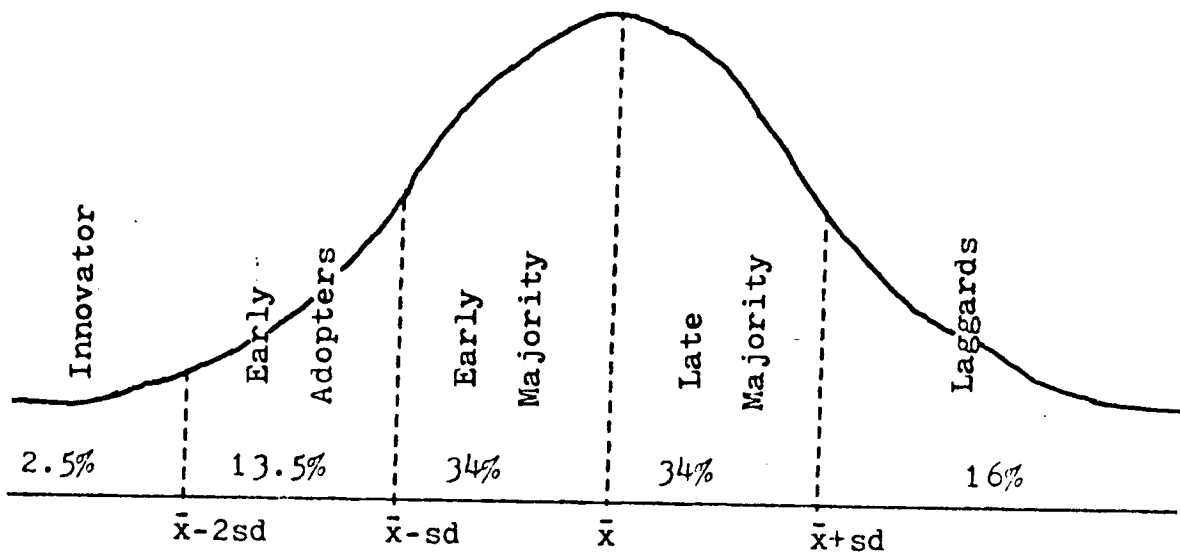


Figure II-6. Adopter categorization on the basis of innovativeness.

Note: The innovativeness dimension, as measured by the time at which an individual adopts an innovation or innovations, is continuous. However, this variable may be partitioned into five adopter categories by laying off standard deviations from the average time of adoption.

Source: Rogers and Shoemaker, 1971.

example, Feldman and Armstrong (1975) defined "early buyers" as the first 2,500 to purchase an automobile innovation. Robertson (1968a), and Robertson and Kennedy (1969) used the first 10% of a given market to purchase. Donnelly and Ivancevich (1974) defined innovators as those who purchased in the first three months. Peat, Gentry, and Brown (1975) defined innovators as those who purchased in the first four months. Rogers (see Figure II-6) defines innovators as the first 2.5% of the individuals to adopt an innovation.

There is no right or absolute number of adopter categories that is best for all innovations, provided that they are, ideally speaking, mutually exclusive, and exhaustive, and are derived from one classificatory principle (Jahoda et al., 1951, p. 264).

For the purpose of this research, the author has defined (1) early adopters as those who adopted V-24 in the first three months after the issuance of the first V-24 card, (2) late adopters as those who adopted V-24 between two years and three months after the issuance of the first V-24 card and up to the time this research was initiated (September, 1980), and (3) nonadopters as those who are aware of the existence of V-24 but who have never used it or discontinued using it. These definitions were considered most appropriate, given the time period elapsed from the first issuance of V-24 card and for the objectives of this research.

In the cross sectional method, a respondent is given a list of prespecified new products generally in a product category, and is required to check whatever the items he owns on the list. The cross sectional method is more appropriate when research interest lies in

measuring innovativeness over products in a product category or across product categories, whereas the relative time method is most often used to measure innovativeness with regard to a specific new product.

The concept, innovativeness, defined most commonly as the degree to which an individual is relatively earlier in actual time of adopting an innovation than other members of his system (Rogers and Shoemaker, 1971), is central to the research of the adoption and diffusion of innovations. The major assumptions underlying the studies are that (1) innovators differ from noninnovators in certain persisting personal characteristics such as empathy, dogmatism, achievement motivation, intelligence, self-monitoring, social participation, social integration, cosmopolitan, education, etc., and that (2) those persisting personal characteristics found to be relevant will be applicable to market research and a variety of managerial purpose such as product development, market segmentation, media selection, promotional campaign, etc.

Based on these assumptions, a great deal of research efforts have been focused on determining those persisting personal characteristics associated with early adopters of an innovation. For example, numerous studies have been conducted in an attempt to relate innovativeness to such personal characteristics as income (Bell, 1964; Coleman, 1960; Hayes, 1959), education (Hayes, 1959), age (Rogers, 1962), magazine readership (Rogers and Stanfield, 1968), group participation (Robertson, 1968b), social mobility; movement on the societal status hierarchy (Opinion Research Corporation, 1959), motivation for achievement, dominance, change, and exploration (White, 1966), inner versus outer directedness; predisposition to rely on internal or external

standards and values to guide one's behavior (Donnelly, 1970; Donnelly and Ivancevich, 1974), attitude toward innovations (Rogers, 1962), venturesomeness (Robertson and Kennedy, 1968; Popielarz, 1967; Robertson, 1968a), dogmatism (Kenneth, 1972; Blake, Brian, Perloff, and Heslin, 1970; Jacoby, 1971), dissemination of information (Engel, Kegerreis, and Blackwell, 1969), and status concern; the person's need to be noticed and admired (Bourne, 1957; Whyte, 1954).

Table II-2 presents a summary of the findings of a number of these studies. While these studies provide valuable insight into the relationship between innovativeness and personal characteristics, they have also initiated considerable ambiguity due to the numerous contradictory findings.

One of the logical explanations for these contradictory findings appears to be an improper conceptualization of the model of innovativeness. The most frequently used model of innovativeness in the field of marketing views innovativeness as a function of persisting personal characteristics. The model assumes that innovators have certain distinguishable persisting personal characteristics that are different from noninnovators. This conceptualization virtually implies that the person who is an innovator for one product would also be the innovator for other products because of his certain personality traits. Furthermore, the model implicitly ignores the presence of such intervening variables as interpersonal communication, perceived product attributes, product interest, and situational factors and their impact upon new product decision making. Situational factors in general involve such factors as unanticipated circumstances (an unexpected change in status

TABLE II-2  
FACTORS RELATED TO CONSUMER INNOVATIVENESS  
ACROSS PRODUCT CATEGORIES

| Factor                                                  | Number of Studies and Relationships Shown* |      |          |
|---------------------------------------------------------|--------------------------------------------|------|----------|
|                                                         | Positive                                   | None | Negative |
| <u>Demographic Factors</u>                              |                                            |      |          |
| Age                                                     | 1                                          | 6    | 4        |
| Education                                               | 7                                          | 3    | 0        |
| Income                                                  | 9                                          | 4    | 0        |
| Occupational Status                                     | 6                                          | 5    | 0        |
| Number of Children                                      | 1                                          | 8    | 1        |
| <u>Communication Behavior</u>                           |                                            |      |          |
| Print Readership                                        | 7                                          | 2    | 0        |
| Television Viewership                                   | 1                                          | 3    | 1        |
| <u>Social Interaction Factors</u>                       |                                            |      |          |
| Social Participation:                                   |                                            |      |          |
| Informal                                                | 6                                          | 6    | 0        |
| Formal                                                  | 4                                          | 3    | 0        |
| Opinion Leadership                                      | 10                                         | 3    | 0        |
| Cosmopolitanism                                         | 1                                          | 3    | 0        |
| Social Mobility                                         | 4                                          | 0    | 0        |
| Norm on Innovation                                      | 6                                          | 0    | 0        |
| <u>Attitudinal, Perceptual, and Personality Factors</u> |                                            |      |          |
| Venturesomeness                                         | 5                                          | 0    | 0        |
| Perceived Risk                                          | 0                                          | 4    | 5        |
| Self-Perception of Innovativeness                       | 2                                          | 0    | 0        |
| Personality:                                            |                                            |      |          |
| Inventories**                                           | 2                                          | 3    | 0        |
| Other-Directedness                                      | 1                                          | 5    | 0        |
| Generalized Self-Confidence                             | 1                                          | 1    | 0        |
| Attitude toward Innovations                             | 8                                          | 0    | 0        |
| <u>Value Factors</u>                                    |                                            |      |          |
| Religious Participation                                 | 0                                          | 1    | 1        |
| Values                                                  | 1                                          | 0    | 0        |

TABLE II-2 (continued)

| Factor                          | Number of Studies and Relationships Shown* |      |          |
|---------------------------------|--------------------------------------------|------|----------|
|                                 | Positive                                   | None | Negative |
| <u>Consumption Patterns</u>     |                                            |      |          |
| Product Category Usage Rate     | 7                                          | 1    | 0        |
| Number of Stores Shopped        | 1                                          | 0    | 1        |
| Willingness to Try New Products | 4                                          | 1    | 0        |
| Brand Loyalty                   | 0                                          | 1    | 3        |

\*In the derivation of this table, a number of judgments had to be made. Not all studies reported significance levels of results, and a variety of statistical techniques was used when significance levels were reported. Certain definitional difficulties were also involved since what appeared to be equivalent concepts were not always presented as such or, operational definitions did not always suggest equivalent concepts.

\*\*By personality "inventories" is meant administration of instruments measuring a variety of traits. Other studies discussed in this chapter have sometimes shown specific variables to be related to personality.

Source: Robertson, 1971.

of income levels, available alternatives, time pressure, social or organizational setting, and other environmental influences at the time of choice), anticipated circumstances (the expected status of income levels, available alternatives, time pressure, social and organizational setting, and other environmental influences at the time of choice) or a need for an innovation.

If the commonly held conceptualization that general consumer behavior is a stimulus-organism-response (see Figure II-2, p. 23), as reflected in EKB consumer behavior model (see Figure II-7), has any validity in it, what most of these studies have measured may not be the innovativeness influenced solely by personal characteristics but rather that influenced by the interaction between personal characteristics and intervening variables. The findings shown in Table II-2 would be less ambiguous in its ability to explain innovativeness if the intervening variables that influenced and/or interacted with personal characteristics are accounted for.

Some examples from the literature may serve to facilitate the logics of utilizing intervening variables in the model of innovativeness. Pessemier, Burger, and Tigert (1967) found that most innovators of a new heavy duty laundry detergent were of a relatively low socioeconomic background than noninnovators, whereas Robertson (1966) found quite the opposite for touch-tone telephone innovators. King (1964) found that heavy users of the product were more likely to accept a new style of millinery, whereas in the study of Frank, Massy, and Morrison (1964), this was not found to be true for heavy coffee users when faced with a new brand of coffee.

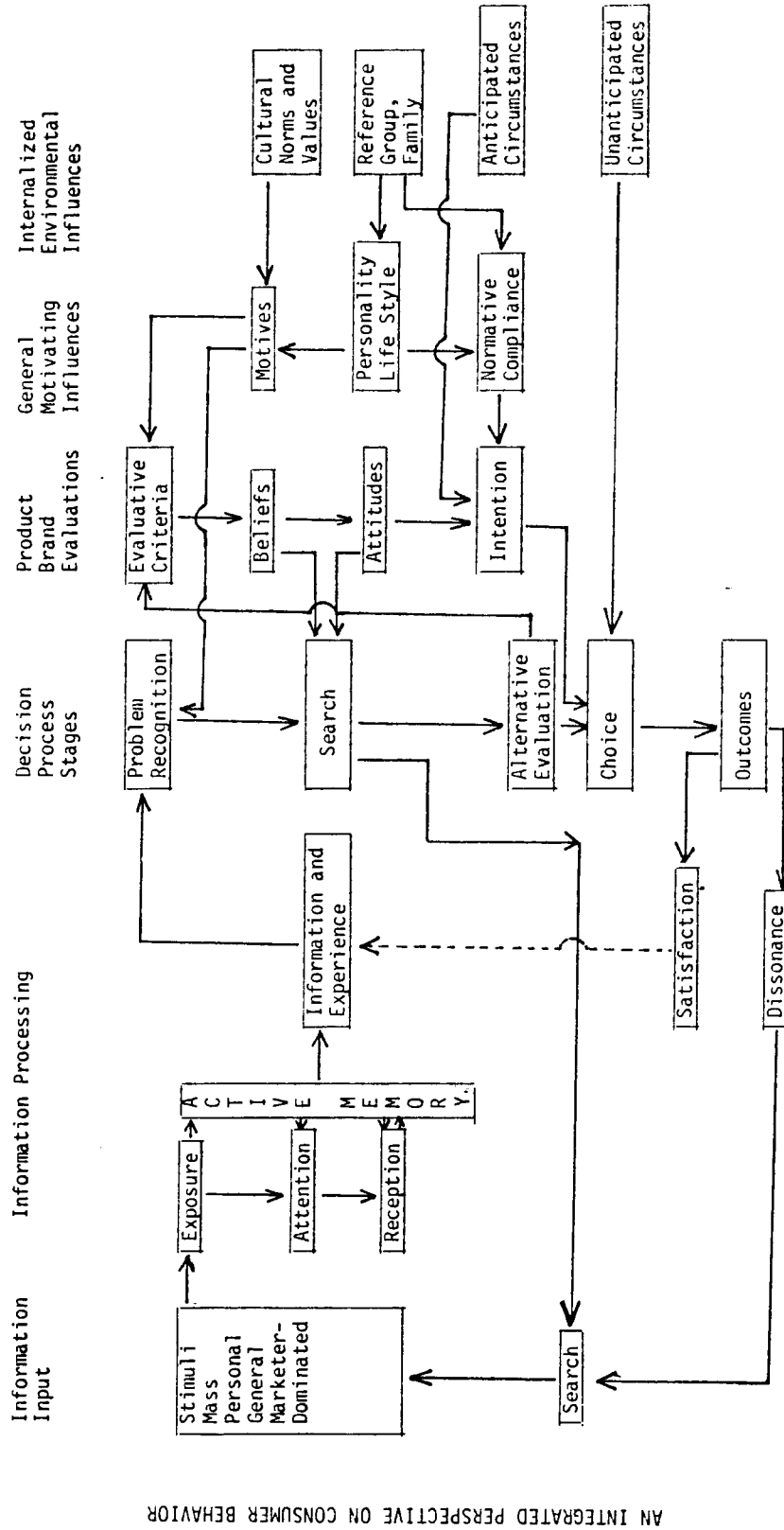


Figure II-7. The EKB model.

Source: Engel, Blackwell, and Kollat, 1978.



The findings of these four studies appear to be inconsistent and contradictory when viewed under the tenet of the conventional model of innovativeness. However, if the hypothesis that intervening variables between the personal characteristics and innovativeness do influence and/or interact with the personal characteristics is tenable, a logical inference that may explicate the ambiguity associated with these findings can be presented. Although a variety of intervening variables come into play in an innovation decision-making, two intervening variables, a latent need for an innovation and perceived product attributes may suffice for the argument to be made to a certain extent.

In terms of perceived product attributes inferrable, (1) a new heavy-duty laundry detergent might have been perceived as a thrift oriented basic necessity; (2) touch-tone telephone as a luxury item as compared to a conventional telephone; (3) a new style of millinery as a conspicuous fashion oriented item; and (4) a new brand of coffee as a low priced food item which has to be compared to a particular existing brand of coffee that one has established a particular taste for, especially from the heavy habitual usage.

In terms of a latent need for an innovation inferrable, (1) consumers in a low socioeconomic status are generally forced to make more efficient use of their low income while at the same time, a certain amount of basic necessities have to be consumed for their daily life and thus, may be more sensitive to and/or willing to try a new thrift oriented basic necessity, if perceived as such; (2) apart from one's predisposition to innovate, the income of a consumer in a low socioeconomic status may not stretch far enough to materialize one's

innovativeness over a new luxury item (even if he can afford it financially, his infelt low socioeconomic status may not likely encourage his innovativeness over a new luxury item), whereas consumers in upper socioeconomic status may see a need to innovate over a luxury item such as a touch-tone telephone in order to manifest their socioeconomic status; (3) heavy users of fashion oriented items may be more often than not more conspicuousness minded individuals than others, and since the very nature of a fashion item has its meaning and potency in the context of time, they may see a need to try a new style of millinery earlier in time; and (4) heavy coffee users may have most likely established a taste for a particular brand of coffee from habitual heavy use, and since their heavy consumption implies to a degree that they are more satisfied than dissatisfied with a particular brand of coffee, they may not see a need to switch to a new brand of coffee.

The argument so far presented is merely an inference. However, it does provide insight into how intervening variables can influence and/or interact with personal characteristics. The importance of intervening variables in the model of innovativeness was earlier suggested in Summer's study (1971) investigating the relationship between innovativeness and opinion leadership and the extent and character of generalized innovativeness. He (1971, p. 316) suggests:

. . . innovativeness may be a function both of situational variables, such as income and product involvement, and behavioral considerations. It may be that situational factors are unique to specific products and product categories and serve to constrain the individual's innovativeness to a particular area, while his behavioral (sociological, psychological, etc.) make-up influences his basic tendency to innovate.

In view of the research findings in Table II-2 (p. 57), some examples from the literature, and the arguments so far presented, the tenet of the conventional model of innovativeness appears to have much room for reevaluation for the validity of its conceptualization. Furthermore, the commonly held implicit assumption that an individual with a particular set of personal characteristics that are supposedly the profile of an innovator would be an innovator for all new products across product categories does not appear to be valid empirically or theoretically. In the empirical context, an example can be made of Robertson's rigorous assessment of the literature in the area. He concluded that the consistency of innovativeness cannot be expected across product categories, but can be expected within product categories, and, sometimes, between related product characteristics (Robertson, 1971).

In view of the present theoretical integration and a series of contradictory findings, it is perhaps too early in time to draw inexpugnable generalizations with regard to these research findings. And yet, some generalizations are warranted to improve the theoretical approach of future studies in the area and to have some insight into the properties of innovativeness. Figure II-8 presents the selected generalizations of the properties of innovativeness.

#### Automatic Teller Machine Research

There has been substantial research work in the field of EFT systems in connection with the general consumer acceptance of the new systems. However, most of the research studies have focused on assessing the general nature of consumer acceptance of EFT systems as

Earlier adopters have a shorter innovation-decision period than later adopters (5 studies, or 84%, support; 1 study does not support).

The relative advantage of a new idea, as perceived by members of a social system, is positively related to its rate of adoption (29 studies, or 67%, support; 14 studies do not support).

The compatibility of a new idea, as perceived by members of a social system, is positively related to its rate of adoption (18 studies, or 67%, support; 9 studies do not support).

The complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption (9 studies, or 56%, support; 7 studies do not support).

The trialability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (9 studies, or 69%, support; 4 studies do not support).

The observability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (7 studies, or 78%, support; 2 studies do not support).

The degree of communication integration in a social system is positively related to the rate of adoption of innovations (6 studies, or 100%, support).

Earlier adopters are no different from later adopters in age (44 studies, or 19%, show that earlier adopters are younger; 108 studies, or 48%, show no relationship; and 76 studies, or 33%, show that earlier adopters are older).

Earlier adopters have more years of education than do later adopters (203 studies, or 74%, support; 72 do not support).

Earlier adopters have higher social status than later adopters (275 studies, or 68%, support; 127 studies do not support).

Earlier adopters have a greater degree of upward social mobility than do later adopters (5 studies, or 100%, support).

Earlier adopters are more likely to have a commercial (rather than a subsistence) orientation than are later adopters (20 studies, or 71%, support; 8 studies do not support).

Earlier adopters have a more favorable attitude toward credit (borrowing money) than later adopters (19 studies, or 76%, support; 6 studies do not support).

Figure II-8. Selected generalization of the properties of innovativeness.

- Earlier adopters have more specialized operations than later adopters (9 studies, or 60%, support; 6 studies do not support).
- Earlier adopters have greater empathy than later adopters (9 studies, or 64%, support; 5 studies do not support).
- Earlier adopters are less dogmatic than later adopters (17 studies, or 47%, support; 19 studies do not support).
- Earlier adopters have a greater ability to deal with abstractions than do later adopters (5 studies, or 63%, support; 3 studies do not support).
- Earlier adopters have greater rationality than later adopters (11 studies, or 79%, support; 3 studies do not support).
- Earlier adopters have greater intelligence than later adopters (5 studies, or 100%, support).
- Earlier adopters have more favorable attitude toward change than later adopters (43 studies, or 75%, support; 14 studies do not support).
- Earlier adopters have a more favorable attitude toward risk than later adopters (27 studies, or 73%, support; 10 studies do not support).
- Earlier adopters have a more favorable attitude toward education than later adopters (25 studies, or 81%, support; 6 studies do not support).
- Earlier adopters have a more favorable attitude toward science than later adopters (20 studies, 74%, support; 7 studies do not support).
- Earlier adopters are less fatalistic than later adopters (14 studies, or 82%, support; 3 studies do not support).
- Earlier adopters have higher levels of achievement motivation than later adopters (14 studies, or 61%, support; 9 studies do not support).
- Earlier adopters have higher aspirations (for education, occupations, and so on) than later adopters (29 studies, or 74%, support, 10 studies do not support).
- Earlier adopters have more social participation than later adopters (109 studies, or 73%, support; 40 studies do not support).
- Earlier adopters are more highly integrated with the social system than later adopters (6 studies, or 100%, support).
- Earlier adopters are more cosmopolite than later adopters (132 studies, or 76%, support; 42 studies do not support).
- Earlier adopters have more change agent contact than later adopters (135 studies, or 87%, support; 21 studies do not support).

Figure II-8 (continued)

Earlier adopters have greater exposure to mass media communication channels than later adopters (80 studies, or 69%, support; 36 studies do not support).

Earlier adopters have greater exposure to interpersonal communication channels than later adopters (46 studies, or 77%, support; 14 studies do not support).

Earlier adopters seek information about innovations more than later adopters (61 studies, or 76%, support; 19 studies do not support).

Earlier adopters have greater knowledge of innovation than later adopters (61 studies, or 76%, support; 19 studies do not support).

Earlier adopters have a higher degree of opinion leadership than later adopters (42 studies, or 76%, support; 13 studies do not support).

Earlier adopters are more likely to belong to systems with modern rather than traditional norms than are later adopters (32 studies, or 70%, support; 14 studies do not support).

Earlier adopters are more likely to belong to well-integrated systems than are later adopters (8 studies, or 53%, support; 7 studies do not support).

Figure II-8 (continued)

Source: Rogers and Shoemaker, 1971.

a whole and are nonempirical nature analyzed more often from the perspective of financial institutions than from the consumer's.

The author's extensive search of the literature in the area indicates the existence of very few studies, including both empirical and nonempirical nature, that propose specifically to investigate the properties associated with the nature of consumer acceptance of ATM.

The few empirical studies that exist in the area of consumer acceptance of ATM have focused primarily on determining demographic characteristics of the users of ATMs and their general attitudes toward a few selected attributes of ATMs. Empirical research investigating the process of adoption and diffusion of ATMs on a full scale from the perspective of diffusion theory is virtually nonexistent.

Some examples of the few empirical research work above mentioned are noteworthy as they provide valuable insight into the demographic characteristics of the users of ATMs and their general attitudes toward ATMs.

Hood (1979) has carried out a study investigating whether significant differences exist among the users of ATMs in terms of their demographic characteristics. According to the study, typical ATM users appear to be young, from middle-income to high-income groups, and are male Caucasians.

In the study, the ATM users were asked to evaluate the ATM in terms of advantage, disadvantage, and the desirability of their bank having the ATM. It was found that none of the demographic factors were significantly related to the users' perception of advantages and disadvantages of the ATM, while sex was significantly related to the desirability of the respondent's bank having an ATM.

Pugh and Ingram (1978) in the survey of a consumer panel on their usage of and attitudes toward the ATM reported somewhat similar findings. Their study found that only 8% of the panel consisting of more than 800 urban households in South Carolina had ever used ATMs. These users were primarily under thirty-one years old and from middle- to high-income groups, had a relatively high education, and were generally married. The use of ATMs was found to be generally convenience oriented; only 27% of the users made their bank transactions through ATMs during regular banking hours.

With regard to nonusers of the ATM, the study reported that 42.3% indicated that present banking facilities were adequate for their purpose, 38.9% that ATMs were not available, 12.4% that they were suspicious of the new system and the possibility of its malfunctioning, 0.6% that ATMs encouraged overspending, 3% that they never heard of them, and 0.6% that ATMs are poorly located and lighted and unsafe.

Zimmer's study (1975) and the survey conducted by the Unidex Corporation (1976) on the consumer acceptance of ATM further support the study findings of Pugh and Ingram that the use of ATM is primarily convenience oriented.

According to the survey results of the Unidex Corporation, the need for convenience appears to be related to age and sex; males were more concerned with convenience factor than females while the need for convenience was more prevalent among younger people.

Another interesting finding in the survey with regard to the respondent's demographics is that income, occupation and sex were significantly related to the perceived importance of personal contact



with human tellers; male respondents and those holding professional occupations and/or with higher income viewed this human element in the banking transactions as less important.

The survey results also appear to support the suggestion frequently made by those associated with financial institutions that one of the ATM's primary benefits lies in attracting new customers; the majority of the respondents in the survey viewed the financial institution with ATM more favorably than the one without it, provided all other things are equal.

These empirical studies basically assume that some set of demographic characteristics are associated with the users of ATMs, and to a degree their research findings appear to support the assumption.

However, the particular set of demographic characteristics thus found to be associated with the users of ATMs may also be shared with nonadopters and/or late adopters of ATMs. Furthermore, these studies are not structured to detect the discrepancies in demographic characteristics between users and nonusers of ATMs, let alone late users. Therefore, findings of these studies, unlikely as they appear at par, may not be of much practical value to the users of the findings of these studies.

In order to answer such questions as (1) what are the basic underlying dimensions of innovativeness which are characteristic of early adopters, of later adopters, and of nonadopters of ATM?, (2) are there significant differences in characteristics among the three groups of consumers?, and (3) how do they go about making a decision to adopt and not to adopt?, it would be more logical to analyze the consumer

acceptance of ATM under the framework of the theory of the adoption and diffusion of innovations.

## CHAPTER III

### RESEARCH HYPOTHESES AND METHODOLOGY

As indicated in previous chapters, there has been hardly any empirical research in the area of the adoption and diffusion of service-oriented innovations. Within this context, the focus of this study is on ascertaining broad insight into the general nature of innovativeness in connection with V-24 usage.

This chapter contains seven major subsections. The first two sections describe the specific data requirements for the study and the mail survey questionnaire used in the data collecting task. The next three sections explain survey population, sample selection process and data collection, and sample size. The sixth section is concerned with the statistical procedures used in analyzing the data. The final section presents the statements of hypotheses to be tested in this study.

#### Data Requirements

As reflected in the model of the innovation-decision process (Figure II-3, p. 25) which serves as the theoretical framework of this study, and in its supporting model of information seeking behavior (Figure II-5, p. 40), the general information required to execute this study is, broadly stated, receiver variables, social systems variables (internalized environmental influences in EKB terminology), respondents' information and experience regarding general bank related services and V-24, and those variables that play a pivotal role in each of the four

adoption stages. Each category of information is briefly described in the following:

Receiver variables (personal characteristics). As was indicated in the S.O.R paradigm (Figure II-2, p. 23), it takes three basic components for a behavior to be materialized: situation, objects, and person. In this context, numerous research works have related person related variables (hereafter referred to as receiver variables) to innovativeness as was clearly evidenced in the previous chapter.

In this survey, numerous receiver variables were selected on the basis of their predictive ability of innovative behavior in previous studies. Questions regarding receiver variables include measures of the following variables:

1. Demographic factors
  - marital status
  - sex
  - ethnic background
  - family life cycle
  - type of residence
  - occupation
  - education
  - employment status
  - regular working hours
  - age
  - income

2. Social interaction factors
  - social participation
  - cosmopolitanism
  - social mobility
3. Communication behavior
  - print readership
  - exposure to news media in general
4. Proclivity to comply with prevailing social influence

Personality. Although personality is a part of receiver variables, separate attention for the variable was deemed to be warranted in view of the findings of previous studies. Kassarian (1971), in his article reviews on the relationship between consumer behavior and personality, suggested that the relationship was so weak to be questionable or perhaps meaningless. Considering the cold reality that researchers in the area are not even sure of how to logically define personality as of yet, Kassarian's suggestion is understandable.

However, from the basic theoretical perspective on personality hypothesized by EKB, personality may influence one's motives and normative compliance. However questionable the relationship between personality and consumer behavior is, personality has been found to relate to specific attributes of product choice (Alpert, 1972).

In the field of marketing research, the most commonly used personality measurement instruments are the California Psychological Inventory (CPI) or the Edwards Personal Preference Schedule (EPPS). The CPI is composed of more than 480 true-false items which provide a profile of 18 scales, of which 3 are validity scales. The other 15 scales

include scores on such dimensions as dominance, socialization, tolerance, achievement via conformance, achievement via independence, intellectual efficiency, sense of well-being, self-control, and flexibility. In the EPPS, items are paired on the basis of their similar social desirability scale values. The EPPS consists of 210 pairs of items, in which the item response choices are equally attractive and similarly socially acceptable to the examinee.

These two tests are basically designed for clinical purposes and thus, the applicability to marketing research is questionable. Furthermore, the number of questions in CPI and EPPS are too many to be efficiently administered as a part of a lengthy questionnaire, especially in a mail survey; this was clearly evidenced in the pretest of the questionnaire for this study.

For the purposes of marketing research, Cohen (1967) developed a personality measurement instrument, CAD, using the Horney paradigm (1945) to measure predominant interpersonal orientation. The Horney paradigm, a representative example of social-psychological personality theory, suggests that human behavior results basically from three predominant, interpersonal orientations: compliant, aggressive, and detached. Each mode of interpersonal orientation is defined as follows (Cohen, 1967):

Compliant Orientation. Compliant-oriented people want to be part of the activities of others. They wish to be loved, wanted, appreciated, and needed. They see in other people a solution for many problems of life and wish to be protected, helped, and guided. Because of the importance given to the companionship and love of others, compliant people become oversensitive to others' needs, overgenerous, overgrateful, and overconsiderate. Such people tend to avoid conflict and subordinate

themselves to the wishes of others. They are inhibited in criticism, and apologetic and willing to blame themselves rather than others if things go wrong. Among the most important attributes associated with a compliant tendency are: goodness, sympathy, love, unselfishness, and humility. The compliant person dislikes egotism, aggression, assertiveness, and power-seeking. The compliant type seeks to manipulate others by being weak and dependent and relying on others to help him achieve his goals. Since many of his goals are tied to finding an accepted place in society, he will go out of his way to conform to what he believes are accepted forms of behavior.

Aggressive Orientation. Aggressive-oriented people want to excel, to achieve success, prestige, and admiration. Other people are seen as competitors. Aggressive people strive to be superior strategists, to control their emotions, and to bring their fears under control. Strength, power, and unemotional realism are seen as necessary qualities. People are valued if useful to one's goals. Everyone is thought to be motivated by self-interest, with feelings simply a cover for hidden objectives. The aggressive person seeks to manipulate others by achieving power over them. Yet, he needs people to confirm his self-image, to bolster what may well be uncertain confidence in his competitive talents. He will go out of his way to be noticed if such notice brings admiration.

Detached Orientation. Detached-oriented people want to put emotional "distance" between themselves and others. Freedom from obligations, independence, and self-sufficiency are highly valued. Such people do not want to be influenced or to share experiences. Conformity is repellent, intelligence and reasoning are valued instead of

feelings. Detached people consider themselves more or less unique, possessing certain gifts and abilities that should be recognized without having any need to go out of their way to show them to others. The detached type is distrustful of others, but does not wish to "stay and fight." Horney suggested that people frustrated in their compliant or aggressive tendencies, or both, may well adopt this response trait. If one is uncertain as to how to deal effectively with people, and receives negative reinforcement from early social interaction, this latter mode may be a solution. Goals and values that support this individualistic orientation will acquire positive reinforcement character.

The measurements of the three predominant interpersonal orientations can provide us an insight into a person's perception of his social environment and his behavioral tendencies toward the objects in his life space since much of human action is interpersonal. The measurements are especially helpful in the study of the adoption process of innovations as the communication aspect of the process plays one of the pivotal roles.

As shown in Section 2 of the questionnaire included as Appendix A, the CAD scale was designed to measure compliant, aggressive, and detached interpersonal orientations. The scale consists of 35 incomplete statements followed at equal intervals by six blank lines, the first and last of which are labeled extremely undesirable and extremely desirable, respectively. The instrument was shown to have adequate test-retest and internal consistency reliability and instrument validity (Cohen, 1967).



Of the various personality measurement instruments considered for this study, the CAD scale was chosen for the reasons that communication is an important aspect of the adoption process as reflected in the innovation-decision model (Figure II-3, p. 25), and that according to the pretest result of the questionnaire for this study, the CAD scale was the only feasible instrument to be administered as a part of the questionnaire in a mail survey because of its simplicity and less number of questions as compared to the CPI and the EPPS.

Information and experience with regard to general bank-related services. As was reflected in the model of the innovation-decision process (Figure II-3), a person's general information and experience with regard to product class and a given alternative influence his formation of beliefs and his perception of the difference between the ideal state of affairs and the actual situation. Furthermore, the amount and relevancy of information and previous experience he has with regard to product class and a given alternative influence his perception of risk in a decision making situation, which in turn affects his information handling behavior (Figure II-5, p. 40).

Questions regarding the information and experience include measures of the usage patterns and rate of V-24 and of conventional tellers, one's experience with bank or gasoline credit cards, knowledge on the liability in connection with fraudulent use of V-24 card, and complaints and problems one has concerning the use of V-24.

Factors considered in the knowledge stage. Behavior begins when an individual recognizes a problem due to his perception of an

intolerable difference between the ideal state of affairs and the actual situation. Problem recognition may occur due to normative social influence by reference groups, the desire to engender new atmosphere, marketing appeals by arousing dominant motives, or the perception of the present state as being inadequate. As was discussed in the previous chapter, earlier knowers of innovations are more likely to be early adopters.

Borrowing Hassinger's (1959) notion of selective exposure that individuals are inclined to expose themselves to those ideas consistent with their beliefs, attitudes, needs, or interests, the sooner one recognizes a problem, the sooner he is likely to become aware of the existence of innovation. In view of this conceptualization, the survey respondents were asked to indicate their perceptions of the overall quality of bank services and of the usage of V-24 by reference group members, and date of their first awareness.

As to the date of first awareness, it was expected that recall might exhibit some level of inaccuracy due to the passage of time. However, the pretest result of the questionnaire indicated that most of the respondents could recall reasonably accurately by a time unit of a year. Accordingly the questionnaire was redesigned to meet this need.

Factors considered in the persuasion stage. In the persuasion stage, two major activities take place for an individual to form a favorable or unfavorable attitude toward the innovation—search and alternative evaluation. As was discussed in the previous chapter (Figure II-5, p. 40), information handling behavior (information sources, transmission, and processing) varies from individual to individual and

from one situation to the next, and is influenced largely by the motives aroused and risks perceived in a decision making situation.

Once relevant information is procured, alternative evaluation takes place on the basis of one's evaluative criteria and perceptions of certain product attributes. Evaluative criteria is formed primarily by one's information and experience regarding product class and a given alternative and by the aroused motives, which dictate certain needs or wants to be fulfilled.

In this context, respondents were asked to provide the following information with regard to V-24 usage:

1. Information sources used to become aware of V-24 and to make a decision whether or not to adopt it, and its helpfulness in each instance.
2. Perceptions of the Roger's five innovation attributes—relative advantage, compatibility, complexity, trialability, and observability.
3. Perceptions of the six types of risks<sup>2</sup> identified by Jacoby and Kaplan (1972)—financial/performance risk, social risk, psychological risk, time risk, physical risk, and financial risk.

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<sup>2</sup>As was discussed in the previous chapter, perceived risk has been generally conceptualized as a function of uncertainty and consequences. The consequence aspect of the six types of risk was pretested on a scale of 1 to 6, the first and last labeled as strongly disagree and strongly agree, respectively. All respondents in the pretest responded to 6 since the consequences of any financial risk related to V-24 usage was considered crucially important. In view of this development, questions regarding the consequence aspect of perceived risks were eliminated.

4. Needs-wants-concerns in their V-24 usage (these elements were most frequently cited in previous studies on V-24 usage).
5. General attitude toward computers.
6. Perceptions of V-24 usage as being convenience oriented.

These variables were selected not only on the basis of the theoretical framework so far developed but also of their predictive ability of innovative behavior in previous studies.

Factors considered in the decision stage. In the decision stage, an individual engages in activities that led to a choice to adopt or reject the innovation. Most individuals are not apt to adopt an innovation without trying it on a small scale. The probationary trial is often part of the decision to adopt. It provides an opportunity to determine the utility of an innovation in their own situation and to a degree, to verify the beliefs held concerning the certain attributes of an innovation.

In this context, the individual's experience or impression on the first few trials is of crucial importance in deciding whether or not to adopt an innovation. All the respondents, except those who have never used V-24, were asked to indicate their experience and first impression on the first few trials of V-24.

Factors considered in the confirmation stage. In the confirmation stage, the individual seeks reinforcement for an innovation decision he has made. The input of information after the decision may confirm or not confirm the decision he has already made. If not confirmed, he may reverse his previous decision by discontinuing the innovation.

In this context, his feelings of satisfaction with the use of an innovation is of considerable importance. All the respondents except those who have never used V-24 were asked to indicate whether they were satisfied with the use of V-24.

Date of adoption. Respondents were asked to indicate when they first used V-24 with V-24 card for the purpose of classifying them into three subpopulations—early adopters, late adopters, and nonadopters. Since this question relies on respondents' recall ability for its accuracy, some level of inaccuracy was expected.

Through three successive pretests of the questionnaire, it was found that respondents could recall the time reasonably accurately by a time unit of a year. Accordingly, the questionnaire was redesigned to meet this need. As was discussed in the previous chapter, those who first used V-24 between July and December, 1976, were classified as early adopters, those who first used it between January, 1979, and December, 1980, as late adopters and those who have never used it as nonadopters.

Factors utilized in screening the respondents. Three questions were included in the questionnaire to screen out certain respondents in order to ensure homogeneity in the sample. The respondents who were screened out are as follows: (1) those who were not aware of the existence of V-24 at the time of this survey; (2) of those who lived outside Knoxville before the time V-24 was first introduced in Knoxville, those who were exposed to automatic teller machines in their place of residence; and (3) those who were not classified into one of the three populations—early adopters, late adopters, or nonadopters.

### Questionnaire Design

The survey questionnaire (see Appendix A) was pretested on three separate occasions, each time using a randomly selected sample of 25 people, in order to ensure clarity, internal consistency, and reliability.

On the first two occasions, the questionnaire was drafted on 11 x 8-1/2" sheets of paper, but on the final pretest, it was reduced to 7-1/2 x 5-1/2" sheets of paper in view of the fact that most of the respondents in the pretest exhibited a higher preference for a smaller size survey questionnaire.

Broadly stated, the questionnaire is composed of three subsections with 111 questions in total. The first section deals primarily with V-24 and bank services related variables. The second section is concerned exclusively with personality measures. The third section focuses on receiver variables in general.

Throughout the three pretests, two major revisions have taken place. On the first pretest, the CPI instrument, which consists of more than 480 questions, was employed to measure personality. The result of the pretest on the CPI was found to be very poor due to the unwillingness of respondents to answer a large number of questions.

In light of this development, it was deemed warranted in the theoretical context of this study to employ the CAD scale. The other revision was in connection with the six types of perceived risk in V-24 usage. As indicated previously, the consequence aspect of perceived risks was considered crucially important by all respondents in the pretest; on a scale of 1 to 6, all respondents responded to 6, which

corresponds to highest importance. Accordingly, only the uncertainty aspect of perceived risks was included in the final survey questionnaire.

Figure III-1 presents the entire set of variables with the references (question numbers in the survey questionnaire) which identify these variables.

### Survey Population

The survey was made possible with the cooperation of Valley Fidelity Bank in Knoxville, which provided generous assistance in the area of data collection and sample generation. The bank first introduced automatic teller machines, V-24, in Knoxville in 1974. For the first two years of the introduction of V-24, the use of V-24 was made available only to those customers of the bank who held a Visa card issued through the bank. During the time period, the scope of the services provided by V-24 was limited to the functions of Cash Dispensers.

In September, 1975, the bank made V-24 services available to all the customers who had bank accounts with the bank by issuing V-24 cards, and at the same time, the scope of the services provided by V-24 was extended to the regular services of human tellers.

For the purposes of this study, the relevant population from which a sample was selected was confined to those customers of the bank who had their bank accounts with the bank before September, 1976. The fundamental reason for this confinement was to ensure homogeneity in the population in terms of their opportunity to be exposed to the presence of V-24 and to subsequently classify the sample using one classificatory principle.

Receiver Variables

## Demographic Factors: Question Number

|                            |        |
|----------------------------|--------|
| Marital Status.....        | 86     |
| Sex.....                   | 87     |
| Ethnic Background.....     | 88     |
| Family Life Cycle.....     | 89, 90 |
| Type of Residence.....     | 91     |
| Occupation.....            | 92     |
| Education.....             | 93     |
| Employment Status.....     | 99     |
| Regular Working Hours..... | 100    |
| Age.....                   | 110    |
| Income.....                | 111    |

## Social Interaction Factors:

|                           |                         |
|---------------------------|-------------------------|
| Social Participation..... | 94                      |
| Cosmopolitanism.....      | 101, 102, 103, 104, 105 |
| Social Mobility.....      | 106                     |

## Communication Behavior:

|                                       |     |
|---------------------------------------|-----|
| Print Readership.....                 | 96  |
| Exposure to News Media in General.... | 107 |

|                                                               |    |
|---------------------------------------------------------------|----|
| Proclivity to Comply with<br>Prevailing Social Influence..... | 98 |
|---------------------------------------------------------------|----|

Personality\*

|                             |                                                                  |
|-----------------------------|------------------------------------------------------------------|
| Aggressive Orientation..... | 54, 57, 58, 61, 62, 64, 66,<br>68, 71, 73, 74, 76, 79, 81,<br>83 |
| Compliant Orientation.....  | 52, 53, 59, 63, 67, 70, 75,<br>78, 82, 85                        |
| Detached Orientation.....   | 51, 56, 60, 65, 69, 77, 80,<br>84                                |

Information and Experience with Regard to  
General Bank Related Services and V-24

|                                                                          |                            |
|--------------------------------------------------------------------------|----------------------------|
| V-24 Usage Patterns.....                                                 | 7, 8, 9, 10, 11, 12, 13    |
| Conventional Teller Usage Patterns.....                                  | 14, 15, 16, 17, 18, 19, 20 |
| V-24 Average Usage Rate per Month.....                                   | 47                         |
| Conventional Teller Usage Rate<br>per Month.....                         | 48                         |
| Knowledge on the Liability Regarding<br>Fraudulent Use of V-24 Card..... | 49                         |

Figure III-1. Variables investigated in the survey.



|                                                  | Question Number |
|--------------------------------------------------|-----------------|
| Number of Gasoline Credit Cards                  |                 |
| Owned.....                                       | 108             |
| Number of Bank Credit Cards Owned.....           | 109             |
| Complaints and Problems in V-24                  |                 |
| Usage.....                                       | 50              |
| <u>Problem Recognition.....</u>                  | 36              |
| <u>Perception of the Usage of V-24 by</u>        |                 |
| <u>Reference Group Members.....</u>              | 37              |
| <u>Date of First Awareness.....</u>              | 5               |
| <u>Date of Adoption.....</u>                     | 6               |
| <u>Information Searching.....</u>                | 21, 22, 23, 24  |
| <u>V-24 Usage as Being Convenience</u>           |                 |
| <u>Oriented.....</u>                             | 28, 29          |
| <u>Perception of V-24 Attributes</u>             |                 |
| Relative Advantage.....                          | 30              |
| Complexity.....                                  | 31              |
| Compatibility.....                               | 32              |
| Observability.....                               | 33              |
| Trialability.....                                | 34              |
| <u>Perception of the Risks in V-24 Usage</u>     |                 |
| Financial/Performance Risk.....                  | 41              |
| Social Risk.....                                 | 42              |
| Psychological Risk.....                          | 43              |
| Time Risk.....                                   | 44              |
| Physical Risk.....                               | 45              |
| Financial Risk.....                              | 46              |
| <u>Needs-Wants-Concerns in V-24 Usage.....</u>   | 38, 39, 40      |
| <u>Attitude toward Computers.....</u>            | 35              |
| <u>Impression on the Few Trials of V-24.....</u> | 25, 26          |

Figure III-1 (continued)

## Question Number

Satisfaction with V-24 Usage..... 27

Variables Used for Screening Purposes.... 1, 3, 4

## Figure III-1 (continued)

\*Due to the difficulties encountered in the construction of the questionnaire, two questions related to detached orientation were not included.

Due to the private nature of the data and to the manner in which the bank kept the customers' records, neither the actual number of the customers who had their accounts with the bank before September, 1976, nor the records concerning these customers' V-24 usage was made available to this study. However, the best estimate of the total number of these customers, according to the author, appears to be in the range of 21,000 to 25,000.

### Sample Size

The factors presented in Figure III-2 were considered in estimating the sample size and total number of questionnaires to be mailed. Of the five factors in Figure III-2, factors I, II, and III are more relevant to estimating the sample size whereas factors IV and V are to estimating the total number of questionnaires to be mailed.

Factor analysis and discriminant analysis are two of the statistical procedures employed in this study. Factor analysis dictates that sample size should be at least five times the number of variables used in the analysis whereas discriminant analysis requires sample size to be at least two or three times the number of the variables employed in the analysis. Since factor analysis requires larger sample size than discriminant analysis, the sample size was estimated largely by the constraint imposed by factor analysis.

### Sample Selection and Data Collection

The absence (or unavailability) of the statistical information concerning the parent population from which the sample was selected

I. Factor Analysis

$$N > 5P$$

II. Discriminant Analysis

$$N \geq 2(P+K-1)+25$$

or

$$N \geq (2 \text{ or } 3)P$$

where

P = number of predictor variables

K = number of groups

N = sample size

III. Split Sample Test\*

IV. Estimated Number of Responses to be Screened Out

V. Expected Survey Response Ratio

Figure III-2. Factors considered for the sample size and the total number of questionnaires to be mailed.

\*Total number of usable responses was not large enough to execute this plan.

made it impossible to utilize the stratified random or systematic sampling procedure, which are most suitable for the purpose of this study. Using the sample random sampling procedure, 4,000 individual accounts, not including the commercial accounts, were randomly selected from the predefined population as indicated in the previous section.

Of the various data collection methods, a mail survey was seen to be the only feasible method in light of the nature of variables to be measured, the considerable sample size that was to be required, and the limited financial resources available for the study.

The survey was represented as a sole project of Valley Fidelity Bank. Survey questionnaires were sent to randomly selected 4,000 individuals, not including commercial accounts, approximately two weeks before Christmas, 1980. Although the timing for the survey was definitely poor, time constraints imposed upon this study did not leave any other choice.

Each survey questionnaire was mailed in a Valley Fidelity Bank regular business envelope with a cover letter on the bank's stationery and a postage-paid, Valley Fidelity Bank's regular business reply envelope (see Appendix A).

Figure III-3 presents the summary results of the responses of the mail survey. Of the 4,000 survey questionnaires mailed, 735 questionnaires were returned. Of the 735 questionnaires returned, 185 responses were deleted for the reasons specified in Figure III-3. This generated a net total of 546 usable responses. Of these 546 responses, 93 responses did not belong to any of the three groups of research interest—early adopters, late adopters or nonadopters.

|                                                                                 |             |       |
|---------------------------------------------------------------------------------|-------------|-------|
| Total Mailing, Not Including Commercial Accounts                                |             | 4,000 |
| Total Number of the Questionnaires Returned                                     |             | 735   |
| Incorrect Addresses                                                             | - 30        |       |
| Unusable Responses                                                              | -140        |       |
| Responses Screened Out by<br>Questions 1, 3, and 4                              | <u>- 19</u> |       |
| Total Responses Deleted                                                         | -189        |       |
| Net Total of Usable Responses                                                   |             | 546   |
| Responses Not Classified as Early<br>Adopters, Late Adopters, or<br>Nonadopters | - 93        |       |
| Net Total of the Responses<br>Used in This Study                                |             | 543   |

Figure III-3. Summary responses of the mail survey.

Finally, 453 responses were selected to be used in this study. Table III-1 summarizes the breakdowns of the 453 responses by adopter categories.

TABLE III-1  
ADOPTER CATEGORIES

|                | Absolute<br>Frequency | Frequency<br>(%) | Frequency<br>(%) | Cumulative<br>Adj. Freq.<br>(%) |
|----------------|-----------------------|------------------|------------------|---------------------------------|
| Early Adopters | 102                   | 22.5             | 22.5             | 22.5                            |
| Late Adopters  | 68                    | 15.0             | 15.0             | 37.5                            |
| Nonadopters    | 283                   | 62.5             | 62.5             | 100.0                           |
| Total          | 453                   | 100.0            | 100.0            |                                 |

### Data Analysis

Three different multivariate and one bivariate statistical procedures were employed to sequentially analyze the data collected from the questionnaires. Two-way cross tabulation analyses were used to have preliminary insight into the general nature of innovativeness in V-24 usage. Secondly, Hotelling  $T^2$  was applied to further probe and/or reinterpret at a higher level of abstraction the information resultant from the two-way cross tabulation analyses. Thirdly, factor analysis was used to explore the domain of innovativeness in V-24 usage by reducing complex interrelationships to relatively simple linear expressions, and to derive factor scores for the final statistical analysis—multiple stepwise discriminant analysis. Finally, multiple stepwise discriminant analysis was used to identify major underlying

discriminant dimensions and to ascertain their order of importance in their ability to discriminate among three adopter groups.

Cross tabulation analysis. The cross tabulation analysis provides an important mechanism for studying the relationships between and among variables. Throughout the following chapter, the two-way cross tabulation using the chi-square significance test is extensively used for the purpose of investigating the specific relation between innovativeness and each of the selected variables of importance.

Although the two-way cross tabulation provides some insight into a dependency relationship, it does not necessarily provide a final answer since the relationship determined in the analysis may change with the introduction of a third variable. The primary objective of employing this method is to have some basic insight into the properties of innovativeness at the outset as well as to make further use of that insight in the final statistical analysis—discriminant analysis.

Hotelling's  $T^2$ . The Hotelling  $T^2$  test is basically an extension of the univariate t-test to the multiple case, and is used to determine whether two samples came from populations with equal means when all the means of interest are considered simultaneously.

This test is employed to make pairwise comparisons among the three adopter groups on sets of variables that may characterize certain underlying dimensions of innovativeness—personality orientation, general perception of risks in V-24 usage, general perception of the Rogers' five attributes, general impression on the few trials of V-24, general information and experience regarding V-24 and bank-related



services, general consumption patterns of V-24 and conventional teller services, and cosmopolitanism.

Unlike in the case of the two-way cross tabulation analysis, Hotelling  $T^2$  evaluates a number of variables in a set simultaneously to test for group differences. Therefore, it can provide a more realistic picture of the properties of innovativeness, and can be of help in reinterpreting the results provided by the two-way cross tabulation analysis.

Wilks Lambda statistics was considered as an equally desirable method for the above tests. However, due to the exploratory nature of this study, three pairwise group comparisons on each set of the variables mentioned above were seen to provide more information than one three-group test using Wilks Lambda statistics on each set of variables. In this context, Hotelling  $T^2$  was chosen over Wilks Lambda statistics.

Factor analysis. Factor analysis is frequently employed in marketing research for the purpose of exploring the unknown domain by reducing complex interrelationships to a relatively simple linear expression. It is employed in this study for the following purposes:

1. To discover the basic structure of innovativeness in V-24 usage by determining the primary dimensions of variations among the three adopter groups in receiver variables (personal characteristics), personality, and the bank services and V-24 related perceptions, attitudes, general information and experience, and consumption patterns.

2. To verify the hypotheses regarding the Rogers' five innovation attributes, the six dimensions of perceived risks discussed in the previous chapter, and the three personality orientations in the CAD scale.
3. To transform the original data into factor scores in order to use them as a part of the input data for the discriminant analysis.

A fundamental advantage in using factor scores as the input data for the discriminant analysis is in eliminating multicollinearity relations among predictor variables since the factor scores derived from orthogonal rotations are independent from one another. In general, multicollinearity relations among the variables tend to increase the likelihood of generating a distorted picture of group differences by producing somewhat biased coefficient values.

In this study, factor analysis is applied separately to the ratio and interval data in each of the three sections in the survey questionnaire since they are related to different aspects of innovativeness as discussed previously.

In implementing factor analysis, the following statistical approaches were used to generate unbiased, conservative results. Firstly, Bartlett's test of significance of correlational matrix was employed to determine at the outset whether there exists any relationship among variables. Its operation is as follows:

$$H_0: R = I, \quad H_1: R \neq I$$

$$\chi^2 = -(n-1 - \frac{2V+5}{6}) \ln|R|$$

$$\text{Degree of Freedom} = \frac{V(V-1)}{2},$$

where

$n$  = number of observations,

$v$  = number of variables used, and

$|R|$  = determinant of the correlational matrix.

Secondly, scree test and Harris procedure were employed to extract the exact number of factors. In scree test, all the characteristic roots are plotted with the value of the root along the ordinate and the root's factor number as the abscissa. The point where the factors curve above the straight line formed by the smaller roots gives the number of factors. The basic idea is that when the roots drop dramatically in size, an additional factor would add relatively little to the information already extracted.

In this study, scree test is used as a preliminary step to subsequently execute the Harris procedure since it tends to generate less conservative results than the Harris procedure. In the Harris procedure, a number of different factor solutions are employed to examine the patterns of factor loadings across the different factor solutions employed. The number of factors is determined when the patterns of factor loadings are most consistent across the different factor solutions employed. In this study, Minres factor analysis, Truncated factor analysis, Image factor analysis, and Alpha factor analysis were employed for the Harris procedure.

Finally, in computing the factor scores, Z sum factor scores were chosen over regression estimate factor scores. Since regression estimate factor scores are computed as

$$F = \begin{matrix} Z & W \\ n.f & n.v & v.f \end{matrix}$$

where

$$W = \begin{matrix} R^{-1} & S \\ v.f & v.v & v.f \end{matrix},$$

$W$  = factor score coefficient matrix,

$R^{-1}$  = inverse correlational matrix,

$S$  = correlations of variables with factors, and

$Z$  = matrix of individuals' Z values on variables,

those variables having very low factor loadings are included in the calculation of factor scores. In view of the fact that individual factor scores will be used as the input data for the discriminant analysis, the use of regression estimate factor scores was seen to have a higher probability to produce biased discriminant functions than Z sum factor scores due to the inclusion of a large number of variables with low factor loadings. In Z sum factor scores, those variables that have low factor loadings are not included in its calculation.

Discriminant analysis. Discriminant analysis is the method by which observations (or objects) are classified into one of two or more mutually exclusive and exhaustive categories on the basis of a linear combination of predictor variables which can maximize the ratio of between-group variation to within-group variation.

In this study, stepwise multiple discriminant analysis using the BMDP7M computer program is used to develop predictive models to

classify individuals into three adopter groups, to profile characteristics of these groups which are most dominant in terms of discrimination, and to identify the major underlying dimensions which differentiate among these groups. The analysis uses as the input data both Z sum factor scores derived in the previous factor analysis and the dummy variables which were transformed from the classification variables proved to be significant in the previous two-way cross tabulation analysis.

The use of dummy variables in the analysis violates multivariate normality assumption required by the analysis. It is therefore deemed necessary to apply jackknife in the estimation of the error or misclassification probabilities. "The jackknife is appropriate in any research situation where the analysis procedures (and test statistics) assume normality but the data seriously violate this assumption" (Crask and Perreault, 1977, p. 66). According to Gray and Schucany (1972, p. 5), "the jackknife is a general method for reducing the bias in an estimator and for obtaining a measure of the variance of the resulting estimator by sample reuse. Thus the result of the procedure is usually a nearly unbiased estimator and an associated approximate confidence interval."

The estimation of error rates by testing each observation in the samples on the basis of the discriminant function computed from all the observations has been known for sometime to be subject to serious bias (Miller, 1974). In jackknife, each observation is tested with the discriminant functions computed from the data with that particular observation removed. Therefore, the error rate provided by jackknife is usually less biased.

### Statements of Hypotheses

Although there exists substantial research work in the area of the diffusion and adoption of innovations, practically all of them have focused on the diffusion and adoption of product-oriented innovations rather than service-oriented innovations. Research investigating consumers' adoption behavior in service-oriented innovations is virtually nonexistent; this is especially so for the innovations related to bank services.

In view of this fact, this study is undertaken as a comprehensive exploratory research effort with its primary objective aimed at discovering the pertinent factors associated with the innovative behavior in the adoption of V-24 rather than at examining the interactions and causality relationships among them. Accordingly, the hypotheses established here to attack the issues outlined in the previous chapter are broad in nature, and are based upon the generalizations drawn by Rogers (Figure II-8, p. 64) and summary findings of past studies in the area (Table II-2, p. 57) in the context of the framework of the model (Figure II-3, p. 25) the author has developed for this study. The following hypotheses will be tested.

Hypothesis (A) Early adopters, late adopters, and nonadopters differ on the basis of the selected receiver variables<sup>3</sup> (personal characteristics) specified below:

Demographic factors:

Hypothesis (A-1) marital status

---

<sup>3</sup> Refer to this terminology in Figure II-3.

Hypothesis (A-2) sex

Hypothesis (A-3) ethnic background

Hypothesis (A-4) family life cycle

Hypothesis (A-5) type of residence

Hypothesis (A-6) occupation

Hypothesis (A-7) education

Hypothesis (A-8) employment status

Hypothesis (A-9) regular working hours

Hypothesis (A-10) age

Hypothesis (A-11) income

Social interaction factors:

Hypothesis (A-12) social participation

Hypothesis (A-13) cosmopolitanism

Hypothesis (A-14) social mobility

Communication behavior:

Hypothesis (A-15) print readership

Hypothesis (A-16) exposure to news media in general

Hypothesis (A-17) proclivity to comply with perceived  
prevailing social influences

Hypothesis (B) Early adopters, late adopters, and nonadopters differ on the basis of aggressive orientation (Hypothesis B-1) and detached orientation (Hypothesis B-2) but not on the basis of compliant orientation (Hypothesis B-3).

Hypothesis (C) Early adopters, late adopters, and nonadopters differ on the basis of their general information and/or experience with respect to general bank-related services and V-24:

- Hypothesis (C-1) V-24 usage patterns
- Hypothesis (C-2) conventional teller usage patterns
- Hypothesis (C-3) V-24 average usage rate per month
- Hypothesis (C-4) conventional teller usage rate per month
- Hypothesis (C-5) knowledge on the liability due to fraudulent use of V-24 card
- Hypothesis (C-6) complaints and problems concerning the use of V-24
- Hypothesis (C-7) number of bank credit cards owned
- Hypothesis (C-8) number of gasoline credit cards owned
- Hypothesis (D) Early adopters, late adopters, and nonadopters differ on the basis of their perception of the overall quality of the bank services before the introduction of V-24.
- Hypothesis (E) Early adopters, late adopters, and nonadopters differ on the basis of their perceptions of the usage of V-24.
- Hypothesis (F) Early adopters, late adopters, and nonadopters differ on the basis of the date of their first awareness of the existence of V-24.
- Hypothesis (G-1) No differences exist among early adopters, late adopters, and nonadopters in the sources of information used to become aware of the existence of V-24.
- Hypothesis (G-2) Early adopters, late adopters, and nonadopters differ on the basis of their perceived helpfulness of the information sources used to become aware of the existence of V-24.



- Hypothesis (G-3) Early adopters, late adopters, and nonadopters differ on the basis of the information sources relied on most when considering whether or not to use V-24.
- Hypothesis (G-4) Early adopters, late adopters, and nonadopters differ on the basis of the perceived helpfulness of the information sources used in considering whether or not to use V-24.
- Hypothesis (H) Early adopters, late adopters, and nonadopters differ on the basis of the time they usually (or would) use V-24.
- Hypothesis (J) Early adopters, late adopters, and nonadopters differ on the basis of their perceptions of the relative advantage, complexity, compatibility, observability and trialability of V-24.
- Hypothesis (K) Early adopters, late adopters, and nonadopters differ on the basis of their perceptions of the financial/performance risk, social risk, psychological risk, time risk, physical risk, and financial risk with regard to V-24 usage.
- Hypothesis (L) Early adopters, late adopters, and nonadopters differ on the basis of their needs, wants, and concerns with regard to V-24 usage.
- Hypothesis (M) Early adopters, late adopters, and nonadopters differ on the basis of their general attitude toward computers.
- Hypothesis (N) Early adopters and late adopters differ on the basis of their first impressions on the first few trials of V-24.

- Hypothesis (O) No differences exist between early adopters and late adopters in the outcomes (satisfaction or dissatisfaction) of their decision to adopt V-24.
- Hypothesis (P) Early adopters, late adopters, and nonadopters can be better discriminated among one another along the dimension of the overall perceived attributes of V-24 than of receiver (personal) characteristics or personality orientations.

## CHAPTER IV

### STATISTICAL ANALYSES AND FINDINGS

This chapter presents the major empirical findings of this study based on the evaluations of the hypotheses proposed in the previous chapter. The chapter contains four major subsections. In the first section, hypotheses A-1 to A-12, A-14, B-1 to B-3, C-3 to C-8, D, E, F, G-1 to G-4, M, and O are evaluated by two-way cross tabulation analyses using chi-square significance test. In the second section, hypotheses A-13, B, C-1, C-2, H, J, K, L, and N are evaluated by Hotelling's  $T^2$ . In the third section, the underlying dimensions of the variables associated with the consumer innovativeness in V-24 usage are explored by factor analysis in order to ascertain the underlying dimensions of innovativeness over which the three adopter groups can be effectively discriminated among one another.

#### Findings of Cross Tabulation Analyses

Receiver variables (personal characteristics). Hypothesis A states that early adopters, late adopters, and nonadopters differ on the basis of the selected receiver variables (personal characteristics): marital status, sex, ethnic background, family life cycle, type of residence, occupation, education, employment status, regular working hours, age, income, social participation, social mobility, print readership, exposure to news media in general, and proclivity to comply with perceived prevailing social influences. A summary of cross

tabulation analyses on these variables is presented in Table IV-1. The discussion of the results of the cross tabulation analyses on each receiver variable is presented subsequently in detail.

Marital Status. Hypothesis A-1 states that early adopters, late adopters, and nonadopters differ on the basis of marital status. Table B-1 (Appendix B) presents the results.

Five categories of marital status were originally used in the survey questionnaire. However, due to the insufficient observations in the category "separated," insufficient in terms of the assumption that less than 20% of the total cells should be permitted to have expected frequencies less than 5 and none should have an expected frequency less than 1 (Snedecor and Cochran, 1967), it was combined with the category "divorced." This combination resulted in four distinct categories for the variable.

A large percentage of each of the three adopter groups are married. Looking only at the early adopters and nonadopters, these two groups are virtually identical in overall profile. However, late adopters are significantly different from both early and nonadopters in all categories except the category "single"; 67.6% of late adopters are married as compared to 71.6% of early adopters and 72.8% of nonadopters; 17.6% of late adopters are separated or divorced as compared to 5.9% of early adopters and 3.9% of nonadopters; and 4.4% of late adopters are widowed as compared to 9.8% of early adopters and 12.7% of nonadopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

Sex. Hypothesis A-2 states that early adopters, late adopters, and nonadopters differ on the basis of sex. Table B-2 (Appendix B)

TABLE IV-1

A SUMMARY OF CROSS TABULATION ANALYSES ON RECEIVER  
VARIABLES (PERSONAL CHARACTERISTICS)

| Variables                                          | Chi-Square<br>Significance<br>Test | Index* for<br>Cross Tabulation<br>Analysis |
|----------------------------------------------------|------------------------------------|--------------------------------------------|
| Marital Status                                     | Significant at .05                 | Table B-1                                  |
| Sex                                                | Significant at .10                 | Table B-2                                  |
| Family Life Cycle:                                 |                                    |                                            |
| Number of Children<br>under Age 19                 |                                    |                                            |
| Living at Home                                     | Significant at .05                 | Table B-4                                  |
| Number of Children<br>in the Age Range<br>1 to 5   |                                    |                                            |
| Living at Home                                     | Significant at .05                 | Table B-5                                  |
| Number of Children<br>in the age Range<br>6 to 12  |                                    |                                            |
| Living at Home                                     | Significant at .05                 | Table B-6                                  |
| Number of Children<br>in the Age Range<br>13 to 18 |                                    |                                            |
| Living at Home                                     | Significant at .10                 | Table B-7                                  |
| Type of Residence                                  | Significant at .10                 | Table B-8                                  |
| Occupation                                         | Significant at .05                 | Table B-9                                  |
| Education                                          | Significant at .05                 | Table B-10                                 |
| Employment Status                                  | Significant at .05                 | Table B-11                                 |
| Regular Working<br>Hours                           | Significant at .05                 | Table B-12                                 |
| Age                                                | Significant at .05                 | Table B-13                                 |
| Income                                             | Significant at .05                 | Table B-14                                 |
| Social Participation                               | Not Significant at .05             | Table B-15                                 |
| Social Mobility                                    | Significant at .05                 | Table B-16                                 |
| Print Readership                                   | Not Significant at .10             | Table B-17                                 |

TABLE IV-1 (continued)

| Variables                                                                 | Chi-Square<br>Significance<br>Test | Index* for<br>Cross Tabulation<br>Analysis |
|---------------------------------------------------------------------------|------------------------------------|--------------------------------------------|
| Exposure to News<br>Media in General                                      | Significant at .10                 | Table B-18                                 |
| Proclivity to Comply<br>with Perceived<br>Prevailing Social<br>Influences | Significant at .05                 | Table B-19                                 |

\*Tables B-1 through B-19 are in Appendix B.

presents the results. The three adopter groups are dissimilar from one another, although the differences between early adopters and late adopters are more apparent than those between early adopters and non-adopters. Fifty-seven percent of early adopters are males, as compared to 36.8% of late adopters and 48.2% of nonadopters. Nonadopters are distributed approximately evenly over the two categories, whereas among late adopters, there are almost twice as many females as males. Chi-square analysis shows the differences between the three adopter groups to be significant at the 0.10 alpha level.

Ethnic Background. An application of cross-tabulation analysis to this variable was deemed to be unwarranted due to a concentration of 98.2% of the sample in the category "White" (Table B-3, Appendix B). There were no cases in the categories "Indian," "Oriental," and "Others."

Family Life Cycle. Hypothesis A-4 states that early adopters, late adopters, and nonadopters differ on the basis of family life cycle. For the purpose of ascertaining detailed information, this hypothesis is tested separately in relation to each of the four variables associated with family life cycle: (1) number of children under age 19 living at home, (2) number of children in the age range 1 to 5, (3) number of children in the age range 6 to 12, and (4) number of children in the age range 13 to 18.

Table B-4 (Appendix B) presents the results of the hypothesis tested based on (1), Table B-5 based on (2), Table B-6 based on (3), and Table B-7 based on (4). For the purpose of this analysis, family life cycle measured by the number of children under age 19 living at home was collapsed into the following categories: none (no children),

1 child, 2 children, and more than 2 children. Family life cycle measured by the other three variables was collapsed into two categories: none and one child or more.

The differences among the three adopter groups in terms of the number of children under age 19 living at home are quite apparent: early adopters have more children under age 19 at home than both late adopters and nonadopters, whereas late adopters have more children under age 19 at home than nonadopters. Of the early adopters, 21.3% (15.2% + 6.1%) have two or more children under age 19 at home as compared to 16.9% (15.4% + 1.5%) of late adopters and 11.8% (7.5% + 4.3%) of nonadopters; 56.6% of early adopters falls in the category "none" as compared to the corresponding 67.6% of late adopters and 75.3% of nonadopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the three groups.

Secondly, no significant differences can be demonstrated between early adopters and late adopters in terms of the number of children in the age range 1 to 5 living at home, whereas both groups are quite different from nonadopters. Only 5% of nonadopters have at home children in this age range, less than half the 11.3% of early adopters, and 13.8% of late adopters. Chi-square testing indicates these differences to be significant at the 0.05 alpha level.

Thirdly, the three adopter groups are quite dissimilar from one another in terms of the number of children in the age range 6 to 12 living at home: 20.6% of early adopters have one or more children in this range in contrast with 10.8% of late adopters; 16.9% of late adopters fall in this category, as compared to 10.8% of late adopters.



The differences between early adopters and nonadopters are more apparent than those between early adopters and late adopters, although the three groups are quite dissimilar from one another. The chi-square test is significant at the 0.05 alpha level for the three group differences.

Finally, significant differences exist among the three adopter group in terms of the numbers of children in the age range 13 to 18. Of the late adopters, 9.2% fall in the category "one or more children" in contrast with 22.7% of early adopters and 16.8% of nonadopters. The differences between early adopters and late adopters are more apparent than those between early adopters and nonadopters. Chi-square analysis shows the differences among the three groups to be significant at the 0.10 alpha level.

Summarizing the above four tests, three different patterns emerge: early adopters have more children under age 19 with a large percentage of them being clustered in the age range 6 to 18; late adopters have fewer children under age 19 than early adopters with a large percentage of them being clustered in the age range 1 to 12; and nonadopters have the least number of children under age 19 with a large percentage of them being clustered in the age range 13 to 18. Therefore, the hypothesis that early adopters, late adopters, and nonadopters differ on the basis of family life cycle can be accepted.

Type of Residence. Hypothesis A-5 states that early adopters, late adopters, and nonadopters differ on the basis of type of residence. Table B-8 (Appendix B) presents results. Type of residence does not appear to distinguish early adopters from late adopters while both groups are quite different from nonadopters. Of the

nonadopters, 9.3% fall in the category "rent apartment or rent house," as compared to 15.8% of early adopters and late adopters. Therefore, more individuals in the nonadopter group appear to own houses than those in the early and the late groups. Chi-square testing shows these differences to be significant at the 0.10 alpha level.

Occupation. Hypothesis A-8 states that early adopters, late adopters and nonadopters differ on the basis of occupation. Table B-9 (Appendix B) presents the results. Twelve categories of occupation were originally used in the survey questionnaire. However, due to the insufficient number of observations in six categories of occupation, categories were collapsed, based on a continuum from white to blue collar, into the following six categories: managerial; professional; skilled trade; technical; office worker, or general labor; retired; homemaker; and others (students, salesperson, military, or service worker).

Significant differences can be demonstrated between early adopters and nonadopters in overall profile. Early adopters are dissimilar from late adopters only in the two categories: skilled trade, technical, office worker, or general labor; and homemaker. Of the early adopters, 52% (25.5% + 26.5%) fall in the categories "skilled trade, office worker, technical, or general labor and professional," as compared to 37.1% (18.4% + 18.7%) of nonadopters. A large percentage (26.9%) of nonadopters are retired, as compared to 8.8% of early adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Education. Hypothesis A-7 states that the three adopter groups differ on the basis of education. Table B-10 (Appendix B) presents the

results. More individuals in the early adopter group have higher education than those in the late adopter and nonadopter groups, while more individuals in the late adopter group have higher education than those in the nonadopter group. Of the early adopters, 76.4% (43.1% + 33.3%) have a college or graduate school education, as compared to 67.6% of late adopters and 60.4% of nonadopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Employment Status. Hypothesis A-8 states that the three adopter groups differ on the basis of employment status. Table B-11 (Appendix B) presents the results. More individuals among early adopters fall in the category "fulltime" than those among late adopters and nonadopters, while more individuals in the late adopter groups are fulltime employed than the corresponding individuals in the nonadopter group. Thirty percent of nonadopters are retired in contrast with only 11.8% of early adopters and 17.6% of late adopters. Of early adopters, 20.6% are not working (not employed or retired), as compared to the corresponding 36.7% of late adopters and 39.2% of nonadopters. The chi-square test is significant at the 0.05 alpha level for the three group differences.

Regular Working Hours. Hypothesis A-9 states that the three adopter groups differ on the basis of regular working hours. Table B-12 (Appendix B) presents the results. More individuals in the early adopter group are working during the bank hours than those in the late adopter and nonadopter groups, while there are more individuals working during the bank hours in the late adopter group than those in the nonadopter group. Of early adopters, 65.7% are working during the bank hours, as compared to 57.4% of late adopters and 46.6% of nonadopters.

Chi-square testing shows these differences to be significant at the 0.05 alpha level.

Age. Hypothesis A-10 states that the three adopter groups differ on the basis of age. Table B-13 presents the results. In general, early adopters and late adopters are somewhat younger than nonadopters, while age differences are not as apparent between early and late adopters. Of the nonadopters, 17.3% are age 40 or younger, as compared to 37.3% of early adopters and 30.8% of late adopters. Of nonadopters, 65.5% are age 51 or older in contrast with 37.3% of early adopters and 45.5% of late adopters. Chi-square shows these differences to be significant at the 0.05 alpha level for the three groups.

Income. Hypothesis A-11 states that the three adopter groups differ on the basis of total income. Table B-14 (Appendix B) presents the results. Early adopters are somewhat more likely to have higher total family income than both the late adopter and nonadopter groups. Of the early adopters, 56.5% (22.8% + 33.7%) have a total family income of \$25,000 or more, whereas slightly more than 60% of the late adopters and of the nonadopters have a total family income of \$24,999 or less.

Considering only the late adopter and nonadopter groups, overall differences are not apparent although there are considerably more individuals with a total family income less than \$15,000 among nonadopters than 20% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

Social Participation. Hypothesis A-12 states that the three adopter groups differ on the basis of social participation. Table B-15 (Appendix B) presents the results. As was mentioned in the previous

chapter, social participation was measured by the total number of different categories of groups or organizations to which one belonged. Unlike in the case of product oriented innovations, chi-square testing shows that no significant differences exist among the three adopter groups in terms of social participation. This result is not unusual considering the fact that most individuals prefer to restrain themselves from talking about personal financial matters such as banking transactions. Accordingly, hypothesis A-12 is rejected.

Social Mobility. Hypothesis A-14 states that the three adopter groups differ on the basis of social mobility. Table B-16 (Appendix B) presents the results. As was mentioned in the previous chapter, social mobility was measured by the number of different residences one has lived in during the past 15 years. In view of the frequency distributions of this variable, responses to this question were collapsed into three categories: 0 to 1 residence; 2 or 3 residences; and more than 3 residences.

The three adopter groups are quite dissimilar: early adopters tend to be most socially mobile, late adopters the next, and nonadopters the last. Thirty-five percent of early adopters fall in the category of "more than 3 residences" as compared to 20.6% of late adopters and 10.7% of nonadopters. Only 24% of early adopters fall in the category "0 to 1 residence" in contrast with 33.8% of late adopters and 56.1% of nonadopters. Chi-square testing shows these differences to be significant at 0.05 alpha level.

Print Readership. Hypothesis A-15 states that the three adopter groups differ on the basis of print readership. Table B-17 (Appendix B) presents the results. As indicated in the previous chapter, print

readership is measured by the total number of different categories of magazines or newspapers usually read. Unlike in the case of product oriented innovations, chi-square testing reveals that no significant differences exist among the three adopter groups. It appears that one's exposure to printed news media does not have a significant impact upon the adoption decision to be made is, to a degree, associated with personal financial security.

Exposure to News Media in General. Hypothesis A-16 states that the three adopter groups differ on the basis of exposure to news media in general. Table B-18 (Appendix B) presents the results. Exposure to news media in general was measured by the average time spent per day reading magazines or watching TV. In view of the patterns of the frequency distribution of this variable, responses to this question were collapsed into five categories: 0 to 1 hour; 2 hours; 3 hours; 4 to 5 hours; and more than 5 hours.

Early adopters appear to be moderate in their exposure to the general news media, whereas both late adopters and nonadopters tend to be more extreme: only 20% (15% + 5%) of early adopters fall in the categories "4 to 5 hours" or "more than 5 hours," as compared to 31.4% (23.9% + 7.5%) of late adopters, and 34.4% (25.9% + 8.5%) of nonadopters. Fifty-nine percent (25% + 34%) of early adopters are in the categories "2 hours" or "3 hours" as compared to 48% of late adopters and 52.8% of nonadopters. Late adopters and nonadopters are quite similar. Chi-square analysis shows these differences to be significant at the 0.10 alpha level.

Proclivity to Comply with Perceived Prevailing Social Influences. Hypothesis A-17 states that the three adopter groups differ on the basis

of their proclivity to comply with perceived prevailing social influences. Table B-19 (Appendix B) presents the results. As indicated in the previous chapter, this variable was measured by asking respondents whether the car they usually drive is a fuel efficient small compact car. Early adopters and late adopters are more likely to drive a fuel efficient small cars than nonadopters, while no significant differences exist between early adopters and late adopters. Of the nonadopters, 31.2% drive a fuel efficient small car as compared to 44.9% of early adopters and 42.4% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

Summarizing the cross tabulation analyses so far performed on the receiver variables, the three adopter groups are significantly different on the basis of demographic factors, social interaction factors, communication behavior, and normative compliance. Compared to late adopters and nonadopters, a larger percentage of early adopters are single, male, in the middle stage of family life cycle, higher in occupational status, full-time employed, working during regular bank business hours, more highly educated, younger, higher in income, more socially mobile, spending moderate time for general news media, more compliant with social influences, and have more children under age 19 living at home. Synthesizing these characteristics of early adopters, they can be described as highly motivated, family oriented, financially more affluent intellectuals. The differences between early adopters and nonadopters in these characteristics are generally more apparent than those between early adopters and late adopters. Receiver variables and other factors influence the basic tendency to innovate, and affect

the way in which the innovation decision process occurs for a given individual (Rogers and Shoemaker, 1971).

Personality. Hypothesis B states that early adopters, late adopters, and nonadopters differ on the basis of aggressive orientation and detached orientation but not on the basis of compliant orientation. A summary of cross tabulation analyses on each personality orientation is presented in Table IV-2. The discussion of the results of the cross tabulation analyses on each personal orientation is presented subsequently in detail.

TABLE IV-2  
A SUMMARY OF CROSS TABULATION ANALYSES  
ON PERSONALITY DIMENSIONS

| Variables                 | Chi-Square<br>Significance<br>Test | Index* for<br>Cross Tabulation<br>Analysis |
|---------------------------|------------------------------------|--------------------------------------------|
| Aggressive<br>Orientation | Significant at .05                 | Table C-1                                  |
| Detached<br>Orientation   | Significant at .10                 | Table C-2                                  |
| Compliant<br>Orientation  | Not Significant at .10             | Table C-3                                  |

\*Tables C-1 through C-3 are in Appendix C.

Aggressive Orientation. Hypothesis B-1 states that the three adopter groups differ on the basis of aggressive orientation. Table C-1 presents the results. For the purpose of this study, respondents' aggressive orientation scores were collapsed into three categories by use of its standard deviation: less than 44 points in sum (below the



mean); between 44 and 51 points in sum (between the mean and plus one standard deviation from the mean); and greater than 51 points (from plus one standard deviation to the maximum).

Early adopters are more likely to be aggressive as compared to both late adopters and nonadopters, while there are more individuals with a score greater than 51 among late adopters than those in nonadopters. Of the early adopters, 35.3% fall in the category "greater than 51" as compared to 23.5% of late adopters and 14.8% of nonadopters. Of the nonadopters, 52.7% fall in the category "less than 44 (below the mean)" in contrast with 34.3% of early adopters and 36.8% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Detached Orientation. Hypothesis B-2 states that the three adopter groups differ on the basis of detached behavior. Table C-2 (Appendix C) presents the results. As in the case of testing hypothesis B-1, the standard deviation scheme was used to collapse the respondents' detached scores into three categories: less than 26 points (below the mean); between 26-31 points (from the mean to plus one standard deviation from the mean); and greater than 31 points (from plus one standard deviation to the maximum).

Nonadopters are more likely to be detached than both early adopters and late adopters, while no significant differences exist between early adopters and late adopters. Of nonadopters, 14.5% fall in the category "greater than 31," in contrast with 5.9% of early adopters and 8.8% of nonadopters. There are far less individuals with low detached orientation scores among nonadopters, as compared to the corresponding 55.9% of early adopters and 58.8% of late adopters.

Chi-square testing shows these differences to be significant at the 0.10 alpha level.

Compliant Orientation. Hypothesis B-3 states that the three adopter groups do not differ on the basis of compliant orientation. Table C-3 (Appendix C) presents the results. Chi-square testing shows that no significant differences exist among the three adopter groups at the 0.10 alpha level.

As was stated in the previous chapter, "compliant-oriented people want to be part of the activities of others." This behavior is, to a degree, shared by all of us, borrowing Aristotle's statement that "man is a social animal." As shown in the test of hypothesis A-12, which evaluates the relation between the three adopter groups and social participation, the nature of the usage of V-24 is very personal and thus, one's desire to be part of the activities of others does not appear to play an important role in one's adoption decision process of V-24.

Summarizing the above three tests on personality dimensions, three different patterns emerge: early adopters are most aggressive; non-adopters are most detached; and no significant differences exist among the three adopter groups in compliant orientation.

Information and/or experiences regarding general bank-related services and V-24. Hypothesis A states that early adopters, late adopters, and nonadopters differ on the basis of their general information and/or experience with respect to general bank-related services and V-24: average usage rate per month of V-24, conventional teller usage rate per month, knowledge on the liability due to fraudulent use of V-24 card, complaints or problems concerning the use

of V-24, number of bank credit cards owned, and number of gasoline credit cards owned. A summary of cross tabulation analyses on these variables is presented in Table IV-3. The discussion of the results of the cross tabulation analyses on each of these variables is presented subsequently in detail.

TABLE IV-3

A SUMMARY OF CROSS TABULATION ANALYSES ON GENERAL INFORMATION  
AND/OR EXPERIENCE WITH REGARD TO GENERAL BANK-  
RELATED SERVICES AND V-24

| Variables                                   | Chi-Square<br>Significance<br>Test | Index* for<br>Cross Tabulation<br>Analysis |
|---------------------------------------------|------------------------------------|--------------------------------------------|
| V-24 Average Usage<br>Rate per Month        | Significant at .01                 | Table D-1                                  |
| Conventional Teller<br>Usage Rate per Month | Not Significant at .10             | Table D-2                                  |
| Knowledge on the<br>Liability               | Significant at .0001               | Table D-3                                  |
| Complaints or<br>Problems                   | Significant at .0001               | Table D-4                                  |
| Number of Bank Credit<br>Cards Owned        | Significant at .0001               | Table D-5                                  |
| Number of Gasoline<br>Credit Cards Owned    | Significant at .05                 | Table D-6                                  |

\*Tables D-1 through D-6 are in Appendix D.

V-24 Average Usage Rate per Month. Hypothesis C-3 states that early adopters and late adopters differ on the basis of their average usage rate of V-24 per month. Table D-1 presents the results. Non-adopters were excluded from this analysis since they did not use V-24.

Early adopters are far more likely to be heavy users of V-24 as compared to late adopters: 43.7% (26% + 17.7%) of early adopters use V-24 five or more times per month, more than twice the corresponding 21% for late adopters. Only 56.3% of early adopters use V-24 four times or less in contrast with 78.9% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the two groups.

Conventional Teller Usage Rate per Month. Hypothesis C-4 states that the three adopter groups differ on the basis of conventional teller usage rate per month. Table D-2 (Appendix D) presents the results. In view of the patterns of the frequency distributions of this variable, responses were collapsed into five categories: 1 or 2 times; 3 or 4 times; 5 or 6 times; 7 or 8 times; and more than 8 times.

The chi-square value in Figure 4-24 reveals that no significant differences can be demonstrated among the three adopter groups. The interpretation of this finding appears to connote that conventional teller services and V-24 are perceived as two different entities although they provide the same services in terms of the functions. Also, the relationship between the usage rates of conventional tellers and of V-24 seems to be weak, if not independent.

Knowledge on the Liability Due to Fraudulent Use of V-24 Card. Hypothesis C-5 states that the three adopter groups differ on the basis of their knowledge on the liability due to fraudulent use of V-24 card. Table D-3 (Appendix D) presents the results.

If an individual's V-24 card is lost or stolen and the bank is notified within two business days, the maximum amount of money he can

lose through fraudulent use of his card is \$50.00. More individuals among early adopters are knowledgeable about the liability than those in both late adopters and nonadopters, while there are more individuals knowledgeable among late adopters than those among nonadopters. Of the early adopters, 46.1% are knowledgeable about the liability in contrast with 16.3% of nonadopters and 39.7% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

#### Complaints and Problems Concerning the Use of V-24.

Hypothesis C-7 states that the three adopter groups differ on the basis of their complaints and problems concerning the use of V-24. Table D-4 (Appendix D) presents the results. For the purpose of this analysis, open-ended responses to this question on the survey were collapsed into four categories: no complaints; mechanical (general malfunctions of V-24); psychological; and others (physical, social, financial, or time risks).

More individuals among early adopters have complaints or problems in their V-24 usage than those in both late adopters and nonadopters. Most of the complaints and problems mentioned by early adopters are related to the general malfunctions of V-24. As expected, nonadopters had least complaints or problems since they did not use V-24. However, the interesting point to note as to the complaints or problems mentioned by nonadopters is that most of their complaints and problems are of a psychological nature. Forty-eight percent ( $39.2\% + 3.9\% + 4.9\%$ ) of early adopters had some complaints or problems in their V-24 usage, as compared to 30.9% of late adopters and 23.7% of nonadopters. Chi-square

testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Number of Bank Credit Cards Owned. Hypothesis C-7 states that the three adopter groups differ on the basis of the number of bank credit cards owned. Table D-5 (Appendix D) presents the results.

Early adopters appear to have a larger number of bank credit cards than both late adopters and nonadopters. Of the early adopters, 88.1% have one or more bank credit cards, as compared to 82.4% of late adopters and 70.6% of nonadopters. Nearly 20% of early adopters fall in the category "more than 2 cards," more than twice the corresponding 8.8% of late adopters and 7.4% of nonadopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Number of Gasoline Credit Cards Owned. Hypothesis C-8 states that the three adopter groups differ on the basis of the number of gasoline credit cards owned. Table D-6 (Appendix D) presents the results.

Early adopters are more likely to have a larger number of gasoline credit cards than both late adopters and nonadopters, while no significant differences seem to exist between late adopters and nonadopters in this aspect. A larger percentage of early adopters have gasoline credit cards, as compared to late adopters and nonadopters. Of the early adopters, 39.6% have more than two gasoline credit cards as compared to 22.4% of late adopters and 26.2% of nonadopters. Of the early adopters, 71.3% have one or more gasoline credit cards as compared to 65.7% of late adopters and 60.3% of nonadopters. Chi-square

testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Summarizing the cross tabulation analyses on general information and/or experience with respect to general bank-related services and V-24, the three adopter groups are significantly different in that early adopters are more familiar with general bank-related services and V-24, late adopters next, and nonadopters last. Compared to both late adopters and nonadopters, a larger percentage of early adopters have more bank and gasoline credit cards, more complaints or problems in their V-24 usage with most of them being of mechanical nature, and are more knowledgeable about the liability. Compared to late adopters, early adopters are far more likely to be heavy users of V-24.

Perception of the overall quality of the bank services before the introduction of V-24. Hypothesis D states that the three adopter groups differ on the basis of their perception of the overall quality of the bank services before the introduction of V-24. Table IV-4 presents the results.

As indicated in the previous chapter, respondents were asked, for the purpose of measuring the level of "problem recognition," how they viewed limited bank hours, waiting in teller lines, and inexperienced bank tellers before the bank introduced V-24. Table IV-4 indicates that more individuals among the early adopters had a higher level of problem recognition than those in both the early adopter and the nonadopter groups. The differences between early adopters and late adopters are far less apparent than those between early adopters and nonadopters. Of the early adopters 36.3% fall in the category

TABLE IV-4

RELATION BETWEEN THREE ADOPTER GROUPS AND PROBLEM RECOGNITION

| COUNT         | ROW PCT        | COL PCT | TOT PCT | STRONGLY DISAGRE | SLIGHTLY DISAGRE | NEUTRAL | SLIGHTLY AGREE | STRONGLY AGREE | ROW TOTAL |
|---------------|----------------|---------|---------|------------------|------------------|---------|----------------|----------------|-----------|
|               |                |         |         |                  |                  |         |                |                |           |
| XADAPT        | 1              | 1       | 1       | 1                | 2                | 3       | 1              | 4              | 5         |
|               | 1              | 1       | 1       | 1                | 5                | 20      | 1              | 30             | 37        |
|               | EARLY ADAPTERS | 1       | 1       | 1                | 4.9              | 19.6    | 1              | 29.4           | 36.3      |
|               |                | 1       | 1       | 1                | 6.4              | 18.5    | 1              | 29.4           | 52.1      |
| LATE ADAPTERS | 2              | 1       | 1       | 1                | 1.1              | 4.5     | 1              | 6.8            | 8.3       |
|               | 1              | 1       | 1       | 1                | 10               | 10      | 1              | 24             | 20        |
|               | 1              | 1       | 1       | 1                | 14.7             | 14.7    | 1              | 35.3           | 29.4      |
|               | 1              | 1       | 1       | 1                | 12.8             | 9.3     | 1              | 23.5           | 28.2      |
| NON-ADAPTERS  | 3              | 1       | 1       | 1                | 2.3              | 2.3     | 1              | 5.4            | 4.5       |
|               | 1              | 1       | 1       | 1                | 63               | 78      | 1              | 48             | 14        |
|               | 1              | 1       | 1       | 1                | 23.0             | 28.5    | 1              | 17.5           | 5.1       |
|               | 1              | 1       | 1       | 1                | 80.8             | 72.2    | 1              | 47.1           | 15.7      |
| COLUMN TOTAL  | 1              | 1       | 1       | 1                | 14.2             | 17.6    | 1              | 10.8           | 3.2       |
|               | 1              | 1       | 1       | 1                | 78               | 108     | 1              | 102            | 71        |
|               |                |         |         | 15.1             | 17.6             | 24.3    | 23.0           | 16.0           | 100.0     |

RAW CHI SQUARE = 101.19951 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000



"strongly agree" (highest level of problem recognition) as compared to 29.4% of late adopters and 5.1% of nonadopters. Only 14.7% of early adopters are in the categories "strongly disagree" and "slightly disagree" as compared to 20.6% of late adopters and 48.9% of nonadopters. Chi-square analysis shows these differences among the three groups to be significant at the 0.05 alpha level.

Perception of the Usage of V-24 by reference group members.

Hypothesis E states that the three adopter groups differ on the basis of their perceptions of the usage of V-24 by their reference group members. Table IV-5 presents the results.

As indicated in the previous chapter, this variable was intended to measure the self-perceived environmental pressure in connection with the adoption of V-24. Table IV-5 indicates that early adopters appear to have received least environmental pressure in connection with the adoption of V-24 among the three adopter groups, while no significant differences appear to exist between late adopters and nonadopters. Forty-eight percent (36% + 12%) of early adopters are in the categories "strongly disagree" and "slightly disagree" as compared to 16.2% of late adopters and 12.7% of nonadopters. Eleven percent of early adopters are in the categories "slightly agree" and "strongly agree" in contrast with the corresponding 44.2% of late adopters and 38.1% of nonadopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

Date of first awareness. Hypothesis F states that the three adopter groups differ on the basis of the date of their first awareness of the existence of V-24. Table IV-6 presents the results. Most early

TABLE IV-5

RELATION BETWEEN THREE ADAPTER GROUPS AND V-24 USAGE BY REFERENCE GROUP MEMBERS

| COUNT          | ROW PCT | COL PCT | TOT PCT | I    | STRONGLY DISAGRE | SLIGHTLY DISAGRE | NEUTRAL | SLIGHTLY AGREE | STRONGLY AGREE | ROW TOTAL |
|----------------|---------|---------|---------|------|------------------|------------------|---------|----------------|----------------|-----------|
|                |         |         |         |      |                  |                  |         |                |                |           |
| XADAPT         | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
| EARLY ADAPTERS | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
| LATE ADAPTERS  | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
| NON-ADAPTERS   | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
|                | I       | I       | I       | I    | I                | I                | I       | I              | I              | I         |
| COLUMN TOTAL   |         |         |         | 65   | 26               | 192              | 64      | 73             | 420            |           |
| TOTAL          |         |         |         | 15.5 | 6.2              | 45.7             | 15.2    | 17.4           | 100.0          |           |

1 OUT OF 15 ( 6.7%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
 MINIMUM EXPECTED CELL FREQUENCY = 4.210  
 RAW CHI SQUARE = 64.12020 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000

TABLE IV-6

RELATION BETWEEN THREE ADOPTER GROUPS AND DATE OF FIRST AWARENESS OF V-24

| COUNT          |     | I   |      | S    |      | SEP-DEC |      | JAN 1977 |      | JAN 1979 |      | ROW   |      |
|----------------|-----|-----|------|------|------|---------|------|----------|------|----------|------|-------|------|
| ROW            | PCT | IB  | EF   | CR   | E    | 1976    | 1976 | -DEC     | 197  | -OCT     | 198  | TOTAL |      |
| COL            | PCT | IEP | 1976 | 1976 | 1976 | 1976    | 1976 | 1976     | 1976 | 1976     | 1976 | 1976  | 1976 |
| TOT            | PCT | I   | I    | I    | I    | I       | I    | I        | I    | I        | I    | I     | I    |
| XADAPT         |     | I   |      | I    |      | I       |      | I        |      | I        |      | I     |      |
| EARLY ADAPTERS |     | 1   | 88   | 1    | 14   | 1       | 14   | 1        | 0    | 1        | 0    | 102   |      |
|                |     | I   | 86.3 | I    | 13.7 | I       | 13.7 | I        | 0.0  | I        | 0.0  | 23.6  |      |
|                |     | I   | 29.4 | I    | 25.0 | I       | 25.0 | I        | 0.0  | I        | 0.0  |       |      |
|                |     | I   | 20.3 | I    | 3.2  | I       | 3.2  | I        | 0.0  | I        | 0.0  |       |      |
| LATE ADAPTERS  |     | 2   | 28   | 1    | 6    | 1       | 6    | 1        | 10   | 1        | 18   | 62    |      |
|                |     | I   | 45.2 | I    | 9.7  | I       | 9.7  | I        | 16.1 | I        | 29.0 | 14.3  |      |
|                |     | I   | 5.4  | I    | 10.7 | I       | 10.7 | I        | 28.6 | I        | 41.9 |       |      |
|                |     | I   | 6.5  | I    | 1.4  | I       | 1.4  | I        | 2.3  | I        | 4.2  |       |      |
| NON-ADAPTERS   |     | 3   | 183  | 1    | 36   | 1       | 36   | 1        | 25   | 1        | 25   | 269   |      |
|                |     | I   | 68.0 | I    | 13.4 | I       | 13.4 | I        | 9.3  | I        | 9.3  | 62.1  |      |
|                |     | I   | 61.2 | I    | 64.3 | I       | 64.3 | I        | 71.4 | I        | 58.1 |       |      |
|                |     | I   | 42.3 | I    | 8.3  | I       | 8.3  | I        | 5.8  | I        | 5.8  |       |      |
| COLUMN TOTAL   |     |     | 299  |      | 56   |         | 56   |          | 35   |          | 43   | 433   |      |
| TOTAL          |     |     | 69.1 |      | 12.9 |         | 12.9 |          | 8.1  |          | 9.9  | 100.0 |      |

RAW CHI SQUARE = 56.86333 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000

adopters became aware of the existence of V-24 earlier in time than late adopters and nonadopters, while there were more individuals aware of the existence of V-24 earlier in time among nonadopters than those among late adopters. Of the early adopters, 86.3% became aware of the existence of V-24 before September, 1976, as compared to nearly twice the corresponding 45.2% of late adopters and to 68% of nonadopters. There are no individuals between January, 1977, and October, 1980, among early adopters in contrast with the corresponding 45.1% of late adopters and 18.6% of nonadopters. The chi-square test is significant at the 0.05 alpha level for the three group differences.

Sources of information used to become aware of the existence of V-24. Hypothesis G-1 states that no differences exist among early adopters, late adopters, and nonadopters in the sources of information used to become aware of the existence of V-24. Table IV-7 presents the results.

Most of the individuals in the three adopter groups became aware of the existence of V-24 from the V-24 cards mailed from the bank in September, 1976. The information sources most commonly used next to the V-24 card mailed from the bank by the three adopter groups are radio, TV, or newspapers. Chi-square testing reveals that no significant differences exist among the three adopter groups at the 0.05 alpha level.

Perceived helpfulness of the information sources used to become aware of the existence of V-24. Hypothesis G-2 states that the three adopter groups differ on the basis of their perceived helpfulness of the information sources used to become aware of the existence of V-24. Table IV-8 presents the results. The two categories "strongly disagree"

TABLE IV-7

RELATION BETWEEN THREE ADAPTER GROUPS AND SOURCE OF FIRST KNOWLEDGE OF V-24

| COUNT          |         | I         |        | RELATIVE RADIO, TV CARD IN |          | VALLEY S |          | RCW      |          |
|----------------|---------|-----------|--------|----------------------------|----------|----------|----------|----------|----------|
| ROW PCT        | COL PCT | I & FRIEN | NEWSAP | MAIL                       | ADAPTERS | ADAPTERS | ADAPTERS | ADAPTERS | ADAPTERS |
| TOT PCT        | TOT PCT | 1         | 2      | 3                          | 4        | 5        | 6        | 7        | 8        |
| XADAPT         |         |           |        |                            |          |          |          |          |          |
| 1              |         |           |        |                            |          |          |          |          |          |
| EARLY ADAPTERS |         |           |        |                            |          |          |          |          |          |
| 1              | 1       | 2         | 1      | 19                         | 1        | 59       | 1        | 19       | 1        |
|                |         | 2.0       |        | 19.2                       |          | 59.6     |          | 19.2     |          |
|                |         | 22.2      |        | 23.8                       |          | 20.3     |          | 30.2     |          |
|                |         | 0.5       |        | 4.3                        |          | 13.3     |          | 4.3      |          |
| 2              |         |           |        |                            |          |          |          |          |          |
| LATE ADAPTERS  |         |           |        |                            |          |          |          |          |          |
| 1              | 1       | 2         | 1      | 11                         | 1        | 42       | 1        | 13       | 1        |
|                |         | 2.9       |        | 16.2                       |          | 61.8     |          | 19.1     |          |
|                |         | 22.2      |        | 13.8                       |          | 14.5     |          | 20.6     |          |
|                |         | 0.5       |        | 2.5                        |          | 9.5      |          | 2.9      |          |
| 3              |         |           |        |                            |          |          |          |          |          |
| NON-ADAPTERS   |         |           |        |                            |          |          |          |          |          |
| 1              | 1       | 5         | 1      | 50                         | 1        | 189      | 1        | 31       | 1        |
|                |         | 1.8       |        | 18.2                       |          | 68.7     |          | 11.3     |          |
|                |         | 55.6      |        | 62.5                       |          | 65.2     |          | 49.2     |          |
|                |         | 1.1       |        | 11.3                       |          | 42.8     |          | 7.0      |          |
| COLUMN         |         |           |        |                            |          |          |          |          |          |
| TOTAL          |         | 9         | 80     | 290                        | 63       | 442      |          | 100.0    |          |

2 OUT OF 12 ( 16.7%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
 MINIMUM EXPECTED CELL FREQUENCY = 1.385  
 RAW CHI SQUARE = 6.18627 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.4027

TABLE IV-8

RELATION BETWEEN THREE ADOPTER GROUPS AND PERCEIVED HELPFULNESS OF THE  
INFORMATION SOURCES USED TO BECOME AWARE OF V-24

| XADAPT         | COUNT   | 1   | 2    | 3    | NEUTRAL | SLIGHTLY<br>AGREE | STRONGLY<br>AGREE | ROW<br>TOTAL |
|----------------|---------|-----|------|------|---------|-------------------|-------------------|--------------|
|                |         |     |      |      |         |                   |                   |              |
| EARLY ADAPTERS | ROW PCT | 1   | 0    | 12   | 1       | 19                | 70                | 101          |
|                | COL PCT | 1   | 0.0  | 11.9 | 1       | 18.8              | 69.3              | 23.1         |
|                | TOT PCT | 1   | 0.0  | 6.6  | 1       | 22.9              | 45.2              |              |
|                |         | 1   | 0.0  | 2.7  | 1       | 4.3               | 16.0              |              |
| LATE ADAPTERS  | ROW PCT | 2   | 1    | 20   | 1       | 18                | 29                | 68           |
|                | COL PCT | 1   | 1.5  | 29.4 | 1       | 26.5              | 42.6              | 15.5         |
|                | TOT PCT | 1   | 5.9  | 10.9 | 1       | 21.7              | 18.7              |              |
|                |         | 1   | 0.2  | 4.6  | 1       | 4.1               | 6.6               |              |
| NON-ADAPTERS   | ROW PCT | 3   | 16   | 151  | 1       | 46                | 56                | 269          |
|                | COL PCT | 1   | 5.9  | 56.1 | 1       | 17.1              | 20.8              | 61.4         |
|                | TOT PCT | 1   | 94.1 | 82.5 | 1       | 55.4              | 36.1              |              |
|                |         | 1   | 3.7  | 34.5 | 1       | 10.5              | 12.8              |              |
| COLUMN TOTAL   |         | 17  | 183  |      | 83      | 155               |                   | 438          |
|                |         | 3.9 | 41.8 |      | 18.9    | 35.4              |                   | 100.0        |

2 OUT OF 12 ( 16.7%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
MINIMUM EXPECTED CELL FREQUENCY = 2.639  
RAW CHI SQUARE = 97.76472 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000

and "slightly disagree" were collapsed into the category "disagree" due to insufficient number of cases in the two categories.

Table IV-8 indicates that a significantly large percentage of early adopters viewed the information sources used to become aware of the existence of V-24 as very helpful as compared to late adopters and nonadopters. Of the early adopters, 69.3% viewed the information sources used as very helpful ("strongly agree") in contrast with the corresponding 20.8% of nonadopters and 42.6% of late adopters. The findings of this test appears to connote that early adopters tend to put high trust in the bank whereas nonadopters seem to be somewhat the opposite.

Information sources relied on most in the adoption decision making of V-24. Hypothesis G-3 states that the three adopter groups differ on the basis of the information sources relied on most when considering whether or not to use V-24. Table IV-9 presents the results. Eight categories of information sources were originally used in the survey questionnaire. Radio, TV, and newspapers were combined into one category. Message board and none of these were combined into another category. This combination resulted in five categories for this variable: relatives and friends; radio, TV, and newspapers; bank employees; message board and others; and card in mail.

Table IV-9 indicates that a larger percentage of early adopters relied on bank-related information sources (bank employees and V-24 card mailed from the bank) as compared to those in both the late adopter and the nonadopter groups, while more individuals among late adopters relied on relatives and friends than those among early adopters and nonadopters. Of the early adopters, 78.4% (25.5% + 52.9%) relied on bank-related

TABLE IV-9

RELATION BETWEEN THREE ADOPTER GROUPS AND INFORMATION SOURCES  
RELIED ON MOST FOR V-24 ADOPTION DECISION MAKING

| COUNT          | RELATIVE RADIO, TV AND FRI ,NEWSPAP S | EMPLOYEE | MSG BOAR D & OTHE | CARE IN MAIL | ROW TOTAL |       |     |   |
|----------------|---------------------------------------|----------|-------------------|--------------|-----------|-------|-----|---|
| ROW PCT        | COL PCT                               | TOT PCT  | 1                 | 2            | 3         | 4     | 5   | 1 |
| XADAPT         | 1                                     | 3        | 4                 | 26           | 15        | 54    | 102 |   |
| EARLY ADAPTERS | 2.9                                   | 3.9      | 25.5              | 14.7         | 52.9      | 22.9  |     |   |
|                | 13.6                                  | 21.1     | 44.8              | 10.3         | 26.9      |       |     |   |
|                | 0.7                                   | 0.9      | 5.8               | 3.4          | 12.1      |       |     |   |
| LATE ADAPTERS  | 9                                     | 1        | 15                | 14           | 28        | 67    |     |   |
|                | 13.4                                  | 1.5      | 22.4              | 20.9         | 41.8      | 15.1  |     |   |
|                | 40.9                                  | 5.3      | 25.9              | 9.7          | 13.9      |       |     |   |
|                | 2.0                                   | 0.2      | 3.4               | 3.1          | 6.3       |       |     |   |
| NON-ADAPTERS   | 10                                    | 14       | 17                | 116          | 119       | 276   |     |   |
|                | 3.6                                   | 5.1      | 6.2               | 42.0         | 42.1      | 62.0  |     |   |
|                | 45.5                                  | 73.7     | 29.3              | 80.0         | 55.2      |       |     |   |
|                | 2.2                                   | 3.1      | 3.8               | 26.1         | 26.7      |       |     |   |
| COLUMN TOTAL   | 22                                    | 19       | 58                | 145          | 201       | 445   |     |   |
|                | 4.9                                   | 4.3      | 13.0              | 32.6         | 45.2      | 100.0 |     |   |

3 OUT OF 15 ( 20.0%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
MINIMUM EXPECTED CELL FREQUENCY = 2.861  
RAW CHI SQUARE = 62.03270 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000



information sources in their adoption decision making as compared to 49.3% of nonadopters and 64.2% of late adopters. Of the late adopters, 13.4% relied on relatives and friends in contrast to the corresponding 2.9% of early adopters and 3.6% of nonadopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level for the three group differences.

Perceived helpfulness of the information sources used in considering whether or not to use V-24. Hypothesis G-4 states that the three adopter groups differ on the basis of the perceived helpfulness of the information sources used in considering whether or not to use V-24. Table IV-10 presents the results. Due to insufficient number of observations in the categories "strongly disagree" and "slightly disagree," the two categories were combined into one category labeled as "disagree."

Nonadopters are significantly different across all categories from late adopters and early adopters, while no significant differences can be demonstrated between early adopters and late adopters. Of the nonadopters, 30.6% (14.9% + 15.7%) viewed the information sources relied on as very helpful ("strongly agree") or helpful ("slightly agree") in their decision making in contrast with the corresponding 76.3% of early adopters and 74.2% of late adopters. Similarly, 10.3% of nonadopters viewed the information sources relied on as not helpful (disagree) in their decision making as compared to three times the 3.1% of early adopters and 3.2% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

TABLE IV-10

RELATION BETWEEN THREE ADOPTER GROUPS AND PERCEIVED HELPFULNESS OF  
THE INFORMATION SOURCES USED IN V-24 ADOPTION DECISION MAKING

|                | COUNT | I    | DISAGREE | NEUTRAL | SLIGHTLY<br>AGREE | STRONGLY<br>AGREE | RCW<br>TOTAL |
|----------------|-------|------|----------|---------|-------------------|-------------------|--------------|
| ROW PCT        | I     |      |          |         |                   |                   |              |
| COL PCT        | I     |      |          |         |                   |                   |              |
| TOT PCT        | I     | 2    | 1        | 3       | 1                 | 5                 | 1            |
| XADAPT         | I     |      |          |         |                   |                   |              |
|                | 1     | 3    | 1        | 20      | 15                | 59                | 97           |
| EARLY ADAPTERS | I     | 3.1  | 1        | 20.6    | 15.5              | 60.8              | 24.2         |
|                | I     | 10.0 | 1        | 11.3    | 23.1              | 45.7              | 1            |
|                | I     | 0.7  | 1        | 5.0     | 3.7               | 14.7              | 1            |
|                | -I    |      |          |         |                   |                   |              |
|                | 2     | 2    | 1        | 14      | 14                | 32                | 62           |
| LATE ADAPTERS  | I     | 3.2  | 1        | 22.6    | 22.6              | 51.6              | 15.5         |
|                | I     | 6.7  | 1        | 7.9     | 21.5              | 24.8              | 1            |
|                | I     | 0.5  | 1        | 3.5     | 3.5               | 8.0               | 1            |
|                | -I    |      |          |         |                   |                   |              |
|                | 3     | 25   | 1        | 143     | 36                | 38                | 242          |
| NON-ADAPTERS   | I     | 10.3 | 1        | 59.1    | 14.9              | 15.7              | 60.3         |
|                | I     | 83.3 | 1        | 80.8    | 55.4              | 29.5              | 1            |
|                | I     | 6.2  | 1        | 35.7    | 9.0               | 9.5               | 1            |
|                | -I    |      |          |         |                   |                   |              |
| COLUMN         |       | 30   | 177      | 65      | 129               |                   | 401          |
| TOTAL          |       | 7.5  | 44.1     | 16.2    | 32.2              |                   | 100.0        |

1 OUT OF 12 ( 8.33) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
MINIMUM EXPECTED CELL FREQUENCY = 4.638  
RAW CHI SQUARE = 91.86119 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000

Summarizing the results of the tests of hypotheses G-3 and G-4, it appears that most early adopters used bank-related information sources as their major source of information and had the highest trust in the bank-related information sources among the three adopter groups, whereas most late adopters appear to have relied on either bank-related information sources or relatives and friends in their adoption decision making. Unlike the two groups, nonadopters appear to be rather peculiar in information handling behavior. As shown in Table IV-9, a large percentage (42%) of nonadopters relied on message boards and other information sources and did not seem to have made much use for that information in their decision making. As shown in Table IV-10, 59.1% of nonadopters are in the category "neutral."

General attitude toward computers. Hypothesis M states that the three adopter groups differ on the basis of their general attitude toward computers. Table IV-11 presents the results. Early adopters and late adopters are more likely to have favorable attitude toward computers than nonadopters, while no significant differences exist between early adopters and late adopters. Of the nonadopters, 42.4% have favorable or very favorable attitudes ("slightly agree" or "strongly agree" categories) toward computers as compared to 66.6% of early adopters and 61.2% of late adopters. Chi-square testing shows these differences to be significant at the 0.05 alpha level.

Outcomes of the decision to adopt V-24. Hypothesis O states that no differences exist between early adopters and late adopters in the outcomes (satisfaction or dissatisfaction) of their decision to adopt V-24. Table IV-12 presents the results. Due to insufficient number of

TABLE IV-11

RELATION BETWEEN THREE ADOPTER GROUPS AND GENERAL ATTITUDE TOWARD COMPUTERS

| XADAPT         | COUNT<br>ROW PCT<br>COL PCT<br>TOT PCT | I | STRONGLY<br>DISAGRE | SLIGHTLY<br>DISAGRE | NEUTRAL | SLIGHTLY<br>AGREE | STRONGLY<br>AGREE | ROW<br>TOTAL |
|----------------|----------------------------------------|---|---------------------|---------------------|---------|-------------------|-------------------|--------------|
|                |                                        |   | 1                   | 2                   | 3       | 4                 | 5                 |              |
| EARLY ADAPTERS | 1                                      | I | 10                  | 7                   | 17      | 29                | 39                | 102          |
|                | I                                      | I | 5.8                 | 6.9                 | 16.7    | 28.4              | 38.2              | 22.8         |
|                | I                                      | I | 14.5                | 12.5                | 17.9    | 27.6              | 32.0              | I            |
|                | I                                      | I | 2.2                 | 1.6                 | 3.8     | 6.5               | 8.7               | I            |
| LATE ADAPTERS  | 2                                      | I | 7                   | 6                   | 13      | 24                | 17                | 67           |
|                | I                                      | I | 10.4                | 9.0                 | 15.4    | 35.8              | 25.4              | 15.0         |
|                | I                                      | I | 10.1                | 10.7                | 13.7    | 22.9              | 13.9              | I            |
|                | I                                      | I | 1.6                 | 1.3                 | 2.9     | 5.4               | 3.8               | I            |
| NON-ADAPTERS   | 3                                      | I | 52                  | 43                  | 65      | 52                | 66                | 278          |
|                | I                                      | I | 18.7                | 15.5                | 23.4    | 18.7              | 23.7              | 62.2         |
|                | I                                      | I | 75.4                | 76.8                | 68.4    | 49.5              | 54.1              | I            |
|                | I                                      | I | 11.6                | 9.6                 | 14.5    | 11.6              | 14.8              | I            |
| COLUMN TOTAL   |                                        |   | 69                  | 56                  | 95      | 105               | 122               | 447          |
|                |                                        |   | 15.4                | 12.5                | 21.3    | 23.5              | 27.3              | 100.0        |

RAW CHI SQUARE = 25.58103 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0011



cases in the categories "strongly disagree" and "slightly disagree," the two categories were combined into one category labeled as "disagree."

No significant differences exist between the two adopter groups although a slightly larger percentage of early adopters are very satisfied ("strongly agree" category) with the use of V-24 than late adopters. Of the early adopters, 84.8% (13.1% + 71.7%) are generally satisfied with the use of V-24 as compared to 83.8% of late adopters. Chi-square testing shows these differences to be insignificant at the 0.05 alpha level for the two group differences.

Synthesizing the results of cross tabulation analyses performed in this section in the context of selected generalizations of the properties of innovativeness (Figure II-8, p. 64) suggested by Rogers and Shoemaker (1971), the following generalizations in Figure II-8 are supported:

1. Early adopters have greater knowledge of innovation than late adopters.
2. Early adopters have higher levels of achievement motivation than late adopters.
3. Early adopters have higher aspirations than late adopters.
4. Early adopters have higher social status than late adopters.
5. Early adopters have a greater degree of upward social mobility than do late adopters.
6. Early adopters have a more favorable attitude toward credit.
7. Early adopters have more specialized operations than late adopters.
8. Early adopters have more years of education than late adopters.

The findings are not, however, in agreement with the following generalizations of the properties of innovativeness:

1. Early adopters are no different from late adopters in age.
2. Early adopters have more social participation than late adopters.
3. Early adopters have greater exposure to mass media communication channels than late adopters.

The discrepancy between the findings of cross tabulation analyses and the generalizations may be inferred to be attributable to the fact that the generalizations in Figure II-8 (p. 64) are based on product oriented innovations, whereas V-24 is a service oriented innovation. Since the use of V-24 is directly related to an individual's personal financial affairs, conversations on V-24 do not appear to take place in any social gathering situations. In the same context, the intensity of an individual's exposure to mass media, communication channels do not appear to exert significant influence over the adoption process of V-24 usage. Compared to late adopters and nonadopters, the majority of early adopters relied on bank-related information sources in their adoption decision making and appear to have high trust in bank-related information sources.

### Findings of Hotelling's $T^2$

To implement Hotelling's  $T^2$  tests on the selected variables of interest in this section, it is assumed that the distribution of the variables in concern in each of the three adopter groups is multivariate normal and that the variances and covariances are equal to justify the pooling of the sample variances-covariance matrices. The sample size

in this study for each of the three adopter groups is large enough to satisfy the multivariate normality assumption.

As was discussed in the previous chapter, three pairwise group comparisons (early adopters vs. late adopters, early adopters vs. noadopters, and late adopters vs. noadopters) were made on each set of the variables when considered simultaneously in order to test the hypotheses A-13, B, C-1 and C-2, H, J, K, L, and N for the purpose of probing the properties of innovativeness in V-24 usage. Table IV-13 presents a summary of Hotelling's  $T^2$  analyses on cosmopolitanism, personality, V-24 usage patterns, conventional teller usage patterns, convenience oriented usage of V-24, perceived V-24 attributes (relative advantage, complexity, compatibility, observability, and trialability), perceived risk in V-24 usage (financial/performance risk, social risk, psychological risk, time risk, physical risk, and financial risk), needs-wants-concerns in V-24 usage, and first impressions on the first few trials of V-24. The discussion of the results of Hotelling's  $T^2$  analyses on each of these variables is presented subsequently in detail.

#### Differences in cosmopolitanism among the three adopter groups.

Hypothesis A-13 states that the three adopter groups differ on the basis of their cosmopolitanism. As indicated in Figure III-1 (p. 84), the variable, cosmopolitanism, is made of the following components: average number of long-distance calls per month (Question 101); average number of air trips per year (Question 102); average driving distance per year (Question 103); average number of times eating out per month (Question 104); and average number of attendance at movies, concerts, or plays per month (Question 105).



TABLE IV-13

RECEIVER VARIABLES, AND THE PERCEPTIONS AND ATTITUDES ASSOCIATED WITH V-24

| Variables                                               | Hotelling's $T^2$ Test of             |                                    | Index* for                            |  |
|---------------------------------------------------------|---------------------------------------|------------------------------------|---------------------------------------|--|
|                                                         | Overall Significance                  | and                                | Hotelling's Analysis                  |  |
| Cosmopolitanism                                         | Significant at .05<br>Figure E-1      | Significant at .001<br>Figure E-2  | Not Significant at .10<br>Figure E-3  |  |
| Personality                                             | Not Significant at .10<br>Figure E-4  | Significant at .001<br>Figure E-5  | Significant at .05<br>Figure E-6      |  |
| V-24 Usage Patterns                                     | Significant at .05<br>Figure E-7      | Not Applicable                     | Not Applicable                        |  |
| Conventional Teller<br>Usage Patterns                   | Not Significant at .10<br>Figure E-8  | Significant at .10<br>Figure E-9   | Not Significant at .10<br>Figure E-10 |  |
| Convenience Oriented<br>Usage                           | Not Significant at .10<br>Figure E-11 | Significant at .05<br>Figure E-12  | Significant at .05<br>Figure E-13     |  |
| Perceived V-24<br>Attributes                            | Significant at .05<br>Figure IV-1     | Significant at .05<br>Figure IV-2  | Significant at .05<br>Figure IV-3     |  |
| Perceived Risk<br>in V-24 Usage                         | Significant at .05<br>Figure IV-4     | Significant at .05<br>Figure IV-5  | Significant at .05<br>Figure IV-6     |  |
| Needs-Wants-Concerns<br>in V-24 Usage                   | Not Significant at .10<br>Figure E-14 | Significant at .001<br>Figure E-15 | Significant at .05<br>Figure E-16     |  |
| First Impressions on<br>the First Few Trials<br>of V-24 | Significant at .05<br>Figure E-17     | Not Applicable                     | Not Applicable                        |  |

\*Figures E-1 through E-17 are in Appendix E.

Figures E-1, E-2, and E-3 (Appendix E) present the results of multivariate tests for the differences between early adopters and late adopters, between early adopters and nonadopters, and between late adopters and nonadopters, respectively.

Early Adopters vs. Late Adopters. Figure E-1 indicates that early adopters are significantly different from late adopters in cosmopolitanism when all the means of the five component variables are considered simultaneously; early adopters are more cosmopolitan than late adopters. Calculated  $F$  exceeds critical  $F$  for degrees of freedom = 5, 154, and alpha level = 0.05.

Evaluating the differences on each component variable between the two adopter groups using the univariate  $t$ -test at the 0.05 alpha level, significant differences exist between the two groups on the following components variables: average number of long-distance calls per month, average number of trips per year, and average driving distance per year. Early adopters make more long-distance calls (6.6276 times vs. 4.3582 times), take more trips by air (2.95 trips vs. 1.2769), and drive more miles than late adopters (16,295.7969 vs. 11,356.0781 miles).

Early Adopters vs. Nonadopters. Figure E-2 indicates that early adopters are significantly different from nonadopters in cosmopolitanism when all the means of the five component variables are considered simultaneously; early adopters are more cosmopolitan nonadopters. Calculated  $F$  exceeds critical  $F$  for degrees of freedom = 5, 358, and alpha level = 0.05.

Evaluating the differences on each component variable between the two adopter groups using the univariate  $t$ -test at the 0.05 alpha

level, significant differences exist between the two adopter groups on the following component variables: average number of air trips per year, average driving distance per year, and average number of attendance at movies, concerts, or plays per month. Early adopters take more air trips (2.95 trips vs. 1.4561), drive more miles (16,295.7969 miles vs. 11,702.5430), and attend movies, concerts, or plays more frequently (1.59 times vs. 0.8221 times) than nonadopters.

Late Adopters vs. Nonadopters. Figure E-3 (Appendix E) indicates that no significant differences exist between late adopters and nonadopters in cosmopolitanism. The variable cosmopolitanism does not appear to distinguish late adopters from nonadopters. Calculated F does not exceed critical F for degrees of freedom = 5, 326, and  $\alpha = 0.05$ .

In view of the findings of the three pairwise group comparisons, the three adopter groups do differ on the basis of their cosmopolitanism although no significant differences can be demonstrated between late adopters and nonadopters.

#### Differences in personality among the three adopter groups.

Hypothesis B states that the three adopter groups differ on the basis of aggressive orientation and detached orientation but not on the basis of compliant orientation. As discussed in the previous chapter, the variable, personality, is made of the following components: aggressive orientation (abbreviated as AG1); detached orientation (abbreviated as DET1); and compliant orientation (abbreviated as COM1). Figures E-4, E-5, and E-6 (Appendix E) present the results of multivariate tests for the differences between early adopters and late adopters, between early

adopters and nonadopters, and between late adopters and nonadopters, respectively.

Early Adopters vs. Late Adopters. Figure E-4 (Appendix E) indicates that no significant differences exist between early adopters and late adopters in personality when all the means of aggressive orientation, detached orientation, and compliant orientation are considered simultaneously. Calculated F does not exceed critical F for degrees of freedom = 3, 166, and alpha level = 0.05.

Early Adopters vs. Nonadopters. Figure E-5 (Appendix E) indicates that early adopters are significantly different from nonadopters in personality when all the means of the three component variables are considered simultaneously. Calculated F exceeds critical F for degrees of freedom = 3, 381, and alpha level = 0.05.

Evaluating the differences on each component variable between the two adopter groups using the univariate t-test at the 0.05 alpha level, significant differences exist between the two groups on the following component variables: aggressive orientation and detached orientation. Early adopters are more aggressive (46.2938 points vs. 42.8258 points), and are less detached (24.6663 points vs. 26.1121 points) than nonadopters. No significant differences can be demonstrated between early adopters and nonadopters in compliant orientation.

Late Adopters vs. Nonadopters. Figure E-6 (Appendix E) indicates that late adopters are significantly different from nonadopters in personality when all the means of the three component variables are considered simultaneously. Calculated F exceeds critical F for degrees of freedom = 3, 381, and alpha level = 0.05.

Evaluating the differences on each component variable between the two adopter groups using the univariate t-test at the 0.05 alpha level, no significant differences appear to exist between the two groups on any of the three component variables, although the group differences are almost significant in detached behavior. This discrepancy in the statistical results between the Hotelling's  $T^2$  test and univariate t-test is basically due to the assumption of common variance-covariance matrix in the former to justify the pooling of the sample variance-covariance matrices.

Summarizing the findings of the three pairwise group comparisons, the three adopter groups appear to differ on the basis of aggressive orientation and detached orientation although no significant differences can be demonstrated between early adopters and late adopters.

Differences in V-24 usage patterns between early adopters and late adopters. Hypothesis C-1 states that early adopters and late adopters differ on the basis of their V-24 usage patterns. Nonadopters were excluded from the group comparisons since they did not use V-24. As shown in Figure III-1 (p. 84), the variable, V-24 usage patterns, is made of the following components: checking account deposit (Question 7); checking account withdrawals (Question 8); savings account deposit (Question 9); savings account withdrawals (Question 10); credit card cash advances (Question 11); utility and loan payments (Question 12); and fund transfers (Question 13). Figure E-7 (Appendix E) presents the results. This indicates that early adopters are significantly different from late adopters in V-24 usage patterns when

all the means of the seven component variables are simultaneously considered; in general, early adopters use V-24 more frequently than late adopters. Calculated F exceeds critical F for degrees of freedom = 7, 126, and alpha level = 0.05.

Evaluating the differences on each component variable between between the two adopter groups using the univariate t-test at the 0.05 alpha level, significant differences exist between the two groups on the following component variables: checking account withdrawals and credit card cash advances. Early adopters make checking account withdrawals (3.9001 vs. 3.2879) and advance cash on credit cards (1.8139 vs. 1.4314) through V-24 more frequently than late adopters.

Differences in conventional teller usage patterns among the three adopter groups. Hypothesis C-2 states that the three adopter groups differ on the basis of their conventional teller usage patterns. As shown in Figure III-1 (p. 84), the variable, conventional teller usage patterns, is made of the following components: checking account deposits (Question 14); checking account withdrawals (Question 15); savings account deposits (Question 16); savings account withdrawals (Question 17); credit card cash advances (Question 18); utility and loan payments (Question 19); and fund transfers (Question 20). Figures E-8, E-9, and E-10 (Appendix E) present the results of multivariate tests for the differences between early adopters and late adopters, between early adopters and nonadopters, and between late adopters and nonadopters, respectively.

Early Adopters vs. Late Adopters. Figure E-8 indicates that no significant differences exist between early adopters and late adopters

in their conventional teller usage patterns when all the means of the seven component variables are considered simultaneously. Calculated F does not exceed critical F for degrees of freedom = 7, 131, and alpha level = 0.05.

Early Adopters vs. Nonadopters. Figure E-9 (Appendix E) indicates that no significant differences exist between early adopters and nonadopters in their conventional teller usage patterns when all the means of the seven component variables are considered simultaneously. Calculated F does not exceed critical F for degrees of freedom = 7, 307, and alpha level = 0.05.

Late Adopters vs. Nonadopters. Figure E-10 (Appendix E) indicates that no significant differences exist between late adopters and nonadopters in their conventional teller usage patterns when all the means of the seven component variables are considered simultaneously. Calculated F does not exceed critical F for degrees of freedom = 7, 273, and alpha level = 0.05.

In view of the findings of the three pairwise group comparisons, the three adopter groups do not differ on the basis of conventional teller usage patterns.

Differences in convenience oriented usage of V-24 among the three adopter groups. Hypothesis H states that the three adopter groups differ on the basis of the time they usually (or would) use V-24. As indicated in Figure III-1 (p. 84), the variable, convenience oriented usage of V-24, is made of the following components: use of V-24 outside regular bank business hours during the weekdays (Question 28) and use of V-24 during the weekends (Question 29). Figures E-11, E-12, and

E-13 (Appendix E) present the results of multivariate tests for the differences between early adopters and late adopters, between early adopters and nonadopters, and between late adopters and nonadopters, respectively.

Early Adopters vs. Late Adopters. Figure E-11 (Appendix E) indicates that no significant differences exist between early adopters and late adopters in their convenience oriented usage of V-24 when all the means of the two component variables are considered simultaneously. Calculated F does not exceed critical F for degrees of freedom = 2, 163, and alpha level = 0.05. Both early adopters and late adopters appear to use V-24 mostly outside regular bank business hours during the weekdays and during the weekends.

Early Adopters vs. Nonadopters. Figure E-12 (Appendix E) indicates that early adopters are significantly different from the nonadopters in their convenience oriented usage of V-24 when all the means of the two component variables are considered simultaneously; early adopters are far more likely to use V-24 as convenience oriented than nonadopters. Calculated F exceeds critical F for degrees of freedom = 2, 356, and alpha level = 0.05.

Evaluating the differences on each component variable between the two adopter groups using the univariate t-test at the 0.05 alpha level, early adopters are significantly different from nonadopters in all the component variables; as compared to nonadopters, early adopters appear to use V-24 primarily for convenience, considering the mean scores for the two groups on each component variable: 4.5346 vs. 3.0736 on the first component variable, and 4.6534 vs. 3.2234 on the second.



Late Adopters vs. Nonadopters. Figure E-13 (Appendix E)

indicates that late adopters are significantly different from non-adopters in their convenience oriented usage of V-24 when all the means of the two component variables are considered simultaneously; late adopters are more likely to use V-24 for convenience as compared to nonadopters. Calculated F exceeds critical F for degrees of freedom = 2, 356, and alpha level = 0.05.

Evaluating the differences on each component variable between the two groups using the univariate t-test at the 0.05 alpha level, late adopters are significantly different from nonadopters on each variable. The mean scores of late adopters are significantly higher than nonadopters on each variable: 4.0289 vs. 3.0736 on the first and 4.4091 vs. 3.2234 on the second.

Summarizing the findings of the three pairwise group comparisons, nonadopters are significantly different from both early adopters and late adopters while no significant differences can be demonstrated between early adopters and late adopters.

Differences in perceived V-24 attributes among the three adopter groups. Hypothesis J states that the three adopter groups differ on the basis of their perceptions of the relative advantage (Question 30), complexity (Question 31), compatibility (Question 32), observability (Question 33), and trialability (Question 34) of V-24. Figures IV-1, IV-2, and IV-3 present the results of multivariate tests for the differences between early adopters and late adopters, between early adopters and nonadopters, and between late adopters and non-adopters, respectively.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.5681  
HOTELLING T SQUARE 22.9112  
F VALUE 4.4631 P VALUE 0.001  
DEGREES OF FREEDOM 5, 162

DIFFERENCES ON SINGLE VARIABLES

Relative Advantage

\*\*\*\*\*  
\* 30 \* VARIABLE NUMBER 2 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 4.5980 4.3731  
STD DEV 0.9362 1.0708  
S.E.M. 0.0927 0.1308  
T (SEPARATE) 1.40 0.163 127.9 SAMPLE SIZE 102 67  
T (POOLED) 1.44 0.151 167 MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 2.99 0.086 1, 167

Complexity

\*\*\*\*\*  
\* 31 \* VARIABLE NUMBER 3 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 4.6863 4.5224  
STD DEV 0.8672 0.8766  
S.E.M. 0.0859 0.1071  
T (SEPARATE) 1.19 0.235 140.3 SAMPLE SIZE 102 67  
T (POOLED) 1.20 0.233 167 MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 1.97 0.162 1, 167

Compatibility

\*\*\*\*\*  
\* 32 \* VARIABLE NUMBER 4 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 3.7426 3.6176  
STD DEV 1.3613 1.2817  
S.E.M. 0.1355 0.1554  
T (SEPARATE) 0.61 0.545 149.6 SAMPLE SIZE 101 68  
T (POOLED) 0.60 0.550 167 MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 1.34 0.248 1, 167

Observability

\*\*\*\*\*  
\* 33 \* VARIABLE NUMBER 5 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 4.6633 4.3582  
STD DEV 0.6209 0.9487  
S.E.M. 0.0618 0.1159  
T (SEPARATE) 2.32 0.022 103.3 SAMPLE SIZE 101 67  
T (POOLED) 2.52 0.013 166 MAXIMUM 5.0000 5.0000  
MINIMUM 3.0000 2.0000  
F (FOR VARIANCES)  
LEvene 17.37 0.000 1, 166

Figure IV-1. Hotelling's  $T^2$  test for differences in perceived V-24 attributes between early adopters and late adopters.

```

Trifalability
*****
* 34 * VARIABLE NUMBER 6 GROUP 1 EA 2 LA
*****
STATISTICS P VALUE DF MEAN 2.6078 3.5000
STD DEV 1.4969 1.2032
S.E.M. 0.1482 0.1459
T (SEPARATE) -4.29 0.000 162.1 SAMPLE SIZE 102 69
T (POOLED) -4.11 0.000 168 MAXIMUM 5.0000 5.0000
MINIMUM 1.0000 1.0000
F (FOR VARIANCES)
LEVENE 11.87 0.001 1, 168

```

Figure IV-1 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 2.7055  
HOTELLING T SQUARE 192.3108  
F VALUE 37.9567 P VALUE 0.000  
DEGREES OF FREEDOM 5, 333

DIFFERENCES ON SINGLE VARIABLES

Relative Advantage

\*\*\*\*\*  
\* 30 \* VARIABLE NUMBER 2  
\*\*\*\*\*

| STATISTICS        | P VALUE | DF    | GROUP 1 EA | 3 NA   |
|-------------------|---------|-------|------------|--------|
| MEAN              |         |       | 4.5980     | 3.3985 |
| STD DEV           |         |       | 0.5362     | 1.2634 |
| S.E.M.            |         |       | 0.0927     | 0.0767 |
| SAMPLE SIZE       |         |       | 102        | 271    |
| MAXIMUM           |         |       | 5.0000     | 5.0000 |
| MINIMUM           |         |       | 1.0000     | 1.0000 |
| T (SEPARATE)      | 9.57    | 0.000 | 244.0      |        |
| T (POOLED)        | 8.73    | 0.000 | 371        |        |
| F (FOR VARIANCES) |         |       |            |        |
| LEvene            | 22.69   | 0.000 | 1, 371     |        |

Complexity

\*\*\*\*\*  
\* 31 \* VARIABLE NUMBER 3  
\*\*\*\*\*

| STATISTICS        | P VALUE | DF    | GROUP 1 EA | 3 NA   |
|-------------------|---------|-------|------------|--------|
| MEAN              |         |       | 4.6863     | 3.4835 |
| STD DEV           |         |       | 0.8672     | 1.2750 |
| S.E.M.            |         |       | 0.0859     | 0.0772 |
| SAMPLE SIZE       |         |       | 102        | 273    |
| MAXIMUM           |         |       | 5.0000     | 5.0000 |
| MINIMUM           |         |       | 1.0000     | 1.0000 |
| T (SEPARATE)      | 10.42   | 0.0   | 265.7      |        |
| T (POOLED)        | 8.79    | 0.000 | 373        |        |
| F (FOR VARIANCES) |         |       |            |        |
| LEvene            | 45.99   | 0.000 | 1, 373     |        |

Compatibility

\*\*\*\*\*  
\* 32 \* VARIABLE NUMBER 4  
\*\*\*\*\*

| STATISTICS        | P VALUE | DF    | GROUP 1 EA | 3 NA   |
|-------------------|---------|-------|------------|--------|
| MEAN              |         |       | 3.7426     | 2.7888 |
| STD DEV           |         |       | 1.3613     | 1.3260 |
| S.E.M.            |         |       | 0.1355     | 0.0807 |
| SAMPLE SIZE       |         |       | 101        | 270    |
| MAXIMUM           |         |       | 5.0000     | 5.0000 |
| MINIMUM           |         |       | 1.0000     | 1.0000 |
| T (SEPARATE)      | 6.05    | 0.000 | 175.4      |        |
| T (POOLED)        | 6.12    | 0.000 | 369        |        |
| F (FOR VARIANCES) |         |       |            |        |
| LEvene            | 1.49    | 0.223 | 1, 369     |        |

Observability

\*\*\*\*\*  
\* 33 \* VARIABLE NUMBER 5  
\*\*\*\*\*

| STATISTICS        | P VALUE | DF    | GROUP 1 EA | 3 NA   |
|-------------------|---------|-------|------------|--------|
| MEAN              |         |       | 4.6633     | 2.9661 |
| STD DEV           |         |       | 0.6209     | 1.2479 |
| S.E.M.            |         |       | 0.0618     | 0.0765 |
| SAMPLE SIZE       |         |       | 101        | 266    |
| MAXIMUM           |         |       | 5.0000     | 5.0000 |
| MINIMUM           |         |       | 3.0000     | 1.0000 |
| T (SEPARATE)      | 17.26   | 0.0   | 340.1      |        |
| T (POOLED)        | 13.06   | 0.0   | 365        |        |
| F (FOR VARIANCES) |         |       |            |        |
| LEvene            | 21.10   | 0.000 | 1, 365     |        |

Figure IV-2. Hotelling's  $T^2$  test for differences in perceived V-24 attributes between early adopters and nonadopters.

```

Trialability
*****
* 34      * VARIABLE NUMBER 6      GROUP 1 EA      3 NA
*****
      STATISTICS      P VALUE      DF      MEAN      2.6078      2.8358
      STD DEV      1.4969      0.9989
      S.E.M.      0.1482      0.0705
T (SEPARATE)      -1.39      0.167      148.0      SAMPLE SIZE      102      201
T (POOLED)      -1.58      0.116      301      MAXIMUM      5.0000      5.0000
      MINIMUM      1.0000      1.0000
F(FOR VARIANCES)
      LEVENE      64.05      0.000      1, 301

```

Figure IV-2 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 1.8291  
HOTELLING T SQUARE 95.6337  
F VALUE 18.8681 P VALUE 0.000  
DEGREES OF FREEDOM 5, 299

DIFFERENCES ON SINGLE VARIABLES

Relative Advantage

\*\*\*\*\*  
\* 30 \* VARIABLE NUMBER 2 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 4.3731 3.3985  
STD DEV 1.0708 1.2634  
S.E.M. 0.1308 0.0767  
SAMPLE SIZE 67 271  
T (SEPARATE) 6.43 0.000 115.9 MAXIMUM 5.0000 5.0000  
T (POOLED) 5.82 0.000 336 MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 4.62 0.032 1, 336

Complexity

\*\*\*\*\*  
\* 31 \* VARIABLE NUMBER 3 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 4.5224 3.4835  
STD DEV 0.8766 1.2750  
S.E.M. 0.1071 0.0772  
SAMPLE SIZE 67 273  
T (SEPARATE) 7.87 0.000 143.0 MAXIMUM 5.0000 5.0000  
T (POOLED) 6.31 0.000 338 MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 19.46 0.000 1, 338

Compatibility

\*\*\*\*\*  
\* 32 \* VARIABLE NUMBER 4 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 3.6176 2.7898  
STD DEV 1.2817 1.3260  
S.E.M. 0.1554 0.0807  
SAMPLE SIZE 68 270  
T (SEPARATE) 4.73 0.000 106.1 MAXIMUM 5.0000 5.0000  
T (POOLED) 4.64 0.000 336 MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 0.03 0.863 1, 336

Observability

\*\*\*\*\*  
\* 33 \* VARIABLE NUMBER 5 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 4.3582 2.9661  
STD DEV 0.5487 1.2479  
S.E.M. 0.1159 0.0765  
SAMPLE SIZE 67 266  
T (SEPARATE) 10.02 0.0 129.9 MAXIMUM 5.0000 5.0000  
T (POOLED) 8.53 0.000 331 MINIMUM 2.0000 1.0000  
F (FOR VARIANCES)  
LEvene 1.19 0.275 1, 331

Figure IV-3. Hotelling's  $T^2$  test for differences in perceived V-24 attributes between late adopters and nonadopters.

```

Trialability
*****
* 34 * VARIABLE NUMBER 6 GROUP 2 LA 3 NA
*****
STATISTICS F VALUE DF MEAN 3.5000 2.8358
STD DEV 1.2032 0.9989
S.E.M. 0.1459 0.0705
T (SEPARATE) 4.10 0.000 100.1 SAMPLE SIZE 68 201
T (POOLED) 4.49 0.000 267 MAXIMUM 5.0000 5.0000
MINIMUM 1.0000 1.0000
F (FOR VARIANCES)
LEvene 11.85 0.001 1, 267

```

Figure IV-3 (continued)

Early Adopters vs. Late Adopters. Figure IV-1 indicates that significant differences exist between early adopters and late adopters in their perception of the V-24 attributes when the five perceived V-24 attributes are considered simultaneously; early adopters' perceptions of the V-24 attributes are more favorable toward the adoption of V-24 usage than late adopters'. Calculated F exceeds critical F for degrees of freedom = 5, 162, and alpha level = 0.05.

Evaluating the two group differences on each variable using the univariate t-test at the 0.05 alpha level, the two adopter groups are significantly different on the following variables: observability (Question 33) and trialability (Question 34). The mean score of early adopters on "observability" is significantly higher than that of late adopters (4.6633 vs. 4.3582) while the mean score of early adopters on "trialability" is significantly lower than that of late adopters (2.6078 vs. 3.5). These scores imply that early adopters would have less difficulty talking about what V-24 is like and understood its operations more easily than late adopters.

Early Adopters vs. Nonadopters. Figure IV-2 indicates that early adopters are significantly different from nonadopters in their perception of V-24 attributes when the five perceived V-24 attributes are considered simultaneously; early adopters' perceptions of the V-24 attributes are far more favorable toward the adoption of V-24 usage than nonadopters'. Calculated F exceeds critical F for degrees of freedom = 5, 333, and alpha level = 0.05.

Evaluating the two group differences on each variable using the univariate t-test at the 0.05 alpha level, early adopters are



significantly different from nonadopters on the following variables: relative advantage, compatibility, observability, and complexity. The mean scores on these four variables of early adopters are significantly higher than the corresponding scores of nonadopters.

Late Adopters vs. Nonadopters. Figure IV-3 indicates that late adopters are significantly different from nonadopters in their perception of the V-24 attributes when the five perceived V-24 attributes are considered simultaneously; late adopters' perceptions of the V-24 attributes are more favorable toward the adoption of V-24 usage than nonadopters'. Calculated F exceeds critical F for degrees of freedom = 5, 2999, and alpha level = 0.05.

Evaluating the two group differences on each variable using the univariate t-test at the 0.05 alpha level, late adopters are significantly different from nonadopters on all the perceived attributes. Late adopters' perception of each V-24 attribute is more favorable to the adoption of V-24 usage than nonadopters'.

In view of the findings of the three pairwise group comparisons, the three adopter groups do differ on the basis of their perceptions of the relative advantage, complexity, compatibility, observability, and trialability of V-24.

Differences in perceived risks in V-24 usage among the three adopter groups. Hypothesis K states that the three adopter groups differ on the basis of their perceptions of the financial/performance risk (Question 41), social risk (Question 42), psychological risk (Question 43), time risk (Question 44), physical risk (Question 45), and financial risk (Question 46) with regard to V-24 usage.

Figures IV-4, IV-5, and IV-6 present the results of multivariate tests for the differences between early adopters and late adopters, between early adopters and nonadopters, and between late adopters and non-adopters, respectively.

Early Adopters vs. Late Adopters. Figure IV-4 indicates that significant differences exist between early adopters and late adopters in their perceptions of the risks in V-24 usage when all the means of the risks are considered simultaneously; early adopters perceive less risk in V-24 usage than late adopters. Calculated F exceeds critical F for degrees of freedom = 6, 161, and alpha level = 0.05.

Evaluating the two group differences on each of the risks using the univariate t-test at the 0.05 alpha level, early adopters are significantly different from late adopters on the following risks: financial/performance risk, psychological risk, and financial risk. The mean scores on these three risks of early adopters are significantly lower than those of late adopters: 2.7647 vs. 3.2941 on financial/performance risk; 2.5247 vs. 3.1176 on psychological risk; and 1.7157 vs. 2.0735 on financial risk.

Early Adopters vs. Nonadopters. Figure IV-5 indicates that significant differences exist between early adopters and nonadopters in their perceptions of the risks in V-24 usage when all the means of the risks are considered simultaneously; early adopters perceive far less risk in V-24 usage than nonadopters. Calculated F exceeds critical F for degrees of freedom = 6, 364, and alpha level = 0.05.

Evaluating the two group differences on each of the risks using the univariate t-test at the 0.05 alpha level, early adopters are significantly different from nonadopters on all the risks. Early

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

|                      |         |         |       |
|----------------------|---------|---------|-------|
| MAHALANOBIS D SQUARE | 0.4584  |         |       |
| HOTELLING T SQUARE   | 18.6191 |         |       |
| F VALUE              | 2.9944  | P VALUE | 0.008 |
| DEGREES OF FREEDOM   | 6, 161  |         |       |

DIFFERENCES ON SINGLE VARIABLES

Financial/Performance Risk

\*\*\*\*\*  
\* 41 \* VARIABLE NUMBER 2 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -2.81 0.006 154.3  
T (POOLED) -2.75 0.007 168  
F (FOR VARIANCES)  
LEVENE 2.04 0.156 1, 168

|             |        |        |
|-------------|--------|--------|
| MEAN        | 2.7647 | 3.2941 |
| STD DEV     | 1.2834 | 1.1468 |
| S.E.M.      | 0.1271 | 0.1391 |
| SAMPLE SIZE | 102    | 68     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Social Risk

\*\*\*\*\*  
\* 42 \* VARIABLE NUMBER 3 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 1.52 0.131 149.2  
T (POOLED) 1.50 0.135 166  
F (FOR VARIANCES)  
LEVENE 1.62 0.205 1, 166

|             |        |        |
|-------------|--------|--------|
| MEAN        | 3.5200 | 3.2647 |
| STD DEV     | 1.1054 | 1.0455 |
| S.E.M.      | 0.1105 | 0.1268 |
| SAMPLE SIZE | 100    | 68     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Psychological Risk

\*\*\*\*\*  
\* 43 \* VARIABLE NUMBER 4 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -1.76 0.080 136.1  
T (POOLED) -1.79 0.075 168  
F (FOR VARIANCES)  
LEVENE 1.66 0.200 1, 168

|             |        |        |
|-------------|--------|--------|
| MEAN        | 1.7255 | 2.0588 |
| STD DEV     | 1.1532 | 1.2445 |
| S.E.M.      | 0.1142 | 0.1509 |
| SAMPLE SIZE | 102    | 68     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Time Risk

\*\*\*\*\*  
\* 44 \* VARIABLE NUMBER 5 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -0.22 0.828 147.6  
T (POOLED) -0.22 0.830 167  
F (FOR VARIANCES)  
LEVENE 0.27 0.603 1, 167

|             |        |        |
|-------------|--------|--------|
| MEAN        | 2.4554 | 2.5000 |
| STD DEV     | 1.2381 | 1.2871 |
| S.E.M.      | 0.1331 | 0.1561 |
| SAMPLE SIZE | 101    | 68     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Figure IV-4. Hotelling's  $T^2$  test for differences in perceived risks in V-24 usage between early adopters and late adopters.

## Physical Risk

\*\*\*\*\*

| * 45 * VARIABLE NUMBER 6 |       |       |       | GROUP 1 EA  |        | 2 LA   |  |
|--------------------------|-------|-------|-------|-------------|--------|--------|--|
| *****                    |       |       |       | MEAN        | 2.5247 | 3.1176 |  |
| STATISTICS               |       |       |       | P VALUE     | OF     |        |  |
|                          |       |       |       | STD DEV     | 1.3899 | 1.3986 |  |
|                          |       |       |       | S.E.M.      | 0.1383 | 0.1696 |  |
| T (SEPARATE)             | -2.71 | C.008 | 143.3 | SAMPLE SIZE | 101    | 68     |  |
| T (POOLED)               | -2.71 | C.007 | 167   | MAXIMUM     | 5.0000 | 5.0000 |  |
| F(FOR VARIANCES)         |       |       |       | MINIMUM     | 1.0000 | 1.0000 |  |
| LEVENE                   |       |       |       | 0.05        | C.822  | 1, 167 |  |

## Financial Risk

\*\*\*\*\*

| * 46 * VARIABLE NUMBER 7 |       |       |       | GROUP 1 EA  |        | 2 LA   |  |
|--------------------------|-------|-------|-------|-------------|--------|--------|--|
| *****                    |       |       |       | MEAN        | 1.7157 | 2.0735 |  |
| STATISTICS               |       |       |       | P VALUE     | DF     |        |  |
|                          |       |       |       | STD DEV     | 1.1114 | 1.1371 |  |
|                          |       |       |       | S.E.M.      | 0.1100 | 0.1379 |  |
| T (SEPARATE)             | -2.03 | 0.044 | 141.5 | SAMPLE SIZE | 102    | 68     |  |
| T (POOLED)               | -2.04 | 0.043 | 168   | MAXIMUM     | 5.0000 | 4.0000 |  |
| F(FOR VARIANCES)         |       |       |       | MINIMUM     | 1.0000 | 1.0000 |  |
| LEVENE                   |       |       |       | 0.67        | 0.413  | 1, 168 |  |

Figure IV-4 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 3.7703  
HOTELLING T SQUARE 276.9080  
F VALUE 45.5093 P VALUE 0.000  
DEGREES OF FREEDOM 6, 364

DIFFERENCES ON SINGLE VARIABLES

Financial/Performance Risk

\*\*\*\*\*

| * 41 * VARIABLE NUMBER 2 |       |       |        | GROUP 1 EA 3 NA |        |
|--------------------------|-------|-------|--------|-----------------|--------|
| *****                    |       |       |        | MEAN            |        |
| STATISTICS               |       |       |        | P VALUE         | DF     |
| T (SEPARATE)             | -6.21 | C.000 | 167.8  | 2.7647          | 3.6690 |
| T (POOLED)               | -6.45 | C.000 | 378    | 1.2834          | 1.1828 |
|                          |       |       |        | S.E.M.          | 0.0709 |
|                          |       |       |        | SAMPLE SIZE     | 102    |
|                          |       |       |        | MAXIMUM         | 5.0000 |
|                          |       |       |        | MINIMUM         | 1.0000 |
| F (FOR VARIANCES)        |       |       |        |                 |        |
| LEVENE                   | 3.22  | C.074 | 1, 378 |                 |        |

Social Risk

\*\*\*\*\*

| * 42 * VARIABLE NUMBER 3 |      |       |        | GROUP 1 EA 3 NA |        |
|--------------------------|------|-------|--------|-----------------|--------|
| *****                    |      |       |        | MEAN            |        |
| STATISTICS               |      |       |        | P VALUE         | DF     |
| T (SEPARATE)             | 7.04 | 0.000 | 167.7  | 3.5200          | 2.6240 |
| T (POOLED)               | 7.22 | C.000 | 372    | 1.1054          | 1.0453 |
|                          |      |       |        | S.E.M.          | 0.0631 |
|                          |      |       |        | SAMPLE SIZE     | 100    |
|                          |      |       |        | MAXIMUM         | 5.0000 |
|                          |      |       |        | MINIMUM         | 1.0000 |
| F (FOR VARIANCES)        |      |       |        |                 |        |
| LEVENE                   | 1.13 | C.288 | 1, 372 |                 |        |

Psychological Risk

\*\*\*\*\*

| * 43 * VARIABLE NUMBER 4 |        |       |        | GROUP 1 EA 3 NA |        |
|--------------------------|--------|-------|--------|-----------------|--------|
| *****                    |        |       |        | MEAN            |        |
| STATISTICS               |        |       |        | P VALUE         | DF     |
| T (SEPARATE)             | -15.74 | C.0   | 195.3  | 1.7255          | 3.8808 |
| T (POOLED)               | -15.12 | 0.0   | 377    | 1.1532          | 1.2584 |
|                          |        |       |        | S.E.M.          | 0.0756 |
|                          |        |       |        | SAMPLE SIZE     | 102    |
|                          |        |       |        | MAXIMUM         | 5.0000 |
|                          |        |       |        | MINIMUM         | 1.0000 |
| F (FOR VARIANCES)        |        |       |        |                 |        |
| LEVENE                   | 2.36   | C.125 | 1, 377 |                 |        |

Time Risk

\*\*\*\*\*

| * 44 * VARIABLE NUMBER 5 |       |       |        | GROUP 1 EA 3 NA |        |
|--------------------------|-------|-------|--------|-----------------|--------|
| *****                    |       |       |        | MEAN            |        |
| STATISTICS               |       |       |        | P VALUE         | DF     |
| T (SEPARATE)             | -4.86 | C.000 | 148.1  | 2.4554          | 3.1734 |
| T (POOLED)               | -5.43 | 0.000 | 370    | 1.2381          | 1.0485 |
|                          |       |       |        | S.E.M.          | 0.0637 |
|                          |       |       |        | SAMPLE SIZE     | 101    |
|                          |       |       |        | MAXIMUM         | 5.0000 |
|                          |       |       |        | MINIMUM         | 1.0000 |
| F (FOR VARIANCES)        |       |       |        |                 |        |
| LEVENE                   | 24.46 | C.000 | 1, 370 |                 |        |

Figure IV-5. Hotelling's  $T^2$  test for differences in perceived risks in V-24 usage between early adopters and nonadopters.

## Physical Risk

\*\*\*\*\*

| * 45 * VARIABLE NUMBER 6 |       |       |        | GROUP 1 EA  | 3 NA          |
|--------------------------|-------|-------|--------|-------------|---------------|
| *****                    |       |       |        | MEAN        | 2.5247 3.3054 |
| STATISTICS               |       |       |        | STD DEV     | 1.3899 1.3323 |
| P VALUE                  |       |       |        | S.E.M.      | 0.1383 0.0803 |
| DF                       |       |       |        | SAMPLE SIZE | 101 275       |
| T (SEPARATE)             | -4.88 | 0.000 | 171.7  | MAXIMUM     | 5.0000 5.0000 |
| T (POOLED)               | -4.98 | 0.000 | 374    | MINIMUM     | 1.0000 1.0000 |
| F(FOR VARIANCES)         |       |       |        |             |               |
| LEVENE                   | 2.60  | 0.108 | 1, 374 |             |               |

## Financial Risk

\*\*\*\*\*

| * 46 * VARIABLE NUMBER 7 |       |       |        | GROUP 1 EA  | 3 NA          |
|--------------------------|-------|-------|--------|-------------|---------------|
| *****                    |       |       |        | MEAN        | 1.7157 2.4485 |
| STATISTICS               |       |       |        | STD DEV     | 1.1114 1.3437 |
| P VALUE                  |       |       |        | S.E.M.      | 0.1100 0.0815 |
| DF                       |       |       |        | SAMPLE SIZE | 102 272       |
| T (SEPARATE)             | -5.35 | 0.000 | 217.7  | MAXIMUM     | 5.0000 5.0000 |
| T (POOLED)               | -4.91 | 0.000 | 372    | MINIMUM     | 1.0000 1.0000 |
| F(FOR VARIANCES)         |       |       |        |             |               |
| LEVENE                   | 14.25 | 0.000 | 1, 372 |             |               |

Figure IV-5 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

|                      |          |         |       |
|----------------------|----------|---------|-------|
| MAHALANOBIS D SQUARE | 2.3481   |         |       |
| HOTELLING T SQUARE   | 127.5752 |         |       |
| F VALUE              | 20.9283  | P VALUE | 0.000 |
| DEGREES OF FREEDOM   | 6, 331   |         |       |

DIFFERENCES ON SINGLE VARIABLES

Financial/Performance Risk

|                  |            |         |        |             |        |        |
|------------------|------------|---------|--------|-------------|--------|--------|
| *****            |            |         |        | GROUP       | 2 LA   | 3 NA   |
| * 41 *           | VARIABLE   | NUMBER  | 2      | MEAN        | 3.2941 | 3.6690 |
| *****            |            |         |        | STD DEV     | 1.1468 | 1.1828 |
|                  | STATISTICS | P VALUE | DF     | S.E.M.      | 0.1351 | 0.0709 |
| T (SEPARATE)     | -2.40      | 0.018   | 104.7  | SAMPLE SIZE | 68     | 278    |
| T (POOLED)       | -2.36      | 0.019   | 344    | MAXIMUM     | 5.0000 | 5.0000 |
|                  |            |         |        | MINIMUM     | 1.0000 | 1.0000 |
| F(FOR VARIANCES) |            |         |        |             |        |        |
| LEVENE           | 0.00       | 0.990   | 1, 344 |             |        |        |

Social Risk

|                  |            |         |        |             |        |        |
|------------------|------------|---------|--------|-------------|--------|--------|
| *****            |            |         |        | GROUP       | 2 LA   | 3 NA   |
| * 42 *           | VARIABLE   | NUMBER  | 3      | MEAN        | 3.2647 | 2.6240 |
| *****            |            |         |        | STD DEV     | 1.0455 | 1.0453 |
|                  | STATISTICS | P VALUE | DF     | S.E.M.      | 0.1268 | 0.0631 |
| T (SEPARATE)     | 4.52       | 0.000   | 102.9  | SAMPLE SIZE | 68     | 274    |
| T (POOLED)       | 4.52       | 0.000   | 340    | MAXIMUM     | 5.0000 | 5.0000 |
|                  |            |         |        | MINIMUM     | 1.0000 | 1.0000 |
| F(FOR VARIANCES) |            |         |        |             |        |        |
| LEVENE           | 0.35       | 0.552   | 1, 340 |             |        |        |

Psychological Risk

|                  |            |         |        |             |        |        |
|------------------|------------|---------|--------|-------------|--------|--------|
| *****            |            |         |        | GROUP       | 2 LA   | 3 NA   |
| * 43 *           | VARIABLE   | NUMBER  | 4      | MEAN        | 2.0588 | 3.8808 |
| *****            |            |         |        | STD DEV     | 1.2445 | 1.2584 |
|                  | STATISTICS | P VALUE | DF     | S.E.M.      | 0.1509 | 0.0756 |
| T (SEPARATE)     | -10.79     | 0.0     | 103.3  | SAMPLE SIZE | 68     | 277    |
| T (POOLED)       | -10.72     | 0.0     | 343    | MAXIMUM     | 5.0000 | 5.0000 |
|                  |            |         |        | MINIMUM     | 1.0000 | 1.0000 |
| F(FOR VARIANCES) |            |         |        |             |        |        |
| LEVENE           | 0.02       | 0.900   | 1, 343 |             |        |        |

Time Risk

|                  |            |         |        |             |        |        |
|------------------|------------|---------|--------|-------------|--------|--------|
| *****            |            |         |        | GROUP       | 2 LA   | 3 NA   |
| * 44 *           | VARIABLE   | NUMBER  | 5      | MEAN        | 2.5000 | 3.1734 |
| *****            |            |         |        | STD DEV     | 1.2871 | 1.0485 |
|                  | STATISTICS | P VALUE | DF     | S.E.M.      | 0.1561 | 0.0637 |
| T (SEPARATE)     | -3.99      | 0.000   | 90.5   | SAMPLE SIZE | 68     | 271    |
| T (POOLED)       | -4.51      | 0.000   | 337    | MAXIMUM     | 5.0000 | 5.0000 |
|                  |            |         |        | MINIMUM     | 1.0000 | 1.0000 |
| F(FOR VARIANCES) |            |         |        |             |        |        |
| LEVENE           | 13.58      | 0.000   | 1, 337 |             |        |        |

Figure IV-6. Hotelling's  $T^2$  test for differences in perceived risks in V-24 usage between late adopters and nonadopters.

## Physical Risk

\*\*\*\*\*

| * 45 * VARIABLE NUMBER 6 |       |       |       | GROUP       | 2 LA   | 3 NA   |
|--------------------------|-------|-------|-------|-------------|--------|--------|
| *****                    |       |       |       | MEAN        | 3.1176 | 3.3054 |
| STATISTICS               |       |       |       | STD DEV     | 1.3986 | 1.3323 |
| P VALUE                  |       |       |       | S.E.M.      | 0.1656 | 0.0803 |
| DF                       |       |       |       | SAMPLE SIZE | 68     | 275    |
| T (SEPARATE)             | -1.00 | 0.320 | 99.2  | MAXIMUM     | 5.0000 | 5.0000 |
| T (POOLED)               | -1.03 | 0.304 | 341   | MINIMUM     | 1.0000 | 1.0000 |
| F (FOR VARIANCES)        |       |       |       |             |        |        |
| LEVENE                   |       | 1.26  | 0.263 | 1, 341      |        |        |

## Financial Risk

\*\*\*\*\*

| * 46 * VARIABLE NUMBER 7 |       |       |       | GROUP       | 2 LA   | 3 NA   |
|--------------------------|-------|-------|-------|-------------|--------|--------|
| *****                    |       |       |       | MEAN        | 2.0735 | 2.4485 |
| STATISTICS               |       |       |       | STD DEV     | 1.1371 | 1.3437 |
| P VALUE                  |       |       |       | S.E.M.      | 0.1379 | 0.0815 |
| DF                       |       |       |       | SAMPLE SIZE | 68     | 272    |
| T (SEPARATE)             | -2.34 | 0.021 | 118.4 | MAXIMUM     | 4.0000 | 5.0000 |
| T (POOLED)               | -2.12 | 0.035 | 338   | MINIMUM     | 1.0000 | 1.0000 |
| F (FOR VARIANCES)        |       |       |       |             |        |        |
| LEVENE                   |       | 5.66  | 0.018 | 1, 338      |        |        |

Figure IV-6 (continued)



adopters perceive far less risk on each of the six types of risks than nonadopters.

Late Adopters vs. Nonadopters. Figure IV-6 indicates that significant differences exist between late adopters and nonadopters in their perceptions of the risks in V-24 usage when all the means of the risks are considered simultaneously; late adopters perceive far less risk in V-24 usage than nonadopters. Calculated  $F$  exceeds critical  $F$  for degrees of freedom = 6, 331, and alpha level = 0.05.

Evaluating the two group differences on each of the risks using the univariate  $t$ -test at the 0.05 alpha level, late adopters are significantly different from nonadopters on all the risks except physical risk. Late adopters perceive far less risk on these risks than nonadopters.

Summarizing the findings of the three pairwise group comparisons, significant differences exist among the three adopter groups in their perceptions of the financial/performance risk, social risk, psychological risk, time risk, physical risk, and financial risk in V-24 usage.

Differences in needs-wants-concerns in V-24 usage among the three adopter groups. Hypothesis L states that the three adopter groups differ on the basis of their needs, wants and concerns with regard to V-24 usage. As indicated in Figure III-1 (p. 84), the variable, needs-wants-concerns in V-24 usage, is made of "desire for convenient locations for V-24" (Question 38), "need of a telephone on V-24" (Question 39), and "wants of privacy for V-24 use" (Question 40). Figures E-14, E-15, and E-16 (Appendix E) present the results of multivariate tests for the differences between early adopters and late

adopters, between early adopters and nonadopters, and between late adopters and nonadopters, respectively.

Early Adopters vs. Late Adopters. Figure E-14 (Appendix E) indicates that no significant differences exist between early adopters and late adopters in their needs-wants-concerns in V-24 usage. Calculated F does not exceed critical F for degrees of freedom = 3, 165, and alpha level = 0.05.

Early Adopters vs. Nonadopters. Figure E-15 (Appendix E) indicates that significant differences exist between early adopters and nonadopters in their needs-wants-concerns in V-24 usage when all the means of the three component variables are considered simultaneously; early adopters want present V-24 services to be improved far more than nonadopters. Calculated F exceeds critical F for degrees of freedom = 3, 367, and alpha level = 0.05.

Evaluating the two group differences on each of the component variables using the univariate t-test at the 0.05 alpha level, early adopters are significantly different from nonadopters on "desire for convenient locations for V-24" and "need of a telephone on V-24." Early adopters want these two services far more than nonadopters.

Late Adopters vs. Nonadopters. Figure E-16 (Appendix E) indicates that significant differences exist between late adopters and nonadopters in their needs-wants-concerns in V-24 usage when all the means of the three component variables are considered simultaneously; late adopters want present V-24 services to be improved far more than nonadopters. Calculated F exceeds critical F for degrees of freedom = 3, 333, and alpha level = 0.05.

Evaluating the two group differences on each of the component variables using the univariate t-test at the 0.05 alpha level, late adopters are significantly different from nonadopters on the component variable "desire for convenient locations for V-24." Late adopters want this service far more than nonadopters.

In view of the findings of the three pairwise group comparisons, the three adopter groups differ on the basis of their needs, wants, and concerns in V-24 usage, although no significant differences can be demonstrated between early adopters and late adopters.

Differences in first impressions on the first few trials of V-24 between early adopters and late adopters. Hypothesis N states that early adopters and late adopters differ on the basis of their first impressions on the first few trials of V-24. As indicated in Figure III-1 (p. 84), the variable, "first impressions on the few trials of V-24," is made of the following components: feelings of being comfortable (Question 25) and influence of the first impression upon the future V-24 usage (Question 26). Figure E-17 (Appendix E) indicates that significant differences exist between early adopters and late adopters in their first impressions on the first few trials of V-24; early adopters had far better impression than late adopters. Calculated F exceeds critical F for degrees of freedom = 2, 163, and alpha level = 0.05.

Evaluating the two group differences on each component variables using the univariate t-test at the 0.05 alpha level, early adopters are significantly different from late adopters on each of the two component variables. The mean scores on the two component variables of early

adopters are significantly higher than those of late adopters: 4.111 vs. 3.4706 on the first variable and 4.35 vs. 3.9104 on the second. As compared to late adopters, early adopters appear to have felt more comfortable with V-24 when they first used it, and their first impression of V-24 appears to have had a greater influence upon their decision to make regular use of V-24.

Synthesizing the results of Hotelling's  $T^2$  analyses in this section in the context of selected generalizations of the properties of innovativeness (Figure II-8, p. 64) suggested by Rogers and Shoemaker (1971), the following generalizations in Figure II-8 are supported:

1. The relative advantage of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.
2. The compatibility of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.
3. The complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption.
4. The observability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption.
5. Early adopters have a more favorable attitude toward risk than late adopters.
6. Early adopters have a more favorable attitude toward credit.
7. Early adopters are more cosmopolitan than late adopters.

In addition to the differences generalized above, the three adopter groups are significantly different in that early adopters and late adopters appear to use V-24 primarily for convenience and want present V-24 services to be improved far more than nonadopters.

### Findings of Factors Analyses

The information obtained with the survey questionnaire was factor analyzed using Minres factor solution, and the extracted factors were orthogonally rotated via the Varimax method. Minres is the most widely accepted factoring method (Kim, 1975), and as compared to other factor solutions, it provides more accuracy in the estimates of off diagonal elements of the correlation matrix and in the angular relationships among vectors in N-dimensional space. The Varimax method of rotation was used to maximize the variance of the square of the loading in each column. As compared to other rotation methods, factor patterns produced by Varimax rotation are more easily interpretable (Harman, 1967).

As indicated in the previous chapter, the three sections of the survey questionnaire provide three different types of information: the first section deals with bank services and V-24 related variables; the second with personality orientations; and the third with receiver variables. In this context, factor analysis was applied to each section separately to summarize the important information contained in each section of the survey questionnaire and to utilize the resulting factor scores in discriminant analysis.

In determining the number of factors, scree test and Harris procedure were used sequentially throughout the three sections in order

to obtain the conservative number of factors. For the purpose of this study, Harris procedure employs the following factor solutions: Minres, Backdoor Image (BI), Image, and Alpha. The results of factor analyses for each of the three sections of the survey questionnaire is presented below.

Factor analysis on bank services and V-24 related variables in Section 1. The responses of 453 early adopters, late adopters, and non-adopters to 37 items shown in Table IV-14 were factor analyzed. Before factor analyzing the data, Bartlett's test of the significance of the correlation matrix was executed to determine whether any relationship exists among the 37 variables. If no relationship exists, then factor analysis is not warranted. The test indicates, as shown below, that the variables are interrelated.

$$H_0: R = I, \quad H_1: R \neq 0$$

$$\chi^2 = -(n-1 - \frac{2v+5}{6}) \ln|R| = 7800.8462$$

$$d.f = v(v-1)/2$$

$$|R| = \text{determinant of correlation matrix (see Table IV-15)}$$

$$7800.8462 > \chi^2_{0.05, 666}$$

The scree test presented in Figure IV-7 indicates that five or six factors are the logical number of factors to be extracted for the analysis: the plots of the eigenvalues provided by Minres, BI, and Alpha suggest five factors whereas Image suggests six factors. Based on these findings, Harris procedure (Table IV-16) was carried out across the four different factor solutions (Alpha, BI, Image, and Minres) using four factors ( $5 \pm 1$ ) as the minimum trial number of factors and the seven factors ( $6 \pm 1$ ) as the maximum number with 0.3 as

TABLE IV-14  
LIST OF THE VARIABLES ENTERED FOR FACTOR  
ANALYSIS ON SECTION 1

| Variables | Labels                                              |
|-----------|-----------------------------------------------------|
| 7         | Use V-24 for Checking Account Deposits              |
| 8         | Use V-24 for Checking Account Withdrawals           |
| 9         | Use V-24 for Savings Account Deposits               |
| 10        | Use V-24 for Savings Account Withdrawals            |
| 11        | Use V-24 for Credit Card Cash Advances              |
| 12        | Use V-24 for Utility and Loan Payments              |
| 13        | Use V-24 for Fund Transfers                         |
| 14        | Conventional Checking Account Deposits              |
| 15        | Conventional Checking Account Withdrawals           |
| 16        | Conventional Savings Account Deposits               |
| 17        | Conventional Savings Account Withdrawals            |
| 18        | Conventional Credit Card Cash Advances              |
| 19        | Conventional Utility and Loan Payments              |
| 20        | Conventional Fund Transfers                         |
| 22        | Helpfulness of Info Source, Refer to Question 21    |
| 24        | Helpfulness of Info Source, Refer to Question 23    |
| 28        | Use V-24 on Weekdays Outside Banking Hours          |
| 29        | Use V-24 on Weekends                                |
| 30        | Relative Advantage                                  |
| 31        | Complexity                                          |
| 32        | Compatibility                                       |
| 33        | Observability                                       |
| 34        | Trialability                                        |
| 35        | General Attitude toward Computers                   |
| 36        | Previous Experience (Problem Recognition)           |
| 37        | Perception of V-24 Usage by Reference Group Members |
| 38        | Desire for Convenient Locations for V-24            |
| 39        | Need of a Telephone on V-24                         |
| 40        | Wants of Privacy in V-24 Usage                      |
| 41        | Financial/Performance Risk                          |
| 42        | Social Risk                                         |
| 43        | Psychological Risk                                  |
| 44        | Time Risk                                           |
| 45        | Physical Risk                                       |
| 46        | Financial Risk                                      |
| 47        | Avg. Times Use V-24 per Month                       |
| 48        | Avg. Times Use Human Teller per Month               |

Total Number of the Variables Entered: 37.  
Sample Size: 453.

TABLE IV-15  
FACTOR LOADINGS OF THE VARIABLES IN SECTION 1

| VARIMAX ROTATED FACTOR MATRIX/ MINRES FACTOR SOLUTION                      |          |          |          |          |          |                      |
|----------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------------------|
|                                                                            | FACTOR 1 | FACTOR 2 | FACTOR 3 | FACTOR 4 | FACTOR 5 | FACTOR 6 COMMUNALITY |
| 7                                                                          | 0.31405  | -0.08975 | 0.30994  | 0.09525  | 0.45894  | -0.20932             |
| 8                                                                          | 0.53070  | -0.03814 | 0.22798  | 0.13304  | 0.51024  | -0.24195             |
| 9                                                                          | 0.09893  | 0.04658  | 0.82398  | 0.02265  | 0.10036  | -0.13753             |
| 10                                                                         | 0.15283  | 0.05212  | 0.91306  | -0.03113 | 0.07920  | -0.08329             |
| 11                                                                         | 0.26365  | -0.05580 | 0.12025  | 0.05989  | 0.36200  | 0.22264              |
| 12                                                                         | 0.09995  | -0.05493 | 0.18162  | -0.07324 | 0.22845  | -0.03018             |
| 13                                                                         | 0.16737  | -0.01213 | 0.66222  | 0.08988  | 0.31180  | 0.05823              |
| 14                                                                         | 0.08109  | 0.54145  | -0.08805 | -0.02304 | -0.24492 | 0.01821              |
| 15                                                                         | -0.00826 | 0.60840  | -0.08230 | -0.02093 | -0.16896 | 0.03685              |
| 16                                                                         | -0.05200 | 0.76744  | 0.04047  | -0.10865 | -0.06168 | 0.01260              |
| 17                                                                         | -0.07184 | 0.80729  | 0.04274  | -0.07435 | -0.02372 | -0.00890             |
| 18                                                                         | -0.02522 | 0.50558  | 0.06391  | 0.03620  | 0.12051  | 0.38450              |
| 19                                                                         | -0.05970 | 0.40040  | 0.03211  | 0.10749  | -0.03515 | 0.09392              |
| 20                                                                         | -0.09375 | 0.66590  | 0.05138  | 0.03805  | -0.07601 | -0.02546             |
| 22                                                                         | 0.64253  | -0.00516 | 0.10556  | -0.05416 | 0.00368  | -0.08704             |
| 24                                                                         | 0.57604  | 0.06213  | 0.15562  | -0.08380 | -0.05273 | -0.09346             |
| 28                                                                         | 0.64522  | -0.08011 | 0.10066  | 0.18582  | 0.17385  | -0.11175             |
| 29                                                                         | 0.71857  | -0.04223 | 0.08894  | 0.22706  | 0.06193  | -0.09255             |
| 30                                                                         | 0.73818  | -0.05106 | 0.04113  | 0.23593  | 0.09804  | -0.12594             |
| 31                                                                         | 0.70263  | -0.04535 | 0.05265  | 0.03657  | 0.13595  | -0.08423             |
| 32                                                                         | 0.51745  | -0.06806 | -0.01192 | 0.22160  | 0.10128  | -0.19281             |
| 33                                                                         | 0.63135  | -0.08861 | 0.10168  | 0.11767  | 0.18535  | -0.14206             |
| 34                                                                         | 0.14973  | 0.00499  | -0.01696 | 0.30516  | -0.18182 | 0.26907              |
| 35                                                                         | 0.35656  | -0.03993 | 0.01203  | 0.10173  | -0.00096 | 0.25327              |
| 36                                                                         | 0.35903  | -0.03739 | 0.06423  | 0.10173  | -0.00096 | -0.26943             |
| 37                                                                         | 0.02082  | -0.01981 | -0.15490 | 0.27522  | -0.29593 | -0.07562             |
| 38                                                                         | 0.33555  | -0.01588 | 0.07014  | 0.18567  | -0.16252 | 0.32677              |
| 39                                                                         | 0.12265  | -0.05541 | 0.05093  | 0.63423  | 0.13261  | -0.19262             |
| 40                                                                         | -0.00043 | 0.01139  | 0.05491  | 0.75506  | -0.03292 | 0.04147              |
| 41                                                                         | -0.15589 | 0.11452  | -0.02916 | 0.76992  | -0.09491 | 0.59363              |
| 42                                                                         | 0.30565  | -0.14763 | -0.03859 | -0.27758 | -0.07820 | 0.61459              |
| 43                                                                         | -0.38202 | 0.08596  | -0.05701 | 0.26371  | 0.23209  | 0.26106              |
| 44                                                                         | -0.26735 | 0.03821  | -0.16462 | -0.16672 | -0.33123 | 0.13852              |
| 45                                                                         | -0.17438 | -0.04820 | -0.08144 | 0.01460  | 0.02129  | 0.43973              |
| 46                                                                         | -0.23590 | 0.02845  | -0.01689 | 0.07666  | 0.06221  | 0.51130              |
| 47                                                                         | 0.04114  | -0.08446 | -0.03159 | 0.05494  | -0.18856 | 0.52195              |
| 48                                                                         | -0.14739 | 0.15012  | 0.03900  | -0.04258 | -0.05439 | 0.33398              |
|                                                                            |          |          | 0.02208  | -0.05254 | 0.77445  | 0.26858              |
|                                                                            |          |          |          |          | -0.33683 | 0.13557              |
|                                                                            |          |          |          |          | 0.35134  | 0.61332              |
|                                                                            |          |          |          |          |          | 0.36544              |
| Eigenvalues                                                                |          |          |          |          |          |                      |
| % of Common Variance                                                       |          |          |          |          |          |                      |
| 44.9%                                                                      |          |          |          |          |          |                      |
| % of Total Variance                                                        |          |          |          |          |          |                      |
| 19.6%                                                                      |          |          |          |          |          |                      |
| % of the Total Variance of All the Variables Explained by 6 Factors: 43.6% |          |          |          |          |          |                      |
| Determinant of Correlation Matrix= 0.00000000 ( 0.21204503D-07)            |          |          |          |          |          |                      |
|                                                                            | 7.23398  | 2.83217  | 2.35308  | 1.66046  | 1.12242  | 0.89871              |
|                                                                            |          | 17.6%    | 14.6%    | 10.3%    | 7.0%     | 5.6%                 |
|                                                                            |          | 7.7%     | 6.4%     | 4.5%     | 3.0%     | 2.4%                 |



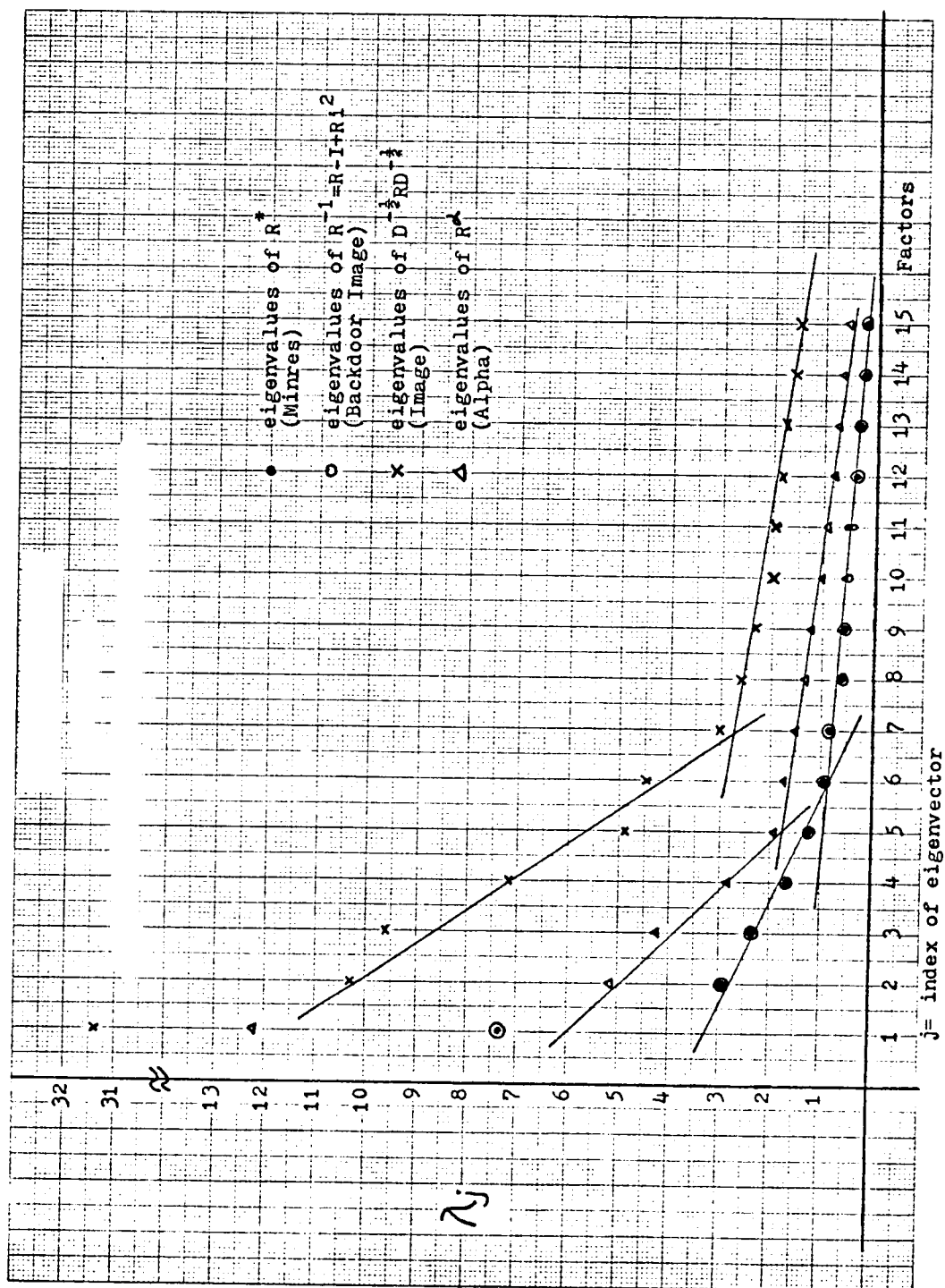


Figure IV-7. Scree test—Bank services and V-24 related variables.

TABLE IV-16

SECTION 1: DETERMINATION OF THE NUMBER  
OF FACTORS BY HARRIS PROCEDURE

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 1 | FACTOR 1 | FACTOR 1 | FACTOR 1 |
| 7                             | 0.29036  | 0.30097  | 0.38697  | 0.31405  |
| 8                             | 0.52062  | 0.52262  | 0.52695  | 0.53820  |
| 9                             | 0.08171  | 0.08956  | 0.14176  | 0.09893  |
| 10                            | 0.14614  | 0.14460  | 0.18153  | 0.15283  |
| 11                            | 0.27411  | 0.26371  | 0.28813  | 0.26369  |
| 12                            | 0.09355  | 0.09353  | 0.11739  | 0.09995  |
| 13                            | 0.19697  | 0.18000  | 0.16257  | 0.18737  |
| 14                            | 0.09789  | 0.08607  | 0.04075  | 0.08109  |
| 15                            | 0.01935  | -0.00531 | -0.04229 | -0.00826 |
| 16                            | -0.05190 | -0.04710 | -0.06354 | -0.05200 |
| 17                            | -0.07176 | -0.07099 | -0.07284 | -0.07184 |
| 18                            | -0.03503 | -0.02480 | -0.04378 | -0.02922 |
| 19                            | -0.04614 | -0.06030 | -0.10317 | -0.06970 |
| 20                            | -0.11335 | -0.09452 | -0.08091 | -0.09375 |
| 22                            | 0.66062  | 0.65099  | 0.59811  | 0.64253  |
| 24                            | 0.59245  | 0.61593  | 0.55733  | 0.57604  |
| 28                            | 0.56490  | 0.67455  | 0.70012  | 0.64522  |
| 29                            | 0.66205  | 0.74604  | 0.74931  | 0.71857  |
| 30                            | 0.69677  | 0.71693  | 0.69525  | 0.73818  |
| 31                            | 0.69510  | 0.69062  | 0.63711  | 0.70263  |
| 32                            | 0.48892  | 0.49646  | 0.49814  | 0.51745  |
| 33                            | 0.60978  | 0.62723  | 0.61866  | 0.63135  |
| 34                            | 0.17460  | 0.15820  | 0.04074  | 0.14973  |
| 35                            | 0.35198  | 0.34369  | 0.37023  | 0.35656  |
| 36                            | 0.34702  | 0.33562  | 0.36037  | 0.35903  |
| 37                            | 0.02632  | 0.02583  | -0.07872 | 0.02082  |
| 38                            | 0.29261  | 0.30506  | 0.36411  | 0.33555  |
| 39                            | 0.10225  | 0.10802  | 0.08131  | 0.12265  |
| 40                            | -0.00380 | -0.00427 | -0.04601 | -0.00043 |
| 41                            | -0.13679 | -0.14096 | -0.35929 | -0.15589 |
| 42                            | 0.30498  | 0.29832  | 0.30901  | 0.30565  |
| 43                            | -0.33974 | -0.35194 | -0.53465 | -0.38202 |
| 44                            | -0.27021 | -0.25516 | -0.43503 | -0.26735 |
| 45                            | -0.13751 | -0.16012 | -0.27174 | -0.17438 |
| 46                            | -0.19465 | -0.22943 | -0.30412 | -0.23590 |
| 47                            | 0.01332  | 0.02468  | 0.11514  | 0.04114  |
| 48                            | -0.14098 | -0.14078 | -0.14249 | -0.14739 |

TABLE IV-16 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 2 | FACTOR 2 | FACTOR 2 | FACTOR 2 |
| 7                             | -0.09627 | -0.09100 | -0.09578 | -0.08975 |
| 8                             | -0.04330 | -0.03506 | -0.02611 | -0.03818 |
| 9                             | 0.23090  | 0.04766  | 0.05302  | 0.04659  |
| 10                            | 0.03483  | 0.05405  | 0.06715  | 0.05212  |
| 11                            | -0.04066 | -0.05700 | -0.07444 | -0.05580 |
| 12                            | -0.04083 | -0.05615 | -0.06704 | -0.05493 |
| 13                            | -0.02342 | -0.01310 | -0.01084 | -0.01213 |
| 14                            | 0.55335  | 0.56069  | 0.52413  | 0.54145  |
| 15                            | 0.60997  | 0.63408  | 0.58296  | 0.60840  |
| 16                            | 0.68216  | 0.79209  | 0.78425  | 0.76744  |
| 17                            | 0.70244  | 0.80982  | 0.79257  | 0.80729  |
| 18                            | 0.55176  | 0.51789  | 0.43824  | 0.50958  |
| 19                            | 0.43603  | 0.40697  | 0.32878  | 0.40040  |
| 20                            | 0.66032  | 0.65636  | 0.53667  | 0.66590  |
| 22                            | 0.01105  | -0.00814 | 0.00294  | -0.00516 |
| 24                            | 0.07675  | 0.06282  | 0.07185  | 0.06213  |
| 28                            | -0.07987 | -0.07927 | -0.07250 | -0.08011 |
| 29                            | -0.04661 | -0.04099 | -0.02990 | -0.04223 |
| 30                            | -0.05305 | -0.05020 | -0.05559 | -0.05106 |
| 31                            | -0.06572 | -0.04425 | -0.02870 | -0.04535 |
| 32                            | -0.06533 | -0.06736 | -0.07478 | -0.06806 |
| 33                            | -0.06274 | -0.09044 | -0.09082 | -0.08861 |
| 34                            | -0.01969 | 0.00667  | 0.03151  | 0.00499  |
| 35                            | -0.08781 | -0.09138 | -0.09820 | -0.08993 |
| 36                            | -0.04995 | -0.03489 | -0.02851 | -0.03739 |
| 37                            | -0.04259 | -0.01854 | -0.00188 | -0.01931 |
| 38                            | 0.00157  | -0.01599 | -0.02757 | -0.01588 |
| 39                            | 0.05930  | 0.05625  | 0.04769  | 0.05541  |
| 40                            | -0.03312 | 0.01339  | 0.01263  | 0.01139  |
| 41                            | 0.09893  | 0.11683  | 0.13249  | 0.11452  |
| 42                            | -0.15711 | -0.14879 | -0.13831 | -0.14763 |
| 43                            | 0.07517  | 0.08610  | 0.08450  | 0.08596  |
| 44                            | 0.05060  | 0.06974  | 0.07488  | 0.06821  |
| 45                            | -0.00988 | -0.01312 | 0.00480  | -0.00820 |
| 46                            | 0.03685  | 0.02778  | 0.01514  | 0.02845  |
| 47                            | -0.13687 | -0.07569 | -0.06719 | -0.08446 |
| 48                            | 0.17531  | 0.15108  | 0.11688  | 0.15012  |

TABLE IV-16 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 4 | FACTOR 3 | FACTOR 3 | FACTOR 3 |
| 7                             | 0.32292  | 0.35502  | 0.34578  | 0.30994  |
| 8                             | 0.22403  | 0.28089  | 0.28844  | 0.22798  |
| 9                             | 0.77382  | 0.82464  | 0.79567  | 0.82393  |
| 10                            | 0.87575  | 0.87947  | 0.83134  | 0.91506  |
| 11                            | 0.11275  | 0.15998  | 0.15080  | 0.12025  |
| 12                            | 0.17018  | 0.20502  | 0.20611  | 0.18162  |
| 13                            | 0.66953  | 0.71024  | 0.67747  | 0.65222  |
| 14                            | -0.08872 | -0.10685 | -0.13894 | -0.08305 |
| 15                            | -0.08611 | -0.09576 | -0.12768 | -0.08230 |
| 16                            | 0.01828  | 0.02943  | 0.03836  | 0.04347  |
| 17                            | 0.00528  | 0.03666  | 0.04662  | 0.04274  |
| 18                            | 0.03106  | 0.01380  | 0.01558  | 0.00391  |
| 19                            | 0.06073  | 0.03671  | 0.02228  | 0.03211  |
| 20                            | 0.04818  | 0.05628  | 0.07097  | 0.05133  |
| 22                            | 0.11696  | 0.11557  | 0.08570  | 0.10556  |
| 24                            | 0.16342  | 0.17380  | 0.11726  | 0.15562  |
| 28                            | 0.13306  | 0.10057  | 0.13801  | 0.10066  |
| 29                            | 0.13424  | 0.08501  | 0.10323  | 0.08834  |
| 30                            | 0.03422  | 0.04431  | 0.07640  | 0.04113  |
| 31                            | 0.03057  | 0.05920  | 0.08297  | 0.05265  |
| 32                            | -0.04612 | -0.00951 | 0.03510  | -0.01192 |
| 33                            | 0.09804  | 0.12032  | 0.12390  | 0.10168  |
| 34                            | -0.02237 | -0.03262 | -0.04211 | -0.01696 |
| 35                            | -0.00121 | 0.00555  | 0.02863  | 0.01208  |
| 36                            | 0.03030  | 0.08198  | 0.09537  | 0.06423  |
| 37                            | -0.14360 | -0.19115 | -0.16736 | -0.15490 |
| 38                            | 0.07540  | 0.08414  | 0.09645  | 0.07014  |
| 39                            | 0.08732  | 0.04785  | 0.05099  | 0.05093  |
| 40                            | -0.01716 | -0.03659 | -0.03918 | -0.02916 |
| 41                            | -0.05986 | -0.04680 | -0.06616 | -0.03859 |
| 42                            | -0.08499 | -0.04021 | -0.01899 | -0.05701 |
| 43                            | -0.15511 | -0.19828 | -0.20848 | -0.16462 |
| 44                            | -0.09212 | -0.08339 | -0.09092 | -0.08144 |
| 45                            | -0.00702 | -0.01972 | -0.06112 | -0.01689 |
| 46                            | -0.03769 | -0.03033 | -0.04369 | -0.03159 |
| 47                            | 0.03439  | 0.06079  | 0.15172  | 0.03900  |
| 48                            | 0.05512  | 0.02144  | -0.00993 | 0.02208  |

TABLE IV-16 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 3 | FACTOR 4 | FACTOR 4 | FACTOR 4 |
| 7                             | 0.09819  | 0.10127  | 0.06170  | 0.09525  |
| 8                             | 0.15066  | 0.14782  | 0.11478  | 0.13304  |
| 9                             | 0.04017  | 0.02736  | -0.00990 | 0.02265  |
| 10                            | 0.00601  | 0.00766  | -0.00358 | -0.00113 |
| 11                            | 0.05510  | 0.06743  | 0.08778  | 0.05939  |
| 12                            | -0.07514 | -0.07465 | -0.06907 | -0.07324 |
| 13                            | 0.09949  | 0.09402  | 0.09330  | 0.08988  |
| 14                            | -0.04306 | -0.01855 | 0.02629  | -0.02304 |
| 15                            | -0.03315 | -0.01778 | 0.01457  | -0.02093 |
| 16                            | -0.08114 | -0.11586 | -0.11281 | -0.10865 |
| 17                            | -0.04397 | -0.07771 | -0.08356 | -0.07435 |
| 18                            | 0.04443  | 0.03292  | 0.03333  | 0.03620  |
| 19                            | 0.09360  | 0.11126  | 0.11255  | 0.10749  |
| 20                            | 0.06359  | 0.03600  | 0.01074  | 0.03905  |
| 22                            | -0.10291 | -0.09112 | -0.02755 | -0.09416 |
| 24                            | -0.09542 | -0.10295 | -0.03045 | -0.03380 |
| 28                            | 0.22610  | 0.19792  | 0.21247  | 0.18582  |
| 29                            | 0.26466  | 0.24399  | 0.27534  | 0.22706  |
| 30                            | 0.27040  | 0.25941  | 0.27031  | 0.23593  |
| 31                            | 0.07439  | 0.05602  | 0.09126  | 0.03697  |
| 32                            | 0.27382  | 0.24656  | 0.21050  | 0.22160  |
| 33                            | 0.13753  | 0.13834  | 0.15155  | 0.11767  |
| 34                            | 0.33725  | 0.32038  | 0.34341  | 0.30616  |
| 35                            | 0.14176  | 0.12119  | 0.07355  | 0.10173  |
| 36                            | 0.39755  | 0.43003  | 0.39751  | 0.37522  |
| 37                            | 0.22349  | 0.19548  | 0.20007  | 0.18597  |
| 38                            | 0.63672  | 0.65098  | 0.57402  | 0.63422  |
| 39                            | 0.71765  | 0.74013  | 0.66973  | 0.75506  |
| 40                            | 0.74328  | 0.72900  | 0.66713  | 0.76992  |
| 41                            | -0.02898 | -0.03761 | 0.06929  | -0.02759 |
| 42                            | 0.29794  | 0.28278  | 0.22909  | 0.26371  |
| 43                            | -0.16532 | -0.19258 | -0.11813 | -0.16672 |
| 44                            | 0.00032  | -0.00114 | 0.08749  | 0.01460  |
| 45                            | 0.07235  | 0.07717  | 0.12880  | 0.07666  |
| 46                            | 0.05679  | 0.05369  | 0.07166  | 0.05494  |
| 47                            | -0.00460 | -0.06188 | -0.11538 | -0.04298 |
| 48                            | -0.06853 | -0.05888 | -0.03999 | -0.05254 |

TABLE IV-16 (continued)

| VARIMAX ROTATED FACTOR MATRIX |                 |                 |                 |                 |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|
|                               | ALPHA           | BI              | IMAGE           | MINRES          |
|                               | FACTOR 5        | FACTOR 5        | FACTOR 5        | FACTOR 5        |
| 7                             | <u>0.43234</u>  | <u>0.40906</u>  | <u>0.30895</u>  | <u>0.45894</u>  |
| 8                             | <u>0.60967</u>  | <u>0.58310</u>  | <u>0.41557</u>  | <u>0.61024</u>  |
| 9                             | 0.09622         | 0.04468         | 0.00901         | 0.10036         |
| 10                            | 0.12418         | 0.03284         | -0.04319        | 0.07920         |
| 11                            | <u>0.44452</u>  | <u>0.36734</u>  | 0.14222         | <u>0.36200</u>  |
| 12                            | 0.26415         | <u>0.20546</u>  | 0.10745         | 0.22849         |
| 13                            | <u>0.33274</u>  | 0.26258         | 0.14781         | <u>0.31180</u>  |
| 14                            | -0.22293        | -0.25109        | -0.25936        | -0.24492        |
| 15                            | -0.15617        | -0.17385        | -0.20696        | -0.16896        |
| 16                            | -0.09432        | -0.04698        | 0.00324         | -0.06168        |
| 17                            | -0.05368        | -0.01692        | 0.00420         | -0.02372        |
| 18                            | 0.15151         | 0.12644         | 0.08233         | 0.12051         |
| 19                            | 0.01952         | -0.03867        | -0.06354        | -0.03519        |
| 20                            | 0.06375         | 0.07117         | 0.06997         | 0.07601         |
| 22                            | 0.02932         | -0.01802        | -0.10149        | 0.00368         |
| 24                            | -0.02762        | -0.10718        | -0.20292        | -0.05272        |
| 28                            | 0.14646         | 0.19213         | 0.21880         | 0.17385         |
| 29                            | 0.02934         | 0.06959         | 0.08482         | 0.06193         |
| 30                            | 0.11641         | 0.10854         | 0.10533         | 0.09804         |
| 31                            | 0.15590         | 0.14700         | 0.11617         | 0.13995         |
| 32                            | 0.11127         | 0.10287         | 0.08296         | 0.10128         |
| 33                            | 0.21718         | 0.16588         | 0.04045         | 0.13535         |
| 34                            | -0.22214        | -0.15239        | -0.08321        | -0.18182        |
| 35                            | 0.00787         | -0.00805        | 0.02791         | -0.00096        |
| 36                            | 0.23226         | 0.19467         | 0.06343         | 0.19960         |
| 37                            | <u>-0.35138</u> | -0.25231        | -0.11222        | -0.29953        |
| 38                            | <u>0.12908</u>  | 0.08076         | 0.03077         | 0.10261         |
| 39                            | -0.05441        | -0.02578        | 0.03278         | -0.03292        |
| 40                            | -0.09228        | -0.07534        | -0.01141        | -0.09491        |
| 41                            | -0.11243        | -0.04137        | -0.02452        | -0.07820        |
| 42                            | 0.26086         | 0.22439         | 0.16489         | 0.23209         |
| 43                            | <u>-0.37854</u> | -0.28040        | -0.13151        | <u>-0.33123</u> |
| 44                            | <u>-0.02501</u> | 0.04041         | 0.07562         | 0.02129         |
| 45                            | -0.19119        | -0.17698        | -0.15380        | -0.18856        |
| 46                            | -0.00628        | -0.03968        | -0.05949        | -0.05439        |
| 47                            | <u>0.63103</u>  | <u>0.88768</u>  | <u>0.86227</u>  | <u>0.77445</u>  |
| 48                            | <u>-0.11210</u> | <u>-0.13206</u> | <u>-0.13613</u> | <u>-0.12379</u> |

TABLE IV-16 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 6 | FACTOR 6 | FACTOR 6 | FACTOR 6 |
| 7                             | -0.23298 | -0.24443 | 0.27052  | -0.20932 |
| 8                             | -0.25269 | -0.30074 | 0.46848  | -0.24185 |
| 9                             | -0.17829 | -0.13793 | 0.02647  | -0.13753 |
| 10                            | -0.10009 | -0.08767 | 0.04152  | -0.03329 |
| 11                            | 0.00479  | -0.04557 | 0.24611  | -0.03003 |
| 12                            | -0.02585 | -0.04697 | 0.08317  | -0.03018 |
| 13                            | 0.05978  | 0.05089  | 0.03093  | 0.05823  |
| 14                            | 0.04001  | 0.01160  | 0.06005  | 0.01821  |
| 15                            | 0.06401  | 0.02897  | 0.09177  | 0.03685  |
| 16                            | -0.00615 | 0.01792  | -0.10795 | 0.01260  |
| 17                            | -0.03698 | -0.00481 | -0.07189 | -0.00890 |
| 18                            | 0.13015  | 0.08897  | -0.00080 | 0.08450  |
| 19                            | 0.15290  | 0.10148  | 0.00447  | 0.09392  |
| 20                            | -0.04441 | -0.01897 | -0.06170 | -0.02546 |
| 22                            | -0.09959 | -0.10815 | 0.09102  | -0.08704 |
| 24                            | -0.10800 | -0.10581 | 0.16340  | -0.09346 |
| 28                            | -0.20826 | -0.09614 | -0.25086 | -0.11175 |
| 29                            | -0.19050 | -0.07479 | -0.21846 | -0.09255 |
| 30                            | -0.22045 | -0.14993 | -0.09446 | -0.12594 |
| 31                            | -0.16442 | -0.11492 | 0.00131  | -0.08423 |
| 32                            | -0.25269 | -0.21996 | -0.01558 | -0.19281 |
| 33                            | -0.13793 | -0.17679 | 0.19502  | -0.14206 |
| 34                            | 0.23755  | 0.29035  | -0.10195 | 0.25027  |
| 35                            | -0.29454 | -0.28828 | 0.00361  | -0.26943 |
| 36                            | -0.06338 | -0.10635 | 0.23054  | -0.07562 |
| 37                            | 0.10537  | 0.20127  | -0.30378 | 0.16252  |
| 38                            | -0.20916 | -0.20907 | 0.12759  | -0.19262 |
| 39                            | 0.00368  | 0.05049  | -0.01952 | 0.04147  |
| 40                            | 0.12282  | 0.12573  | -0.00309 | 0.10874  |
| 41                            | 0.62256  | 0.62650  | -0.11095 | 0.62645  |
| 42                            | -0.11646 | -0.16735 | 0.17722  | -0.13852 |
| 43                            | 0.44373  | 0.50443  | -0.32537 | 0.43973  |
| 44                            | 0.62272  | 0.61600  | -0.14788 | 0.66221  |
| 45                            | 0.38624  | 0.38697  | -0.01921 | 0.33398  |
| 46                            | 0.35227  | 0.29535  | -0.03713 | 0.26858  |
| 47                            | -0.13839 | -0.05318 | 0.14832  | -0.03683 |
| 48                            | 0.08173  | 0.06727  | -0.03636 | 0.05104  |

the criterion loading point. Of the four alternative number of factors, 4 factors, 5 factors, 6 factors, or 7 factors, six factors yielded the most consistent factor loadings across the four different factor solutions as shown in Table IV-16.

Table IV-15 presents the Varimax rotated factor matrix based on Minres factor solution using six factors. As in the previous Harris procedure, 0.3 is used as the criterion loading. Factor 1 is significantly correlated with the variables 7, 8, 22 to 33, 35, 36, 38, 42, and 43 and explains 19.6% of variation of the 37 variables. Factor 2 is significantly correlated with the variables 14 to 20 and explains 7.7% of variation of the 37 variables. Factor 3 is significantly correlated with the variables 7, 9, 10, and 13 and explains 6.4% of variation of the 37 variables. Factor 4 is significantly correlated with the variables 34, 36, 38, 39, and 40 and explains 4.5% of variation of the 37 variables. Factor 5 is significantly correlated with the variables 7, 8, 11, 13, 43, and 47 and explains 3.0% of variation of the 37 variables. Factor 6 is significantly correlated with the variables 41, 43, 44, and 45 and explains 2.4% of variation of the 37 variables.

The total proportion of variation of the 37 variables that can be explained by the six factors amounts to 43.6%. As shown in Table IV-15, factor 1 explains 44.9% of that total proportion, factor 2 17.6%, factor 3 14.6%, factor 4 10.3%, factor 5 7.0%, and factor 6 5.6%. Thus factor 1 can explain the largest percentage of the variation that can be explained by the six factors.

Evaluating the communality for each variable, these six factors can best explain the variance of variable 10 ("V-24 for savings account



withdrawals"); 86.7% of variation of this variable can be explained by the six factors. Looking at the cluster and nature of those variables that are significantly correlated with each factor, factor 1 appears to represent perceived general V-24 characteristics, factor 2 human teller usage, factor 3 V-24 savings account usage and account transfer, factor 4 general dissatisfaction in V-24 usage, factor 5 V-24 checking account usage and frequency of its usage, and factor 6 risk in V-24 usage (Table IV-17). Factor 1 has salient loadings by the following variables: 7, 8, 22, 24, 28, 29, 30, 31, 32, 33, 35, 36, 38, 42, and 43. Looking at the nature of these variables in Table IV-14 (p. 171), these variables may be synthesized to represent "perceived general V-24 characteristics." Factor 2 has salient loadings by the following variables: 14, 15, 16, 17, 18, 19, and 20. All these seven variables are related to conventional teller usage patterns, and thus, may be synthesized to represent "human teller usage." Factor 3 has salient loading by the following variables: 7, 9, 10, and 13. These four variables are related to the measures of V-24 usage patterns, as shown in Table IV-14. Of these four variables, variables 9, 10, and 13 have greater loadings than variable 7. In this context, they may be synthesized to represent "V-24 savings account usage and account transfer." Factor 4 has salient loadings by variables 34, 36, 38, 39, and 40. Of these five variables, variables 38, 39, and 40 have far greater loadings than variables 34 and 36. Accordingly, they may be synthesized to represent "general dissatisfaction in V-24 usage." Factor 5 has salient loadings by variables 7, 8, 11, 13, 43, and 47. Of these six variables, variables 7, 8, and 47 have far greater loadings than variables 11, 13, and 43. In this context, they may be synthesized

TABLE IV-17

SALIENT LOADINGS ON EXTRACTED FACTORS IN SECTION 1

| Variables | Factor |     |     |     |      |     |
|-----------|--------|-----|-----|-----|------|-----|
|           | 1      | 2   | 3   | 4   | 5    | 6   |
| 7         | .31    |     |     |     |      |     |
| 8         | .54    |     |     |     |      |     |
| 22        | .64    |     |     |     |      |     |
| 24        | .58    |     |     |     |      |     |
| 28        | .65    |     |     |     |      |     |
| 29        | .72    |     |     |     |      |     |
| 30        | .74    |     |     |     |      |     |
| 31        | .70    |     |     |     |      |     |
| 32        | .52    |     |     |     |      |     |
| 33        | .63    |     |     |     |      |     |
| 35        | .36    |     |     |     |      |     |
| 36        | .36    |     |     |     |      |     |
| 38        | .34    |     |     |     |      |     |
| 42        | .31    |     |     |     |      |     |
| 43        | -.38   |     |     |     |      |     |
| 14        |        | .54 |     |     |      |     |
| 15        |        | .61 |     |     |      |     |
| 16        |        | .77 |     |     |      |     |
| 17        |        | .81 |     |     |      |     |
| 18        |        | .51 |     |     |      |     |
| 19        |        | .40 |     |     |      |     |
| 20        |        | .67 |     |     |      |     |
| 7         |        |     | .31 |     |      |     |
| 9         |        |     | .82 |     |      |     |
| 10        |        |     | .91 |     |      |     |
| 13        |        |     | .66 |     |      |     |
| 34        |        |     |     | .31 |      |     |
| 36        |        |     |     | .38 |      |     |
| 38        |        |     |     | .63 |      |     |
| 39        |        |     |     | .76 |      |     |
| 40        |        |     |     | .77 |      |     |
| 7         |        |     |     |     | .46  |     |
| 8         |        |     |     |     | .61  |     |
| 11        |        |     |     |     | .36  |     |
| 13        |        |     |     |     | .31  |     |
| 43        |        |     |     |     | -.33 |     |
| 47        |        |     |     |     | .77  |     |
| 41        |        |     |     |     |      | .62 |
| 43        |        |     |     |     |      | .44 |
| 44        |        |     |     |     |      | .66 |
| 45        |        |     |     |     |      | .33 |

to represent "V-24 checking account usage and frequency of its usage." Factor 6 has salient loadings by variables 41, 43, 44, and 45. These variables represent financial/performance risk, psychological risk, time risk, and physical risk. In this context, these variables may be synthesized to represent "risk in V-24 usage."

Factor analysis on personality orientations in Section 2. The responses of 453 early adopters, late adopters, and nonadopters to 33 items shown in Table IV-18 were factor analyzed. Before factor analyzing the data, Bartlett's test of the significance of the correlation matrix was carried out to determine whether there exists any relationship among the 33 items. If no relationship exists, factor analysis is not warranted. The test indicates, as shown below, that the items are interrelated.

$$H_0: R = I, \quad H_1: R \neq I$$

$$\chi^2 = -(n-1 - \frac{2v+5}{6}) \ln |R| = 2689.27$$

$$\text{d.f.} = v(v-1)/2$$

$$|R| = \text{determinant of correlation matrix (see Table IV-19)}$$

$$2689.27 > \chi^2_{0.05, 528}$$

The scree test presented in Figure IV-8 indicates that three or four factors are the logical number of factors to be extracted for the analysis: the plots of the eigenvalues provided by Minres and Backdoor Image suggest three factors, whereas Image and Alpha suggest four factors. Based on these findings, Harris procedure (Table IV-20) was carried out across the four different factor solutions (Alpha, BI, Image, and Minres) using two factors ( $3 \pm 1$ ) as the minimum trial

TABLE IV-18  
LIST OF THE VARIABLES ENTERED FOR FACTOR  
ANALYSIS ON SECTION 2

| Variables | Labels                                                  |
|-----------|---------------------------------------------------------|
| 51        | Freedom from Emotional Ties with Others (Detached)      |
| 52        | Comforting Those in Need of Friends (Compliant)         |
| 53        | Knowing Most People Fond of Me All Time (Compliant)     |
| 54        | Refusing to Give in an Argument (Aggressive)            |
| 56        | Little Attention to Others' Thoughts of Me (Detached)   |
| 57        | Owning an Item before Friends (Aggressive)              |
| 58        | Knowing Others Envious of Me (Aggressive)               |
| 59        | Feeling That I Like Everyone I Know (Compliant)         |
| 60        | Working Hard While Others Have Fun (Detached)           |
| 61        | Using Pull to Get Ahead (Aggressive)                    |
| 62        | Impressing Self-Styled Big-Shots (Aggressive)           |
| 63        | Basing Life on Duty to Others (Compliant)               |
| 64        | Working under Tension (Aggressive)                      |
| 65        | Living All Alone in Cabin in Woods or Mts. (Detached)   |
| 66        | Punishing Those Who Insult My Honor (Aggressive)        |
| 67        | Giving Aid to Poor and Underprivileged (Compliant)      |
| 68        | Standing in Way of Too-Sure Persons (Aggressive)        |
| 69        | Being Free of Social Obligations (Detached)             |
| 70        | Saying Something Good About Everybody (Compliant)       |
| 71        | Telling a Waiter about Inferior Food (Aggressive)       |
| 73        | Spotting and Exploiting Others' Weakness (Aggressive)   |
| 74        | Strong Desire to Surpass Others (Aggressive)            |
| 75        | Sharing Personal Feelings with Others (Compliant)       |
| 76        | Ability to Blame Others for Their Mistakes (Aggressive) |
| 77        | Avoiding Influences from Others (Detached)              |
| 78        | Repaying Thoughtlessness with Friendship (Compliant)    |
| 79        | Competing for Rewards (Aggressive)                      |
| 80        | Know Others Care Little About My Affairs (Detached)     |
| 81        | Defending My Rights by Force (Aggressive)               |
| 82        | Putting Self Out to Be Considerate (Compliant)          |
| 83        | Correct Those Expressing Ignorant Belief (Aggressive)   |
| 84        | To Work Alone (Detached)                                |
| 85        | To Be Fair to Wrong-Doers (Compliant)                   |

Total Number of the Variables Entered: 33.  
Sample Size: 453.

TABLE IV-19

## FACTOR LOADINGS OF THE VARIABLES IN SECTION 2

| VARIMAX ROTATED FACTOR MATRIX/MINRES FACTOR SOLUTION |          |          |          |             |
|------------------------------------------------------|----------|----------|----------|-------------|
|                                                      | FACTOR 1 | FACTOR 2 | FACTOR 3 | COMMUNALITY |
| 51                                                   | -0.06143 | 0.02928  | 0.46453  | 0.22042     |
| 52                                                   | -0.01786 | 0.37876  | -0.10837 | 0.15552     |
| 53                                                   | 0.08406  | 0.35922  | -0.03681 | 0.13746     |
| 54                                                   | 0.15460  | -0.19057 | 0.09448  | 0.06915     |
| 56                                                   | 0.08028  | -0.15234 | 0.28019  | 0.10816     |
| 57                                                   | 0.01140  | -0.02545 | 0.01252  | 0.37462     |
| 58                                                   | 0.67651  | -0.09051 | -0.02184 | 0.46633     |
| 59                                                   | -0.01131 | 0.57767  | 0.17504  | 0.36446     |
| 60                                                   | -0.13340 | 0.25725  | 0.04806  | 0.08628     |
| 61                                                   | 0.35697  | -0.06451 | 0.05544  | 0.13466     |
| 62                                                   | 0.63756  | 0.00674  | 0.08277  | 0.41337     |
| 63                                                   | -0.09371 | 0.41537  | -0.15054 | 0.20397     |
| 64                                                   | 0.14161  | -0.13022 | -0.12785 | 0.05336     |
| 65                                                   | 0.13039  | -0.01655 | 0.16989  | 0.06168     |
| 66                                                   | 0.47677  | -0.07135 | 0.08997  | 0.24049     |
| 67                                                   | -0.19717 | 0.45349  | -0.19772 | 0.28362     |
| 68                                                   | 0.53875  | -0.10802 | -0.08664 | 0.30942     |
| 69                                                   | 0.18246  | -0.00636 | 0.54337  | 0.32859     |
| 70                                                   | -0.04852 | 0.58156  | 0.13506  | 0.35881     |
| 71                                                   | 0.15521  | -0.07741 | -0.15890 | 0.05522     |
| 73                                                   | 0.40648  | -0.12691 | 0.02332  | 0.18188     |
| 74                                                   | 0.57107  | 0.04072  | -0.18932 | 0.36362     |
| 75                                                   | 0.08793  | 0.14369  | -0.34095 | 0.14462     |
| 76                                                   | 0.47748  | -0.10413 | -0.00147 | 0.23884     |
| 77                                                   | 0.18534  | 0.10510  | 0.14024  | 0.06507     |
| 78                                                   | -0.01695 | 0.46355  | -0.04868 | 0.21754     |
| 79                                                   | 0.31682  | 0.10302  | -0.29842 | 0.20004     |
| 80                                                   | -0.11453 | -0.03868 | 0.40080  | 0.17526     |
| 81                                                   | 0.34551  | -0.14463 | 0.11070  | 0.15255     |
| 82                                                   | -0.11548 | 0.39545  | -0.23862 | 0.22665     |
| 83                                                   | 0.43005  | -0.12914 | -0.11599 | 0.21508     |
| 84                                                   | 0.15960  | -0.08482 | 0.30041  | 0.12291     |
| 85                                                   | -0.15502 | 0.22864  | -0.06346 | 0.08034     |

|                                                                            |         |         |         |
|----------------------------------------------------------------------------|---------|---------|---------|
| Eigenvalues                                                                | 3.62665 | 1.90177 | 1.28159 |
| % of Common Variance                                                       | 53.3%   | 27.9%   | 18.8%   |
| % of Total Variance                                                        | 11%     | 5.8%    | 3.9%    |
| % of the Total Variance of All the Variables Explained by 3 Factors: 20.7% |         |         |         |
| Determinant of Correlation Matrix= 0.0022213                               |         |         |         |
| ( 0.22212912D-02)                                                          |         |         |         |

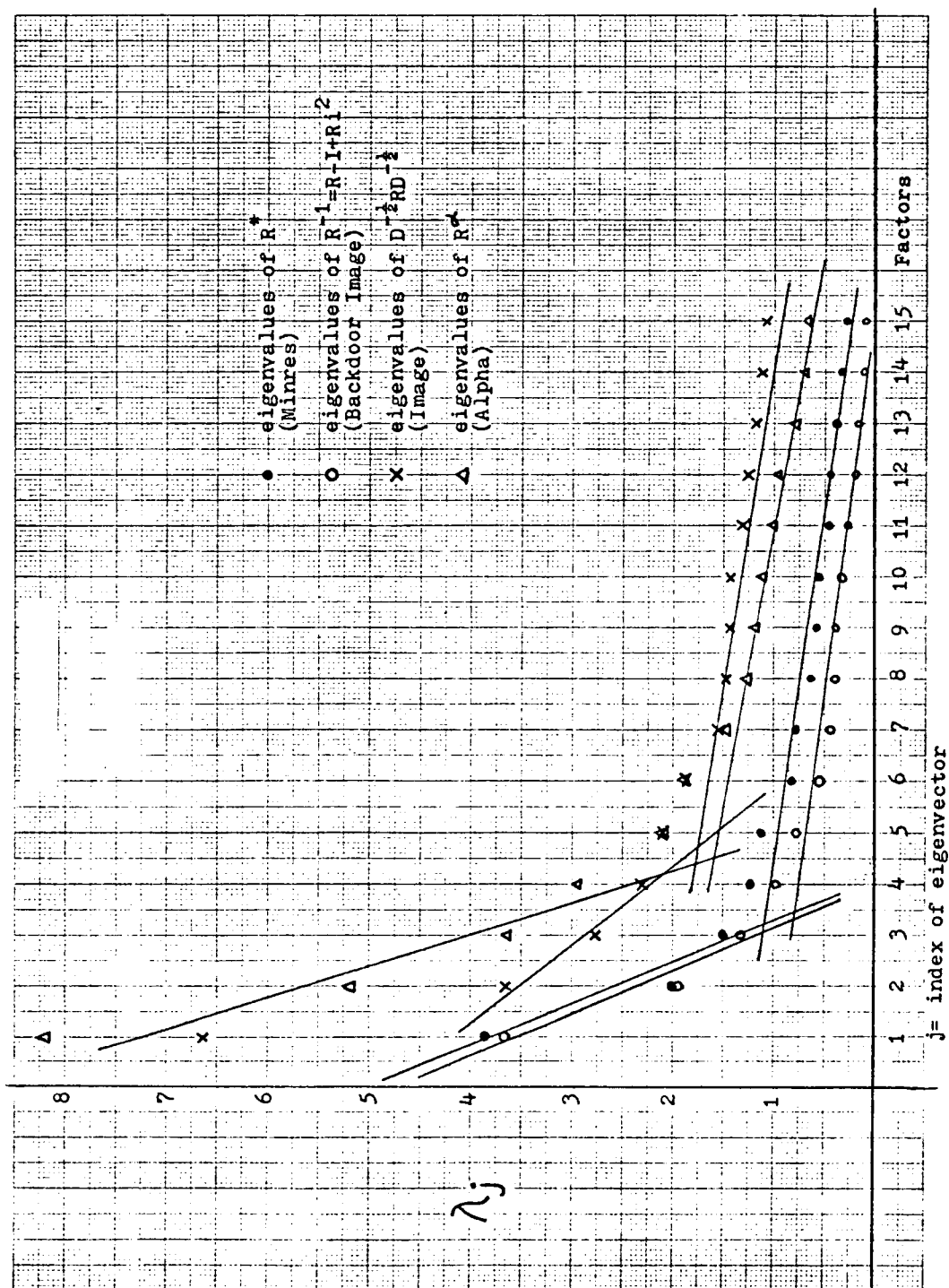


Figure IV-8. Scree test—Personality.

TABLE IV-20

SECTION 2: DETERMINATION OF THE NUMBER OF  
FACTORS BY HARRIS PROCEDURE

| VARIMAX ROTATED FACTOR MATRIX |                |                |                |                |
|-------------------------------|----------------|----------------|----------------|----------------|
|                               | ALPHA          | BI             | IMAGE          | MINRES         |
|                               | FACTOR 1       | FACTOR 1       | FACTOR 1       | FACTOR 1       |
| 51                            | -0.23329       | -0.06310       | -0.04909       | -0.06143       |
| 52                            | 0.04998        | -0.01431       | -0.02333       | -0.01786       |
| 53                            | 0.06778        | 0.09281        | 0.08399        | 0.08406        |
| 54                            | 0.11201        | 0.15536        | 0.13907        | 0.15460        |
| 56                            | -0.05793       | 0.07845        | 0.07638        | 0.08028        |
| 57                            | <u>0.50275</u> | <u>0.61373</u> | <u>0.58707</u> | <u>0.61140</u> |
| 58                            | <u>0.57600</u> | <u>0.67504</u> | <u>0.63131</u> | <u>0.67651</u> |
| 59                            | -0.02654       | -0.01234       | -0.01716       | -0.01131       |
| 60                            | -0.16121       | -0.13380       | -0.13499       | -0.13240       |
| 61                            | 0.29360        | <u>0.36195</u> | <u>0.23707</u> | <u>0.35697</u> |
| 62                            | <u>0.46360</u> | <u>0.63637</u> | <u>0.59517</u> | <u>0.63756</u> |
| 63                            | -0.01014       | -0.09079       | -0.10111       | -0.09371       |
| 64                            | 0.08187        | 0.14405        | 0.12473        | 0.14161        |
| 65                            | 0.14860        | 0.18582        | 0.17091        | 0.18039        |
| 66                            | <u>0.35394</u> | <u>0.48337</u> | <u>0.44449</u> | <u>0.47677</u> |
| 67                            | -0.06173       | -0.19377       | -0.19480       | -0.19717       |
| 68                            | <u>0.49213</u> | <u>0.54412</u> | <u>0.49146</u> | <u>0.53875</u> |
| 69                            | -0.04206       | 0.17620        | 0.17521        | 0.18246        |
| 70                            | -0.03276       | -0.04977       | -0.05303       | -0.04852       |
| 71                            | 0.24719        | 0.15339        | 0.12241        | 0.15521        |
| 73                            | <u>0.33070</u> | <u>0.41534</u> | <u>0.36672</u> | <u>0.40648</u> |
| 74                            | <u>0.60802</u> | <u>0.56466</u> | <u>0.50356</u> | <u>0.57107</u> |
| 75                            | <u>0.24770</u> | <u>0.09028</u> | <u>0.06366</u> | <u>0.08793</u> |
| 76                            | <u>0.40303</u> | <u>0.48613</u> | <u>0.43306</u> | <u>0.47748</u> |
| 77                            | <u>0.07211</u> | <u>0.19080</u> | <u>0.16882</u> | <u>0.18534</u> |
| 78                            | 0.01600        | -0.01431       | -0.01984       | -0.01695       |
| 79                            | <u>0.44701</u> | <u>0.31941</u> | <u>0.26898</u> | <u>0.31682</u> |
| 80                            | -0.25549       | -0.11630       | -0.09935       | -0.11453       |
| 81                            | <u>0.31744</u> | <u>0.35227</u> | <u>0.30933</u> | <u>0.34551</u> |
| 82                            | <u>0.03722</u> | -0.11199       | -0.12399       | -0.11548       |
| 83                            | <u>0.46846</u> | <u>0.43336</u> | <u>0.38076</u> | <u>0.43005</u> |
| 84                            | -0.00264       | 0.16216        | 0.15926        | 0.15960        |
| 85                            | -0.10858       | -0.15640       | -0.14909       | -0.15502       |

TABLE IV-20 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 2 | FACTOR 2 | FACTOR 2 | FACTOR 2 |
| 51                            | -0.02433 | 0.02807  | 0.01944  | 0.02928  |
| 52                            | 0.22840  | 0.38838  | 0.33536  | 0.37876  |
| 53                            | 0.11828  | 0.38214  | 0.33330  | 0.35922  |
| 54                            | -0.29065 | -0.19991 | -0.17343 | -0.19057 |
| 56                            | -0.12197 | -0.15680 | -0.14551 | -0.15234 |
| 57                            | -0.08243 | -0.02354 | -0.03021 | -0.02545 |
| 58                            | -0.14934 | -0.09030 | -0.09313 | -0.09051 |
| 59                            | 0.39651  | 0.56539  | 0.48542  | 0.57767  |
| 60                            | 0.39910  | 0.27114  | 0.22510  | 0.25725  |
| 61                            | -0.12136 | -0.06558 | -0.05941 | -0.06451 |
| 62                            | -0.09835 | 0.00785  | -0.00631 | 0.00674  |
| 63                            | 0.54623  | 0.41901  | 0.35584  | 0.41537  |
| 64                            | -0.00228 | -0.13657 | -0.12747 | -0.13022 |
| 65                            | -0.00817 | -0.01175 | -0.02199 | -0.01655 |
| 66                            | -0.16456 | -0.07298 | -0.07860 | -0.07135 |
| 67                            | 0.47272  | 0.44889  | 0.38553  | 0.45349  |
| 68                            | -0.14164 | -0.11000 | -0.11698 | -0.10802 |
| 69                            | -0.04029 | -0.01032 | -0.02769 | -0.00686 |
| 70                            | 0.41481  | 0.56262  | 0.48487  | 0.58156  |
| 71                            | -0.09530 | -0.03334 | -0.08165 | -0.07741 |
| 73                            | -0.13575 | -0.13205 | -0.13411 | -0.12691 |
| 74                            | 0.01798  | 0.03758  | 0.01287  | 0.04072  |
| 75                            | 0.15296  | 0.14291  | 0.12649  | 0.14369  |
| 76                            | -0.13790 | -0.10520 | -0.11230 | -0.10413 |
| 77                            | 0.01050  | 0.11297  | 0.03305  | 0.10510  |
| 78                            | 0.69865  | 0.47142  | 0.39609  | 0.46355  |
| 79                            | 0.15262  | 0.10281  | 0.07194  | 0.10302  |
| 80                            | -0.00349 | -0.03795 | -0.04299 | -0.03868 |
| 81                            | -0.14802 | -0.15077 | -0.14589 | -0.14463 |
| 82                            | 0.53554  | 0.40100  | 0.33563  | 0.39545  |
| 83                            | -0.14360 | -0.13107 | -0.13299 | -0.12914 |
| 84                            | -0.00334 | -0.08186 | -0.03690 | -0.08482 |
| 85                            | 0.42544  | 0.24392  | 0.20281  | 0.22864  |



TABLE IV-20 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
| ALPHA                         | BI       | IMAGE    | MINRES   |          |
| FACTOR 3                      | FACTOR 3 | FACTOR 3 | FACTOR 3 |          |
| 51                            | 0.27836  | 0.46024  | 0.36993  | 0.46453  |
| 52                            | -0.11865 | -0.10803 | -0.09566 | -0.10837 |
| 53                            | -0.08786 | -0.03542 | -0.02711 | -0.03681 |
| 54                            | 0.14533  | 0.09872  | 0.07928  | 0.09448  |
| 56                            | 0.37418  | 0.29361  | 0.22502  | 0.28019  |
| 57                            | 0.28516  | 0.01750  | -0.00344 | 0.01252  |
| 58                            | 0.24065  | -0.01973 | -0.03413 | -0.02184 |
| 59                            | 0.00767  | 0.16771  | 0.12908  | 0.17504  |
| 60                            | 0.05120  | 0.05682  | 0.03026  | 0.04806  |
| 61                            | 0.22855  | 0.06096  | 0.04359  | 0.05544  |
| 62                            | 0.28323  | 0.08961  | 0.05309  | 0.08277  |
| 63                            | -0.06756 | -0.14778 | -0.13665 | -0.15054 |
| 64                            | 0.05920  | -0.13277 | -0.12262 | -0.12785 |
| 65                            | 0.46350  | 0.19062  | 0.14164  | 0.16989  |
| 66                            | 0.12293  | 0.09045  | 0.06121  | 0.08997  |
| 67                            | -0.23044 | -0.19392 | -0.16805 | -0.19772 |
| 68                            | 0.11836  | -0.09001 | -0.09656 | -0.08664 |
| 69                            | 0.53249  | 0.52222  | 0.40530  | 0.54337  |
| 70                            | 0.00628  | 0.12750  | 0.09467  | 0.13506  |
| 71                            | -0.11384 | -0.17372 | -0.14910 | -0.15890 |
| 73                            | 0.14837  | 0.02211  | -0.00351 | 0.02332  |
| 74                            | 0.11584  | -0.18145 | -0.17640 | -0.18932 |
| 75                            | -0.19713 | -0.35149 | -0.28971 | -0.34095 |
| 76                            | 0.07654  | -0.00337 | -0.02195 | -0.00147 |
| 77                            | 0.05525  | 0.14957  | 0.10805  | 0.14024  |
| 78                            | 0.04219  | -0.04432 | -0.05830 | -0.04868 |
| 79                            | -0.04874 | -0.30089 | -0.27114 | -0.29842 |
| 80                            | 0.29755  | 0.40324  | 0.31943  | 0.40080  |
| 81                            | 0.25977  | 0.11639  | 0.07849  | 0.11070  |
| 82                            | -0.16156 | -0.23450 | -0.21100 | -0.23862 |
| 83                            | 0.08504  | -0.11826 | -0.11674 | -0.11599 |
| 84                            | 0.85161  | 0.32787  | 0.24509  | 0.30041  |
| 85                            | -0.01630 | -0.06272 | -0.06612 | -0.06346 |

number of factors and five factors ( $4 \pm 1$ ) as the maximum with 0.3 as the criterion loading point. Of the four alternative number of factors, two factors, three factors, four factors or five factors, three factors yielded the most consistent factor loadings across the four different factor solutions, as shown in Table IV-20.

Table IV-19 presents the Varimax rotated factor matrix based on Minres factor solution using three factors. As in the previous Harris procedure, 0.3 is used as the criterion loading. Factor 1 is significantly correlated with the variables 57, 58, 61, 62, 66, 68, 73, 74, 76, 79, 81, and 83 to explain 11% of variation of the 33 variables. Factor 2 is significantly correlated with the variables 52, 53, 59, 63, 67, 70, 78, and 82 and explains 5.8% of variation of the 33 variables. Factor 2 is significantly correlated with 51, 69, 75, 80, and 84 and explains 3.9% of variation of the 33 variables. The total proportion of variation of the 33 variables that can be explained by the three factors amount to 20.7%. As shown in Table IV-19, factor 1 explains 53.3% of that total proportion, factor 2 27.9%, and factor 3 18.8%. Thus factor 1 can explain the largest percentage of the variation that can be explained by the three factors.

Evaluating communality for each variable, these three factors can best explain the variance of the variable 58 ("knowing others envious of me" (aggressive orientation)); 46.63% of variation of this variable can be explained by the three factors. Looking at the cluster and nature of those variables that are significantly correlated with each factor, factor 1 appears to represent aggressive orientation, factor 2 compliant orientation, and factor 3 detached orientation (Table IV-21). Factor 1 has salient loadings by variables 57, 58, 61,

TABLE IV-21  
SALIENT LOADINGS ON EXTRACTED FACTORS IN SECTION 2

| Variables | Factor |     |      |
|-----------|--------|-----|------|
|           | 1      | 2   | 3    |
| 57        | .61    |     |      |
| 58        | .68    |     |      |
| 61        | .36    |     |      |
| 62        | .64    |     |      |
| 66        | .48    |     |      |
| 68        | .54    |     |      |
| 73        | .41    |     |      |
| 74        | .57    |     |      |
| 76        | .48    |     |      |
| 79        | .32    |     |      |
| 81        | .35    |     |      |
| 83        | .43    |     |      |
| 52        |        | .38 |      |
| 53        |        | .36 |      |
| 59        |        | .58 |      |
| 63        |        | .42 |      |
| 67        |        | .45 |      |
| 70        |        | .58 |      |
| 78        |        | .46 |      |
| 82        |        | .40 |      |
| 51        |        |     | .47  |
| 69        |        |     | .54  |
| 75        |        |     | -.34 |
| 80        |        |     | .40  |
| 84        |        |     | .30  |

62, 66, 68, 73, 74, 76, 78, 81, and 83. All these 12 variables are related to the measures of aggressive orientation. In this context, they may be synthesized to represent "aggressive orientation." Factor 2 has salient loadings by variables 52, 53, 59, 63, 67, 70, 78, and 82. All these variables are related to the measures of compliant orientation. Accordingly, they may be synthesized to represent "compliant orientation." Factor 3 has salient loadings by variables 51, 75, 80, and 84. All these variables are related to the measures of detached orientation. Therefore, they may be synthesized to represent "detached orientation."

Factor analysis on receiver variables in Section 3. The responses of 453 early adopters, late adopters, and nonadopters to 26 items in Table IV-22 were factor analyzed. Before factor analyzing the data, Bartlett's test of the significance of the correlation matrix was carried out to determine whether there exists any relationship among the 26 items. If no relationship exists, factor analysis is not warranted. The test indicates, as shown below, that the items are interrelated.

$$H_0: R = I, \quad H_1: R \neq I$$

$$\chi^2 = -(n-1 - \frac{2v+5}{6}) \ln |R| = 4297.5105$$

$$\text{d.f.} = v(v-1)/2$$

$|R|$  = determinant of correlation matrix (see Table IV-23)

$$4297.5105 > \chi^2_{0.05, 325}$$

The scree test presented in Figure IV-9 indicates that five or six factors are the logical number of factors to be extracted for the analysis: the plots of the eigenvalues provided by Minres,

TABLE IV-22  
LIST OF THE VARIABLES ENTERED FOR FACTOR  
ANALYSIS ON SECTION 3

| Variables | Labels                                    |
|-----------|-------------------------------------------|
| 901       | Children Ages 1-5                         |
| 902       | Children Ages 6-12                        |
| 903       | Children Ages 13-18                       |
| 93        | Education                                 |
| 941       | Number Community Groups-Orgs              |
| 942       | Number Business Groups-Orgs               |
| 943       | Number Social Groups-Orgs                 |
| 944       | Number Recreational Groups-Orgs           |
| 945       | Number Religious Groups-Orgs              |
| 946       | Number Other Groups-Orgs                  |
| 961       | Number Homemaker Mags Read                |
| 962       | Number Fashion Mags Read                  |
| 963       | Number Movie-Romance-Crime Mags Read      |
| 964       | Number Light Readings                     |
| 965       | Number Cultural-Intellectual Readings     |
| 101       | Avg-Num Long Distance Calls per Month     |
| 102       | Avg-Num Air Trips per Year                |
| 103       | Avg-Num Miles Driven per Year             |
| 104       | Avg-Num Times Eating Out per Month        |
| 105       | Avg-Num Movies, Concerts, Plays per Month |
| 106       | Number Residences Past 15 Years           |
| 107       | Avg-Hrs Magazines or TV per Day           |
| 108       | Number Gasoline Credit Cards Owned        |
| 109       | Number Bank Credit Cards Owned            |
| 110       | Age                                       |
| 89        | Children Under Age 19 Living with Family  |

Total Number of the Variables Entered: 26.  
Sample Size: 453.

TABLE IV-23  
FACTOR LOADINGS OF THE VARIABLES IN SECTION 3

| VARIMAX ROTATED FACTOR MATRIX/ MINRES FACTOR SOLUTION |          |          |          |          |          |          |         |        |   |        |   |             |
|-------------------------------------------------------|----------|----------|----------|----------|----------|----------|---------|--------|---|--------|---|-------------|
| FACTOR                                                | 1        | FACTOR   | 2        | FACTOR   | 3        | FACTOR   | 4       | FACTOR | 5 | FACTOR | 6 | COMMUNALITY |
| 901                                                   | 0.00088  | -0.01514 | 0.10824  | 0.03029  | 0.96272  | 0.04901  | 0.94212 |        |   |        |   |             |
| 902                                                   | -0.08955 | 0.13835  | 0.90187  | 0.18189  | -0.01888 | -0.14423 | 0.89478 |        |   |        |   |             |
| 903                                                   | 0.07505  | -0.07756 | 0.16762  | 0.54399  | -0.05393 | -0.02472 | 0.93435 |        |   |        |   |             |
| 93                                                    | 0.49605  | 0.26596  | 0.20655  | 0.01778  | 0.13147  | 0.09873  | 0.38682 |        |   |        |   |             |
| 941                                                   | 0.22141  | 0.53790  | -0.03334 | 0.06545  | -0.09523 | 0.13087  | 0.36052 |        |   |        |   |             |
| 942                                                   | 0.27123  | 0.42738  | 0.07751  | 0.05296  | 0.08685  | -0.02325 | 0.33736 |        |   |        |   |             |
| 943                                                   | 0.23166  | 0.67375  | -0.00852 | -0.07298 | 0.04450  | 0.13889  | 0.53434 |        |   |        |   |             |
| 944                                                   | 0.22334  | 0.47428  | 0.20609  | -0.00432 | -0.01378 | 0.08764  | 0.32622 |        |   |        |   |             |
| 945                                                   | -0.03738 | 0.40439  | -0.09546 | -0.03230 | -0.03643 | 0.10037  | 0.18648 |        |   |        |   |             |
| 946                                                   | 0.18918  | 0.54751  | -0.00389 | -0.01599 | -0.04058 | 0.06152  | 0.24128 |        |   |        |   |             |
| 961                                                   | -0.14105 | 0.07477  | 0.00311  | -0.00422 | 0.02399  | 0.48626  | 0.26254 |        |   |        |   |             |
| 962                                                   | 0.04883  | 0.09767  | -0.00859 | 0.05141  | 0.00613  | 0.46153  | 0.22765 |        |   |        |   |             |
| 963                                                   | -0.04981 | 0.02479  | -0.03498 | -0.01457 | 0.05348  | 0.33235  | 0.11785 |        |   |        |   |             |
| 964                                                   | 0.00995  | 0.11178  | -0.03584 | -0.05424 | -0.07936 | 0.41958  | 0.19918 |        |   |        |   |             |
| 965                                                   | 0.33576  | 0.20785  | 0.07680  | -0.04355 | 0.08362  | 0.38861  | 0.32175 |        |   |        |   |             |
| 101                                                   | 0.50298  | 0.09649  | -0.04918 | 0.21720  | 0.05129  | -0.05803 | 0.32218 |        |   |        |   |             |
| 102                                                   | 0.54025  | 0.21905  | -0.02888 | 0.15734  | 0.03241  | -0.01122 | 0.36662 |        |   |        |   |             |
| 103                                                   | 0.48933  | 0.09485  | -0.00246 | 0.12476  | 0.07182  | -0.26145 | 0.33752 |        |   |        |   |             |
| 104                                                   | 0.32257  | 0.12840  | -0.03136 | -0.08467 | -0.03429 | -0.08339 | 0.13682 |        |   |        |   |             |
| 105                                                   | 0.40655  | 0.17756  | 0.16414  | -0.06518 | -0.06988 | 0.14359  | 0.25250 |        |   |        |   |             |
| 106                                                   | 0.27725  | -0.24300 | 0.36965  | -0.02618 | 0.35191  | 0.00512  | 0.35713 |        |   |        |   |             |
| 107                                                   | -0.22710 | 0.05410  | -0.06590 | -0.01581 | -0.03794 | 0.22158  | 0.10963 |        |   |        |   |             |
| 108                                                   | 0.45975  | 0.14789  | 0.05455  | -0.01448 | -0.10280 | -0.07363 | 0.25242 |        |   |        |   |             |
| 109                                                   | 0.23512  | -0.02301 | 0.01224  | -0.05152 | 0.05202  | 0.02452  | 0.11895 |        |   |        |   |             |
| 110                                                   | -0.28376 | 0.27150  | -0.46313 | -0.10307 | -0.29292 | 0.03857  | 0.46663 |        |   |        |   |             |
| 89                                                    | -0.00015 | 0.02524  | 0.63550  | 0.67053  | 0.36445  | -0.07794 | 0.59301 |        |   |        |   |             |

Eigenvalues 3.48632 2.70337 1.28547 1.20989 0.81554 0.62711  
 % of Common Variance 34.4% 26.7% 12.7% 11.9% 8.1% 6.2%  
 % of Total Variance 13.4% 10.4% 4.9% 4.7% 3.1% 2.4%  
 % of the Total Variance of All the Variables Explained by 6 Factors: 38.9%  
 Determinant of Correlation Matrix: 0.0000619 ( 0.61869650D-04)

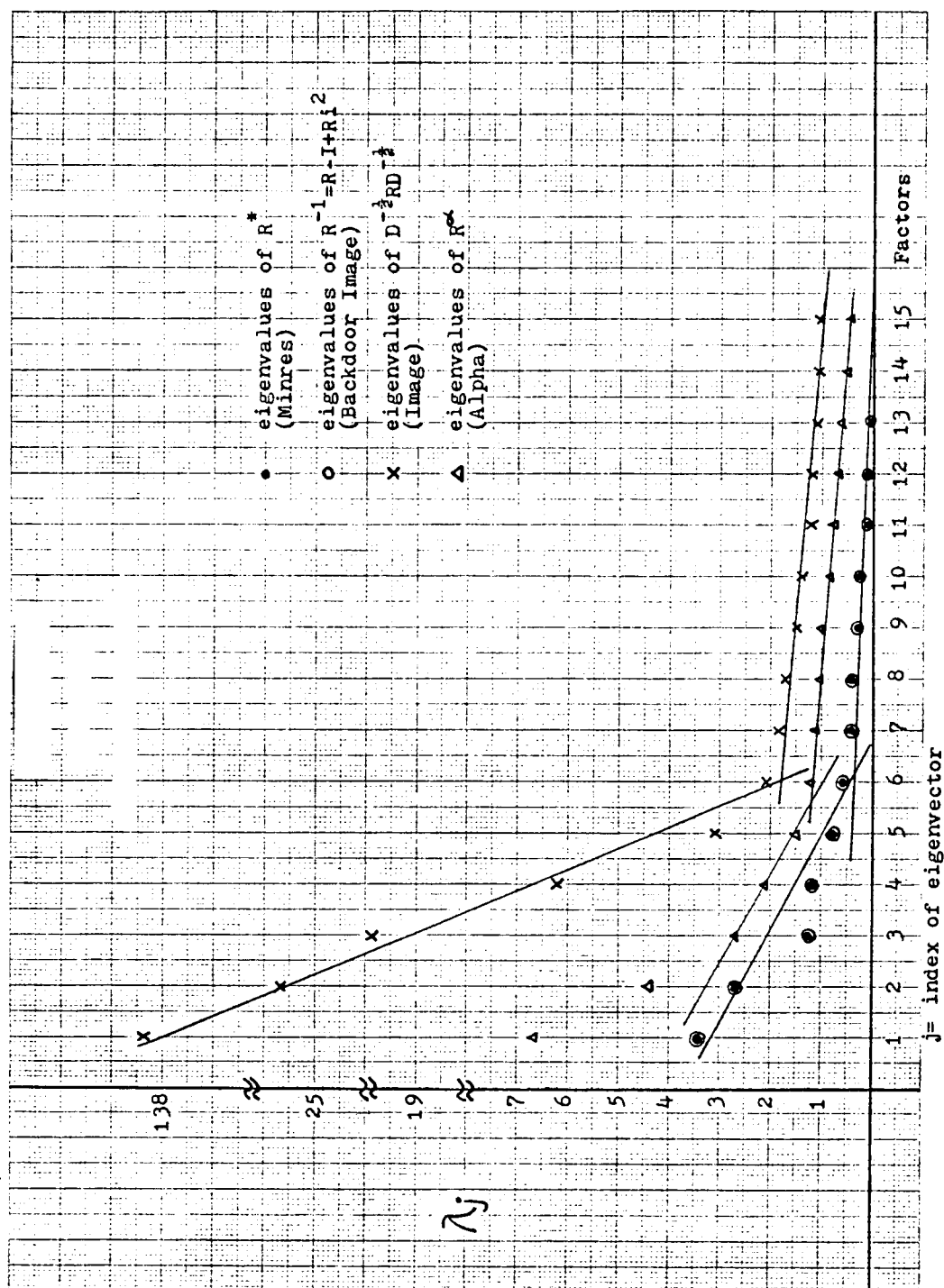


Figure IV-9. Scree test—Receiver variables.

Backdoor Image, and Image suggest six factors, whereas Alpha suggests five factors. Based on these findings, Harris procedure was carried out across the four different solutions (Alpha, BI, Image, and Minres) using four factors ( $5 \pm 1$ ) as the minimum trial number of factors and seven factors ( $6 \pm 1$ ) as the maximum with 0.3 as the criterion loading point. Of the four alternative number of factors, four factors, five factors, six factors, or seven factors, six factors yielded the most consistent loadings across the four different factor solutions, as shown in Table IV-24.

Table IV-23 presents the Varimax rotated factor matrix based on Minres factor solution using six factors. As in the previous Harris procedure, 0.3 is used as the criterion loading. Factor 1 is significantly correlated with the variables 93, 942, 965, 102 to 105, 108, and 109 and explains 13.4% of variation of the 26 variables. Factor 2 is significantly correlated with the variables 941, 942, 943, 944, 945, and 946 and explains 10.4% of variation of the 26 variables. Factor 3 is significantly correlated with the variables 902, 106, 110, and 89 and explains 4.9% of variation of the 26 variables. Factor 4 is significantly correlated with the variables 901, 106, and 89 and explains 3.1% of variation of the 26 variables. Factor 6 is significantly correlated with the variables 961, 962, 963, 964, and 965 and explains 2.4% of variation of the 26 variables. The total proportion of variation of the 26 variables that can be explained by the six factors amounts to 38.9%. As shown in Table IV-23, factor 1 explains 34.4% of that total proportion, factor 2 26.7%, factor 3 12.7%, factor 4 11.9%, factor 5 8.1%, and factor 6 6.2%. Thus, factor 1 can explain the largest percentage of the variation that can be explained by the six factors.



TABLE IV-24

SECTION 3: DETERMINATION OF THE NUMBER OF  
FACTORS BY HARRIS PROCEDURE

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 3 | FACTOR 1 | FACTOR 1 | FACTOR 1 |
| 901                           | -0.00102 | 0.00088  | 0.00520  | 0.00088  |
| 902                           | -0.04594 | -0.08955 | 0.01900  | -0.08955 |
| 903                           | 0.11854  | 0.07505  | 0.05199  | 0.07505  |
| 93                            | 0.27864  | 0.49605  | 0.50958  | 0.49605  |
| 941                           | 0.21618  | 0.22141  | 0.23291  | 0.22141  |
| 942                           | 0.20201  | 0.37123  | 0.43075  | 0.37123  |
| 943                           | 0.14299  | 0.23166  | 0.33777  | 0.23166  |
| 944                           | 0.12189  | 0.22334  | 0.30764  | 0.22334  |
| 945                           | -0.08234 | -0.03738 | 0.04684  | -0.03738 |
| 946                           | 0.10601  | 0.18918  | 0.28591  | 0.18918  |
| 961                           | -0.15535 | -0.14105 | -0.11742 | -0.14105 |
| 962                           | 0.06534  | 0.04883  | 0.04285  | 0.04883  |
| 963                           | -0.04849 | -0.04981 | -0.05205 | -0.04981 |
| 964                           | -0.00891 | 0.00995  | 0.00875  | 0.00995  |
| 965                           | 0.21956  | 0.33576  | 0.32236  | 0.33576  |
| 101                           | 0.57743  | 0.50298  | 0.40753  | 0.50298  |
| 102                           | 0.59473  | 0.54025  | 0.48202  | 0.54025  |
| 103                           | 0.50248  | 0.48933  | 0.43134  | 0.48933  |
| 104                           | 0.24677  | 0.32257  | 0.30482  | 0.32257  |
| 105                           | 0.23573  | 0.40655  | 0.40985  | 0.40655  |
| 106                           | 0.11788  | 0.27729  | 0.23271  | 0.27729  |
| 107                           | -0.13360 | -0.22710 | -0.23352 | -0.22710 |
| 108                           | 0.47107  | 0.45975  | 0.41583  | 0.45975  |
| 109                           | 0.35432  | 0.33512  | 0.26631  | 0.33512  |
| 110                           | -0.11958 | -0.28376 | -0.23323 | -0.28376 |
| 89                            | 0.00770  | -0.00015 | 0.04755  | -0.00015 |

TABLE IV-24 (continued)

| VARIMAX ROTATED FACTOR MATRIX |                |                |                |                |
|-------------------------------|----------------|----------------|----------------|----------------|
|                               | ALPHA          | BI             | IMAGE          | MINRES         |
|                               | FACTOR 1       | FACTOR 2       | FACTOR 5       | FACTOR 2       |
| 901                           | -0.04059       | -0.01514       | -0.03224       | -0.01514       |
| 902                           | 0.11370        | 0.13835        | 0.03953        | 0.13835        |
| 903                           | -0.05266       | -0.07756       | -0.06822       | -0.07756       |
| 93                            | <u>0.45929</u> | 0.26596        | 0.12143        | 0.26596        |
| 941                           | <u>0.49497</u> | <u>0.53790</u> | <u>0.44249</u> | <u>0.53790</u> |
| 942                           | <u>0.53817</u> | <u>0.42738</u> | <u>0.26741</u> | <u>0.42738</u> |
| 943                           | <u>0.69730</u> | <u>0.67379</u> | <u>0.51189</u> | <u>0.67379</u> |
| 944                           | <u>0.51904</u> | <u>0.47628</u> | <u>0.33304</u> | <u>0.47628</u> |
| 945                           | <u>0.37420</u> | <u>0.40439</u> | <u>0.32758</u> | <u>0.40439</u> |
| 946                           | <u>0.55413</u> | <u>0.54751</u> | <u>0.40206</u> | <u>0.54751</u> |
| 961                           | 0.06289        | 0.07477        | 0.07966        | 0.07477        |
| 962                           | 0.11885        | 0.09767        | 0.08234        | 0.09767        |
| 963                           | 0.02237        | 0.02479        | 0.03365        | 0.02479        |
| 964                           | 0.14544        | 0.11178        | 0.11043        | 0.11178        |
| 965                           | <u>0.32350</u> | 0.20785        | 0.14084        | 0.20785        |
| 101                           | <u>0.11013</u> | 0.09649        | 0.10776        | 0.09649        |
| 102                           | 0.23164        | 0.21905        | 0.18461        | 0.21905        |
| 103                           | 0.13405        | 0.09435        | 0.06207        | 0.09435        |
| 104                           | 0.20938        | 0.12840        | 0.07818        | 0.12840        |
| 105                           | <u>0.36768</u> | 0.17756        | 0.06175        | 0.17756        |
| 106                           | -0.04710       | -0.24300       | -0.28407       | -0.24300       |
| 107                           | -0.14420       | -0.05410       | 0.01229        | -0.05410       |
| 108                           | 0.21510        | 0.14789        | 0.10017        | 0.14789        |
| 109                           | 0.01921        | -0.02301       | -0.02056       | -0.02301       |
| 110                           | 0.03891        | 0.27150        | <u>0.32079</u> | 0.27150        |
| 89                            | 0.02230        | 0.02524        | -0.03219       | 0.02524        |

TABLE IV-24 (continued)

| VARIMAX ROTATED FACTOR MATRIX |                |                 |                 |                 |
|-------------------------------|----------------|-----------------|-----------------|-----------------|
|                               | ALPHA          | BI              | IMAGE           | MINRES          |
|                               | FACTOR 5       | FACTOR 3        | FACTOR 2        | FACTOR 3        |
| 901                           | 0.11889        | 0.10824         | 0.05258         | 0.10824         |
| 902                           | -0.10813       | <u>0.90187</u>  | <u>0.95475</u>  | <u>0.90187</u>  |
| 903                           | -0.00545       | 0.16762         | 0.14198         | 0.16762         |
| 93                            | -0.04969       | 0.20655         | 0.12450         | 0.20655         |
| 941                           | 0.21652        | -0.03334        | 0.04921         | -0.03334        |
| 942                           | -0.05348       | 0.07751         | 0.07669         | 0.07751         |
| 943                           | 0.10811        | -0.00852        | 0.02486         | -0.00852        |
| 944                           | 0.03877        | 0.20609         | 0.17615         | 0.20609         |
| 945                           | 0.08534        | -0.09546        | -0.05206        | -0.09546        |
| 946                           | 0.01367        | -0.00389        | 0.00003         | -0.00389        |
| 961                           | <u>0.53398</u> | 0.00311         | 0.04410         | 0.00311         |
| 962                           | <u>0.56500</u> | -0.00859        | -0.04115        | -0.00859        |
| 963                           | <u>0.31621</u> | -0.03498        | -0.03706        | -0.03498        |
| 964                           | <u>0.15206</u> | -0.03584        | -0.02481        | -0.03584        |
| 965                           | 0.12598        | 0.07680         | 0.05369         | 0.07680         |
| 101                           | 0.02710        | -0.08187        | -0.02490        | -0.08187        |
| 102                           | 0.09002        | -0.02888        | 0.00720         | -0.02888        |
| 103                           | -0.14519       | -0.00246        | -0.00170        | -0.00246        |
| 104                           | -0.06395       | -0.03136        | -0.04861        | -0.03136        |
| 105                           | 0.03265        | 0.16414         | 0.07346         | 0.16414         |
| 106                           | -0.09009       | <u>0.36965</u>  | 0.21482         | <u>0.36965</u>  |
| 107                           | 0.11310        | -0.06590        | -0.03929        | -0.06590        |
| 108                           | -0.15073       | 0.05455         | 0.03148         | 0.05455         |
| 109                           | 0.00211        | 0.01224         | -0.01807        | 0.01224         |
| 110                           | -0.00914       | <u>-0.46313</u> | <u>-0.30287</u> | <u>-0.46313</u> |
| 89                            | 0.01436        | <u>0.63550</u>  | <u>0.62434</u>  | <u>0.63550</u>  |

TABLE IV-24 (continued)

| VARIMAX ROTATED FACTOR MATRIX |                |                |                |                |
|-------------------------------|----------------|----------------|----------------|----------------|
|                               | ALPHA          | BI             | IMAGE          | MINRES         |
|                               | FACTOR 2       | FACTOR 4       | FACTOR 3       | FACTOR 4       |
| 901                           | 0.09422        | 0.03029        | 0.01873        | 0.03029        |
| 902                           | 0.50389        | 0.18189        | 0.12941        | 0.18189        |
| 903                           | <u>0.50541</u> | <u>0.94399</u> | <u>0.96096</u> | <u>0.94399</u> |
| 93                            | 0.08620        | 0.01778        | 0.06989        | 0.01778        |
| 941                           | 0.04682        | 0.06549        | 0.02428        | 0.06549        |
| 942                           | 0.07055        | 0.05296        | 0.05744        | 0.05296        |
| 943                           | -0.04739       | -0.07298       | -0.07763       | -0.07298       |
| 944                           | 0.10181        | -0.00433       | 0.03648        | -0.00433       |
| 945                           | -0.05962       | -0.03230       | -0.03371       | -0.03230       |
| 946                           | -0.01200       | -0.01599       | 0.01171        | -0.01599       |
| 961                           | 0.01229        | -0.00422       | -0.05081       | -0.00422       |
| 962                           | -0.02915       | 0.05141        | 0.06151        | 0.05141        |
| 963                           | -0.05367       | -0.01457       | -0.01997       | -0.01457       |
| 964                           | -0.05443       | -0.05424       | -0.04011       | -0.05424       |
| 965                           | -0.01656       | -0.04355       | -0.03298       | -0.04355       |
| 101                           | 0.12203        | 0.21720        | 0.15635        | 0.21720        |
| 102                           | 0.10929        | 0.15734        | 0.11118        | 0.15734        |
| 103                           | 0.06361        | 0.12476        | 0.10261        | 0.12476        |
| 104                           | -0.12808       | -0.08467       | -0.08136       | -0.08467       |
| 105                           | -0.03844       | -0.06518       | -0.00720       | -0.06518       |
| 106                           | 0.09554        | -0.02618       | 0.03320        | -0.02618       |
| 107                           | -0.03808       | -0.01581       | -0.00987       | -0.01581       |
| 108                           | 0.00123        | -0.01448       | -0.00370       | -0.01448       |
| 109                           | -0.06857       | -0.05152       | -0.05132       | -0.05152       |
| 110                           | -0.23302       | -0.10307       | -0.17796       | -0.10307       |
| 89                            | <u>1.15384</u> | <u>0.67053</u> | <u>0.64256</u> | <u>0.67053</u> |

TABLE IV-24 (continued)

| VARIMAX ROTATED FACTOR MATRIX |                 |                 |                 |                 |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|
|                               | ALPHA           | BI              | IMAGE           | MINRES          |
|                               | FACTOR 4        | FACTOR 5        | FACTOR 4        | FACTOR 5        |
| 901                           | <u>0.46363</u>  | <u>0.96273</u>  | <u>0.95268</u>  | <u>0.96273</u>  |
| 902                           | <u>0.22895</u>  | <u>-0.01888</u> | <u>0.05941</u>  | <u>-0.01888</u> |
| 903                           | <u>-0.01687</u> | <u>-0.05393</u> | <u>-0.02410</u> | <u>-0.05393</u> |
| 93                            | <u>0.30881</u>  | <u>0.13147</u>  | <u>0.13054</u>  | <u>0.13147</u>  |
| 941                           | <u>-0.12493</u> | <u>-0.00523</u> | <u>-0.00187</u> | <u>-0.00523</u> |
| 942                           | <u>0.11037</u>  | <u>0.08685</u>  | <u>0.06125</u>  | <u>0.08685</u>  |
| 943                           | <u>-0.14069</u> | <u>-0.04450</u> | <u>-0.05216</u> | <u>-0.04450</u> |
| 944                           | <u>0.05092</u>  | <u>-0.01378</u> | <u>0.01596</u>  | <u>-0.01378</u> |
| 945                           | <u>-0.15590</u> | <u>-0.03643</u> | <u>-0.04450</u> | <u>-0.03643</u> |
| 946                           | <u>-0.07955</u> | <u>-0.04058</u> | <u>-0.05445</u> | <u>-0.04058</u> |
| 961                           | <u>-0.01435</u> | <u>0.02399</u>  | <u>0.00959</u>  | <u>0.02399</u>  |
| 962                           | <u>0.02850</u>  | <u>0.00613</u>  | <u>0.00869</u>  | <u>0.00613</u>  |
| 963                           | <u>0.03965</u>  | <u>0.05348</u>  | <u>0.05678</u>  | <u>0.05348</u>  |
| 964                           | <u>-0.07969</u> | <u>-0.07936</u> | <u>-0.08134</u> | <u>-0.07936</u> |
| 965                           | <u>0.20045</u>  | <u>0.08362</u>  | <u>0.09390</u>  | <u>0.08362</u>  |
| 101                           | <u>-0.01859</u> | <u>0.05129</u>  | <u>0.07635</u>  | <u>0.05129</u>  |
| 102                           | <u>0.01211</u>  | <u>0.03241</u>  | <u>0.03952</u>  | <u>0.03241</u>  |
| 103                           | <u>0.07866</u>  | <u>0.07182</u>  | <u>0.06498</u>  | <u>0.07182</u>  |
| 104                           | <u>0.01080</u>  | <u>-0.03429</u> | <u>-0.03732</u> | <u>-0.03429</u> |
| 105                           | <u>0.12051</u>  | <u>-0.06988</u> | <u>-0.06683</u> | <u>-0.06988</u> |
| 106                           | <u>0.69991</u>  | <u>0.35191</u>  | <u>0.35963</u>  | <u>0.35191</u>  |
| 107                           | <u>-0.08865</u> | <u>-0.03794</u> | <u>-0.02037</u> | <u>-0.03794</u> |
| 108                           | <u>0.01441</u>  | <u>-0.10280</u> | <u>-0.08051</u> | <u>-0.10280</u> |
| 109                           | <u>0.13405</u>  | <u>0.05202</u>  | <u>0.07532</u>  | <u>0.05202</u>  |
| 110                           | <u>-0.67538</u> | <u>-0.29292</u> | <u>-0.30709</u> | <u>-0.29292</u> |
| 89                            | <u>0.41385</u>  | <u>0.26445</u>  | <u>0.41419</u>  | <u>0.26445</u>  |

TABLE IV-24 (continued)

| VARIMAX ROTATED FACTOR MATRIX |          |          |          |          |
|-------------------------------|----------|----------|----------|----------|
|                               | ALPHA    | BI       | IMAGE    | MINRES   |
|                               | FACTOR 6 | FACTOR 6 | FACTOR 6 | FACTOR 6 |
| 901                           | 0.00669  | 0.04901  | 0.06050  | 0.04901  |
| 902                           | -0.03198 | -0.14423 | -0.12474 | -0.14423 |
| 903                           | -0.07991 | -0.02473 | -0.06471 | -0.02472 |
| 93                            | 0.06669  | 0.09873  | 0.14101  | 0.09873  |
| 941                           | -0.04297 | 0.13087  | 0.14153  | 0.13087  |
| 942                           | -0.08536 | -0.02325 | 0.06157  | -0.02325 |
| 943                           | 0.09699  | 0.13889  | 0.19232  | 0.13889  |
| 944                           | 0.02114  | 0.08264  | 0.14370  | 0.08264  |
| 945                           | 0.04944  | 0.10037  | 0.13625  | 0.10037  |
| 946                           | 0.06260  | 0.06152  | 0.14394  | 0.06152  |
| 961                           | 0.15558  | 0.48626  | 0.35414  | 0.48626  |
| 962                           | 0.00991  | 0.46153  | 0.35210  | 0.46153  |
| 963                           | 0.18231  | 0.33235  | 0.24656  | 0.33235  |
| 964                           | 0.49638  | 0.41958  | 0.31243  | 0.41958  |
| 965                           | 0.39185  | 0.38861  | 0.31400  | 0.38861  |
| 101                           | -0.07946 | -0.05803 | -0.10554 | -0.05803 |
| 102                           | -0.05649 | -0.01122 | -0.02760 | -0.01122 |
| 103                           | -0.17673 | -0.26145 | -0.21897 | -0.26145 |
| 104                           | -0.09615 | -0.08339 | -0.04731 | -0.08339 |
| 105                           | -0.00783 | 0.14359  | 0.15834  | 0.14359  |
| 106                           | 0.01016  | 0.00512  | 0.01045  | 0.00512  |
| 107                           | 0.29827  | 0.22158  | 0.14346  | 0.22158  |
| 108                           | 0.07317  | -0.07363 | -0.05503 | -0.07363 |
| 109                           | 0.08285  | 0.02452  | -0.00719 | 0.02452  |
| 110                           | 0.24713  | 0.03857  | 0.02732  | 0.03857  |
| 89                            | -0.01767 | -0.07794 | -0.08312 | -0.07794 |

Evaluating the communality for each variable, these six factors can best explain the variable 89 ("children under age 19 living at home"); 99.3% of variation of this variable can be explained by the six factors. Looking at the cluster and nature of those variables that are significantly correlated with each factor, factor 1 appears to represent cultured cosmopolitanism, factor 2 social interaction, factor 3 life cycle II, factor 4 life cycle III, factor 5 life cycle I, and factor 6 print readership (Table IV-25). Factor 1 has salient loadings by variables 93, 942, 965, 101, 102, 103, 104, 105, 108, and 109. As shown in Table IV-22 (p. 193), the variable 93 represents education, 942 number of business groups or organizations to which one belongs, 965 number of cultural, intellectual magazines and newspapers one reads, 101 to 105 cosmopolitan factor, 108 number of gasoline credit cards owned, and 109 number of bank credit cards owned. Synthesizing the essence of these salient variables, they may be deemed to represent "cultured cosmopolitanism." Factor 2 has salient loadings by variables 941 to 946. All these variables are related to the measures of social participation. Thus, they may be synthesized to represent "social interaction." Factor 3 has salient loadings by variables 902, 106, 110, and 89. Of these four variables, variables 902, 110, and 89 have relatively heavy loadings on the factor. As shown in Table IV-22, variable 902 represents number of children in the age range 6 to 12 living at home, 110 age, and 89 number of children under age 19 living at home. In this context, they may be synthesized to represent "life cycle II." Factor 4 has salient loadings by variables 903 and 89. Variable 903 represents number of children in the age range 13 to 18, and 89 number of children under age 19 living at home.

TABLE IV-25  
SALIENT LOADINGS ON EXTRACTED FACTORS IN SECTION 3

| Variables | Factor |     |      |     |     |     |
|-----------|--------|-----|------|-----|-----|-----|
|           | 1      | 2   | 3    | 4   | 5   | 6   |
| 93        | .50    |     |      |     |     |     |
| 942       | .37    |     |      |     |     |     |
| 965       | .34    |     |      |     |     |     |
| 101       | .50    |     |      |     |     |     |
| 102       | .54    |     |      |     |     |     |
| 103       | .49    |     |      |     |     |     |
| 104       | .32    |     |      |     |     |     |
| 105       | .41    |     |      |     |     |     |
| 108       | .46    |     |      |     |     |     |
| 109       | .33    |     |      |     |     |     |
| 941       |        | .54 |      |     |     |     |
| 942       |        | .43 |      |     |     |     |
| 943       |        | .67 |      |     |     |     |
| 944       |        | .48 |      |     |     |     |
| 945       |        | .40 |      |     |     |     |
| 946       |        | .55 |      |     |     |     |
| 902       |        |     | .90  |     |     |     |
| 106       |        |     | .37  |     |     |     |
| 110       |        |     | -.46 |     |     |     |
| 89        |        |     | .64  |     |     |     |
| 903       |        |     |      | .94 |     |     |
| 89        |        |     |      | .67 |     |     |
| 901       |        |     |      |     | .96 |     |
| 106       |        |     |      |     | .35 |     |
| 89        |        |     |      |     | .36 |     |
| 961       |        |     |      |     |     | .49 |
| 962       |        |     |      |     |     | .46 |
| 963       |        |     |      |     |     | .33 |
| 964       |        |     |      |     |     | .42 |
| 965       |        |     |      |     |     | .39 |



Unlike the salient loadings of other variables on other factors, these two variables have significantly heavier loading on this factor, 0.94399 and 0.67053. They may be synthesized to represent "life cycle III." Factor 5 has salient loadings by variables 901, 106, and 89. The variable 901 represents number of children in the age range 1 to 5, 106 number of different residences an individual has lived in during past 15 years, and 89 age. In this context, they may be synthesized to represent "life cycle I." Factor 6 has salient loadings by variables 961 to 965. All these variables are related to the measures of print readership. Thus, they may be synthesized to represent "print readership."

#### Findings of Discriminant Analyses

Two separate stepwise multiple discriminant analyses were performed to develop predictive models to classify individuals into three adopter groups, to profile characteristics of these groups which are most dominant in terms of discrimination, and to identify the major underlying dimensions which differentiate among these groups.

The first analysis employed as its input data the responses of 411 early adopters, late adopters, and nonadopters (99 early adopters, 60 late adopters, and 252 nonadopters) to 44 variables (or items), of which 15 variables were Z sum factor scores (see Table IV-26) derived in the previous factor analyses and 29 variables, the dummy variables (see Table IV-26) which were transformed from the classification variables proved to be significant in the previous two-way cross tabulation analyses. As shown in Table IV-26, these 29 dummy variables were derived from ten classification variables: marital

TABLE IV-26

## NAMES OF THE VARIABLES EMPLOYED IN DISCRIMINANT ANALYSES

| 15 Z Sum Factor Scores | Original Names of the Variables                                                        |  |  |  |  |
|------------------------|----------------------------------------------------------------------------------------|--|--|--|--|
| S1F1                   | Section 1, Factor 1: Perceived V-24 Characteristics                                    |  |  |  |  |
| S1F2                   | Section 1, Factor 2: Human Teller Usage Factor                                         |  |  |  |  |
| S1F3                   | Section 1, Factor 3: V-24 Savings Account Usage and Account Transfer Factor            |  |  |  |  |
| S1F4                   | Section 1, Factor 4: General Dissatisfaction Factor                                    |  |  |  |  |
| S1F5                   | Section 1, Factor 5: V-24 Checking Account Usage Frequency of the General Usage Factor |  |  |  |  |
| S1F6                   | Section 1, Factor 6: Risk Factor                                                       |  |  |  |  |
| S2F1                   | Section 1, Factor 1: Aggressive Factor                                                 |  |  |  |  |
| S2F2                   | Section 2, Factor 2: Compliant Factor                                                  |  |  |  |  |
| S2F3                   | Section 2, Factor 3: Detached Factor                                                   |  |  |  |  |
| S3F1                   | Section 3, Factor 1: Cultured Cosmopolitan Factor                                      |  |  |  |  |
| S3F2                   | Section 3, Factor 2: Social Interaction Factor                                         |  |  |  |  |
| S3F3                   | Section 3, Factor 3: Life Cycle II                                                     |  |  |  |  |
| S3F4                   | Section 3, Factor 4: Life Cycle III                                                    |  |  |  |  |
| S3F5                   | Section 3, Factor 5: Life Cycle I                                                      |  |  |  |  |
| S3F6                   | Section 3, Factor 6: Print Readership Factor                                           |  |  |  |  |

| 29 Dummy Variables |                                        |                                              |   |   |  |
|--------------------|----------------------------------------|----------------------------------------------|---|---|--|
|                    | Marital Status (Table B-1, Appendix B) | Transformed into Dummy Variables as follows: |   |   |  |
|                    | Single                                 | 0                                            | 0 | 0 |  |
| MARRIED            | Married                                | 1                                            | 0 | 0 |  |
| SEPADIVO           | Separated and Divorced                 | 0                                            | 1 | 0 |  |
| WIDOWED            | Widowed                                | 0                                            | 0 | 1 |  |

|          |                                                   |   |   |   |   |   |
|----------|---------------------------------------------------|---|---|---|---|---|
|          | Occupation (Table B-9, Appendix B)                |   |   |   |   |   |
|          | Managerial                                        | 0 | 0 | 0 | 0 | 0 |
|          | Technical, General Labor, Office Worker & Skilled |   |   |   |   |   |
|          | Trade                                             | 1 | 0 | 0 | 0 | 0 |
| PROFSION | Professional                                      | 0 | 1 | 0 | 0 | 0 |
| RETITR1  | Retired                                           | 0 | 0 | 1 | 0 | 0 |
| HOMEMAKE | Homemaker                                         | 0 | 0 | 0 | 1 | 0 |
| OTHER    | Others                                            | 0 | 0 | 0 | 0 | 1 |

TABLE IV-26 (continued)

| 29 Dummy Variables<br>(continued) |                                                                     | Transformed into Dummy<br>Variables as follows: |   |   |   |
|-----------------------------------|---------------------------------------------------------------------|-------------------------------------------------|---|---|---|
|                                   | Employment Status<br>(Table B-11, Appendix B)                       |                                                 |   |   |   |
|                                   | Part Time                                                           | 0                                               | 0 | 0 | 0 |
| FULLTIME                          | Full Time                                                           | 1                                               | 0 | 0 | 0 |
| SELFEMPD                          | Self-Employed                                                       | 0                                               | 1 | 0 | 0 |
| NOTEMPD                           | Not Employed                                                        | 0                                               | 0 | 1 | 0 |
| RETIRED                           | Retired                                                             | 0                                               | 0 | 0 | 1 |
|                                   | Regular Working Hours<br>(Table B-12, Appendix B)                   |                                                 |   |   |   |
|                                   | Bank Hours                                                          | 0                                               | 0 |   |   |
| NOBNKHRS                          | Outside Bank Hours                                                  | 1                                               | 0 |   |   |
| SOMETIME                          | Sometimes                                                           | 0                                               | 1 |   |   |
|                                   | Total Family Income<br>(Table B-14, Appendix B)                     |                                                 |   |   |   |
|                                   | < 15,000                                                            |                                                 |   |   |   |
| GE15LT25                          | 15,000-24,999                                                       |                                                 |   |   |   |
| GE25LT35                          | 25,000-34,999                                                       |                                                 |   |   |   |
| GE35K                             | > 34,999                                                            |                                                 |   |   |   |
|                                   | Knowledge on Liability<br>(Table D-3, Appendix D)                   |                                                 |   |   |   |
|                                   | Right Amount                                                        | 0                                               |   |   |   |
| WRONG                             | Wrong Amount                                                        | 1                                               |   |   |   |
|                                   | Complaints and Problems<br>in V-24 Usage (Table D-4,<br>Appendix D) |                                                 |   |   |   |
|                                   | No Complaints                                                       | 0                                               | 0 | 0 |   |
| MECHANIC                          | Mechanical                                                          | 1                                               | 0 | 0 |   |
| PSYCLOGY                          | Psychological                                                       | 0                                               | 1 | 1 |   |
| OTHER1                            | Others                                                              | 0                                               | 0 | 1 |   |
|                                   | Date of First Awareness<br>of V-24 (Table IV-6,<br>p. 127)          |                                                 |   |   |   |
|                                   | Before Sept., 1976                                                  | 0                                               | 0 | 0 |   |
| SPDC76                            | Sept.-Dec., 1976                                                    | 1                                               | 0 | 0 |   |
| J77D78                            | Jan., 1977-Dec., 1978                                               | 0                                               | 1 | 0 |   |
| J79080                            | Jan., 1979-Oct., 1980                                               | 0                                               | 0 | 1 |   |

Table IV-26 (continued)

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29 Dummy Variables  
 (continued)

|           | Information Sources Relied<br>on Most for V-24 Adoption<br>Decision Making (Table IV-9,<br>p. 132) | Transformed into Dummy<br>Variables as follows: |   |   |   |
|-----------|----------------------------------------------------------------------------------------------------|-------------------------------------------------|---|---|---|
|           | Relatives and Friends                                                                              | 0                                               | 0 | 0 | 0 |
| MEDIA     | Radio, TV, Newspapers                                                                              | 1                                               | 0 | 0 | 0 |
| EMPLOYEE  | Employees                                                                                          | 0                                               | 1 | 0 | 0 |
| MSGBOARD  | Message Board and Others                                                                           | 0                                               | 0 | 1 | 0 |
| CARDMAIL  | Card in Mail                                                                                       | 0                                               | 0 | 0 | 1 |
| <hr/>     |                                                                                                    |                                                 |   |   |   |
|           | Proclivity to Comply with<br>Perceived Prevailing<br>Social Influences<br>(Table B-19, Appendix B) |                                                 |   |   |   |
|           | Yes                                                                                                | 0                                               |   |   |   |
| NOSMALCAR | No                                                                                                 | 1                                               |   |   |   |

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status, occupation, employment status, regular working hours, total family income, knowledge of liability, complaints and problems in V-24 usage, date of first awareness of V-24, information sources relied on most for V-24 adoption decision making, and proclivity to comply with perceived prevailing social influences. These ten classification variables could not be included as a part of the input data for the factor analyses since they were categorical in nature. However, for the purpose of this study, it was deemed imperative to include these variables in the discriminant analysis in order to secure a realistic picture<sup>4</sup> of the properties of consumers' innovativeness in V-24 usage. Fifteen Z sum factor scores<sup>5</sup> consist of 6 factors extracted from the factor analysis on section 1 of the survey questionnaire, 3 factors on section 2, and 6 factors on section 3. The mathematical operations in calculating the Z sum factor scores are summarized in Figure IV-10.

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<sup>4</sup>One of the fundamental advantages of using the full model over the "reduced form model" is that a particular part of the decision process, which may influence and/or interact with the variables included in the reduced form model, need not arbitrarily be assumed to be held constant. In this context, the full model is capable of producing less biased research results than the reduced form model, especially so in the case of comprehensive exploratory research.

<sup>5</sup>Regression estimate factor scores for the 15 factors extracted from the factor analyses were also calculated separately, and stepwise multiple discriminant analyses were carried out based on both the 15 regression estimate factor scores and 29 dummy variables in an attempt to check the consistency in the research results between the analysis employing Z sum factor scores and the analysis employing regression estimate factor scores. As expected, the research results produced by the analysis using regression estimate factor scores was found to be not much of value due to the high noise level created by the inclusion in the calculation of regression estimate factor scores.

$$\begin{aligned}
S_1^F1 &= Z_7 + Z_8 + Z_{22} + Z_{24} + Z_{28} + Z_{29} + Z_{30} + Z_{31} + Z_{32} + Z_{33} + Z_{35} + Z_{36} + Z_{38} + Z_{42} + Z_{43} \\
S_1^F2 &= Z_{14} + Z_{15} + Z_{16} + Z_{17} + Z_{18} + Z_{19} + Z_{20} \\
S_1^F3 &= Z_7 + Z_{10} + Z_{11} + Z_{13} \\
S_1^F4 &= Z_{34} + Z_{36} + Z_{38} + Z_{39} + Z_{40} \\
S_1^F5 &= Z_7 + Z_8 + Z_{11} + Z_{13} + Z_{43} + Z_{47} \\
S_1^F6 &= Z_{41} + Z_{43} + Z_{44} + Z_{45} \\
S_2^F1 &= Z_{57} + Z_{58} + Z_{61} + Z_{62} + Z_{66} + Z_{68} + Z_{73} + Z_{74} + Z_{76} + Z_{79} + Z_{81} + Z_{83} \\
S_2^F2 &= Z_{52} + Z_{53} + Z_{59} + Z_{63} + Z_{67} + Z_{70} + Z_{78} + Z_{82} \\
S_2^F3 &= Z_{51} + Z_{69} + Z_{75} + Z_{80} + Z_{84} \\
S_3^F1 &= Z_{93} + Z_{942} + Z_{965} + Z_{101} + Z_{102} + Z_{103} + Z_{104} + Z_{105} + Z_{108} + Z_{109} \\
S_3^F2 &= Z_{941} + Z_{942} + Z_{943} + Z_{944} + Z_{945} + Z_{946} \\
S_3^F3 &= Z_{902} + Z_{106} + Z_{110} + Z_{89} \\
S_3^F4 &= Z_{903} + Z_{89}
\end{aligned}$$

Figure IV-10. Calculations of an individual's Z-sum factor scores.

$$S_3F_5 = Z_{901} + Z_{106} + Z_{89}$$

$$S_3F_6 = Z_{961} + Z_{962} + Z_{963} + Z_{964} + Z_{965}$$

Figure IV-10 (continued)

Numerical subscripts denote variable numbers employed in factor analyses.

Using the 44 predictor variables, the first stepwise multiple discriminant analysis was performed with the levels of variables' entry, removal, and tolerance set at 0.001, respectively, for the purpose of separately examining the magnitude of contribution each of the 44 predictor variables makes toward group differentiation. As shown in Table IV-27, partial (or "adjusted") F ratios for the predictor variables reveal that only 11 predictor variables out of 44 contribute significantly to the group separation at the 0.05 alpha level.<sup>6</sup> They are S1F1, S1F5, S1F6, MECHANIC, J79080, J77D78, S3F1, WRONG, EMPLOYEE, NOSMALCAR, and SEPADIVO.

Based on the findings of the first stepwise multiple discriminant analysis, the final discriminant analysis was performed using the responses of 411<sup>7</sup> early adopters, late adopters, and nonadopters to the 11 variables (or items) with the levels<sup>8</sup> of variables' entry, removal, and tolerance set at 4.0, 3.996, and 0.01, respectively (see Figure IV-11). Of the 11 variables entered in the analysis,

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<sup>6</sup>As was discussed in the previous chapter, the utilization of dummy variables as a part of input data in the discriminant analysis violates multivariate normality assumption. Knowing that F value is only approximate, a most conservative alpha level 0.0005, derived from the Bonferroni procedure ( $0.05 \text{ alpha level} / (2 \times 44 \text{ variables})$ ), was chosen as the criterion alpha level at the initial stage of the analysis. The discriminant function derived on this basis was found to be very poor in terms of its ability to correctly classify respondents into the three adopter groups.

<sup>7</sup>Of 453 early adopters, late adopters, and nonadopters, 42 individuals were deleted from the analysis due to their missing data.

<sup>8</sup>Unlike the preliminary discriminant analysis (the first run), the objective in the final run is to ascertain an optimum set of variables which can effectively and efficiently discriminate among the three adopter groups. The levels specified above are the default values of BMDP7M.



TABLE IV-27  
A SUMMARY OF 44 PREDICTORS ENTERED OR REMOVED, ASSOCIATED F VALUES,  
AND INTERGROUP SIGNIFICANCE

| STEP<br>NUMBER | VARIABLE<br>ENTERED<br>REMOVED<br>ENTER OR REMOVE | F VALUE TO | NUMBER OF<br>VARIABLES INCLUDED | U-STATISTIC | APPROXIMATE<br>F-STATISTIC | DEGREES OF<br>FREEDOM |
|----------------|---------------------------------------------------|------------|---------------------------------|-------------|----------------------------|-----------------------|
| 1              | 14 SIF1                                           | 190.5447   | 1                               | 0.5109      | 190.545                    | 2.00                  |
| 2              | 18 SIF5                                           | 30.2052    | 2                               | 0.4434      | 99.606                     | 4.00                  |
| 3              | 19 SIF6                                           | 19.1125    | 3                               | 0.4044      | 75.584                     | 6.00                  |
| 4              | 37 MECHANIC                                       | 18.1883    | 4                               | 0.3703      | 63.538                     | 8.00                  |
| 5              | 31 J79080                                         | 18.1518    | 5                               | 0.3390      | 56.537                     | 10.00                 |
| 6              | 30 J7078                                          | 11.4584    | 6                               | 0.3203      | 50.228                     | 12.00                 |
| 7              | 23 S3F1                                           | 6.2265     | 7                               | 0.3105      | 44.502                     | 14.00                 |
| 8              | 36 WKONG                                          | 4.9152     | 8                               | 0.3029      | 39.936                     | 16.00                 |
| 9              | 33 EMPLOYEE                                       | 4.2808     | 9                               | 0.2964      | 36.267                     | 18.00                 |
| 10             | 48 NOSMLCAR                                       | 4.0617     | 10                              | 0.2903      | 33.299                     | 20.00                 |
| 11             | 41 SEPADIVO                                       | 3.6083     | 11                              | 0.2850      | 30.800                     | 22.00                 |
| 12             | 27 S3F5                                           | 2.5025     | 12                              | 0.2814      | 28.550                     | 24.00                 |
| 13             | 40 MARRIED                                        | 2.6595     | 13                              | 0.2775      | 26.670                     | 26.00                 |
| 14             | 34 MSGBOARD                                       | 1.8970     | 14                              | 0.2748      | 24.958                     | 28.00                 |
| 15             | 39 OTHER1                                         | 1.5346     | 15                              | 0.2726      | 23.428                     | 30.00                 |
| 16             | 28 S3F6                                           | 1.5030     | 16                              | 0.2705      | 22.086                     | 32.00                 |
| 17             | 16 SIF3                                           | 1.2199     | 17                              | 0.2688      | 20.871                     | 34.00                 |
| 18             | 38 PSYCLOGY                                       | 1.0397     | 18                              | 0.2673      | 19.771                     | 36.00                 |
| 19             | 55 GE15LT25                                       | 0.9834     | 19                              | 0.2660      | 18.781                     | 38.00                 |
| 20             | 26 S3F4                                           | 0.9943     | 20                              | 0.2646      | 17.891                     | 40.00                 |
| 21             | 51 NOTEMPD                                        | 1.0451     | 21                              | 0.2631      | 17.091                     | 42.00                 |
| 22             | 56 GE25LT35                                       | 1.0892     | 22                              | 0.2616      | 16.367                     | 44.00                 |
| 23             | 43 GSKILLED                                       | 1.1055     | 23                              | 0.2601      | 15.708                     | 46.00                 |
| 24             | 45 RETIRED                                        | 1.0325     | 24                              | 0.2587      | 15.098                     | 48.00                 |
| 25             | 52 RETIRED                                        | 2.2547     | 25                              | 0.2556      | 14.632                     | 50.00                 |
| 26             | 46 HOMEMAKE                                       | 1.0997     | 26                              | 0.2541      | 14.115                     | 52.00                 |
| 27             | 21 S2F2                                           | 0.6984     | 27                              | 0.2531      | 13.607                     | 54.00                 |
| 28             | 53 NOBKNHRS                                       | 0.5854     | 28                              | 0.2523      | 13.128                     | 56.00                 |
| 29             | 54 SOMETIME                                       | 0.5780     | 29                              | 0.2515      | 12.680                     | 58.00                 |
| 30             | 15 S1F2                                           | 0.5544     | 30                              | 0.2508      | 12.261                     | 60.00                 |
| 31             | 25 S3F3                                           | 0.4404     | 31                              | 0.2502      | 11.862                     | 62.00                 |
| 32             | 24 S3F2                                           | 0.3512     | 32                              | 0.2497      | 11.482                     | 64.00                 |
| 33             | 35 CARDMAIL                                       | 0.2743     | 33                              | 0.2493      | 11.120                     | 66.00                 |
| 34             | 32 MEDIA                                          | 1.1269     | 34                              | 0.2478      | 10.830                     | 68.00                 |
| 35             | 22 S2F3                                           | 0.2737     | 35                              | 0.2474      | 10.508                     | 70.00                 |
| 36             | 42 WIDOWED                                        | 0.2896     | 36                              | 0.2470      | 10.204                     | 72.00                 |
| 37             | 50 SELFEMPD                                       | 0.2705     | 37                              | 0.2467      | 9.915                      | 74.00                 |
| 38             | 49 FULLTIME                                       | 0.1365     | 38                              | 0.2465      | 9.635                      | 76.00                 |
| 39             | 17 SIF4                                           | 0.0918     | 39                              | 0.2464      | 9.367                      | 78.00                 |
| 40             | 44 PROFESION                                      | 0.0419     | 40                              | 0.2463      | 9.109                      | 80.00                 |
| 41             | 47 OTHER                                          | 0.0388     | 41                              | 0.2462      | 8.864                      | 82.00                 |
| 42             | 20 S2F1                                           | 0.0383     | 42                              | 0.2462      | 8.631                      | 84.00                 |
| 43             | 57 GE35K                                          | 0.0370     | 43                              | 0.2461      | 8.408                      | 86.00                 |
| 44             | 29 SPDC76                                         | 0.0269     | 44                              | 0.2461      | 8.195                      | 88.00                 |
|                |                                                   |            |                                 |             |                            | 90.00                 |
|                |                                                   |            |                                 |             |                            | 92.00                 |
|                |                                                   |            |                                 |             |                            | 94.00                 |
|                |                                                   |            |                                 |             |                            | 96.00                 |
|                |                                                   |            |                                 |             |                            | 98.00                 |
|                |                                                   |            |                                 |             |                            | 100.00                |

REMAINING NUMBER OF CASES . . . . . 411

VARIABLES TO BE USED

|             |         |          |             |             |
|-------------|---------|----------|-------------|-------------|
| 14 S1F1     | 18 S1F5 | 19 S1F6  | 37 MECHANIC | 31 J79080   |
| 30 J77078   | 23 S3F1 | 36 WRONG | 33 EMPLOYEE | 48 NOSMLCAR |
| 41 SEPADIVO |         |          |             |             |

|                       |       |       |
|-----------------------|-------|-------|
| TOLERANCE . . . . .   | 0.010 |       |
| F-TO-ENTER . . . . .  | 4.000 | 4.000 |
| F-TO-REMOVE . . . . . | 3.996 | 3.996 |

MEANS

| VARIABLE    | GROUP = ERLADOPT | LATADOPT | NONADOPT | ALL GPS. |
|-------------|------------------|----------|----------|----------|
| 14 S1F1     | 8.33581          | 5.47702  | -4.29147 | C.17620  |
| 18 S1F5     | 2.94413          | 0.63355  | -1.20549 | C.6253   |
| 19 S1F6     | -2.09379         | -1.03464 | 1.01280  | -0.03440 |
| 37 MECHANIC | 0.38384          | 0.23333  | 0.03948  | C.15085  |
| 31 J79080   | 0.0              | 0.28333  | 0.09921  | 0.10219  |
| 30 J77078   | 0.0              | 0.16667  | 0.08730  | 0.07786  |
| 23 S3F1     | 2.68650          | -0.30810 | -0.55567 | C.25530  |
| 36 WRONG    | 0.52525          | 0.58333  | 0.83333  | 0.72263  |
| 33 EMPLOYEE | 0.26263          | 0.23333  | 0.05952  | C.13382  |
| 48 NOSMLCAR | 0.54545          | 0.55000  | 0.69048  | 0.63504  |
| 41 SEPADIVO | 0.06061          | 0.15000  | 0.03571  | 0.05839  |
| 4 USEDWHEN  | 1.00000          | 4.00000  | 6.00000  | 4.50365  |
| COUNTS      | 99.              | 60.      | 252.     | 411.     |

STANDARD DEVIATIONS

| VARIABLE    | GROUP = ERLADOPT | LATADOPT | NONADOPT | ALL GPS. |
|-------------|------------------|----------|----------|----------|
| 14 S1F1     | 5.82841          | 5.38106  | 5.98042  | 5.86079  |
| 18 S1F5     | 4.09454          | 2.98692  | 0.83880  | 2.39805  |
| 19 S1F6     | 2.79429          | 2.54694  | 2.33591  | 2.48401  |
| 37 MECHANIC | 0.48879          | 0.42652  | 0.19560  | 0.32745  |
| 31 J79080   | 0.0              | 0.45442  | 0.29953  | 0.29164  |
| 30 J77078   | 0.0              | 0.37582  | 0.28284  | 0.26389  |
| 23 S3F1     | 5.44073          | 3.79792  | 4.02702  | 4.37854  |
| 36 WRONG    | 0.50190          | 0.49717  | 0.37341  | 0.42665  |
| 33 EMPLOYEE | 0.44230          | 0.42652  | 0.23707  | C.32943  |
| 48 NOSMLCAR | 0.50046          | 0.50169  | 0.46321  | C.47807  |
| 41 SEPADIVO | 0.23982          | 0.36008  | 0.18594  | 0.23202  |
| 4 USEDWHEN  | 0.0              | 0.0      | 0.0      | 0.0      |

Figure IV-11. Variables employed in the final discriminant analysis.

10 variables were found to be important in discriminating among the three adopter groups. They are S1F1, S1F5, S1F6, MECHANIC, J79080, J77D78, S3F1, WRONG, EMPLOYEE, and NOSMLCAR, as shown in Figure IV-12.

It indicates that the centroids of the three adopter groups are significantly different on the basis of the 10 variables: the calculated multivariate F ratio of 33.0316 exceeds critical F for degrees of freedom = 20, 798, and alpha level = 0.001. Furthermore, F-matrix shown at the bottom of Figure IV-12 indicates that 3 pairwise group centroid comparisons (early adopters vs. late adopters, early adopters vs. nonadopters, and late adopters vs. nonadopters) are all significant at the 0.001 alpha level; the calculated F values 12.75, 68.41, and 21.86 for the respective two group centroid comparisons between early adopters and late adopters, between early adopters and nonadopters, and between late adopters and nonadopters exceed critical F for degrees of freedom = 10, 399, and alpha level = 0.001.

Now that a significant difference is found, the second task in the analysis is to study the dimensions of group differences; i.e., the dimension along with maximum group differentiation occurs, and dimension along which is observed the largest group differences not accounted for by the first dimension. Figure IV-13 presents the results.

Two discriminant functions are revealed:

$$\begin{aligned}
 Y_1 = & 0.09059S1F1 + 0.16452S1F5 - 0.14863S1F6 + 1.07835MECHANIC \\
 & - 0.30701J79D80 - 0.54943J77D78 + 0.03522S3F1 \\
 & - 0.34669WRONG + 0.56737EMPLOYEE - 0.35851NOSMLCAR \\
 & + 0.27340.
 \end{aligned}$$

| VARIABLE    | F TO REMOVE | FORCE LEVEL | TOLERANCE | * | VARIABLE    | DF= | F TO ENTER | FORCE LEVEL | TOLERANCE |
|-------------|-------------|-------------|-----------|---|-------------|-----|------------|-------------|-----------|
| 14 SIF1     | 41.870      | 1           | 0.864543  | * | 41 SFPADIVC | 2   | 3.375      | 1           | 0.971565  |
| 18 SIF5     | 21.832      | 1           | 0.876948  | * |             |     |            |             |           |
| 19 SIF6     | 17.663      | 1           | 0.911753  | * |             |     |            |             |           |
| 37 MECHANIC | 17.027      | 1           | 0.976989  | * |             |     |            |             |           |
| 31 J79080   | 19.854      | 1           | 0.962401  | * |             |     |            |             |           |
| 30 J77D78   | 9.842       | 1           | 0.952780  | * |             |     |            |             |           |
| 23 S3F1     | 6.327       | 1           | 0.960623  | * |             |     |            |             |           |
| 36 WRONG    | 5.021       | 1           | 0.934244  | * |             |     |            |             |           |
| 33 EMPLOYEE | 4.446       | 1           | 0.961495  | * |             |     |            |             |           |
| 48 NOSMLCAR | 4.036       | 1           | 0.974490  | * |             |     |            |             |           |

|                              |           |                    |       |   |        |
|------------------------------|-----------|--------------------|-------|---|--------|
| U-STATISTIC OR WILKS' LAMBDA | 0.2994334 | DEGREES OF FREEDOM | 10    | 2 | 408    |
| APPROXIMATE F-STATISTIC      | 33.016    | DEGREES OF FREEDOM | 20.00 |   | 798.00 |

F - MATRIX DEGREES OF FREEDOM = 10 399

|          |          |
|----------|----------|
| ERLADOPT | LATADOPT |
| 12.75    | 21.86    |
| 68.41    |          |
| LATADOPT |          |
| NONADOPT |          |

Figure IV-12. Test of the significance of the overall difference among the three adopter group centroids.

## EIGENVALUES

1.81935      0.18454

## CUMULATIVE PROPORTION OF TOTAL DISPERSION

0.90791      1.00000

## CANONICAL CORRELATIONS

0.80331      0.39470

| VARIABLE    | COEFFICIENTS FOR CANONICAL VARIABLES |          |                          |          |
|-------------|--------------------------------------|----------|--------------------------|----------|
|             |                                      |          | Standardized Coefficient |          |
| 14 SIF1     | 0.09059                              | -0.05919 | 0.53093                  | -0.34690 |
| 18 SIF5     | 0.16452                              | 0.11590  | 0.39453                  | 0.27793  |
| 19 SIF6     | -0.14863                             | -0.03596 | -0.36920                 | -0.08932 |
| 37 MECHANIC | 1.07835                              | 0.03747  | 0.35311                  | 0.01227  |
| 31 J79080   | -0.30701                             | -2.58977 | -0.08954                 | -0.75528 |
| 30 J77078   | -0.54943                             | -1.81604 | -0.14500                 | -0.47923 |
| 23 S3F1     | 0.03522                              | 0.07467  | 0.15421                  | 0.32695  |
| 36 WRONG    | -0.34669                             | 0.65480  | -0.14792                 | 0.27937  |
| 33 EMPLOYEE | 0.56737                              | -0.12558 | 0.18634                  | -0.04124 |
| 48 NOSMLCAR | -0.35851                             | 0.19768  | -0.17139                 | 0.09450  |

CONSTANT      0.27340      -0.19864

| GROUP    | CANONICAL VARIABLES EVALUATED AT GROUP MEANS |          |
|----------|----------------------------------------------|----------|
| ERLADOPT | 2.10397                                      | 0.35823  |
| LATADOPT | 0.82273                                      | -1.00151 |
| NONADOPT | -1.02245                                     | 0.09772  |

## POINTS TO BE PLOTTED

| GROUP    | MEAN COORDINATES |       | SYMBOL FOR CASES | SYMBOL FOR MEAN |
|----------|------------------|-------|------------------|-----------------|
| ERLADOPT | 2.10             | 0.36  | E                | 1               |
| LATADOPT | 0.82             | -1.00 | L                | 2               |
| NONADOPT | -1.02            | 0.10  | N                | 3               |

Figure IV-13. Discriminant functions.

$$\begin{aligned}
Y_2 = & - 0.05919SIF1 + 0.11590SIF5 - 0.03596SIF6 + 0.03747MECHANIC \\
& - 2.58977J79D80 - 1.81604J77D78 + 0.07467S3F1 \\
& + 0.65480WRONG - 0.12558EMPLOYEE + 0.19768NOSMLCAR \\
& - 0.19864.
\end{aligned}$$

Before meaningful interpretations are given to the two discriminant functions, their statistical significance is checked by Bartlett's V statistic (Tatsuoka, 1971) as follows:

$$V = [N - 1 - (P + K)/2] \sum_{m=1}^r \ln (1 + \lambda_m)$$

$$V_m = [N - 1 - (P + K)/2] \ln (1 + \lambda_m)$$

$$\chi^2 = V - V_1$$

$$\text{Degrees of Freedom} = (P - 1)(K - 2)$$

where

N = Sample Size

P = Number of Variables

K = Number of Groups

$$\chi^2: 68.33454$$

$$68.33454 > \chi^2_{0.001, 9} = 27.877.$$

Both functions are significant; calculated  $\chi^2$  exceeds critical  $\chi^2$  for degrees of freedom = 9, and alpha = 0.001.

Eigenvalues for the two discriminant functions indicate that the first function explains 90.791% of total group dispersion and the second 9.209%. Although both discriminant functions are statistically significant, the magnitude of contribution the second function makes toward group separation is relatively very small.

The plot of discriminant function centroids in Figure IV-14 shows that the first discriminant dimension ( $Y_1$ ) separates the three adopter groups in roughly equal steps: the late adopter group mean is about as far from the nonadopter group mean as the early adopter group mean is from the late adopter group mean along this dimension. In terms of the second dimension ( $Y_2$ ), the early adopter group and the nonadopter group are practically indistinguishable, but the late adopter group is separated from them by a considerable distance. The higher the discriminant score is on the first discriminant dimension ( $Y_1$ ), the more innovative an individual becomes in the usage of V-24; the lower the discriminant score is on the first discriminant dimension ( $Y_1$ ), the less innovative an individual becomes in the usage of V-24. In terms of the second discriminant dimension ( $Y_2$ ), no significant differences appear to exist between early adopters and nonadopters, although the centroid of the early adopter group is slightly higher than that of the nonadopter group. If an individual has a considerably lower  $Y_2$  discriminant score on this dimension compared to those of early adopters or nonadopters, the individual is more likely to be a late adopter, otherwise the individual will be either an early adopter or a nonadopter. Considering that the second discriminant dimension explains only 9.209% of group separation, classifying an individual on the basis of  $Y_2$  discriminant score is rather risky.

Looking at the absolute magnitude of standardized discriminant coefficients in Figure IV-13, the relative contributions of the 10 original variables to group differentiation along each of the two dimensions can be assessed. Along the first discriminant dimension, the 10 variables are ranked in terms of their importance as follows:

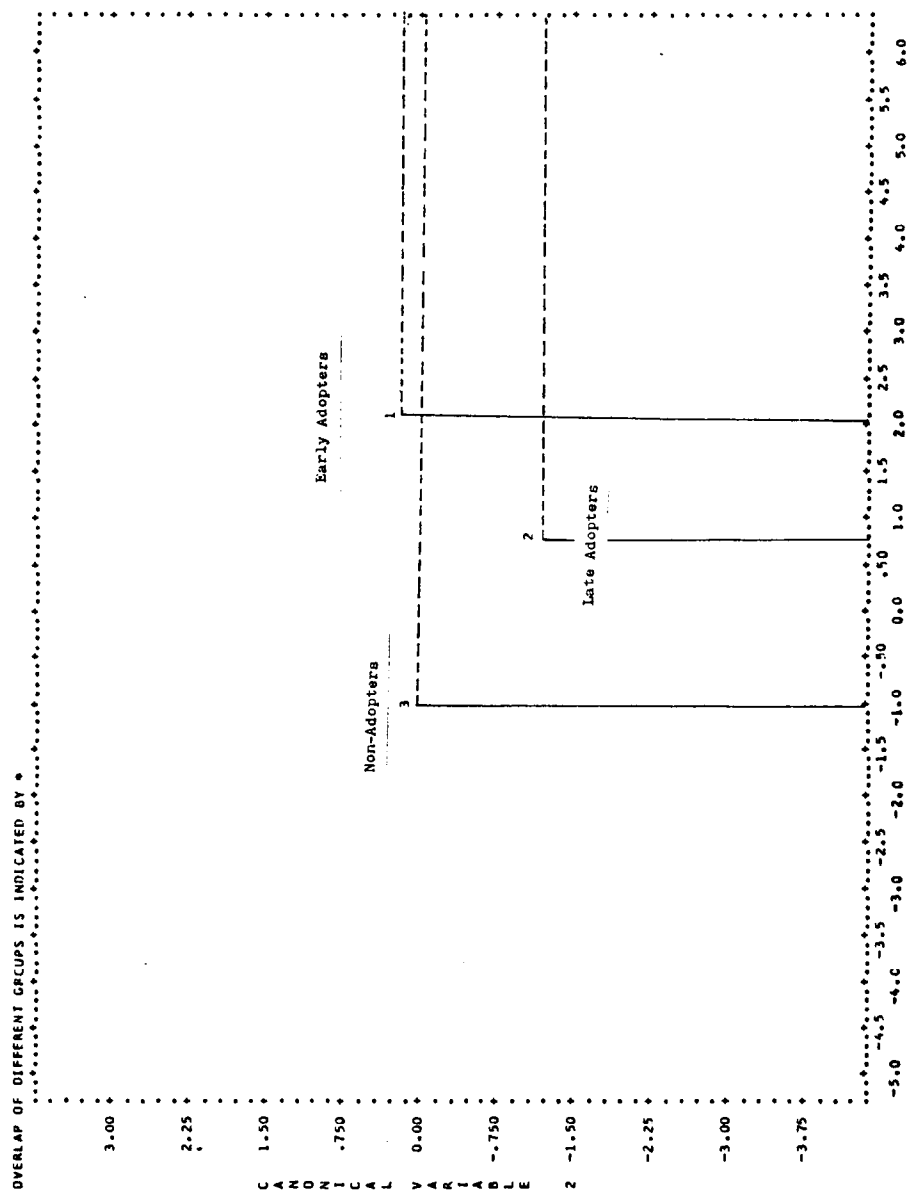


Figure IV-14. The plot of discriminant function centroids.



|      |          |         |                                                                                  |
|------|----------|---------|----------------------------------------------------------------------------------|
| 1st  | S1F1     | .53093  | Perceived V-24 Characteristics                                                   |
| 2nd  | S1F5     | .39453  | V-24 Checking Account Usage and Frequency of the General Usage Factor            |
| 3rd  | S1F6     | -.36920 | Risk Factor                                                                      |
| 4th  | MECHANIC | .35311  | Mechanical (Complaints and Problems in V-24 Usage)                               |
| 5th  | EMPLOYEE | .18634  | Employees (Information Sources Relied on Most for V-24 Adoption Decision Making) |
| 6th  | NOSMLCAR | -.17139 | No Small Car (Proclivity to Comply with Perceived Prevailing Social Influences)  |
| 7th  | S3F1     | .15421  | Cultured Cosmopolitan Factor                                                     |
| 8th  | WRONG    | -.14792 | Wrong Amount (Knowledge on Liability)                                            |
| 9th  | J77D78   | -.14500 | Jan., 1977-Dec., 1978 (Date of First Awareness of V-24)                          |
| 10th | J79080   | -.08954 | Jan., 1979-Oct., 1980 (Date of First Awareness of V-24)                          |

Along the second discriminant dimension, the 10 variables are ranked in terms of their importance as follows:

|     |        |         |                                                         |
|-----|--------|---------|---------------------------------------------------------|
| 1st | J79080 | -.75528 | Jan., 1979-Oct., 1980 (Date of First Awareness of V-24) |
| 2nd | J77D78 | -.47923 | Jan., 1979-Dec., 1978 (Date of First Awareness of V-24) |
| 3rd | S1F1   | -.34690 | Perceived V-24 Characteristics                          |
| 4th | S3F1   | .32695  | Cultured Cosmopolitan Factor                            |
| 5th | WRONG  | .27937  | Wrong Amount (Knowledge on Liability)                   |

|      |          |         |                                                                                        |
|------|----------|---------|----------------------------------------------------------------------------------------|
| 6th  | S1F5     | .27793  | V-24 Checking Account Usage and<br>Frequency of the General Usage Factor               |
| 7th  | NOSMLCAR | .09450  | No Small Car (Proclivity to Comply with<br>Perceived Prevailing Social Influences)     |
| 8th  | S1F6     | -.08932 | Risk Factor                                                                            |
| 9th  | EMPLOYEE | -.04124 | Employees (Information Sources Relied<br>on Most for V-24 Adoption Decision<br>Making) |
| 10th | MECHANIC | .01227  | Mechanical (Complaints and Problems<br>in V-24 Usage)                                  |

The first discriminant analysis ( $Y_1$ ) is relatively highly weighted, in the positive direction, with S1F1, S1F5, S1F6, and MECHANIC; that is, those who perceive the attributes of V-24 favorably, who use V-24 frequently, particularly for checking account withdrawals and deposits, who perceive less risk in the usage of V-24, and who have moderate mechanical problems and complaints in V-24 usage will score high on the first discriminant dimension ( $Y_1$ ) and will be more likely to be innovative in the usage of V-24. Therefore, the first discriminant dimension ( $Y_1$ ) can be deemed to represent "general perception of V-24 attributes and frequency in its usage."

The second discriminant dimension ( $Y_2$ ) is most highly weighted, in the negative direction, with J79080, J77D78; that is, those who became aware of the existence of V-24 considerably late in time will score high in the negative direction and will be more likely to be late adopters rather than early adopters or nonadopters. Therefore, the second discriminant dimension can be deemed to represent "late awareness of V-24." S1F1 and S3F1 also contribute somewhat heavily to the second

discriminant dimension. However, the magnitude of the contribution of these two variables are only about 50% of that of J79080 and J77078. Considering that the second discriminant dimension explains only about 9% of group separation, the magnitude of the contribution of S1F1 and S3F1 to group differentiation along the second dimension is not of significance.

Figure IV-15 presents the two different estimate error rates: the first estimate of error rates is derived from testing each observation in the sample on the basis of the two discriminant functions computed from all the observations; and the second estimate, jackknife, from testing each observation on the basis of the discriminant functions computed from the data with that particular observation removed.

The first estimate indicates that the two discriminant functions can correctly classify 83.9% of respondents, which is slightly higher than that estimated by jackknifed classification. In view of the fact that the data violates multivariate normality assumption, the estimate provided by jackknifed classification is deemed more appropriate. This indicates that 83% of respondents can be correctly classified. By chance, only 45.52% of respondents will be classified correctly, as shown in Figure IV-16. The chi-square goodness of fit test in Figure IV-16 indicates that significant differences exist between the expected frequency ( $411 \times 45.52\%$ ) and the observed frequency ( $411 \times 83\%$ ); calculated  $\chi^2$  exceeds critical  $\chi^2$  for degrees of freedom = 1, and alpha level = 0.001.

## CLASSIFICATION MATRIX

| GROUP    | PERCENT<br>CORRECT | NUMBER OF CASES CLASSIFIED INTO GROUP - |                   |
|----------|--------------------|-----------------------------------------|-------------------|
|          |                    | ERLADOPT                                | LATADOPT NONADOPT |
| ERLADOPT | 77.8               | 77                                      | 7 15              |
| LATADOPT | 43.3               | 17                                      | 26 17             |
| NONADOPT | 96.0               | 4                                       | 6 242             |
| TOTAL    | 83.9               | 98                                      | 39 274            |

## JACKKNIFED CLASSIFICATION

| GROUP    | PERCENT<br>CORRECT | NUMBER OF CASES CLASSIFIED INTO GROUP - |                   |
|----------|--------------------|-----------------------------------------|-------------------|
|          |                    | ERLADOPT                                | LATADOPT NONADOPT |
| ERLADOPT | 77.8               | 77                                      | 7 15              |
| LATADOPT | 41.7               | 17                                      | 25 18             |
| NONADOPT | 94.8               | 6                                       | 7 239             |
| TOTAL    | 83.0               | 100                                     | 39 272            |

Figure IV-15. Jackknifed classification matrix.

Hit Ratio by Chance

| EA              | LA           | NA            |
|-----------------|--------------|---------------|
| EA $(99/411)^2$ |              |               |
| LA              | $(60/411)^2$ |               |
| NA              |              | $(252/411)^2$ |

$$\text{Hit Ratio by Chance} = .4552 = (99/411)^2 + (60/411)^2 + (252/411)^2$$

Goodness of Fit

|                      | Hit                            | Miss                           |
|----------------------|--------------------------------|--------------------------------|
| Expected Probability | $p_0 = 0.4552$                 | $q_0 = 0.5448$                 |
| Expected Frequency   | $(411 \times 0.4552) = 187.09$ | $(411 \times 0.5448) = 223.91$ |
| Observed Frequency   | $(411 \times 0.83) = 341.13$   | $(411 \times 0.17) = 69.87$    |

$$\chi^2 = \sum_{i=1}^k \frac{(O - E)^2}{E} = 232.8010$$

where O = observed number of cases

E = expected number of cases

K = number of categories

$$232.8010 > \chi^2_{0.001, 1}$$

Figure IV-16. The chi-square goodness of fit test.

## CHAPTER V

### DISCUSSION AND CONCLUSION

The concluding chapter of this study proposes to summarize the major findings of this study in light of the objectives of the study, to discuss implications for the existing models of innovativeness, and to suggest marketing action. Limitations of the study and areas for future research are also delineated.

The purpose of this study was to examine the consumer adoption process of ATMs, the differences among the three adopter groups in personal characteristics (or "receiver variables"), personality, bank services and V-24 related experience and information, perceptions and attitudes, and basic underlying dimensions of innovativeness which are characteristic of early adopters, late adopters, and nonadopters.

#### Summary of Findings

This study was carried out in the form of comprehensive exploratory research, and thus, the findings of this study are largely descriptive in nature. The major findings of this study are summarized as follows.

Receiver variables (personal characteristics). Comparing the three adopter groups, significant differences are found in marital status, sex, family life cycle, occupation, education, employment status, regular working hours, age, income, cosmopolitanism, social mobility, exposure to news media, and proclivity to comply with social influences.

Compared to late adopters and nonadopters, a larger percentage of early adopters are single, male, in the middle stage of family life cycle, higher in occupational status, full-time employed, working during regular bank business hours, more highly educated, younger, higher in income, more cosmopolitan, more socially mobile, spending moderate time for general news media, more compliant with social influences, and have more children under age 19 living at home. The differences between early adopters and nonadopters in these personal characteristics are generally more apparent than those between early adopters and late adopters.

No significant differences are found in social participation and print readership among the three adopter groups.

Personality. Comparing the three adopter groups, significant differences were found in aggressive orientation and detached orientation although no significant differences can be demonstrated between early adopters and late adopters. Early adopters are more aggressive and less detached than nonadopters.

General information and/or experience with respect to general bank-related services and V-24. Comparing the three adopter groups, significant differences were found in V-24 usage patterns, V-24 average usage rate per month, knowledge on the liability due to fraudulent use of V-24 card, complaints and problems concerning the use of V-24, number of bank credit cards owned and number of gasoline cards owned. Compared to late adopters, early adopters are far more likely to be heavy users of V-24, and make checking account withdrawals and advance cash on

credit cards through V-24 more frequently than late adopters. Compared to both late adopters and nonadopters, a larger percentage of early adopters have more complaints or problems in their V-24 usage with most of them being of a mechanical nature. Early adopters also have more bank and gasoline credit cards and are more knowledgeable about the liability.

No significant differences are found in conventional teller usage patterns and conventional teller usage rate per month among the three adopter groups. The interpretation of these findings appear to connote that conventional teller services and V-24 are perceived as two different entities although they provide the same services in terms of the functions. The correlation between their consumption habits of conventional tellers and of V-24 seems to be very weak, if not independent.

Perception of the overall quality of the bank services before the introduction of V-24. Compared to late adopters and nonadopters, a larger percentage of early adopters experienced a higher level of problem recognition; early adopters viewed limited bank hours, waiting in teller lines and/or inexperienced bank tellers as more inconvenient before the introduction of V-24. In view of this finding, it may be inferred that early adopters perceived a higher level of need for an innovation such as V-24 and thus, were more sensitive to information related to the innovation in concern.

Perception of the usage of V-24 by reference group members (social systems norms). Compared to late adopters and nonadopters, a



larger percentage of early adopters were reported to have received least environmental pressure in connection with the adoption of V-24. No significant differences can be demonstrated between late adopters and nonadopters.

Date of first awareness. Compared to late adopters and nonadopters, most early adopters became aware of the existence of V-24 significantly earlier in time. No significant differences exist between late adopters and nonadopters.

Information handling behavior. Comparing the three adopter groups, significant differences were found in "perceived helpfulness of the information sources used to become aware of the existence of V-24," "information sources relied on most in the adoption decision making of V-24," and "perceived helpfulness of the information sources used in considering whether or not to use V-24." Compared to late adopters and nonadopters, most early adopters used bank-related information sources as their major source of information and appear to have relatively high trust in them. Compared to early adopters and nonadopters, a relatively large percentage of late adopters had relied on the information from relatives and friends in their adoption decision making.

Convenience oriented usage of V-24. Nonadopters are significantly different from both early adopters and late adopters while no significant differences can be demonstrated between early adopters and late adopters. Both early adopters and late adopters appear to use V-24 primarily for convenience.

Perceptions of V-24 attributes. Comparing the three adopter groups, significant differences are found in their perceptions of the relative advantage, complexity, compatibility, observability, and trialability of V-24. Early adopters are significantly different from late adopters in their perceptions of observability and trialability; early adopters appear to have less difficulty talking about what V-24 is like, and understand its operations more easily than late adopters. Early adopters are significantly different from nonadopters in their perceptions of relative advantage, compatibility, observability, and complexity. Late adopters are significantly different from nonadopters in their perceptions of all five attributes. In general, both early adopters' and late adopters' perceptions of the V-24 attributes are far more favorable toward the adoption of V-24 usage than nonadopters.

Perceptions of risks in V-24 usage. Comparing the three adopter groups, significant differences are found in their perceptions of the financial/performance risk, social risk, psychological risk, time risk, physical risk, and financial risk in V-24 usage. Compared to late adopters, early adopters rate V-24 usage as lower in financial/performance risk, psychological risk, and financial risk. No significant differences exist in their perceptions of time risk, physical risk, and social risk. Compared to nonadopters, early adopters perceive far less risk on each of the six types of risks. Comparing late adopters and nonadopters, late adopters perceive far less risk on all the risks except physical risk.

Needs-wants-concerns with regard to V-24 usage. Comparing the three adopter groups, significant differences are found in their

"desire for convenient locations for V-24," "need of a telephone on V-24," and "wants of privacy for V-24 use." Both early adopters and late adopters want present V-24 services to be improved far more than nonadopters. Compared to nonadopters, early adopters are significantly different in "desire for convenient locations for V-24," and "need of a telephone on V-24." Compared to nonadopters, late adopters are different in "desire for convenient locations." No significant differences are found between early adopters and late adopters.

General attitude toward computers. A larger percentage of early adopters and late adopters have favorable attitude toward computers, as compared to nonadopters. No significant differences exist between early adopters and late adopters.

First impressions on the first few trials of V-24. Comparing early adopters and late adopters, significant differences are found in "feeling of being comfortable" and "influence of the first impression upon the future V-24 usage." Early adopters are reported to have felt more comfortable with V-24 when they first used it, and their first impression of V-24 appears to have had a greater impact upon their decision to make regular use of V-24.

Outcomes of the decision to adopt V-24. Comparing early adopters and late adopters, no significant differences are found in their rating of "satisfaction with V-24 usage." The majority of early adopters and late adopters are generally satisfied with the use of V-24.

Prediction of innovativeness in the adoption of V-24. The summary findings of the study so far delineated suggest that the three adopter groups do differ on the basis of personal characteristics, personality, and bank services and V-24 related experience and information, perceptions and attitudes. However, in terms of their potentialities to discriminate among the three adopter groups, the following ten variables are found to significantly contribute to group differentiation: S1F1, S1F5, S1F6, MECHANIC, EMPLOYEE, NOSMLCAR, S3F1, WRONG, J77D78, and J79080. The two discriminant dimensions along which maximum group differentiation occurs are determined as:

$$Y_1 = 0.09059S1F1 + 0.1645S1F5 - 0.14863S1F6 + 1.07835MECHANIC \\ - 0.30701J79D80 - 0.54943J77D78 + 0.03522S3F1 \\ - 0.34669WRONG + 0.56737EMPLOYEE - 0.35851NOSMLCAR \\ + 0.27340$$

$$Y_2 = - 0.05919S1F1 + 0.11590S1F5 - 0.03596S1F6 + 0.03747MECHANIC \\ - 2.58977J79D80 - 1.81604J77D78 + 0.07467S3F1 + 0.65480WRONG \\ - 0.12558EMPLOYEE + 0.19768NOSMLCAR - 0.19864$$

The first discriminant dimension ( $Y_1$ ) explains 90.791% of total group separation, and is relatively heavily weighted with S1F1, S1F5, S1F6, and MECHANIC. These four variables, in general, represent "general perceptions of V-24 attributes and frequency in its usage."

The second discriminant dimension ( $Y_2$ ) explains 9.209% of total group separation, and is relatively heavily weighted with J79080 and J77D78. These variables, in general, represent "late awareness of V-24."

Early adopters have relatively higher scores on the  $Y_1$  discriminant dimension, as compared to late adopters and nonadopters.

Nonadopters have relatively lower scores on the  $Y_1$  discriminant dimension, as compared to late adopters and early adopters.

In terms of the second discriminant dimension ( $Y_2$ ), both early adopters and nonadopters have considerably higher scores, as compared to late adopters.

The higher the score is on the  $Y_1$  dimension, the more innovative an individual becomes in the adoption of V-24 usage; the lower the score on  $Y_1$  dimension, the less innovative an individual becomes. On the  $Y_2$  dimension, early adopters and nonadopters are practically indistinguishable, while late adopters have considerably lower  $Y_2$  scores, as compared to early adopters and nonadopters. The two discriminant dimensions can classify 83% of the respondents correctly.

#### Implications for the Existing Models of Innovativeness and for Marketing Action

The findings of this study present significant implications for the existing models of innovativeness in that personal characteristics, personality, interpersonal communication, and social process, which are commonly conceptualized as key components in the innovation adoption decision process, do not appear to exert significant influence over the adoption process of V-24.

The commonly held conceptualization that innovativeness is a function of persisting personal characteristics does not appear to be valid for the adoption process of V-24. Furthermore, "word of mouth," widely publicized key component in the adoption process of an innovation, does not appear to be of significance. The findings of the discriminant analysis suggest that an individual's innovativeness in the adoption of

V-24 usage is determined primarily by his perceptions of V-24 attributes and the time of his awareness of the existence of V-24.

Synthesizing the findings of this study, the very nature of the innovation, V-24, appears to have important bearings on the role play of the variables related to the adoption of V-24 usage. Unlike many innovations introduced in the consumer market, V-24 is a service oriented innovation, and furthermore, the nature of V-24 in terms of usage is rather personal. In this context, this research supports the conceptualization that innovativeness is product specific.

The findings of this study also present important implications for marketing action in that overall marketing promotional activities should be designed in the direction toward educating the consumers and enhancing their perceptions of automatic teller machines. Furthermore, an understanding of their needs, wants, and concerns in the usage of V-24 is imperative to ameliorate the quality of V-24 services.

### Limitations

The respondents in this study are classified into the three adopter groups based on their recall data. Although the pretest results indicated considerable accuracy in their ability to recall, a slight degree of inaccuracy in their ability to recall is expected due to the passage of time.

The second limitation of this study regards the sample size used. The sample size for the study is large enough to execute the statistical analyses employed in this study. However, in terms of running a split sample test, the size is not large enough. In estimating the error rates in the discriminant analysis performed, a slight degree of upward bias

may be expected from classifying the same individuals used to calculate the discriminant functions.

The final limitation of this study concerns the scope of the generalizability of the results. Due to the unavailability of the 1981 census data at the time of the survey, the generalization of the results beyond the survey population of this study is deemed unwarranted at this point in time.

#### Suggestions for Future Research

The major endeavor of this study has been centered upon ascertaining those entities exerting significant influence over the adoption decision process of V-24 usage. The knowledge gained from this study enables us to delineate "what they are and who they are" that produce certain behavioral manifestations. However, it provides us hardly any information on "why" and "how."

"Who" and "what" are basically exogenous in nature and thus, they are mostly uncontrollable, whereas "why" and "how" are basically endogenous in nature and thus are somewhat controllable. The study designed to investigate "why" and "how" utilizing the findings of this study would provide us valuable information in facilitating the adoption process of automatic teller machines. Furthermore, the study needs to be replicated in order to ensure the validity of the research findings.

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## APPENDICES

APPENDIX A

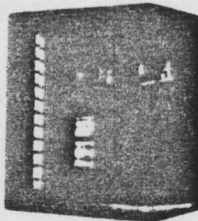
SURVEY QUESTIONNAIRE, MAILING ENVELOPE, AND COVER LETTER



Valley Bank

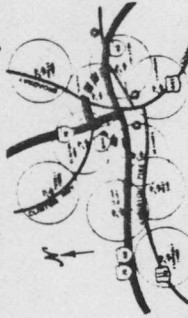


Valley Bank



## Valley 24 Customer Survey

Valley 24 is just minutes away from you!



There are 6 locations now, 4 on the way.

BEARDEN 4805 Kingston Pike  
NORTH KNOXVILLE 2600 Broadway, N.E.  
HOLSTON CENTER 4216 Asheville Hwy  
CHAPMAN HIGHWAY 3314 Chapman Hwy  
WEST END 1908 Kingston Pike  
CEDAR BLUFF 9123 Executive Pike Blvd.

CLINTON HWY.  
HALLS  
POWELL  
FARRAGUT

Service begins during 1980

Easy to operate at your own pace.

2. STEP-BY-STEP DIRECTIONS APPEAR HERE

**Make Your Banking Simpler**

1. INSERT VALLEY 24 CARD HERE

**Valley 24**

16740 47 8012050

Valley Family Bank and Trust Company

There are three sections in this questionnaire. The questions have been designed so that you can answer the entire questionnaire quickly. Please read any instructions carefully. The purpose of this survey will be served best if you accurately answer every question.

WE HOPE YOU ENJOY COMPLETING THE QUESTIONNAIRE. THANK YOU.

#### Section 1 --- Valley-24 Automatic Teller Machines (V-24)

For each statement, please circle the number which best describes your feeling about the statement or your experience with Valley Bank's Valley 24 Automatic Teller Machines (hereafter referred to as V-24). Where a line is provided, please write in your answer.

Example 1:

Is the nearest Valley Bank located within 15 minutes of your home?

① Yes 2. No

For example, number 1 has been circled. This means that the nearest Valley Bank is located within 15 minutes of your home.

Example 2:

On the average, I have been using V-24 for finding out my current account balances.

You are asked to indicate how often on the average you have been using V-24 for finding out your current account balances by circling the appropriate number. For example, if you have been using V-24 frequently for finding out your account balances, you would circle the number 4 (frequently).

Never 1 2 3 4 5  
Rarely Sometimes Frequently Very frequently

Example 3:

V-24 will be the way most banking will be done in the future.

You are asked to indicate whether you agree or disagree with this statement by circling the appropriate number. For example, if you strongly agree that V-24 will be the way most banking will be done in the future, you would circle the number 5 (Strongly Agree).

There are no best answers. The purpose of this survey will be best achieved if you answer every question as accurately as possible. You may think many items are similar. Actually no two items are exactly alike.

Strongly Disagree 1 2 3 4 5  
Slightly Disagree Neutral Slightly Agree Strongly Agree

1. Are you aware of the existence of V-24?  
1. Yes 2. No (If "No" please continue with question 5) In Section 2
2. Did you use V-24 with Bank credit cards (Master Charge or Visa) before September 1976 when the first V-24 Card was issued?  
1. Yes 2. No
3. Did you live in Knoxville between 1971 and 1973?  
1. Yes 2. No (If "Yes", please continue with question 5)
4. If "No", were any automatic teller machines available in your place of residence before 1974?  
1. Yes 2. No 3. I don't know
5. I first became aware of the existence of V-24 during:  
1. Sometime before September, 1976 when the first V-24 Card was issued.  
2. Sept.-Dec., 1976 3. Jan.-Dec., 1977 4. Jan.-Dec., 1978  
5. Jan.-Dec., 1979 6. Jan.-Oct., 1980  
6. I first used V-24 with my V-24 Card during:  
1. July-Dec., 1976 2. Jan.-Dec., 1977 3. Jan.-Dec., 1978  
4. Jan.-Dec., 1979 5. Jan.-Sept., 1980 6. Never

On the average, I have been using V-24 for :

|                                 |   |   |   |   |   |
|---------------------------------|---|---|---|---|---|
| 7. Checking Account Deposits    | 1 | 2 | 3 | 4 | 5 |
| 8. Checking Account Withdrawals | 1 | 2 | 3 | 4 | 5 |
| 9. Savings Account Deposits     | 1 | 2 | 3 | 4 | 5 |
| 10. Savings Account Withdrawals | 1 | 2 | 3 | 4 | 5 |
| 11. Credit Card Cash Advances   | 1 | 2 | 3 | 4 | 5 |
| 12. Utility and Loan Payments   | 1 | 2 | 3 | 4 | 5 |
| 13. Fund Transfers              | 1 | 2 | 3 | 4 | 5 |

Never Rarely Sometimes Frequently Very frequently

|                                                                                                                                                                                   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Strongly Agree |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|---------|----------------|----------------|
| 27. I am satisfied with the use of V-24.                                                                                                                                          | 1                 | 2                 | 3       | 4              | 5              |
| 28. I usually (or would) use V-24 outside regular Bank business hours during the weekdays.                                                                                        | 1                 | 2                 | 3       | 4              | 5              |
| 29. I usually (or would) use V-24 during the weekends.                                                                                                                            | 1                 | 2                 | 3       | 4              | 5              |
| 30. V-24 offers relative advantages over conventional Bank teller services because of 24 hours, 7 days a week access to my accounts and unnecessary waiting time in teller lines. | 1                 | 2                 | 3       | 4              | 5              |
| 31. It is (or would be) rather easy for me to operate V-24.                                                                                                                       | 1                 | 2                 | 3       | 4              | 5              |
| 32. V-24 is basically the same as conventional Bank teller services, in terms of my idea of what a Bank service should be.                                                        | 1                 | 2                 | 3       | 4              | 5              |
| 33. I would have no difficulty telling my friends what V-24 is like.                                                                                                              | 1                 | 2                 | 3       | 4              | 5              |
| 34. Before I felt comfortable operating V-24, it was necessary for me to try it several times.                                                                                    | 1                 | 2                 | 3       | 4              | 5              |
| 35. Generally, computers are as reliable and accurate as men.                                                                                                                     | 1                 | 2                 | 3       | 4              | 5              |
| 36. Before the Bank introduced V-24, limited Bank hours, waiting in teller lines, and/or inexperienced Bank tellers had been irritating.                                          | 1                 | 2                 | 3       | 4              | 5              |
| 37. I believe several friends of mine used V-24 before I did.                                                                                                                     | 1                 | 2                 | 3       | 4              | 5              |
| 38. If V-24 were available near where I work or in major shopping centers (not attached to the Bank building), I would use V-24 more often than I do now.                         | 1                 | 2                 | 3       | 4              | 5              |
| 39. If a telephone were provided along with V-24 in case I need help, I would use V-24 more often than I do now.                                                                  | 1                 | 2                 | 3       | 4              | 5              |
| 40. If some type of privacy were provided for V-24, I would use V-24 more often than I do now.                                                                                    | 1                 | 2                 | 3       | 4              | 5              |

4

|                                                                                                                            | Never | Rarely | Sometimes | Frequently | Very Frequently |
|----------------------------------------------------------------------------------------------------------------------------|-------|--------|-----------|------------|-----------------|
| On the average, I have been using conventional (lobby or drive-in) Bank teller services for:                               |       |        |           |            |                 |
| 14. Checking Account Deposits                                                                                              | 1     | 2      | 3         | 4          | 5               |
| 15. Checking Account Withdrawals                                                                                           | 1     | 2      | 3         | 4          | 5               |
| 16. Savings Account Deposits                                                                                               | 1     | 2      | 3         | 4          | 5               |
| 17. Savings Account Withdrawals                                                                                            | 1     | 2      | 3         | 4          | 5               |
| 18. Credit Card Cash Advances                                                                                              | 1     | 2      | 3         | 4          | 5               |
| 19. Utility and Loan Payments                                                                                              | 1     | 2      | 3         | 4          | 5               |
| 20. Fund Transfers                                                                                                         | 1     | 2      | 3         | 4          | 5               |
| 21. I first became aware of the existence of V-24 from: (Please circle only one)                                           |       |        |           |            |                 |
| 1. Relatives and Friends                                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 2. Radio                                                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 3. Newspapers                                                                                                              | 1     | 2      | 3         | 4          | 5               |
| 4. T.V.                                                                                                                    | 1     | 2      | 3         | 4          | 5               |
| 5. Billboards                                                                                                              | 1     | 2      | 3         | 4          | 5               |
| 6. Valley Bank Employees                                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 7. Valley Bank Electronic Message Boards                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 8. V-24 Card Mailed from the Bank                                                                                          | 1     | 2      | 3         | 4          | 5               |
| 9. None of These                                                                                                           | 1     | 2      | 3         | 4          | 5               |
| 22. The source of information indicated above was very helpful for learning about V-24.                                    | 1     | 2      | 3         | 4          | 5               |
| 23. When considering whether or not to use V-24, the source I relied on most for information was: (Please circle only one) |       |        |           |            |                 |
| 1. Relatives and Friends                                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 2. Radio                                                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 3. Newspapers                                                                                                              | 1     | 2      | 3         | 4          | 5               |
| 4. T.V.                                                                                                                    | 1     | 2      | 3         | 4          | 5               |
| 5. Valley Bank Employees (Including V-24 Demonstrations)                                                                   | 1     | 2      | 3         | 4          | 5               |
| 6. Valley Bank Electronic Message Boards                                                                                   | 1     | 2      | 3         | 4          | 5               |
| 7. V-24 Card Mailed from the Bank                                                                                          | 1     | 2      | 3         | 4          | 5               |
| 8. None of These                                                                                                           | 1     | 2      | 3         | 4          | 5               |
| 24. This information source indicated above was very helpful in considering whether or not to use V-24.                    | 1     | 2      | 3         | 4          | 5               |
| 25. When I first used V-24, I felt comfortable with it. [If you have never used V-24, please continue with question 28]    | 1     | 2      | 3         | 4          | 5               |
| 26. My impression on the first use of V-24 influenced my decision whether or not to continue using it.                     | 1     | 2      | 3         | 4          | 5               |

3

"wrong" answers. In fact, people's opinions regarding each statement seem to be quite different. The purpose of this survey will be served best if you accurately report your feelings toward each statement. You may notice that many items are similar. Actually, no two items are exactly alike.

#### Example:

Asking a friend to loan you money is:

Extremely Undesirable 1 2 3 4 5 6  
Undesirable  
Slightly Undesirable  
Neutral  
Slightly Desirable  
Desirable  
Extremely Desirable

For example, number 3 has been circled. This means that the situation described is slightly undesirable to the individual concerned. These same six numbers will be provided for each statement. Please circle the number which best expresses how desirable or undesirable the situation seems to you.

51. Being free of emotional ties with others is: 1 2 3 4 5 6  
Extremely Undesirable  
Undesirable  
Slightly Undesirable  
Neutral  
Slightly Desirable  
Desirable  
Extremely Desirable

52. Giving comfort to those in need of friends is: 1 2 3 4 5 6

53. The knowledge that most people would be fond of me at all times would be: 1 2 3 4 5 6

54. To refuse to give in to others in an argument seems: 1 2 3 4 5 6

55. To refuse to give in to others is: 1 2 3 4 5 6

56. For me to pay little attention to what others think of me seems: 1 2 3 4 5 6

57. For me to be able to own an item before most of my friends are able to buy it would be: 1 2 3 4 5 6

58. Knowing that others are somewhat envious of me is: 1 2 3 4 5 6

59. To feel that I like everyone I know would be: 1 2 3 4 5 6

60. To be able to work hard while others are elsewhere having fun is: 1 2 3 4 5 6

61. Using "pull" to get ahead would be: 1 2 3 4 5 6

6

41. The use of V-24 would involve a possibility of money loss because of such things as computer errors and V-24 Card being lost or stolen. 1 2 3 4 5  
Strongly Disagree  
Slightly Disagree  
Neutral  
Slightly Agree  
Strongly Agree

42. If my friends observe me using V-24, they will be favorably impressed. 1 2 3 4 5

43. The use of V-24 wouldn't fit in well with the way I prefer to do things. 1 2 3 4 5

44. The use of V-24 would lead to a time loss for me because of its frequent breakdowns and extra time that may have to be spent with the Bank personnel to correct computer errors. 1 2 3 4 5

45. The use of V-24 could involve a possibility of being physically harmed. 1 2 3 4 5

46. The use of V-24 would encourage me to overspend. 1 2 3 4 5

47. How many times a month on the average do you use V-24? \_\_\_\_\_

48. How many times a month on the average do you use conventional Bank teller services? \_\_\_\_\_

49. If your V-24 Card is lost or stolen and the Bank is notified within two business days, the maximum amount of money you can lose through fraudulent use of your card is \_\_\_\_\_

50. If you have any specific problems and complaints concerning the use of V-24, please state them below. \_\_\_\_\_

#### Section 2 -- Your Feelings Toward a Variety of Situations

In the previous section, you have been asked questions pertaining to your use of V-24. Now we would like to ask some more general questions about you and your feelings toward a number of different types of situations. These questions are very important and your responses will enable the development of banking services most suitable to your needs. Your responses will remain completely anonymous and confidential.

In this section you will find a number of incomplete statements followed by six numbers. These statements describe a variety of situations. There are no "right" or

5

|                                                                                       | Extremely Undesirable | Undesirable | Slightly Undesirable | Slightly Desirable | Desirable | Extremely Desirable |
|---------------------------------------------------------------------------------------|-----------------------|-------------|----------------------|--------------------|-----------|---------------------|
| 62. For me to have enough money or power to impress self-styled "big-shots" would be: | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 63. Basing my life on duty to others is:                                              | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 64. To work under tension would be:                                                   | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 65. If I could live all alone in a cabin in the woods or mountains, it would be:      | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 66. Punishing those who insult my honor is:                                           | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 67. To give aid to the poor and underprivileged is:                                   | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 68. Standing in the way of people who are too sure of themselves is:                  | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 69. Being free of social obligations is:                                              | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 70. To have something good to say about everybody seems:                              | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 71. Telling a waiter when you have received inferior food is:                         | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 72. Planning to get ahead without others is:                                          | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 73. To be able to spot and exploit weakness in others is:                             | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 74. A strong desire to surpass other's achievements seems:                            | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 75. Sharing my personal feelings with others would be:                                | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 76. To have the ability to blame others for their mistakes is:                        | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 77. For me to avoid situations where others can influence me would be:                | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 78. Wanting to repay others' thoughtless actions with friendship is:                  | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 79. Having to compete with others for various rewards is:                             | 1                     | 2           | 3                    | 4                  | 5         | 6                   |

7

|                                                                                  | Extremely Undesirable | Undesirable | Slightly Undesirable | Slightly Desirable | Desirable | Extremely Desirable |
|----------------------------------------------------------------------------------|-----------------------|-------------|----------------------|--------------------|-----------|---------------------|
| 80. If I knew that others paid very little attention to my affairs, it would be: | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 81. To defend my rights by force would be:                                       | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 82. Putting myself out to be considerate of others' feelings is:                 | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 83. Correcting people who express an ignorant belief is:                         | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 84. For me to work alone would be:                                               | 1                     | 2           | 3                    | 4                  | 5         | 6                   |
| 85. To be fair to people who do things which I consider wrong seems:             | 1                     | 2           | 3                    | 4                  | 5         | 6                   |

## Section 3 -- Demographic Information

The following questions are for statistical purposes only. They are solely to help us analyze the data from the survey and all information given will remain completely anonymous and confidential.

For each statement, please circle the number which best describes you. Where a line is provided, please write in your answer. The purpose of this survey will be served best if you accurately answer each question. Please be sure to answer every question.

86. I am: 1. Single 2. Married 3. Separated 4. Divorced 5. Widowed
87. I am: 1. Male 2. Female
88. I am: 1. White 2. Black 3. Indian 4. Oriental 5. Other
89. How many children 18 and under live in your family?  
0 1 2 3 4 5 6 7 8 9
90. Please indicate the number of children in each age range living at home?

| Age Range | Number |
|-----------|--------|
| 1 — 5     | —      |
| 6 — 12    | —      |
| 13 — 18   | —      |

91. Please indicate where you live?

1. Your Own Home 2. Rent Apartment 3. Rent House

8



92. Which of the following classifications comes closest to describing your occupation?

- |                  |                    |                    |
|------------------|--------------------|--------------------|
| 1. Managerial    | 2. Skilled Trade   | 3. General Laborer |
| 4. Office Worker | 5. Technical       | 6. Professional    |
| 7. Student       | 8. Homemaker       | 9. Retired         |
| 11. Military     | 12. Service Worker | 10. Salesperson    |

93. Please circle the highest grade that you completed in school.

- |                 |    |    |    |    |    |    |    |    |
|-----------------|----|----|----|----|----|----|----|----|
| Grade School    | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| High School     | 9  | 10 | 11 | 12 |    |    |    |    |
| College         | 13 | 14 | 15 | 16 |    |    |    |    |
| Graduate School | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

94. Do you belong to:

- |                                                  |        |       |                         |
|--------------------------------------------------|--------|-------|-------------------------|
| community groups or organizations?               | 1. Yes | 2. No | 95. If "yes", how many? |
| business or job related groups or organizations? | 1. Yes | 2. No |                         |
| social groups or organizations?                  | 1. Yes | 2. No |                         |
| recreational groups or organizations?            | 1. Yes | 2. No |                         |
| religious groups or organizations?               | 1. Yes | 2. No |                         |
| other groups or organizations?                   | 1. Yes | 2. No |                         |

96. Do you usually read magazines or newspapers that would fall into each category below?

- |                                                                                                               |        |       |                         |
|---------------------------------------------------------------------------------------------------------------|--------|-------|-------------------------|
| Homemaker magazines (Woman's Day, Family Circle, Better Homes and Gardens, etc.)                              | 1. Yes | 2. No | 97. If "yes", how many? |
| Fashion magazines (Glamour, Vogue, Mademoiselle, Ebony, etc.)                                                 | 1. Yes | 2. No |                         |
| Movie, Romance, Crime magazines                                                                               | 1. Yes | 2. No |                         |
| Light reading, news magazines and newspapers (Life, T.V. Guide, Readers' Digest, Jet, etc.)                   | 1. Yes | 2. No |                         |
| Cultural, intellectual magazines and newspapers (Time, Business Week, New York Times, Atlantic Monthly, etc.) | 1. Yes | 2. No |                         |

98. Is the car you usually drive a fuel efficient small compact car?

- |        |       |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

99. Please indicate your employment status.

- |                 |              |                  |
|-----------------|--------------|------------------|
| 1. Part-time    | 2. Full-time | 3. Self-employed |
| 4. Not employed | 5. Retired   |                  |

100. Please indicate your regular working hours.

- |                                  |
|----------------------------------|
| 1. Weekdays: From _____ to _____ |
| 2. Weekends: From _____ to _____ |

- |                                                                                      |       |
|--------------------------------------------------------------------------------------|-------|
| 101. How many long-distance calls a month on the average do you make?                | _____ |
| 102. How many times a year on the average do you travel by air?                      | _____ |
| 103. How many miles a year on the average do you drive?                              | _____ |
| 104. How many times a month on the average do you go out to eat?                     | _____ |
| 105. How many times a month on the average do you attend movies, concerts, or plays? | _____ |

106. Please indicate the number of different residences you have lived in during past 15 years. \_\_\_\_\_

107. Please indicate the average time you spend per day reading magazines and watching T.V. \_\_\_\_\_

108. How many gasoline credit cards do you own? \_\_\_\_\_

109. How many bank credit cards (Master Charge, Visa, etc.) do you own? \_\_\_\_\_

110. Please indicate your age. \_\_\_\_\_

111. Please indicate your approximate total family income (before taxes).

- |                    |                    |                       |
|--------------------|--------------------|-----------------------|
| 1. \$1-4,999       | 4. \$15,000-19,999 | 7. \$30,000-34,999    |
| 2. \$5,000-9,999   | 5. \$20,000-24,999 | 8. \$35,000-39,999    |
| 3. \$10,000-14,999 | 6. \$25,000-29,999 | 9. More than \$40,000 |

THANK YOU VERY MUCH FOR YOUR TIME. COOPERATION. ASSISTANCE.

A postage paid, self-addressed envelope is enclosed for your convenience.

**Valley Bank**

601 Market Street, Knoxville, Tennessee 37901

Telephone 615/546-1950

November 28, 1980

Dear Customer:

We are writing to ask your help in a research project studying how our customers use and feel about Valley Bank's Valley-24 Automatic Teller Machines. The purpose of this survey is to learn more about our customers who use (or would use) Valley-24 Automatic Teller Machines. By collecting information from our customers, we at Valley Bank hope to serve you better by developing improved services for you.

Enclosed you will find a questionnaire that we would like for you to answer anonymously and then return to us as soon as possible using the enclosed postage paid self-addressed reply envelope. If you have a joint bank account, the questionnaire should be completed by the person who makes bank transactions most frequently. Your quick and accurate attention to completing and returning the questionnaire will be greatly appreciated.

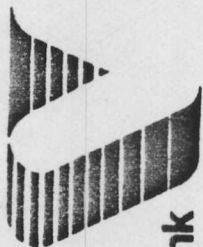
In this questionnaire, you will find a number of questions do not appear to be directly related to Valley-24 Automatic Teller Machines. Please rest assured that they are all of value to the study.

Your questionnaire will remain completely anonymous and confidential. Please "do not" put your name or address on the questionnaire or the enclosed self-addressed reply envelope. If you have any questions, please feel free to call me at Valley Bank (546-1950, Ext. 434).

Thank you very much for your time and cooperation.

Sincerely yours,

Virgil Avans  
Vice President  
Bank Administration



**Valley Bank**

Valley Fidelity Bank  
and Trust Company  
P.O. Box 1991  
Knoxville, TN  
37901

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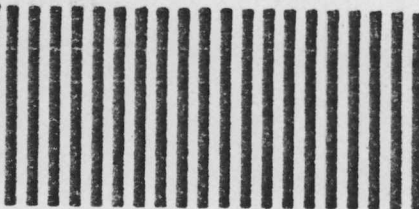
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**P. O. BOX 1991**

**KNOXVILLE, TENNESSEE 37901**



## APPENDIX B

### RECEIVER VARIABLES

TABLE B-1

RELATION BETWEEN THREE ADAPTER GROUPS AND MARITAL STATUS

| XADAPT          | COUNT<br>ROW PCT<br>COL PCT<br>TOT PCT | ISINGLE | MARRIED | SEPARATED<br>, DIVORCED | WIDOWED | PCW<br>TOTAL |
|-----------------|----------------------------------------|---------|---------|-------------------------|---------|--------------|
|                 |                                        | 1       | 2       | 3                       | 4       |              |
| EARLY ADAPTERS  | 1                                      | 13      | 73      | 6                       | 10      | 102          |
|                 | I                                      | 12.7    | 71.6    | 5.9                     | 9.8     | 22.5         |
|                 | I                                      | 26.0    | 22.5    | 20.7                    | 20.4    |              |
|                 | I                                      | 2.9     | 16.1    | 1.3                     | 2.2     |              |
| LATE ADAPTERS   | 2                                      | 7       | 46      | 12                      | 3       | 68           |
|                 | I                                      | 10.3    | 67.6    | 17.6                    | 4.4     | 15.0         |
|                 | I                                      | 14.0    | 14.2    | 41.4                    | 6.1     |              |
|                 | I                                      | 1.5     | 10.2    | 2.6                     | 0.7     |              |
| NON-ADAPTERS    | 3                                      | 30      | 206     | 11                      | 36      | 283          |
|                 | I                                      | 10.6    | 72.8    | 3.9                     | 12.7    | 62.5         |
|                 | I                                      | 60.0    | 63.4    | 37.9                    | 73.5    |              |
|                 | I                                      | 6.6     | 45.5    | 2.4                     | 7.9     |              |
| COLUMN<br>TOTAL | 50                                     | 325     | 29      | 49                      | 453     | 100.0        |
|                 | 11.0                                   | 71.7    | 6.4     | 10.8                    |         |              |

1 OUT OF 12 ( 8.3%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
 MINIMUM EXPECTED CELL FREQUENCY = 4.353  
 RAW CHI SQUARE = 20.45058 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0023

TABLE B-2  
RELATION BETWEEN THREE ADAPTER GROUPS AND SEX

| XADAPT           | COUNT                                                    |         |         | FEMALE |      | ROW<br>TOTAL |
|------------------|----------------------------------------------------------|---------|---------|--------|------|--------------|
|                  | 1                                                        | 2       | 3       | 1      | 2    |              |
|                  | ROW PCT                                                  | COL PCT | TOT PCT | 1      | 2    |              |
|                  | 1                                                        | 2       | 3       | 1      | 2    |              |
| EARLY ADAPTERS   | 1                                                        | 1       | 1       | 57     | 45   | 102          |
|                  | 1                                                        | 1       | 1       | 55.9   | 44.1 | 22.6         |
|                  | 1                                                        | 1       | 1       | 26.1   | 19.2 | 1            |
|                  | 1                                                        | 1       | 1       | 12.6   | 10.0 | 1            |
| LATE ADAPTERS    | 2                                                        | 1       | 1       | 25     | 43   | 68           |
|                  | 1                                                        | 1       | 1       | 36.8   | 63.2 | 15.0         |
|                  | 1                                                        | 1       | 1       | 11.5   | 18.4 | 1            |
|                  | 1                                                        | 1       | 1       | 5.5    | 9.5  | 1            |
| NON-ADAPTERS     | 3                                                        | 1       | 1       | 136    | 146  | 282          |
|                  | 1                                                        | 1       | 1       | 48.2   | 51.8 | 62.4         |
|                  | 1                                                        | 1       | 1       | 62.4   | 62.4 | 1            |
|                  | 1                                                        | 1       | 1       | 30.1   | 32.3 | 1            |
| COLUMN<br>TOTAL  | 218                                                      | 234     | 452     | 48.2   | 51.8 | 100.0        |
| RAW CHI SQUARE = | 5.57216 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0505 |         |         |        |      |              |

TABLE B-3  
FREQUENCY DISTRIBUTION OF ETHNIC BACKGROUND

|               | Absolute<br>Frequency | Relative<br>Frequency<br>(%) | Adjusted<br>Frequency<br>(%) | Cumulative<br>Adjusted Frequency<br>(%) |
|---------------|-----------------------|------------------------------|------------------------------|-----------------------------------------|
| White         | 440                   | 97.1                         | 98.2                         | 98.2                                    |
| Black         | 8                     | 1.8                          | 1.8                          | 100.0                                   |
| Missing Cases | <u>5</u>              | <u>1.1</u>                   | <u>Missing</u>               | 100.0                                   |
| Total         | 453                   | 100.0                        | 100.0                        |                                         |

TABLE B-4

RELATION BETWEEN THREE ADOPTER GROUPS AND FAMILY LIFE CYCLE MEASURED  
BY NUMBER OF CHILDREN UNDER AGE 19 LIVING AT HOME

| COUNT          | 1     | 2     | 3    | 4     | 5    | 6     | 7    | 8     | 9    | 10    | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|----------------|-------|-------|------|-------|------|-------|------|-------|------|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| ROW            | PCT   | INONE | 1    | CHILD | 2    | CHILD | >2   | CHILD | REN  | TOTAL |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| COL            | PCT   | 1     | 56   | 1     | 22   | 1     | 15   | 6     | 99   | 22.3  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| TOT            | PCT   | 1     | 56.6 | 1     | 22.2 | 1     | 15.2 | 6.1   | 1    | 1     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| XADAPT         | 1     | 1     | 18.1 | 1     | 32.4 | 1     | 32.6 | 1     | 31.5 | 1     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| EARLY ADAPTERS | 1     | 1     | 12.6 | 1     | 5.0  | 1     | 3.4  | 1     | 1.4  | 1     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| LATE ADAPTERS  | 2     | 1     | 44   | 1     | 10   | 1     | 10   | 1     | 65   | 14.7  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| NON-ADAPTERS   | 3     | 1     | 210  | 1     | 36   | 1     | 21   | 1     | 279  | 62.0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| COLUMN         | TOTAL | 310   | 68   | 46    | 19   | 4.3   | 4.3  | 4.3   | 4.3  | 100.0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |

2 OUT OF 12 (16.7%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
MINIMUM EXPECTED CELL FREQUENCY = 2.788  
RAW CHI SQUARE = 15.64057 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0158



TABLE B-5

RELATION BETWEEN THREE ADOPTER GROUPS AND FAMILY LIFE CYCLE MEASURED  
BY NUMBER OF CHILDREN IN THE AGE RANGE 1 TO 5

| X ADAPT                                               | COUNT        |         |         | INCOME                |    | >=1 CHILDREN          |    | ROW TOTAL |
|-------------------------------------------------------|--------------|---------|---------|-----------------------|----|-----------------------|----|-----------|
|                                                       | 1            | 2       | 3       | 1                     | 2  | 1                     | 2  |           |
|                                                       | ROW PCT      | ROW PCT | ROW PCT | 1                     | 2  | 1                     | 2  |           |
|                                                       | CUL PCT      | CUL PCT | CUL PCT | 1                     | 2  | 1                     | 2  |           |
|                                                       | TOT PCT      | TOT PCT | TOT PCT | 0                     | 1  | 1                     | 1  |           |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- |              |         |         |                       |    |                       |    |           |
| EARLY ADAPTERS                                        | 1            | 1       | 1       | 86                    | 1  | 11                    | 1  | 97        |
|                                                       |              |         |         | 88.7                  | 1  | 11.3                  | 1  | 22.0      |
|                                                       | 1            | 1       | 1       | 21.1                  | 1  | 32.4                  | 1  |           |
|                                                       | 1            | 1       | 1       | 19.5                  | 1  | 2.5                   | 1  |           |
|                                                       | -1           | -1      | -1      | -1                    | -1 | -1                    | -1 |           |
| LATE ADAPTERS                                         | 2            | 1       | 1       | 56                    | 1  | 9                     | 1  | 65        |
|                                                       |              |         |         | 86.2                  | 1  | 13.8                  | 1  | 14.7      |
|                                                       | 1            | 1       | 1       | 13.8                  | 1  | 26.5                  | 1  |           |
|                                                       | 1            | 1       | 1       | 12.7                  | 1  | 2.0                   | 1  |           |
|                                                       | -1           | -1      | -1      | -1                    | -1 | -1                    | -1 |           |
| NON-ADAPTERS                                          | 3            | 1       | 1       | 269                   | 1  | 14                    | 1  | 279       |
|                                                       |              |         |         | 95.0                  | 1  | 5.0                   | 1  | 63.3      |
|                                                       | 1            | 1       | 1       | 65.1                  | 1  | 41.2                  | 1  |           |
|                                                       | 1            | 1       | 1       | 60.1                  | 1  | 3.2                   | 1  |           |
|                                                       | -1           | -1      | -1      | -1                    | -1 | -1                    | -1 |           |
| COLUMN TOTAL                                          |              |         |         | 407                   |    | 34                    |    | 441       |
|                                                       |              |         |         | 92.5                  |    | 7.7                   |    | 100.0     |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- |              |         |         |                       |    |                       |    |           |
| MAN CHI SQUARE =                                      | 8.60789 with |         |         | 2 DEGREES OF FREEDOM. |    | SIGNIFICANCE = 0.0176 |    |           |

TABLE B-6

RELATION BETWEEN THREE ADOPTER GROUPS AND FAMILY LIFE CYCLE MEASURED  
BY NUMBER OF CHILDREN IN THE AGE RANGE 6 TO 12

| XADAPT           | COUNT   |              | INCNT | >=1 CHIL              |       | RCW<br>TOTAL          |
|------------------|---------|--------------|-------|-----------------------|-------|-----------------------|
|                  | ROW PCT | COL PCT      |       | ORGN                  | 1     |                       |
|                  | TOT PCT | I            |       | 0                     | I     |                       |
|                  | -----   | -----        |       | -----                 | ----- |                       |
| EARLY ADAPTERS   | 1       | 1            | 77    | 1                     | 20    | 97                    |
|                  |         | 1            | 79.4  | 1                     | 20.6  | 22.0                  |
|                  | 1       | 1            | 20.6  | 1                     | 32.3  |                       |
|                  | 1       | 1            | 17.5  | 1                     | 4.5   |                       |
| LATE ADAPTERS    | -1      | -1           | ----- | -----                 | ----- | -----                 |
|                  | 2       | 1            | 54    | 1                     | 11    | 65                    |
|                  | 1       | 1            | 52.1  | 1                     | 15.9  | 14.7                  |
|                  | 1       | 1            | 14.2  | 1                     | 18.0  |                       |
| NON-ADAPTERS     | 1       | 1            | 12.2  | 1                     | 2.5   |                       |
|                  | -1      | -1           | ----- | -----                 | ----- | -----                 |
|                  | 3       | 1            | 249   | 1                     | 30    | 279                   |
|                  | 1       | 1            | 85.2  | 1                     | 10.8  | 63.3                  |
| COLUMN<br>TOTAL  | 1       | 1            | 65.5  | 1                     | 49.2  |                       |
|                  | 1       | 1            | 56.5  | 1                     | 6.8   |                       |
|                  | -1      | -1           | ----- | -----                 | ----- | -----                 |
|                  |         |              | 380   |                       | 61    | 441                   |
|                  |         |              | 86.2  |                       | 13.8  | 100.0                 |
| RAW CHI SQUARE = |         | 6.48397 WITH |       | 2 DEGREES OF FREEDOM. |       | SIGNIFICANCE = 0.0390 |

TABLE B-7

RELATION BETWEEN THREE ADOPTER GROUPS AND FAMILY LIFE CYCLE MEASURED  
BY NUMBER OF CHILDREN IN THE AGE RANGE 13 TO 18

| X ADAPT        | COUNT |      | INCORP | >=1 CHILDREN | ROW TOTAL |
|----------------|-------|------|--------|--------------|-----------|
|                | 1     | 2    |        |              |           |
| EARLY ADAPTERS | 1     | 1    | 16     | 22           | 57        |
|                | 1     | 1    | 77.3   | 22.7         | 22.0      |
|                | 1     | 1    | 20.5   | 29.3         |           |
|                | 1     | 1    | 17.0   | 5.0          |           |
|                | -1    | -1   | -      | -            | -         |
| LATE ADAPTERS  | 2     | 1    | 59     | 6            | 65        |
|                | 1     | 1    | 50.8   | 5.2          | 14.7      |
|                | 1     | 1    | 16.1   | 8.0          |           |
|                | 1     | 1    | 13.4   | 1.4          |           |
|                | -1    | -1   | -      | -            | -         |
| NON-ADAPTERS   | 3     | 1    | 232    | 47           | 279       |
|                | 1     | 1    | 83.2   | 16.8         | 63.3      |
|                | 1     | 1    | 63.4   | 62.7         |           |
|                | 1     | 1    | 52.6   | 10.7         |           |
|                | -1    | -1   | -      | -            | -         |
| COLUMN TOTAL   | 266   | 75   |        |              | 441       |
|                | 83.0  | 17.0 |        |              | 100.0     |

KAM CHI SQUARE = 5.00193 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0420



TABLE B-9  
RELATION BETWEEN THREE ADAPTER GROUPS AND OCCUPATION

| XADAPT           | COUNT | MANAGERIAL    | TECH, OFF | PROFESSORIAL           | RETIRED | F.C. MAKE              | OTHER | ROW TOTAL |
|------------------|-------|---------------|-----------|------------------------|---------|------------------------|-------|-----------|
|                  |       |               |           |                        |         |                        |       |           |
|                  |       | 1             | 2         | 3                      | 4       | 5                      | 6     |           |
| EARLY ADAPTERS   | 1     | 19            | 26        | 27                     | 9       | 10                     | 11    | 102       |
|                  |       | 18.6          | 25.5      | 26.5                   | 8.8     | 9.3                    | 10.8  | 22.5      |
|                  |       | 26.4          | 28.9      | 28.1                   | 9.8     | 16.9                   | 25.0  |           |
|                  |       | 4.2           | 5.7       | 6.0                    | 2.0     | 2.2                    | 2.4   |           |
| LATE ADAPTERS    | 2     | 13            | 12        | 16                     | 7       | 12                     | 8     | 68        |
|                  |       | 19.1          | 17.0      | 23.5                   | 10.3    | 17.6                   | 11.8  | 15.0      |
|                  |       | 18.1          | 13.3      | 16.7                   | 7.5     | 20.3                   | 18.2  |           |
|                  |       | 2.9           | 2.6       | 3.5                    | 1.5     | 2.6                    | 1.8   |           |
| NON-ADAPTERS     | 3     | 40            | 52        | 53                     | 76      | 37                     | 25    | 283       |
|                  |       | 14.1          | 18.4      | 18.7                   | 26.9    | 13.1                   | 8.8   | 62.5      |
|                  |       | 55.6          | 57.8      | 55.2                   | 82.6    | 62.7                   | 56.8  |           |
|                  |       | 8.8           | 11.5      | 11.7                   | 16.3    | 8.2                    | 5.5   |           |
| COLUMN TOTAL     |       | 72            | 90        | 96                     | 92      | 59                     | 44    | 453       |
|                  |       | 15.9          | 19.9      | 21.2                   | 20.3    | 13.0                   | 9.7   | 100.0     |
| KAM CHI SQUARE = |       | 24.43564 WITH |           | 10 DEGREES OF FREEDOM. |         | SIGNIFICANCE = 0.00065 |       |           |

TABLE B-10  
RELATION BETWEEN THREE ADAPTER GROUPS AND EDUCATION

| X ADAPT           | COUNT |               | IF HIGH SCH COLLEGE | GRADUATE SCHOOL       | ROW TOTAL |
|-------------------|-------|---------------|---------------------|-----------------------|-----------|
|                   | ROW   | PCT           |                     |                       |           |
|                   | COL   | PCT           |                     |                       |           |
|                   | TOT   | PCT           |                     |                       |           |
|                   | 1     | 1             | 1                   | 3                     | 1         |
| EARLY ADAPTERS    | 1     | 1             | 44                  | 34                    | 102       |
|                   | 1     | 22.5          | 43.1                | 33.3                  | 22.5      |
|                   | 1     | 15.2          | 22.4                | 34.3                  |           |
|                   | 1     | 5.3           | 9.7                 | 7.5                   |           |
| LATE ADAPTERS     | 2     | 1             | 34                  | 12                    | 68        |
|                   | 1     | 22.4          | 50.0                | 17.6                  | 15.0      |
|                   | 1     | 13.9          | 17.3                | 12.1                  |           |
|                   | 1     | 4.9           | 7.5                 | 2.6                   |           |
| NON-ADAPTERS      | 3     | 1             | 118                 | 53                    | 283       |
|                   | 1     | 35.0          | 41.7                | 18.7                  | 62.5      |
|                   | 1     | 70.9          | 60.2                | 52.5                  |           |
|                   | 1     | 24.7          | 26.0                | 11.7                  |           |
| COLUMN TOTAL      |       | 158           | 196                 | 99                    | 453       |
|                   |       | 34.9          | 43.3                | 21.9                  | 100.0     |
| KAP. CHI SQUARE = |       | 14.52224 WITH |                     | 4 DEGREES OF FREEDOM. |           |
|                   |       |               |                     | SIGNIFICANCE = 0.0058 |           |

TABLE B-11  
RELATION BETWEEN THREE ADAPTER GROUPS AND EMPLOYMENT STATUS

| COUNT          | I   | PARTIAL | FULLTIME | SELF-EMP | NOT EMP | RETIRED | PCT   |
|----------------|-----|---------|----------|----------|---------|---------|-------|
|                |     |         |          |          |         |         |       |
| RAW PCT        | 1   | 2       | 3        | 4        | 5       |         | TOTAL |
| CUL PCT        | 1   | 2       | 3        | 4        | 5       |         |       |
| TOT PCT        | 1   | 2       | 3        | 4        | 5       |         |       |
| <hr/>          |     |         |          |          |         |         |       |
| XADAPT         | 1   | 7       | 65       | 8        | 9       | 12      | 107   |
| <hr/>          |     |         |          |          |         |         |       |
| EARLY ADAPTERS | 1   | 6.9     | 54.7     | 7.8      | 8.8     | 11.8    | 22.5  |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 21.9    | 27.8     | 25.6     | 18.3    | 11.0    |       |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 1.5     | 14.6     | 1.8      | 2.0     | 2.6     |       |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 0       | 40       | 2        | 13      | 12      | 68    |
| <hr/>          |     |         |          |          |         |         |       |
| LATE ADAPTERS  | 1   | 0.0     | 58.8     | 4.4      | 19.1    | 17.6    | 15.0  |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 0.0     | 16.9     | 11.1     | 27.1    | 11.0    |       |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 0.0     | 8.8      | 0.7      | 2.9     | 2.6     |       |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 25      | 131      | 16       | 26      | 85      | 283   |
| <hr/>          |     |         |          |          |         |         |       |
| NON-ADAPTERS   | 1   | 8.8     | 46.3     | 5.7      | 9.2     | 20.0    | 62.5  |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 78.1    | 55.3     | 55.3     | 54.2    | 78.0    |       |
| <hr/>          |     |         |          |          |         |         |       |
|                | 1   | 5.5     | 28.9     | 3.5      | 5.7     | 18.8    |       |
| <hr/>          |     |         |          |          |         |         |       |
| COLUMB.        | 32  | 237     | 27       | 48       | 109     |         | 453   |
| TOTAL          | 7.1 | 52.3    | 6.0      | 10.6     | 24.1    |         | 100.0 |

2 OUT OF 15 (13.3%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
 MINIMUM EXPECTED CELL FREQUENCY = 4.053  
 RAW CHI SQUARE = 25.75960 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0002

TABLE B-12

RELATION BETWEEN THREE ADAPTER GROUPS AND REGULAR WORKING HOURS

| COUNT            |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------|-----|----------|------|---|---------------------|----------------|--------|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ROW              | PCT | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| COL              | PCT | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TOT              | PCT | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XADAPT           |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EARLY ADAPTERS   |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| LATE ADAPTERS    |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NON-ADAPTERS     |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| COLUMNS          |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TOTAL            |     | 1        | 2    | 3 | 4                   | 5              | 6      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RAW CHI SQUARE = |     | 12.63917 | WITH | 4 | DEGREES OF FREEDOM. | SIGNIFICANCE = | 0.0121 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



TABLE B-13

RELATION BETWEEN THREE ADAPTER GROUPS AND AGE

| X ADAPT        | COUNT | 1  | 1-31 | YEAR | 31-40 | YE | 41-50 | YE  | 51-60 | YE  | >60  | YEAR | ROW PCT | COL PCT | IS | TOT PCT | ROW TOTAL |
|----------------|-------|----|------|------|-------|----|-------|-----|-------|-----|------|------|---------|---------|----|---------|-----------|
|                |       |    |      |      |       |    |       |     |       |     |      |      |         |         |    |         |           |
| EARLY ADAPTERS | 1     | 1  | 1    | 1    | 2     | 1  | 3     | 1   | 4     | 1   | 5    | 1    | 102     |         |    |         | 102       |
|                |       | 1  | 1    | 1    | 22    | 1  | 26    | 1   | 28    | 1   | 10   | 1    |         |         |    |         | 22.5      |
|                |       | 1  | 15.7 | 1    | 21.6  | 1  | 25.5  | 1   | 27.5  | 1   | 5.3  | 1    |         |         |    |         |           |
|                |       | 1  | 42.1 | 1    | 31.4  | 1  | 28.2  | 1   | 22.4  | 1   | 7.8  | 1    |         |         |    |         |           |
| LATE ADAPTERS  | 2     | 1  | 1    | 1    | 4.9   | 1  | 5.7   | 1   | 6.2   | 1   | 2.2  | 1    |         |         |    |         |           |
|                |       | 1  | 1    | 1    | 9     | 1  | 16    | 1   | 19    | 1   | 12   | 1    |         |         |    |         | 15.0      |
|                |       | 1  | 17.6 | 1    | 13.2  | 1  | 22.5  | 1   | 27.9  | 1   | 17.6 | 1    |         |         |    |         |           |
|                |       | 1  | 31.6 | 1    | 12.9  | 1  | 17.4  | 1   | 15.2  | 1   | 5.4  | 1    |         |         |    |         |           |
| NON-ADAPTERS   | 3     | 1  | 1    | 1    | 2.0   | 1  | 3.5   | 1   | 4.2   | 1   | 2.6  | 1    |         |         |    |         |           |
|                |       | 1  | 1    | 1    | 39    | 1  | 50    | 1   | 78    | 1   | 106  | 1    |         |         |    |         | 283       |
|                |       | 1  | 3.5  | 1    | 13.8  | 1  | 17.7  | 1   | 27.6  | 1   | 37.5 | 1    |         |         |    |         | 62.5      |
|                |       | 1  | 26.3 | 1    | 55.7  | 1  | 54.3  | 1   | 62.4  | 1   | 82.8 | 1    |         |         |    |         |           |
| COLUMN TOTAL   |       | 38 | 8.4  | 70   | 15.5  | 92 | 20.3  | 125 | 27.6  | 128 | 28.3 | 453  |         |         |    |         | 100.0     |

RAW CHI SQUARE = 50.72118 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000

TABLE B-14

RELATION BETWEEN THREE ADOPTER GROUPS AND TOTAL FAMILY INCOME

| COUNT        |     | COUNT |  |  |  | COUNT |  |  |  | ROW TOTAL |
|--------------|-----|-------|--|--|--|-------|--|--|--|-----------|
| COUNT        |     | COUNT |  |  |  | COUNT |  |  |  |           |
| ROW          | PCT | COUNT |  |  |  | COUNT |  |  |  | TOTAL     |
| COL          | PCT | COUNT |  |  |  | COUNT |  |  |  |           |
| TOT          | PCT | COUNT |  |  |  | COUNT |  |  |  |           |
| ADAPT        |     | COUNT |  |  |  | COUNT |  |  |  |           |
| EARLY ADAPT  |     | COUNT |  |  |  | COUNT |  |  |  |           |
| LATE ADAPT   |     | COUNT |  |  |  | COUNT |  |  |  |           |
| NON-ADAPT    |     | COUNT |  |  |  | COUNT |  |  |  |           |
| COLUMN TOTAL |     | COUNT |  |  |  | COUNT |  |  |  |           |
| TOTAL        |     | COUNT |  |  |  | COUNT |  |  |  |           |

KAM CHI SQUARE = 17.70354 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0069

TABLE B-15  
RELATION BETWEEN THREE ADOPTER GROUPS AND SOCIAL PARTICIPATION

| COUNT                                                                     | ROW | PCT  | INONE | 1-2 CATE |        | 3-4 CATE |        | 5-6 CATE |       | PCW   |
|---------------------------------------------------------------------------|-----|------|-------|----------|--------|----------|--------|----------|-------|-------|
|                                                                           | COL | PCT  | I     | CORRS    | GORIES | CORRS    | GORIES | CORRS    | TOTAL |       |
|                                                                           | TOT | PCT  | I     | 0        | 1      | 1        | 2      | 1        | 3     | I     |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----         |     |      |       |          |        |          |        |          |       |       |
| XADAPT                                                                    |     |      |       |          |        |          |        |          |       |       |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----         |     |      |       |          |        |          |        |          |       |       |
| EARLY ADAPTERS                                                            |     |      |       |          |        |          |        |          |       |       |
| 1                                                                         | 1   | 13   | 1     | 35       | 1      | 33       | 1      | 21       | 1     | 102   |
|                                                                           |     | 12.7 | 1     | 34.3     | 1      | 32.4     | 1      | 20.6     | 1     | 22.5  |
| 1                                                                         | 1   | 28.9 | 1     | 19.3     | 1      | 19.6     | 1      | 35.0     | 1     |       |
| 1                                                                         | 1   | 2.9  | 1     | 7.7      | 1      | 7.2      | 1      | 4.6      | 1     |       |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----         |     |      |       |          |        |          |        |          |       |       |
| LATE ADAPTERS                                                             |     |      |       |          |        |          |        |          |       |       |
| 2                                                                         | 1   | 5    | 1     | 30       | 1      | 26       | 1      | 7        | 1     | 63    |
|                                                                           |     | 7.4  | 1     | 44.1     | 1      | 38.2     | 1      | 10.3     | 1     | 15.0  |
| 1                                                                         | 1   | 11.1 | 1     | 16.6     | 1      | 15.6     | 1      | 11.7     | 1     |       |
| 1                                                                         | 1   | 1.1  | 1     | 6.6      | 1      | 5.7      | 1      | 1.5      | 1     |       |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----         |     |      |       |          |        |          |        |          |       |       |
| NON-ADAPTERS                                                              |     |      |       |          |        |          |        |          |       |       |
| 3                                                                         | 1   | 27   | 1     | 116      | 1      | 108      | 1      | 32       | 1     | 283   |
|                                                                           |     | 5.5  | 1     | 41.0     | 1      | 38.2     | 1      | 11.3     | 1     | 62.5  |
| 1                                                                         | 1   | 60.0 | 1     | 64.1     | 1      | 64.7     | 1      | 53.3     | 1     |       |
| 1                                                                         | 1   | 0.0  | 1     | 25.6     | 1      | 23.8     | 1      | 7.1      | 1     |       |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----         |     |      |       |          |        |          |        |          |       |       |
| COLUMN                                                                    |     | 45   |       | 181      |        | 167      |        | 60       |       | 453   |
| TOTAL                                                                     |     | 5.9  |       | 46.0     |        | 36.9     |        | 13.2     |       | 100.0 |
| ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----         |     |      |       |          |        |          |        |          |       |       |
| RAW CHI SQUARE = 6.02358 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.1559 |     |      |       |          |        |          |        |          |       |       |

TABLE B-16  
RELATION BETWEEN THREE ADOPTER GROUPS AND SOCIAL MOBILITY

| XADAPT          | COUNT   |         | 10,1 PCT      |                       | 2,3 RESI       |          | >3 RESID |          | ROW TOTAL |
|-----------------|---------|---------|---------------|-----------------------|----------------|----------|----------|----------|-----------|
|                 | ROW PCT | COL PCT | 10,1 PCT      | 2,3 RESI              | >3 RESID       | 10,1 PCT | 2,3 RESI | >3 RESID |           |
|                 | TOT PCT | TOT PCT | 1             | 2                     | 3              | 1        | 2        | 3        |           |
| EARLY ADAPTERS  | 1       | 1       | 24            | 41                    | 35             | 1        | 1        | 1        | 100       |
|                 |         |         | 24.0          | 41.0                  | 35.0           | 1        | 1        | 1        | 22.3      |
|                 | 1       | 1       | 11.8          | 24.8                  | 44.2           | 1        | 1        | 1        |           |
|                 | 1       | 1       | 5.4           | 9.2                   | 7.8            | 1        | 1        | 1        |           |
| LATE ADAPTERS   | 2       | 1       | 23            | 31                    | 14             | 1        | 1        | 1        | 68        |
|                 |         |         | 33.8          | 45.6                  | 20.6           | 1        | 1        | 1        | 15.2      |
|                 | 1       | 1       | 11.3          | 18.8                  | 17.7           | 1        | 1        | 1        |           |
|                 | 1       | 1       | 5.1           | 6.9                   | 3.1            | 1        | 1        | 1        |           |
| NON-ADAPTERS    | 3       | 1       | 157           | 93                    | 30             | 1        | 1        | 1        | 280       |
|                 |         |         | 56.1          | 33.2                  | 10.7           | 1        | 1        | 1        | 62.5      |
|                 | 1       | 1       | 77.0          | 56.4                  | 38.0           | 1        | 1        | 1        |           |
|                 | 1       | 1       | 35.0          | 20.8                  | 6.7            | 1        | 1        | 1        |           |
| COLUMN TOTAL    |         |         | 204           | 165                   | 79             |          |          |          | 448       |
|                 |         |         | 45.5          | 36.8                  | 17.6           |          |          |          | 100.0     |
| KALCHI SQUARE = |         |         | 40.53300 WITH | 4 DEGREES OF FREEDOM. | SIGNIFICANCE = | 0.0000   |          |          |           |

TABLE B-17

RELATION BETWEEN THREE ADAPTER GROUPS AND PRINT READERSHIP

| COUNT          |     | 1      | 2     | 3    | 4-5   | RCW  |       |      |       |      |       |       |
|----------------|-----|--------|-------|------|-------|------|-------|------|-------|------|-------|-------|
| ROW            | PCT | INC    | CATEG | 1    | CATEG | 2    | CATEG | 3    | CATEG | 4-5  | CATEG | RCW   |
| CUL            | PCT | ICRIES | RY    | RIES | RIES  | RIES | RIES  | RIES | RIES  | RIES | RIES  | TOTAL |
| TOT            | PCT | 1      | 0     | 1    | 1     | 2    | 1     | 3    | 1     | 4    | 1     |       |
| XADAPT         |     |        |       |      |       |      |       |      |       |      |       |       |
| 1              | 1   | 1      | 3     | 1    | 15    | 1    | 42    | 1    | 32    | 1    | 10    | 102   |
| EARLY ADAPTERS |     |        |       |      |       |      |       |      |       |      |       |       |
|                |     |        | 2.9   | 1    | 14.7  | 1    | 41.2  | 1    | 31.4  | 1    | 5.8   | 22.5  |
|                |     |        | 15.8  | 1    | 19.5  | 1    | 22.8  | 1    | 24.8  | 1    | 22.7  |       |
|                |     |        | 0.7   | 1    | 3.3   | 1    | 5.3   | 1    | 7.1   | 1    | 2.2   |       |
| 2              | 1   | 1      | 4     | 1    | 8     | 1    | 33    | 1    | 17    | 1    | 6     | 68    |
| LATE ADAPTERS  |     |        |       |      |       |      |       |      |       |      |       |       |
|                |     |        | 5.9   | 1    | 11.3  | 1    | 48.5  | 1    | 25.0  | 1    | 8.3   | 15.0  |
|                |     |        | 21.1  | 1    | 10.4  | 1    | 17.9  | 1    | 13.2  | 1    | 12.6  |       |
|                |     |        | 0.9   | 1    | 1.8   | 1    | 7.3   | 1    | 3.8   | 1    | 1.3   |       |
| 3              | 1   | 1      | 12    | 1    | 54    | 1    | 105   | 1    | 80    | 1    | 28    | 233   |
| LACK-ADAPTERS  |     |        |       |      |       |      |       |      |       |      |       |       |
|                |     |        | 4.2   | 1    | 19.1  | 1    | 38.5  | 1    | 28.3  | 1    | 5.9   | 62.5  |
|                |     |        | 63.2  | 1    | 70.1  | 1    | 59.2  | 1    | 62.0  | 1    | 63.6  |       |
|                |     |        | 2.6   | 1    | 11.9  | 1    | 24.1  | 1    | 17.7  | 1    | 6.2   |       |
| COLUMN         |     |        |       |      |       |      |       |      |       |      |       |       |
|                |     |        | 19    | 77   | 184   | 40.6 | 129   | 28.5 | 44    | 9.7  | 453   | 100.0 |
|                |     |        | 4.2   | 17.9 | 40.6  | 28.5 | 9.7   |      |       |      |       |       |

2 OUT OF 15 (13.3%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
 MINIMUM EXPECTED CELL FREQUENCY = 2.852  
 RAN CHI SQUARE = 5.00144 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.7574

TABLE B-18

RELATION BETWEEN THREE ADOPTER GROUPS AND EXPOSURE TO NEWS MEDIA IN GENERAL

| COUNT          |     | 1         | 2       | 3       | 4        | 5        | ROW   |
|----------------|-----|-----------|---------|---------|----------|----------|-------|
| ROW            | PCT | 10-1 HOUR | 2 HOURS | 3 HOURS | 4-5 HOUR | >5 HOURS | TOTAL |
| CUL            | PCT | IS        |         |         | S        |          |       |
| TOT            | PCT | 1         | 2       | 3       | 4        | 5        | 1     |
| XADAPT         |     |           |         |         |          |          |       |
| 1              | 1   | 21        | 25      | 34      | 15       | 5        | 100   |
| EARLY ADAPTERS |     |           |         |         |          |          |       |
| 1              | 1   | 21.0      | 25.0    | 34.0    | 15.0     | 5.0      | 22.3  |
| 1              | 1   | 30.0      | 20.5    | 28.6    | 14.4     | 14.7     | 1     |
| 1              | 1   | 4.7       | 5.6     | 7.6     | 3.3      | 1.1      | 1     |
| -1             | -1  | -         | -       | -       | -        | -        | -     |
| 2              | 1   | 13        | 14      | 19      | 16       | 5        | 67    |
| LATE ADAPTERS  |     |           |         |         |          |          |       |
| 1              | 1   | 15.4      | 20.9    | 28.4    | 23.9     | 7.5      | 14.9  |
| 1              | 1   | 18.6      | 11.5    | 16.0    | 15.4     | 14.7     | 1     |
| 1              | 1   | 2.9       | 3.1     | 4.2     | 3.6      | 1.1      | 1     |
| -1             | -1  | -         | -       | -       | -        | -        | -     |
| 3              | 1   | 36        | 63      | 66      | 73       | 24       | 282   |
| NON-ADAPTERS   |     |           |         |         |          |          |       |
| 1              | 1   | 12.8      | 29.4    | 22.4    | 25.9     | 8.5      | 62.8  |
| 1              | 1   | 51.4      | 66.0    | 55.5    | 70.2     | 70.6     | 1     |
| 1              | 1   | 8.0       | 18.5    | 14.7    | 16.3     | 5.3      | 1     |
| -1             | -1  | -         | -       | -       | -        | -        | -     |
| COLUMN         |     | 70        | 122     | 119     | 104      | 34       | 449   |
| TOTAL          |     | 15.6      | 27.2    | 26.5    | 23.2     | 7.6      | 100.0 |

ROW CHI SQUARE = 13.84700 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0858

TABLE B-19

RELATION BETWEEN THREE ADOPTER GROUPS AND PROCLIVITY TO COMPLY WITH  
PERCEIVED PREVAILING SOCIAL INFLUENCES

| XADAPT           | COUNT   |    | ROW PCT |      | COL PCT |    | TOTAL               |       | PCW                   |
|------------------|---------|----|---------|------|---------|----|---------------------|-------|-----------------------|
|                  | 1       | 2  | 1       | 2    | 1       | 2  | 1                   |       |                       |
|                  | YES     | NO | YES     | NO   | YES     | NO | YES                 |       |                       |
|                  | 1       | 2  | 1       | 2    | 1       | 2  | 1                   |       |                       |
| EARLY ADAPTERS   | 1       | 1  | 44      | 54   | 1       | 1  | 1                   | 98    |                       |
|                  | 1       | 1  | 44.9    | 55.1 | 1       | 1  | 1                   | 22.8  |                       |
|                  | 1       | 1  | 28.4    | 19.6 | 1       | 1  | 1                   |       |                       |
|                  | 1       | 1  | 10.2    | 12.6 | 1       | 1  | 1                   |       |                       |
|                  | -1      | -1 | -1      | -1   | -1      | -1 | -1                  |       |                       |
| LATE ADAPTERS    | 2       | 1  | 28      | 38   | 1       | 1  | 1                   | 66    |                       |
|                  | 1       | 1  | 42.4    | 57.6 | 1       | 1  | 1                   | 15.3  |                       |
|                  | 1       | 1  | 18.1    | 13.8 | 1       | 1  | 1                   |       |                       |
|                  | 1       | 1  | 6.5     | 8.8  | 1       | 1  | 1                   |       |                       |
|                  | -1      | -1 | -1      | -1   | -1      | -1 | -1                  |       |                       |
| NON-ADAPTERS     | 3       | 1  | 83      | 183  | 1       | 1  | 1                   | 266   |                       |
|                  | 1       | 1  | 31.2    | 68.8 | 1       | 1  | 1                   | 61.5  |                       |
|                  | 1       | 1  | 52.5    | 66.5 | 1       | 1  | 1                   |       |                       |
|                  | 1       | 1  | 19.3    | 42.6 | 1       | 1  | 1                   |       |                       |
|                  | -1      | -1 | -1      | -1   | -1      | -1 | -1                  |       |                       |
| COLUMN TOTAL     |         |    | 155     | 275  |         |    |                     | 430   |                       |
|                  |         |    | 36.0    | 64.0 |         |    |                     | 100.0 |                       |
| RAW CHI SQUARE = | 7.20200 |    | WITH    |      | 2       |    | DEGREES OF FREEDOM. |       | SIGNIFICANCE = 0.0273 |

APPENDIX C

PERSONALITY DIMENSIONS



TABLE C-1

RELATION BETWEEN THREE ADAPTER GROUPS AND AGGRESSIVE ORIENTATION

| XADAPT         | COUNT   |         |         |          |             | ROW TOTAL |      |       |   |      |
|----------------|---------|---------|---------|----------|-------------|-----------|------|-------|---|------|
|                | 1       | 2       | 3       | 4        | 5           | 1         | 2    | 3     | 4 | 5    |
|                | ROW PCT | COL PCT | TOT PCT | SUM < 44 | SUM 44 - 51 | SUM > 51  | 1    | 2     | 3 | 4    |
|                | 1       | 1       | 1       | 1        | 1           | 1         | 1    | 1     | 1 | 1    |
| EARLY ADAPTERS | 1       | 1       | 1       | 35       | 1           | 31        | 1    | 36    | 1 | 102  |
|                | 1       | 1       | 1       | 34.3     | 1           | 30.4      | 1    | 35.2  | 1 | 22.5 |
|                | 1       | 1       | 1       | 16.7     | 1           | 20.7      | 1    | 38.3  | 1 |      |
|                | 1       | 1       | 1       | 7.7      | 1           | 6.8       | 1    | 7.5   | 1 |      |
| LATE ADAPTERS  | 2       | 1       | 1       | 25       | 1           | 27        | 1    | 16    | 1 | 68   |
|                | 1       | 1       | 1       | 36.8     | 1           | 39.7      | 1    | 23.5  | 1 | 15.0 |
|                | 1       | 1       | 1       | 12.0     | 1           | 18.0      | 1    | 17.0  | 1 |      |
|                | 1       | 1       | 1       | 5.5      | 1           | 6.0       | 1    | 2.5   | 1 |      |
| NON-ADAPTERS   | 3       | 1       | 1       | 149      | 1           | 92        | 1    | 42    | 1 | 283  |
|                | 1       | 1       | 1       | 52.7     | 1           | 32.5      | 1    | 14.8  | 1 | 62.5 |
|                | 1       | 1       | 1       | 71.3     | 1           | 61.3      | 1    | 44.7  | 1 |      |
|                | 1       | 1       | 1       | 32.9     | 1           | 26.3      | 1    | 9.2   | 1 |      |
| COLUMN TOTAL   |         |         |         |          | 209         | 150       | 94   | 453   |   |      |
| TOTAL          |         |         |         |          | 46.1        | 33.1      | 20.8 | 100.0 |   |      |

RAW CHI SQUARE = 23.55208 WITH 4 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0001

TABLE C-2

RELATION BETWEEN THREE ADAPTER GROUPS AND DETACHED ORIENTATION

| COUNT          | 1    | ISUM < 26 | SUM 26-3 | SUM > 31 | KCW<br>TOTAL |
|----------------|------|-----------|----------|----------|--------------|
| ROW PCT        | 1    | 57        | 39       | 6        | 102          |
| COL PCT        | 1    | 55.9      | 38.2     | 5.9      | 22.5         |
| TOT PCT        | 1    | 1         | 2        | 3        |              |
| XADAPT         | 1    | 1         | 1        | 1        |              |
| EARLY ADAPTERS | 1    | 1         | 1        | 1        |              |
|                | 1    | 25.1      | 22.5     | 11.3     |              |
|                | 1    | 12.6      | 8.6      | 1.3      |              |
|                | -1   | -1        | -1       | -1       |              |
| LATE ADAPTERS  | 2    | 40        | 22       | 6        | 68           |
|                | 1    | 58.8      | 32.4     | 8.8      | 15.0         |
|                | 1    | 17.6      | 12.7     | 11.3     |              |
|                | 1    | 8.8       | 4.9      | 1.3      |              |
|                | -1   | -1        | -1       | -1       |              |
| NON-ADAPTERS   | 3    | 130       | 112      | 41       | 283          |
|                | 1    | 45.9      | 39.6     | 14.5     | 62.5         |
|                | 1    | 57.3      | 64.7     | 77.4     |              |
|                | 1    | 28.7      | 24.7     | 9.1      |              |
|                | -1   | -1        | -1       | -1       |              |
| COLUMN         | 227  | 173       | 53       | 453      |              |
| TOTAL          | 50.1 | 38.2      | 11.7     | 100.0    |              |

KAW CHI SQUARE = 8.75256 WITH 4 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0676

TABLE C-3

RELATION BETWEEN THREE ADAPTER GROUPS AND COMPLIANT ORIENTATION

| COUNT          | ISUM < 46 | SUM 46 - 49 | SUM > 49 | ROW TOTAL |
|----------------|-----------|-------------|----------|-----------|
| ROW PCT        | 1         | 1           | 1        |           |
| COL PCT        | 1         | 2           | 3        |           |
| TOT PCT        | 1         | 1           | 1        |           |
| XADAPT         | 1         | 1           | 1        |           |
| EARLY ADAPTERS | 1         | 1           | 1        | 102       |
|                | 1         | 1           | 1        | 22.5      |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
| LATE ADAPTERS  | 1         | 1           | 1        | 68        |
|                | 1         | 1           | 1        | 15.0      |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
| NON-ADAPTERS   | 1         | 1           | 1        | 283       |
|                | 1         | 1           | 1        | 62.5      |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
|                | 1         | 1           | 1        |           |
| COLUMN TOTAL   | 205       | 140         | 108      | 453       |
|                | 45.3      | 30.9        | 23.6     | 100.0     |

RAW CHI SQUARE = 3.59546 WITH 4 DEGREES OF FREEDOM. SIGNIFICANCE = 0.4635

RAW CHI SQUARE = 3.59546 WITH 4 DEGREES OF FREEDOM. SIGNIFICANCE = 0.4635

APPENDIX D

GENERAL INFORMATION AND/OR EXPERIENCE WITH REGARD TO  
GENERAL BANK-RELATED SERVICES AND V-24

TABLE D-1

RELATION BETWEEN THREE ADOPTER GROUPS AND V-24 AVERAGE USAGE RATE PER MONTH

| COUNT          | I                                            |
|----------------|----------------------------------------------|
| ROW PCT        | I 1-4 TIME 5-8 TIME >8 TIMES<br>COL PCT IS S |
| TOT PCT I      | 1 1 2 1 3 I                                  |
| XADAPT         | -I-I-I-I-I-                                  |
| EARLY ADAPTERS |                                              |
| 1              | 54 I 25 I 17 I 96                            |
|                | I 56.3 I 26.0 I 17.7 I 62.7                  |
|                | I 54.5 I 71.4 I 89.5 I                       |
|                | I 35.3 I 16.3 I 11.1 I                       |
|                | -I-I-I-I-I-                                  |
| LATE ADAPTERS  |                                              |
| 2              | 45 I 10 I 2 I 57                             |
|                | I 78.9 I 17.5 I 3.5 I 37.3                   |
|                | I 45.5 I 28.6 I 10.5 I                       |
|                | I 25.4 I 6.5 I 1.3 I                         |
|                | -I-I-I-I-I-                                  |
| COLUMN TOTAL   |                                              |
|                | 99 35 19 153                                 |
|                | 64.7 22.9 12.4 100.0                         |

|                  |              |                       |                       |
|------------------|--------------|-----------------------|-----------------------|
| RAW CHI SQUARE = | 9.78336 WITH | 2 DEGREES OF FREEDOM. | SIGNIFICANCE = 0.0075 |
|------------------|--------------|-----------------------|-----------------------|

TABLE D-2

RELATION BETWEEN THREE ADAPTER GROUPS AND CONVENTIONAL TELLER USAGE RATE PER MONTH

| XADAPT          | COUNT<br>ROW PCT<br>COL PCT<br>TOT PCT | TIME 1-2 |      | TIME 3-4 |      | TIME 5-6 |      | TIME 7-8 |      | TIME >8 |      | ROW<br>TOTAL |
|-----------------|----------------------------------------|----------|------|----------|------|----------|------|----------|------|---------|------|--------------|
|                 |                                        | I        | S    | I        | S    | I        | S    | I        | S    | I       | S    |              |
| EARLY ADAPTERS  | 1                                      | I        | I    | I        | I    | I        | I    | I        | I    | I       | I    | I            |
|                 |                                        | 39       | 35.4 | 31       | 31.3 | 17       | 17.2 | 4        | 4.0  | 8       | 8.1  | 99           |
|                 |                                        | I        | I    | I        | I    | I        | I    | I        | I    | I       | I    | 23.1         |
|                 |                                        | I        | 32.8 | I        | 20.7 | I        | 18.7 | I        | 15.4 | I       | 18.6 | I            |
| LATE ADAPTERS   | 2                                      | I        | I    | I        | I    | I        | I    | I        | I    | I       | I    | I            |
|                 |                                        | I        | 18   | I        | 25   | I        | 11   | I        | 3    | I       | 5    | 62           |
|                 |                                        | I        | 25.0 | I        | 40.3 | I        | 17.7 | I        | 4.8  | I       | 8.1  | 14.5         |
|                 |                                        | I        | 15.1 | I        | 16.7 | I        | 12.1 | I        | 11.5 | I       | 11.5 | I            |
| NON-ADAPTERS    | 3                                      | I        | I    | I        | I    | I        | I    | I        | I    | I       | I    | I            |
|                 |                                        | I        | 4.2  | I        | 5.8  | I        | 2.6  | I        | 0.7  | I       | 1.2  | I            |
|                 |                                        | I        | 62   | I        | 94   | I        | 63   | I        | 19   | I       | 30   | 268          |
|                 |                                        | I        | 23.1 | I        | 35.1 | I        | 23.5 | I        | 7.1  | I       | 11.2 | 62.5         |
| COLUMN<br>TOTAL |                                        | I        | 52.1 | I        | 62.7 | I        | 69.2 | I        | 73.1 | I       | 65.8 | I            |
|                 |                                        | I        | 14.5 | I        | 21.9 | I        | 14.7 | I        | 4.4  | I       | 7.0  | I            |
|                 |                                        | I        | 119  | I        | 150  | I        | 91   | I        | 26   | I       | 43   | 429          |
|                 |                                        | I        | 27.7 | I        | 35.0 | I        | 21.2 | I        | 6.1  | I       | 10.0 | 100.0        |

1 OUT OF 15 ( 6.7%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
 MINIMUM EXPECTED CELL FREQUENCY = 3.758  
 RAW CHI SQUARE = 11.86503 WITH 8 DEGREES OF FREEDOM. SIGNIFICANCE = 0.1573

TABLE D-3  
RELATION BETWEEN THREE ADOPTER GROUPS AND KNOWLEDGE ON LIABILITY

| XADAPT           | COUNT |          | RIGHT AM |      | WRONG AM |                                    | RCW<br>TOTAL |
|------------------|-------|----------|----------|------|----------|------------------------------------|--------------|
|                  | 1     | 2        | 1        | 2    | 1        | 2                                  |              |
| EARLY ADAPTERS   | 1     | 1        | 47       | 55   | 1        | 1                                  | 102          |
|                  |       |          | 46.1     | 53.9 | 1        | 1                                  | 22.5         |
|                  |       |          | 35.2     | 16.5 | 1        | 1                                  |              |
|                  |       |          | 10.4     | 12.1 | 1        | 1                                  |              |
| LATE ADAPTERS    | 2     | 1        | 27       | 41   | 1        | 1                                  | 68           |
|                  |       |          | 39.7     | 60.3 | 1        | 1                                  | 15.0         |
|                  |       |          | 22.5     | 12.3 | 1        | 1                                  |              |
|                  |       |          | 6.0      | 9.1  | 1        | 1                                  |              |
| NON-ADAPTERS     | 3     | 1        | 46       | 237  | 1        | 1                                  | 283          |
|                  |       |          | 16.3     | 83.7 | 1        | 1                                  | 62.5         |
|                  |       |          | 38.3     | 71.2 | 1        | 1                                  |              |
|                  |       |          | 10.2     | 52.3 | 1        | 1                                  |              |
| COLUMN           |       |          | 120      | 333  |          |                                    | 453          |
| TOTAL            |       |          | 26.5     | 73.5 |          |                                    | 100.0        |
| RAW CHI SQUARE = |       | 41.42381 | WITH     |      | 2        | DEGREES OF FREEDOM. SIGNIFICANCE = |              |
|                  |       |          |          |      |          | 0.0000                             |              |

TABLE D-4

RELATION BETWEEN THREE ADAPTER GROUPS AND THEIR COMPLAINTS  
AND PROBLEMS IN V-24 USAGE

| XADAPT         | COUNT | ROW PCT |      |      |      | COL PCT |      |      |     | TOTAL |   |   |   |
|----------------|-------|---------|------|------|------|---------|------|------|-----|-------|---|---|---|
|                |       | 1       | 2    | 3    | 4    | 1       | 2    | 3    | 4   | 1     | 2 | 3 | 4 |
| EARLY ADAPTERS | 1     | 53      | 40   | 4    | 5    | 52.0    | 39.2 | 3.9  | 4.9 | 102   |   |   |   |
|                |       | 16.8    | 59.7 | 8.3  | 22.7 |         |      |      |     | 22.5  |   |   |   |
|                |       | 11.7    | 8.8  | 0.9  | 1.1  |         |      |      |     |       |   |   |   |
|                |       |         |      |      |      |         |      |      |     |       |   |   |   |
|                |       |         |      |      |      |         |      |      |     |       |   |   |   |
| LATE ADAPTERS  | 2     | 47      | 17   | 4    | 0    | 65.1    | 25.0 | 5.9  | 0.0 | 68    |   |   |   |
|                |       | 14.9    | 25.4 | 8.3  | 0.0  |         |      |      |     | 15.0  |   |   |   |
|                |       | 10.4    | 3.8  | 0.9  | 0.0  |         |      |      |     |       |   |   |   |
|                |       |         |      |      |      |         |      |      |     |       |   |   |   |
|                |       |         |      |      |      |         |      |      |     |       |   |   |   |
| NON-ADAPTERS   | 3     | 216     | 10   | 40   | 17   | 76.3    | 3.5  | 14.1 | 6.0 | 283   |   |   |   |
|                |       | 68.4    | 14.9 | 83.3 | 77.3 |         |      |      |     | 62.5  |   |   |   |
|                |       | 47.7    | 2.2  | 8.8  | 3.8  |         |      |      |     |       |   |   |   |
|                |       |         |      |      |      |         |      |      |     |       |   |   |   |
|                |       |         |      |      |      |         |      |      |     |       |   |   |   |
| COLUMN         |       | 316     | 67   | 48   | 22   |         |      |      |     | 453   |   |   |   |
| TOTAL          |       | 65.8    | 14.8 | 10.6 | 4.9  |         |      |      |     | 100.0 |   |   |   |

2 OUT OF 12 ( 16.7%) OF THE VALID CELLS HAVE EXPECTED CELL FREQUENCY LESS THAN 5.0.  
MINIMUM EXPECTED CELL FREQUENCY = 3.302  
RAW CHI SQUARE = 89.69916 WITH 6 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0000





TABLE D-6  
RELATION BETWEEN THREE ADOPTER GROUPS AND NUMBER OF GASOLINE CREDIT CARDS OWNED

| XADAPT                                                                    | COUNT |   | ROW PCT |   | COL PCT |   | INONE |   | 1-2 CARD |   | >2 CARDS |   | ROW TOTAL |
|---------------------------------------------------------------------------|-------|---|---------|---|---------|---|-------|---|----------|---|----------|---|-----------|
|                                                                           | I     |   | I       |   | I       |   | I     |   | S        |   | I        |   |           |
|                                                                           | I     |   | I       |   | I       |   | I     |   | I        |   | I        |   |           |
|                                                                           | I     |   | I       |   | I       |   | I     |   | I        |   | I        |   |           |
| EARLY ADAPTERS                                                            | 1     | 1 | 1       | 1 | 1       | 1 | 1     | 1 | 1        | 1 | 1        | 1 | 101       |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   | 22.4      |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   |           |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   |           |
| LATE ADAPTERS                                                             | 2     | 1 | 1       | 1 | 1       | 1 | 1     | 1 | 1        | 1 | 1        | 1 | 67        |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   | 14.9      |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   |           |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   |           |
| NON-ADAPTERS                                                              | 3     | 1 | 1       | 1 | 1       | 1 | 1     | 1 | 1        | 1 | 1        | 1 | 282       |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   | 62.7      |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   |           |
|                                                                           |       |   |         |   |         |   |       |   |          |   |          |   |           |
| COLUMN TOTAL                                                              |       |   |         |   |         |   |       |   |          |   |          |   | 450       |
| TOTAL                                                                     |       |   |         |   |         |   |       |   |          |   |          |   | 100.0     |
| RAW CHI SQUARE = 9.59077 WITH 4 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0406 |       |   |         |   |         |   |       |   |          |   |          |   |           |

APPENDIX E

HOTELLING'S  $T^2$  TEST ON RECEIVED VARIABLES,  
AND THE PERCEPTIONS AND ATTITUDES  
ASSOCIATED WITH V-24

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.3356  
HOTELLING T SQUARE 12.8872  
F VALUE 2.5111 P VALUE 0.032  
DEGREES OF FREEDOM 5, 154

DIFFERENCES ON SINGLE VARIABLES

Average Number of Long Distance Calls per Month

\*\*\*\*\*  
\* 101 \* VARIABLE NUMBER 2 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 6.6276 4.3582  
STD DEV 6.6655 5.2446  
S.E.M. 0.6875 0.6407  
T (SEPARATE) 2.41 0.017 157.4 SAMPLE SIZE 94 67  
T (POOLED) 2.32 0.022 159 MAXIMUM 30.0000 25.0000  
MINIMUM 0.0 0.0  
F (FOR VARIANCES)  
LEvene 6.86 0.010 1, 159

Average Number of Air Trips per Year

\*\*\*\*\*  
\* 102 \* VARIABLE NUMBER 3 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 2.5500 1.2769  
STD DEV 5.1116 1.9325  
S.E.M. 0.5112 0.2397  
T (SEPARATE) 2.96 0.004 137.1 SAMPLE SIZE 100 65  
T (POOLED) 2.52 0.013 163 MAXIMUM 30.0000 10.0000  
MINIMUM 0.0 0.0  
F (FOR VARIANCES)  
LEvene 12.24 0.001 1, 163

Average Driving Distance per Year

\*\*\*\*\*  
\* 103 \* VARIABLE NUMBER 4 GROUP 1 EA 2 LA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 16295.7969 11356.0781  
STD DEV 12049.8623 8395.0078  
S.E.M. 1223.4780 1066.1670  
T (SEPARATE) 3.04 0.003 155.8 SAMPLE SIZE 97 62  
T (POOLED) 2.82 0.005 157 MAXIMUM 80000.0000 50000.0000  
MINIMUM 0.0 0.0  
F (FOR VARIANCES)  
LEvene 2.48 0.117 1, 157

Figure E-1. Hotelling's  $T^2$  test for differences in cosmopolitanism between early adopters and late adopters.

## Average Number of Times Eating Out per Month

|                  |                   |         |       |             |         |         |
|------------------|-------------------|---------|-------|-------------|---------|---------|
| *****            |                   |         |       |             |         |         |
| * 104            | * VARIABLE NUMBER | 5       | GROUP | 1 EA        | 2 LA    |         |
| *****            |                   |         |       |             |         |         |
|                  | STATISTICS        | P VALUE | DF    | MEAN        |         |         |
|                  |                   |         |       | STD DEV     | 8.2200  | 6.4328  |
|                  |                   |         |       | S.E.M.      | 6.8822  | 5.0937  |
| T (SEPARATE)     | 1.93              | 0.056   | 163.3 | SAMPLE SIZE | 0.6882  | 0.6223  |
| T (POOLED)       | 1.82              | 0.071   | 165   | MAXIMUM     | 100     | 67      |
|                  |                   |         |       | MINIMUM     | 32.0000 | 25.0000 |
|                  |                   |         |       |             | 0.0     | 0.0     |
| F(FOR VARIANCES) |                   |         |       |             |         |         |
|                  | LEVENE            | 2.63    | 0.107 | 1, 165      |         |         |

## Avg. No. of Attendance at Movies, Concerts, or Plays per Month

|                  |                   |         |       |             |        |        |
|------------------|-------------------|---------|-------|-------------|--------|--------|
| *****            |                   |         |       |             |        |        |
| * 105            | * VARIABLE NUMBER | 6       | GROUP | 1 EA        | 2 LA   |        |
| *****            |                   |         |       |             |        |        |
|                  | STATISTICS        | P VALUE | DF    | MEAN        |        |        |
|                  |                   |         |       | STD DEV     | 1.5900 | 1.2537 |
|                  |                   |         |       | S.E.M.      | 1.7529 | 1.4496 |
| T (SEPARATE)     | 1.35              | 0.179   | 157.7 | SAMPLE SIZE | 0.1753 | 0.1771 |
| T (POOLED)       | 1.30              | 0.195   | 165   | MAXIMUM     | 100    | 67     |
|                  |                   |         |       | MINIMUM     | 7.0000 | 6.0000 |
|                  |                   |         |       |             | 0.0    | 0.0    |
| F(FOR VARIANCES) |                   |         |       |             |        |        |
|                  | LEVENE            | 2.10    | 0.149 | 1, 165      |        |        |

Figure E-1 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.5753  
HOTELLING T SQUARE 40.7094  
F VALUE 8.0422 P VALUE 0.000  
DEGREES OF FREEDOM 5, 358

DIFFERENCES ON SINGLE VARIABLES

Average Number of Long Distance Calls per Month

\*\*\*\*\*  
\* 101 \* VARIABLE NUMBER 2 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 6.6276 5.3969  
STD DEV 6.6655 6.6093  
S.E.M. 0.6675 0.4045  
T (SEPARATE) 1.54 0.125 161.7 SAMPLE SIZE 54 267  
T (POOLED) 1.55 0.122 359 MAXIMUM 30.0000 30.0000  
MINIMUM 0.0 0.0

F (FOR VARIANCES)

LEVENE 2.33 0.128 1, 359

Average Number of Air Trips per Year

\*\*\*\*\*  
\* 102 \* VARIABLE NUMBER 3 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 2.9500 1.4561  
STD DEV 5.1116 2.5462  
S.E.M. 0.5112 0.1538  
T (SEPARATE) 2.80 0.006 117.4 SAMPLE SIZE 100 274  
T (POOLED) 3.74 0.000 372 MAXIMUM 30.0000 20.0000  
MINIMUM 0.0 0.0

F (FOR VARIANCES)

LEVENE 25.71 0.000 1, 372

Average Driving Distance per Year

\*\*\*\*\*  
\* 103 \* VARIABLE NUMBER 4 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 16295.7969 11702.5430  
STD DEV 12049.6633 9539.3594  
S.E.M. 1223.4780 581.6250  
T (SEPARATE) 3.39 0.001 141.7 SAMPLE SIZE 97 269  
T (POOLED) 3.78 0.000 364 MAXIMUM 80000.0000 60000.0000  
MINIMUM 0.0 0.0

F (FOR VARIANCES)

LEVENE 1.90 0.169 1, 364

Figure E-2. Hotelling's  $T^2$  test for differences in cosmopolitanism between early adopters and nonadopters.

## Average Number of Times Eating Out per Month

```

*****
* 104      * VARIABLE NUMBER 5      GROUP 1 EA      3 NA
*****
      STATISTICS      P VALUE      DF      MEAN      8.2200      6.7920
      STD DEV      6.8822      6.1818
      S.E.M.      0.6882      0.3701
T (SEPARATE)      1.83      C.070      159.8      SAMPLE SIZE      100      279
T (POOLED)      1.92      C.055      377      MAXIMUM      32.0000      30.0000
      MINIMUM      0.0      0.0
F(FOR VARIANCES)
      LEVENE      0.38      C.541      1, 377

```

## Avg. No. of Attendance at Movies, Concerts, or Plays per Month

```

*****
* 105      * VARIABLE NUMBER 6      GROUP 1 EA      3 NA
*****
      STATISTICS      P VALUE      DF      MEAN      1.5900      0.8221
      STD DEV      1.7529      1.0642
      S.E.M.      0.1753      0.0635
T (SEPARATE)      4.12      C.000      125.9      SAMPLE SIZE      100      281
T (POOLED)      5.15      C.000      379      MAXIMUM      7.0000      6.0000
      MINIMUM      0.0      0.0
F(FOR VARIANCES)
      LEVENE      31.86      C.000      1, 379

```

Figure E-2 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

|                      |         |         |       |
|----------------------|---------|---------|-------|
| MAHALANOBIS D SQUARE | 0.2049  |         |       |
| HOTELLING T SQUARE   | 10.5847 |         |       |
| F VALUE              | 2.0893  | P VALUE | 0.066 |
| DEGREES OF FREEDOM   | 5, 326  |         |       |

DIFFERENCES ON SINGLE VARIABLES

Average Number of Long Distance Calls per Month

\*\*\*\*\*  
\* H101 \* VARIABLE NUMBER 2 GROUP 2 LA 3 NA  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | MEAN   | STD DEV | S.E.M. | SAMPLE SIZE | MAXIMUM | MINIMUM |
|--------------|------------|---------|-------|--------|---------|--------|-------------|---------|---------|
| T (SEPARATE) | -1.37      | C.173   | 124.2 | 4.3582 | 5.2446  | 0.6407 | 67          | 25.0000 | 0.0     |
| T (POOLED)   | -1.20      | C.233   | 332   |        |         |        | 267         | 30.0000 | 0.0     |

F (FOR VARIANCES)  
LEVENE 1.44 C.230 1, 332

Average Number of Air Trips per Year

\*\*\*\*\*  
\* 102 \* VARIABLE NUMBER 3 GROUP 2 LA 3 NA  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | MEAN   | STD DEV | S.E.M. | SAMPLE SIZE | MAXIMUM | MINIMUM |
|--------------|------------|---------|-------|--------|---------|--------|-------------|---------|---------|
| T (SEPARATE) | -0.63      | C.530   | 122.7 | 1.2769 | 1.5325  | 0.2397 | 65          | 10.0000 | 0.0     |
| T (POOLED)   | -0.53      | C.595   | 337   |        |         |        | 274         | 20.0000 | 0.0     |

F (FOR VARIANCES)  
LEVENE 0.76 C.384 1, 337

Average Number of Driving Distance per Year

\*\*\*\*\*  
\* 103 \* VARIABLE NUMBER 4 GROUP 2 LA 3 NA  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | MEAN       | STD DEV   | S.E.M.    | SAMPLE SIZE | MAXIMUM    | MINIMUM |
|--------------|------------|---------|-------|------------|-----------|-----------|-------------|------------|---------|
| T (SEPARATE) | -0.29      | C.776   | 100.7 | 11356.0781 | 8395.0078 | 1066.1670 | 62          | 50000.0000 | 0.0     |
| T (POOLED)   | -0.26      | C.792   | 329   |            |           |           | 269         | 60000.0000 | 0.0     |

F (FOR VARIANCES)  
LEVENE 0.80 C.372 1, 329

Figure E-3. Hotelling's  $T^2$  test for differences in cosmopolitanism between late adopters and nonadopters.



## Average Number of Times Eating Out per Month

```

*****
* 104 * VARIABLE NUMBER 5 GROUP 2 LA 3 NA
*****
STATISTICS P VALUE DF MEAN 6.4328 6.7920
STD DEV 5.0937 6.1818
S.E.M. 0.6223 0.3701
T (SEPARATE) -0.50 0.621 117.5 SAMPLE SIZE 67 279
T (POOLED) -0.44 0.660 344 MAXIMUM 25.0000 30.0000
MINIMUM 0.0 0.0
F (FOR VARIANCES)
LEvene 2.11 0.147 1, 344

```

## Avg. No. of Attendance at Movies, Concerts, or Plays per Month

```

*****
* 105 * VARIABLE NUMBER 6 GROUP 2 LA 3 NA
*****
STATISTICS P VALUE DF MEAN 1.2537 0.8221
STD DEV 1.4496 1.0642
S.E.M. 0.1771 0.0635
T (SEPARATE) 2.29 0.024 83.7 SAMPLE SIZE 67 281
T (POOLED) 2.77 0.006 346 MAXIMUM 6.0000 6.0000
MINIMUM 0.0 0.0
F (FOR VARIANCES)
LEvene 9.01 0.003 1, 346

```

Figure E-3 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.0560  
HOTELLING T SQUARE 2.2864  
F VALUE 0.7531 P VALUE 0.522  
DEGREES OF FREEDOM 3, 166

DIFFERENCES ON SINGLE VARIABLES

Aggressive Orientation

\*\*\*\*\*  
\* AG1 \* VARIABLE NUMBER 2  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | GROUP       | 1 EA    | 2 LA    |
|--------------|------------|---------|-------|-------------|---------|---------|
| T (SEPARATE) | 1.04       | 0.300   | 153.7 | MEAN        | 46.2938 | 44.7645 |
| T (POOLED)   | 1.02       | 0.310   | 168   | STD DEV     | 9.5767  | 8.9678  |
|              |            |         |       | S.E.M.      | 0.9878  | 1.0875  |
|              |            |         |       | SAMPLE SIZE | 102     | 68      |
|              |            |         |       | MAXIMUM     | 65.0000 | 61.0000 |
|              |            |         |       | MINIMUM     | 23.0000 | 23.0000 |

F (FOR VARIANCES)  
LEvene 1.33 0.250 1, 168

Compliant Orientation

\*\*\*\*\*  
\* COM1 \* VARIABLE NUMBER 3  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | GROUP       | 1 EA    | 2 LA    |
|--------------|------------|---------|-------|-------------|---------|---------|
| T (SEPARATE) | -1.15      | 0.251   | 144.1 | MEAN        | 45.2447 | 46.2498 |
| T (POOLED)   | -1.15      | 0.251   | 168   | STD DEV     | 5.5763  | 5.5594  |
|              |            |         |       | S.E.M.      | 0.5523  | 0.6742  |
|              |            |         |       | SAMPLE SIZE | 102     | 68      |
|              |            |         |       | MAXIMUM     | 57.0000 | 57.0000 |
|              |            |         |       | MINIMUM     | 31.0000 | 35.0000 |

F (FOR VARIANCES)  
LEvene 0.05 0.820 1, 168

Detached Orientation

\*\*\*\*\*  
\* DET1 \* VARIABLE NUMBER 4  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | GROUP       | 1 EA    | 2 LA    |
|--------------|------------|---------|-------|-------------|---------|---------|
| T (SEPARATE) | -0.16      | 0.873   | 138.4 | MEAN        | 24.6663 | 24.7939 |
| T (POOLED)   | -0.16      | 0.871   | 168   | STD DEV     | 4.5178  | 5.1848  |
|              |            |         |       | S.E.M.      | 0.4869  | 0.6288  |
|              |            |         |       | SAMPLE SIZE | 102     | 68      |
|              |            |         |       | MAXIMUM     | 38.0000 | 41.0000 |
|              |            |         |       | MINIMUM     | 12.0000 | 16.0000 |

F (FOR VARIANCES)  
LEvene 0.31 0.578 1, 168

Figure E-4. Hotelling's  $T^2$  test for differences in personality between early adopters and late adopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.2562  
HOTELLING T SQUARE 19.2090  
F VALUE 6.3696 P VALUE 0.000  
DEGREES OF FREEDOM 3, 381

DIFFERENCES ON SINGLE VARIABLES

Aggressive Orientation

\*\*\*\*\*  
\* AG1 \* VARIABLE NUMBER 2 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 3.12 0.002 158.7  
T (POOLED) 3.34 0.001 383  
MEAN 46.2938 42.8258  
STD DEV 9.9767 8.6287  
S.E.M. 0.9878 0.5129  
SAMPLE SIZE 102 283  
MAXIMUM 65.0000 65.0000  
MINIMUM 23.0000 16.0000  
F (FOR VARIANCES)  
LEvene 5.68 0.018 1, 383

Compliant Orientation

\*\*\*\*\*  
\* COM1 \* VARIABLE NUMBER 3 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -0.67 0.506 168.5  
T (POOLED) -0.69 0.491 383  
MEAN 45.2447 45.6669  
STD DEV 5.5783 5.2072  
S.E.M. 0.5523 0.3095  
SAMPLE SIZE 102 293  
MAXIMUM 57.0000 60.0000  
MINIMUM 31.0000 31.0000  
F (FOR VARIANCES)  
LEvene 0.61 0.437 1, 383

Detached Orientation

\*\*\*\*\*  
\* DET1 \* VARIABLE NUMBER 4 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -2.54 0.012 180.6  
T (POOLED) -2.52 0.012 383  
MEAN 24.6663 26.1121  
STD DEV 4.9178 4.9780  
S.E.M. 0.4869 0.2959  
SAMPLE SIZE 102 283  
MAXIMUM 38.0000 41.0000  
MINIMUM 12.0000 14.0000  
F (FOR VARIANCES)  
LEvene 0.12 0.730 1, 383

Figure E-5. Hotelling's  $T^2$  test for differences in personality between early adopters and nonadopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.1560  
HOTELLING T SQUARE 8.5515  
F VALUE 2.8342 P VALUE 0.038  
DEGREES OF FREEDOM 3, 347

DIFFERENCES ON SINGLE VARIABLES

Aggressive Orientation

\*\*\*\*\*  
\* AG1 \* VARIABLE NUMBER 2 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 1.61 0.110 99.0  
T (POOLED) 1.65 0.100 349  
MEAN 44.7645 42.8258  
STD DEV 8.5678 8.6287  
S.E.M. 1.0875 0.5129  
SAMPLE SIZE 68 283  
MAXIMUM 61.0000 65.0000  
MINIMUM 23.0000 16.0000  
F(FOR VARIANCES)  
LEvene 0.51 0.477 1, 349

Compliant Orientation

\*\*\*\*\*  
\* COM1 \* VARIABLE NUMBER 3 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 0.79 0.434 97.2  
T (POOLED) 0.82 0.414 349  
MEAN 46.2498 45.6669  
STD DEV 5.5594 5.2072  
S.E.M. 0.6742 0.3095  
SAMPLE SIZE 68 283  
MAXIMUM 57.0000 60.0000  
MINIMUM 35.0000 31.0000  
F(FOR VARIANCES)  
LEvene 0.91 0.342 1, 349

Detached Orientation

\*\*\*\*\*  
\* DET1 \* VARIABLE NUMBER 4 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -1.90 0.061 98.8  
T (POOLED) -1.94 0.053 349  
MEAN 24.7939 26.1121  
STD DEV 5.1848 4.9780  
S.E.M. 0.6288 0.2959  
SAMPLE SIZE 68 283  
MAXIMUM 41.0000 41.0000  
MINIMUM 16.0000 14.0000  
F(FOR VARIANCES)  
LEvene 0.13 0.716 1, 349

Figure E-6. Hotelling's  $T^2$  test for differences in personality between late adopters and nonadopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

|                      |         |         |       |
|----------------------|---------|---------|-------|
| MAHALANOBIS D SQUARE | 0.7113  |         |       |
| HOTELLING T SQUARE   | 22.2985 |         |       |
| F VALUE              | 3.0238  | P VALUE | 0.006 |
| DEGREES OF FREEDOM   | 7, 126  |         |       |

DIFFERENCES ON SINGLE VARIABLES

Checking Account Deposits

|                   |                   |         |        |             |        |        |      |
|-------------------|-------------------|---------|--------|-------------|--------|--------|------|
| *****             |                   |         |        | GROUP       |        | 1 EA   | 2 LA |
| * 7               | * VARIABLE NUMBER | 2       |        | MEAN        | 2.6087 | 2.2641 |      |
| *****             |                   |         |        | STD DEV     | 1.4598 | 1.4564 |      |
|                   | STATISTICS        | P VALUE | DF     | S.E.M.      | 0.1522 | 0.2001 |      |
| T (SEPARATE)      | 1.37              | 0.173   | 108.8  | SAMPLE SIZE | 92     | 53     |      |
| T (POOLED)        | 1.37              | 0.173   | 143    | MAXIMUM     | 5.0000 | 5.0000 |      |
|                   |                   |         |        | MINIMUM     | 1.0000 | 1.0000 |      |
| F (FOR VARIANCES) |                   |         |        |             |        |        |      |
| LEvene            | 0.04              | 0.845   | 1, 143 |             |        |        |      |

Checking Account Withdrawals

|                   |                   |         |        |             |        |        |      |
|-------------------|-------------------|---------|--------|-------------|--------|--------|------|
| *****             |                   |         |        | GROUP       |        | 1 EA   | 2 LA |
| * 8               | * VARIABLE NUMBER | 3       |        | MEAN        | 3.9901 | 3.2879 |      |
| *****             |                   |         |        | STD DEV     | 1.0049 | 1.0490 |      |
|                   | STATISTICS        | P VALUE | DF     | S.E.M.      | 0.1000 | 0.1291 |      |
| T (SEPARATE)      | 4.30              | 0.000   | 134.8  | SAMPLE SIZE | 101    | 66     |      |
| T (POOLED)        | 4.34              | 0.000   | 165    | MAXIMUM     | 5.0000 | 5.0000 |      |
|                   |                   |         |        | MINIMUM     | 1.0000 | 1.0000 |      |
| F (FOR VARIANCES) |                   |         |        |             |        |        |      |
| LEvene            | 2.16              | 0.144   | 1, 165 |             |        |        |      |

Savings Account Deposits

|                   |                   |         |        |             |        |        |      |
|-------------------|-------------------|---------|--------|-------------|--------|--------|------|
| *****             |                   |         |        | GROUP       |        | 1 EA   | 2 LA |
| * 9               | * VARIABLE NUMBER | 4       |        | MEAN        | 1.4186 | 1.2857 |      |
| *****             |                   |         |        | STD DEV     | 0.9263 | 0.9165 |      |
|                   | STATISTICS        | P VALUE | DF     | S.E.M.      | 0.0999 | 0.1166 |      |
| T (SEPARATE)      | 0.87              | 0.389   | 110.6  | SAMPLE SIZE | 86     | 49     |      |
| T (POOLED)        | 0.84              | 0.405   | 133    | MAXIMUM     | 5.0000 | 5.0000 |      |
|                   |                   |         |        | MINIMUM     | 1.0000 | 1.0000 |      |
| F (FOR VARIANCES) |                   |         |        |             |        |        |      |
| LEvene            | 2.22              | 0.139   | 1, 133 |             |        |        |      |

Figure E-7. Hotelling's  $T^2$  test for differences in V-24 usage patterns between early adopters and late adopters.

## Savings Account Withdrawals

\*\*\*\*\*

| * 10 * VARIABLE NUMBER 5 |         |       |        | GROUP 1 EA 2 LA |        |        |
|--------------------------|---------|-------|--------|-----------------|--------|--------|
| *****                    |         |       |        |                 |        |        |
| STATISTICS               | P VALUE | DF    |        | MEAN            | 1.4881 | 1.3921 |
| T (SEPARATE)             | 0.60    | 0.550 | 107.1  | STD DEV         | 0.9117 | 0.8962 |
| T (POOLED)               | 0.60    | 0.552 | 133    | S.E.M.          | 0.0995 | 0.1255 |
| F (FOR VARIANCES)        |         |       |        | SAMPLE SIZE     | 84     | 51     |
| LEvene                   | 0.56    | 0.457 | 1, 133 | MAXIMUM         | 5.0000 | 5.0000 |
|                          |         |       |        | MINIMUM         | 1.0000 | 1.0000 |

## Credit Card Cash Advances

\*\*\*\*\*

| * 11 * VARIABLE NUMBER 6 |         |       |        | GROUP 1 EA 2 LA |        |        |
|--------------------------|---------|-------|--------|-----------------|--------|--------|
| *****                    |         |       |        |                 |        |        |
| STATISTICS               | P VALUE | DF    |        | MEAN            | 1.8139 | 1.4314 |
| T (SEPARATE)             | 2.26    | 0.026 | 113.0  | STD DEV         | 1.0118 | 0.9221 |
| T (POOLED)               | 2.21    | 0.029 | 135    | S.E.M.          | 0.1091 | 0.1291 |
| F (FOR VARIANCES)        |         |       |        | SAMPLE SIZE     | 86     | 51     |
| LEvene                   | 2.04    | 0.155 | 1, 135 | MAXIMUM         | 5.0000 | 5.0000 |
|                          |         |       |        | MINIMUM         | 1.0000 | 1.0000 |

## Utility and Loan Payments

\*\*\*\*\*

| * 12 * VARIABLE NUMBER 7 |         |       |        | GROUP 1 EA 2 LA |        |        |
|--------------------------|---------|-------|--------|-----------------|--------|--------|
| *****                    |         |       |        |                 |        |        |
| STATISTICS               | P VALUE | DF    |        | MEAN            | 1.2381 | 1.0625 |
| T (SEPARATE)             | 1.96    | 0.053 | 125.0  | STD DEV         | 0.7049 | 0.3200 |
| T (POOLED)               | 1.63    | 0.105 | 130    | S.E.M.          | 0.0769 | 0.0462 |
| F (FOR VARIANCES)        |         |       |        | SAMPLE SIZE     | 84     | 48     |
| LEvene                   | 11.08   | 0.001 | 1, 130 | MAXIMUM         | 5.0000 | 3.0000 |
|                          |         |       |        | MINIMUM         | 1.0000 | 1.0000 |

## Fund Transfers

\*\*\*\*\*

| * 13 * VARIABLE NUMBER 8 |         |       |        | GROUP 1 EA 2 LA |        |        |
|--------------------------|---------|-------|--------|-----------------|--------|--------|
| *****                    |         |       |        |                 |        |        |
| STATISTICS               | P VALUE | DF    |        | MEAN            | 1.5747 | 1.3400 |
| T (SEPARATE)             | 1.49    | 0.140 | 112.9  | STD DEV         | 0.5600 | 0.8478 |
| T (POOLED)               | 1.44    | 0.153 | 135    | S.E.M.          | 0.1029 | 0.1199 |
| F (FOR VARIANCES)        |         |       |        | SAMPLE SIZE     | 87     | 50     |
| LEvene                   | 4.58    | 0.034 | 1, 135 | MAXIMUM         | 5.0000 | 5.0000 |
|                          |         |       |        | MINIMUM         | 1.0000 | 1.0000 |

Figure E-7 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.3088  
HOTELLING T SQUARE 10.1570  
F VALUE 1.3779 P VALUE 0.220  
DEGREES OF FREEDOM 7, 131

DIFFERENCES ON SINGLE VARIABLES

Checking Account Deposits

\*\*\*\*\*  
\* 14 \* VARIABLE NUMBER 2  
\*\*\*\*\*  
STATISTICS F VALUE DF  
T (SEPARATE) -1.60 C.113 149.0  
T (POOLED) -1.54 C.125 163  
F (FOR VARIANCES)  
LEvene 3.87 C.051 1, 163

| GROUP       | 1 EA   | 2 LA   |
|-------------|--------|--------|
| MEAN        | 3.8614 | 4.1250 |
| STD DEV     | 1.1316 | 0.9677 |
| S.E.M.      | 0.1126 | 0.1210 |
| SAMPLE SIZE | 101    | 64     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Checking Account Withdrawals

\*\*\*\*\*  
\* 15 \* VARIABLE NUMBER 3  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -1.53 C.129 135.0  
T (POOLED) -1.51 C.132 153  
F (FOR VARIANCES)  
LEvene 0.19 C.663 1, 153

| GROUP       | 1 EA   | 2 LA   |
|-------------|--------|--------|
| MEAN        | 2.9247 | 3.2258 |
| STD DEV     | 1.2357 | 1.1793 |
| S.E.M.      | 0.1281 | 0.1498 |
| SAMPLE SIZE | 93     | 62     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Savings Account Deposits

\*\*\*\*\*  
\* 16 \* VARIABLE NUMBER 4  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -0.06 C.954 117.5  
T (POOLED) -0.06 C.954 142  
F (FOR VARIANCES)  
LEvene 0.22 C.642 1, 142

| GROUP       | 1 EA   | 2 LA   |
|-------------|--------|--------|
| MEAN        | 2.5568 | 2.5714 |
| STD DEV     | 1.4922 | 1.4876 |
| S.E.M.      | 0.1591 | 0.1988 |
| SAMPLE SIZE | 88     | 56     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Figure E-8. Hotelling's  $T^2$  test for differences in conventional teller usage patterns between early adopters and late adopters.

## Savings Account Withdrawals

|                   |                   |         |        |             |        |        |  |  |  |
|-------------------|-------------------|---------|--------|-------------|--------|--------|--|--|--|
| *****             |                   |         |        |             |        |        |  |  |  |
| * 17              | * VARIABLE NUMBER | 5       | GROUP  |             | 1 EA   | 2 LA   |  |  |  |
| *****             |                   |         |        |             |        |        |  |  |  |
| STATISTICS        |                   | P VALUE | DF     | MEAN        | 2.1511 | 2.2963 |  |  |  |
|                   |                   |         |        | STD DEV     | 1.2697 | 1.3546 |  |  |  |
|                   |                   |         |        | S.E.M.      | 0.1369 | 0.1843 |  |  |  |
| T (SEPARATE)      | -0.63             | 0.529   | 107.3  | SAMPLE SIZE | 86     | 54     |  |  |  |
| T (POOLED)        | -0.64             | 0.522   | 138    | MAXIMUM     | 5.0000 | 5.0000 |  |  |  |
|                   |                   |         |        | MINIMUM     | 1.0000 | 1.0000 |  |  |  |
| F (FOR VARIANCES) |                   |         |        |             |        |        |  |  |  |
| LEVENE            | 0.09              | C.762   | 1, 138 |             |        |        |  |  |  |

## Credit Card Cash Advances

|                  |                   |         |        |             |        |        |       |  |  |
|------------------|-------------------|---------|--------|-------------|--------|--------|-------|--|--|
| *****            |                   |         |        |             |        |        |       |  |  |
| * 18             | * VARIABLE NUMBER | 6       | GROUP  |             | 1 EA   | 2 LA   | ***** |  |  |
| STATISTICS       |                   | P VALUE | DF     | MEAN        | 1.5349 | 1.3800 |       |  |  |
|                  |                   |         |        | STD DEV     | 0.8904 | 0.9875 |       |  |  |
|                  |                   |         |        | S.E.M.      | 0.0960 | 0.1396 |       |  |  |
| T (SEPARATE)     | 0.91              | 0.363   | 94.2   | SAMPLE SIZE | 86     | 50     |       |  |  |
| T (POOLED)       | 0.94              | 0.349   | 134    | MAXIMUM     | 5.0000 | 5.0000 |       |  |  |
|                  |                   |         |        | MINIMUM     | 1.0000 | 1.0000 |       |  |  |
| F(FOR VARIANCES) |                   |         |        |             |        |        |       |  |  |
| LEVENE           | 0.41              | 0.523   | 1, 134 |             |        |        |       |  |  |

## Utility and Loan Payments

|                   |                   |  |  |         |       |         |             |        |        |
|-------------------|-------------------|--|--|---------|-------|---------|-------------|--------|--------|
| *****             |                   |  |  |         |       |         |             |        |        |
| * 19              | * VARIABLE NUMBER |  |  | 7       | GROUP |         | 1 EA        | 2 LA   |        |
| *****             |                   |  |  |         |       |         |             |        |        |
| STATISTICS        |                   |  |  | P VALUE | DF    | MEAN    | 1.9111      | 2.0189 |        |
|                   |                   |  |  |         |       | STD DEV | 1.3628      | 1.4343 |        |
|                   |                   |  |  |         |       | S.E.M.  | 0.1436      | 0.1970 |        |
| T (SEPARATE)      |                   |  |  | -0.44   | 0.659 | 104.7   | SAMPLE SIZE | 90     | 53     |
| T (POOLED)        |                   |  |  | -0.45   | 0.655 | 141     | MAXIMUM     | 5.0000 | 5.0000 |
|                   |                   |  |  |         |       |         | MINIMUM     | 1.0000 | 1.0000 |
| F (FOR VARIANCES) |                   |  |  |         |       |         |             |        |        |
| LEVENE            |                   |  |  | 0.84    | C.361 | 1, 141  |             |        |        |

## Fund Transfers

|                   |                   |      |       |         |             |         |        |        |  |
|-------------------|-------------------|------|-------|---------|-------------|---------|--------|--------|--|
| *****             |                   |      |       |         |             |         |        |        |  |
| * 20              | * VARIABLE NUMBER |      |       | 8       | GROUP       |         | 1 EA   | 2 LA   |  |
| *****             |                   |      |       |         |             |         |        |        |  |
| STATISTICS        |                   |      |       | P VALUE | DF          | MEAN    | 1.7954 | 1.5961 |  |
|                   |                   |      |       |         |             | STD DEV | 1.0631 | 1.0893 |  |
|                   |                   |      |       |         |             | S.E.M.  | 0.1133 | 0.1511 |  |
| T (SEPARATE)      |                   | 1.06 | C.294 | 105.0   | SAMPLE SIZE |         | 88     | 52     |  |
| T (POOLED)        |                   | 1.06 | C.290 | 138     | MAXIMUM     |         | 5.0000 | 5.0000 |  |
|                   |                   |      |       |         | MINIMUM     |         | 1.0000 | 1.0000 |  |
| F (FOR VARIANCES) |                   |      |       |         |             |         |        |        |  |
| LEVENE            |                   | 0.04 | C.834 | 1, 138  |             |         |        |        |  |

Figure E-8 (continued)



DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.2046  
HOTELLING T SQUARE 12.9092  
F VALUE 1.8041 P VALUE 0.086  
DEGREES OF FREEDOM 7, 307

DIFFERENCES ON SINGLE VARIABLES

Checking Account Deposits

\*\*\*\*\*

| * 14 * VARIABLE NUMBER 2 |         |       |       | GROUP 1 EA 3 NA |        |
|--------------------------|---------|-------|-------|-----------------|--------|
| *****                    |         |       |       | *****           |        |
| STATISTICS               | F VALUE | DF    |       | MEAN            |        |
| T (SEPARATE)             | -1.33   | C.186 | 190.1 | STD DEV         | 3.8614 |
| T (POOLED)               | -1.28   | C.201 | 377   | S.E.M.          | 0.1126 |
|                          |         |       |       | SAMPLE SIZE     | 101    |
|                          |         |       |       | MAXIMUM         | 5.0000 |
|                          |         |       |       | MINIMUM         | 1.0000 |

F (FOR VARIANCES)  
LEvene 0.31 C.575 1, 377

Checking Account Withdrawals

\*\*\*\*\*

| * 15 * VARIABLE NUMBER 3 |         |       |       | GROUP 1 EA 3 NA |        |
|--------------------------|---------|-------|-------|-----------------|--------|
| *****                    |         |       |       | *****           |        |
| STATISTICS               | F VALUE | DF    |       | MEAN            |        |
| T (SEPARATE)             | -2.68   | 0.008 | 194.2 | STD DEV         | 2.9247 |
| T (POOLED)               | -2.46   | 0.014 | 349   | S.E.M.          | 0.1281 |
|                          |         |       |       | SAMPLE SIZE     | 53     |
|                          |         |       |       | MAXIMUM         | 5.0000 |
|                          |         |       |       | MINIMUM         | 1.0000 |

F (FOR VARIANCES)  
LEvene 12.80 C.000 1, 349

Savings Account Deposits

\*\*\*\*\*

| * 15 * VARIABLE NUMBER 4 |         |       |       | GROUP 1 EA 3 NA |        |
|--------------------------|---------|-------|-------|-----------------|--------|
| *****                    |         |       |       | *****           |        |
| STATISTICS               | F VALUE | DF    |       | MEAN            |        |
| T (SEPARATE)             | -2.19   | C.030 | 163.3 | STD DEV         | 2.5568 |
| T (POOLED)               | -2.13   | 0.034 | 331   | S.E.M.          | 0.1591 |
|                          |         |       |       | SAMPLE SIZE     | 88     |
|                          |         |       |       | MAXIMUM         | 5.0000 |
|                          |         |       |       | MINIMUM         | 1.0000 |

F (FOR VARIANCES)  
LEvene 0.70 C.402 1, 331

Figure E-9. Hotelling's  $T^2$  test for differences in conventional teller usage patterns between early adopters and nonadopters.

## Savings Account Withdrawals

|                  |                   |  |   |         |       |         |             |        |        |
|------------------|-------------------|--|---|---------|-------|---------|-------------|--------|--------|
| *****            |                   |  |   |         |       |         |             |        |        |
| * 17             | * VARIABLE NUMBER |  | 5 | GROUP   |       | 1 EA    | 3 NA        |        |        |
| *****            |                   |  |   |         |       |         |             |        |        |
| STATISTICS       |                   |  |   | P VALUE | DF    | MEAN    | 2.1511      | 2.5974 |        |
|                  |                   |  |   |         |       | STD DEV | 1.2697      | 1.5141 |        |
|                  |                   |  |   |         |       | S.E.M.  | 0.1369      | 0.0986 |        |
| T (SEPARATE)     |                   |  |   | -2.65   | 0.009 | 178.6   | SAMPLE SIZE | 86     | 236    |
| T (POOLED)       |                   |  |   | -2.44   | 0.015 | 320     | MAXIMUM     | 5.0000 | 5.0000 |
|                  |                   |  |   |         |       |         | MINIMUM     | 1.0000 | 1.0000 |
| F(FOR VARIANCES) |                   |  |   |         |       |         |             |        |        |
| LEVENE           |                   |  |   | 10.49   | 0.001 | 1, 320  |             |        |        |

## Credit Card Cash Advances

|                  |                   |       |       |             |       |         |        |        |  |
|------------------|-------------------|-------|-------|-------------|-------|---------|--------|--------|--|
| *****            |                   |       |       |             |       |         |        |        |  |
| * 18             | * VARIABLE NUMBER |       |       | 6           | GROUP | 1 EA    | 3 NA   |        |  |
| *****            |                   |       |       |             |       |         |        |        |  |
| STATISTICS       |                   |       |       | P VALUE     | DF    | MEAN    | 1.5349 | 1.5115 |  |
|                  |                   |       |       |             |       | STD DEV | 0.8904 | 1.1710 |  |
|                  |                   |       |       |             |       | S.E.M.  | 0.0960 | 0.0795 |  |
| T (SEPARATE)     | 0.19              | 0.851 | 203.8 | SAMPLE SIZE |       |         | 86     | 217    |  |
| T (POOLED)       | 0.17              | 0.867 | 301   | MAXIMUM     |       |         | 5.0000 | 5.0000 |  |
|                  |                   |       |       | MINIMUM     |       |         | 1.0000 | 1.0000 |  |
| F(FOR VARIANCES) |                   |       |       |             |       |         |        |        |  |
| LEVENE           |                   | 1.20  | 0.275 | 1, 301      |       |         |        |        |  |

## Utility and Loan Payments

|                  |                   |       |       |         |     |             |        |        |  |
|------------------|-------------------|-------|-------|---------|-----|-------------|--------|--------|--|
| *****            |                   |       |       |         |     |             |        |        |  |
| * 19             | * VARIABLE NUMBER |       | 7     | GROUP   |     | 1 EA        | 3 NA   |        |  |
| *****            |                   |       |       |         |     |             |        |        |  |
| STATISTICS       |                   |       |       | P VALUE | DF  | MEAN        | 1.5111 | 2.3151 |  |
|                  |                   |       |       |         |     | STD DEV     | 1.3628 | 1.5823 |  |
|                  |                   |       |       |         |     | S.E.M.      | 0.1436 | 0.1026 |  |
| T (SEPARATE)     | -2.29             | C.023 | 184.8 |         |     | SAMPLE SIZE | 90     | 238    |  |
| T (POOLED)       | -2.14             | C.033 | 326   |         |     | MAXIMUM     | 5.0000 | 5.0000 |  |
|                  |                   |       |       |         |     | MINIMUM     | 1.0000 | 1.0000 |  |
| F(FOR VARIANCES) |                   |       |       |         |     |             |        |        |  |
| LEVENE           |                   | 16.17 | 0.000 | 1,      | 326 |             |        |        |  |

## Fund Transfers

|                  |            |       |        |         |             |         |        |        |  |
|------------------|------------|-------|--------|---------|-------------|---------|--------|--------|--|
| *****            |            |       |        |         |             |         |        |        |  |
| * 20             | * VARIABLE |       | NUMBER | 8       | GROUP       | 1 EA    | 3 NA   |        |  |
| *****            |            |       |        |         |             |         |        |        |  |
| STATISTICS       |            |       |        | P VALUE | DF          | MEAN    | 1.7954 | 2.0352 |  |
|                  |            |       |        |         |             | STD DEV | 1.0631 | 1.4169 |  |
|                  |            |       |        |         |             | S.E.M.  | 0.1133 | 0.0940 |  |
| T (SEPARATE)     |            | -1.63 | C.105  | 209.8   | SAMPLE SIZE |         | 68     | 227    |  |
| T (POOLED)       |            | -1.44 | C.152  | 313     | MAXIMUM     |         | 5.0000 | 5.0000 |  |
|                  |            |       |        |         |             | MINIMUM | 1.0000 | 1.0000 |  |
| F(FOR VARIANCES) |            |       |        |         |             |         |        |        |  |
| LEVENE           |            | 12.30 | C.001  | 1, 313  |             |         |        |        |  |

Figure E-9 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.2262  
HOTELLING T SQUARE 9.7083  
F VALUE 1.3544 P VALUE 0.225  
DEGREES OF FREEDOM 7, 273

DIFFERENCES ON SINGLE VARIABLES

Checking Account Deposits

\*\*\*\*\*  
\* 14 \* VARIABLE NUMBER 2 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 4.1250 4.0395  
STD DEV 0.5677 1.2204  
S.E.M. 0.1210 0.0732  
SAMPLE SIZE 64 278  
T (SEPARATE) 0.60 C.547 114.1  
T (POOLED) 0.52 C.601 340  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 1.78 C.183 1, 340

Checking Account Withdrawals

\*\*\*\*\*  
\* 15 \* VARIABLE NUMBER 3 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 3.2258 3.3488  
STD DEV 1.1793 1.4874  
S.E.M. 0.1498 0.0926  
SAMPLE SIZE 62 258  
T (SEPARATE) -0.70 C.486 112.6  
T (POOLED) -0.61 C.545 318  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 12.91 C.000 1, 318

Savings Account Deposits

\*\*\*\*\*  
\* 16 \* VARIABLE NUMBER 4 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
MEAN 2.5714 2.9714  
STD DEV 1.4876 1.5950  
S.E.M. 0.1988 0.1019  
SAMPLE SIZE 56 245  
T (SEPARATE) -1.79 C.077 86.4  
T (POOLED) -1.71 C.088 299  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 1.39 C.239 1, 299

Figure E-10. Hotelling's  $T^2$  test for differences in conventional teller usage patterns between late adopters and nonadopters.

## Savings Account Withdrawals

| *****             |                   |         |        | *****       |        |        |
|-------------------|-------------------|---------|--------|-------------|--------|--------|
| * 17              | * VARIABLE NUMBER | 5       |        | GROUP       | 2 LA   | 3 NA   |
| *****             |                   |         |        | *****       |        |        |
|                   | STATISTICS        | P VALUE | DF     | MEAN        |        |        |
| T (SEPARATE)      | -1.44             | 0.153   | 86.0   | STD DEV     | 2.2963 | 2.5974 |
| T (POOLED)        | -1.34             | 0.180   | 288    | S.E.M.      | 1.3546 | 1.5141 |
|                   |                   |         |        | SAMPLE SIZE | 0.1843 | 0.0986 |
|                   |                   |         |        | MAXIMUM     | 54     | 236    |
|                   |                   |         |        | MINIMUM     | 5.0000 | 5.0000 |
| F (FOR VARIANCES) |                   |         |        |             | 1.0000 | 1.0000 |
| LEVENE            | 5.19              | 0.024   | 1, 288 |             |        |        |

## Credit Card Cash Advances

| *****             |                   |         |        | *****       |        |        |
|-------------------|-------------------|---------|--------|-------------|--------|--------|
| * 18              | * VARIABLE NUMBER | 6       |        | GROUP       | 2 LA   | 3 NA   |
| *****             |                   |         |        | *****       |        |        |
|                   | STATISTICS        | P VALUE | DF     | MEAN        |        |        |
| T (SEPARATE)      | -0.82             | 0.416   | 83.9   | STD DEV     | 1.3800 | 1.5115 |
| T (POOLED)        | -0.74             | 0.463   | 265    | S.E.M.      | 0.5875 | 1.1710 |
|                   |                   |         |        | SAMPLE SIZE | 0.1396 | 0.0795 |
|                   |                   |         |        | MAXIMUM     | 50     | 217    |
|                   |                   |         |        | MINIMUM     | 5.0000 | 5.0000 |
| F (FOR VARIANCES) |                   |         |        |             | 1.0000 | 1.0000 |
| LEVENE            | 1.89              | 0.171   | 1, 265 |             |        |        |

## Utility and Loan Payments

| *****             |                   |         |        | *****       |        |        |
|-------------------|-------------------|---------|--------|-------------|--------|--------|
| * 19              | * VARIABLE NUMBER | 7       |        | GROUP       | 2 LA   | 3 NA   |
| *****             |                   |         |        | *****       |        |        |
|                   | STATISTICS        | P VALUE | DF     | MEAN        |        |        |
| T (SEPARATE)      | -1.33             | 0.186   | 82.7   | STD DEV     | 2.0189 | 2.3151 |
| T (POOLED)        | -1.25             | 0.211   | 289    | S.E.M.      | 1.4343 | 1.5823 |
|                   |                   |         |        | SAMPLE SIZE | 0.1970 | 0.1026 |
|                   |                   |         |        | MAXIMUM     | 53     | 238    |
|                   |                   |         |        | MINIMUM     | 5.0000 | 5.0000 |
| F (FOR VARIANCES) |                   |         |        |             | 1.0000 | 1.0000 |
| LEVENE            | 4.83              | 0.029   | 1, 289 |             |        |        |

## Fund Transfers

| *****             |                   |         |        | *****       |        |        |
|-------------------|-------------------|---------|--------|-------------|--------|--------|
| * 20              | * VARIABLE NUMBER | 8       |        | GROUP       | 2 LA   | 3 NA   |
| *****             |                   |         |        | *****       |        |        |
|                   | STATISTICS        | P VALUE | DF     | MEAN        |        |        |
| T (SEPARATE)      | -2.47             | 0.015   | 95.0   | STD DEV     | 1.5961 | 2.0352 |
| T (POOLED)        | -2.10             | 0.037   | 277    | S.E.M.      | 1.0893 | 1.4169 |
|                   |                   |         |        | SAMPLE SIZE | 0.1511 | 0.0940 |
|                   |                   |         |        | MAXIMUM     | 52     | 227    |
|                   |                   |         |        | MINIMUM     | 5.0000 | 5.0000 |
| F (FOR VARIANCES) |                   |         |        |             | 1.0000 | 1.0000 |
| LEVENE            | 8.87              | 0.003   | 1, 277 |             |        |        |

Figure E-10 (continued)

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.1370  
HOTELLING T SQUARE 5.4609  
F VALUE 2.7030 P VALUE 0.070  
DEGREES OF FREEDOM 2, 163

DIFFERENCES ON SINGLE VARIABLES

Use of V-24 Outside Bank Business Hrs. During the Weekdays

\*\*\*\*\*  
\* 28 \* VARIABLE NUMBER 2  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 2.08 0.040 117.5  
T (POOLED) 2.19 0.030 166  
F (FOR VARIANCES)  
LEVENE 5.21 0.024 1, 166

| GROUP       | 1 EA   | 2 LA   |
|-------------|--------|--------|
| MEAN        | 4.5346 | 4.2089 |
| STD DEV     | 0.8434 | 1.0806 |
| S.E.M.      | 0.0839 | 0.1320 |
| SAMPLE SIZE | 101    | 67     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Use of V-24 During the Weekdays

\*\*\*\*\*  
\* 29 \* VARIABLE NUMBER 3  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 1.69 0.095 111.6  
T (POOLED) 1.79 0.075 165  
F (FOR VARIANCES)  
LEVENE 6.93 0.009 1, 165

| GROUP       | 1 EA   | 2 LA   |
|-------------|--------|--------|
| MEAN        | 4.6534 | 4.4091 |
| STD DEV     | 0.7541 | 1.0073 |
| S.E.M.      | 0.0750 | 0.1240 |
| SAMPLE SIZE | 101    | 66     |
| MAXIMUM     | 5.0000 | 5.0000 |
| MINIMUM     | 1.0000 | 1.0000 |

Figure E-11. Hotelling's  $T^2$  test for differences in convenience oriented usage of V-24 between early adopters and late adopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

|                      |          |         |       |
|----------------------|----------|---------|-------|
| MAHALANOBIS D SQUARE | 1.5710   |         |       |
| HOTELLING T SQUARE   | 113.8312 |         |       |
| F VALUE              | 56.7140  | P VALUE | C.000 |
| DEGREES OF FREEDOM   | 2, 356   |         |       |

DIFFERENCES ON SINGLE VARIABLES

Use of V-24 Outside Bank Business Hrs. During the Weekdays

\*\*\*\*\*  
\* 28 \* VARIABLE NUMBER 2 GROUP 1 EA 3 NA  
\*\*\*\*\*

| STATISTICS   | P VALUE | DF  | MEAN  |                       |
|--------------|---------|-----|-------|-----------------------|
| T (SEPARATE) | 12.29   | 0.0 | 288.7 | 4.5346 3.0736         |
| T (POOLED)   | 10.11   | 0.0 | 357   | 0.6434 1.3517         |
|              |         |     |       | S.E.M. 0.0839 0.0842  |
|              |         |     |       | SAMPLE SIZE 101 258   |
|              |         |     |       | MAXIMUM 5.0000 5.0000 |
|              |         |     |       | MINIMUM 1.0000 1.0000 |

F(FOR VARIANCES)  
LEVENE 20.28 C.000 1, 357

Use of V-24 During the Weekdays

\*\*\*\*\*  
\* 29 \* VARIABLE NUMBER 3 GROUP 1 EA 3 NA  
\*\*\*\*\*

| STATISTICS   | P VALUE | DF    | MEAN  |                       |
|--------------|---------|-------|-------|-----------------------|
| T (SEPARATE) | 12.68   | 0.0   | 318.3 | 4.6534 3.2234         |
| T (POOLED)   | 9.94    | 0.000 | 363   | 0.7541 1.3675         |
|              |         |       |       | S.E.M. 0.0750 0.0842  |
|              |         |       |       | SAMPLE SIZE 101 264   |
|              |         |       |       | MAXIMUM 5.0000 5.0000 |
|              |         |       |       | MINIMUM 1.0000 1.0000 |

F(FOR VARIANCES)  
LEVENE 45.71 C.000 1, 363

Figure E-12. Hotelling's  $T^2$  test for differences in convenience oriented usage of V-24 between early adopters and nonadopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.8955  
HOTELLING T SQUARE 47.0783  
F VALUE 23.4230 P VALUE 0.000  
DEGREES OF FREEDOM 2, 321

DIFFERENCES ON SINGLE VARIABLES

Use of V-24 Outside Bank Business Hrs. During the Weekdays

\*\*\*\*\*  
\* 28 \* VARIABLE NUMBER 2 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 7.25 0.000 125.2  
T (POOLED) 6.36 0.000 323  
MEAN 4.2089 3.0736  
STD DEV 1.0806 1.3517  
S.E.M. 0.1320 0.0842  
SAMPLE SIZE 67 258  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEVENE 3.12 0.078 1, 323

Use of V-24 During the Weekdays

\*\*\*\*\*  
\* 29 \* VARIABLE NUMBER 3 GROUP 2 LA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 7.91 0.000 131.8  
T (POOLED) 6.61 0.000 328  
MEAN 4.4091 3.2234  
STD DEV 1.0073 1.3675  
S.E.M. 0.1240 0.0842  
SAMPLE SIZE 66 264  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEVENE 10.28 0.001 1, 328

Figure E-13. Hotelling's  $T^2$  test for differences in convenience oriented usage of V-24 between late adopters and nonadopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 0.1478  
HOTELLING T SQUARE 6.0171  
F VALUE 1.9758 P VALUE 0.120  
DEGREES OF FREEDOM 3, 165

DIFFERENCES ON SINGLE VARIABLES

Desire for Convenient Location for V-24

\*\*\*\*\*  
\* 38 \* VARIABLE NUMBER 2  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 1.14 0.258 142.1  
T (POOLED) 1.14 0.256 167  
F (FOR VARIANCES)  
LEVENE 0.07 0.797 1, 167  
GROUP 1 EA 2 LA  
MEAN 3.4356 3.2059  
STD DEV 1.2761 1.2994  
S.E.M. 0.1270 0.1576  
SAMPLE SIZE 101 68  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000

Need of a Telephone on V-24

\*\*\*\*\*  
\* 39 \* VARIABLE NUMBER 3  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) 1.36 0.176 142.1  
T (POOLED) 1.37 0.174 168  
F (FOR VARIANCES)  
LEVENE 0.04 0.846 1, 168  
GROUP 1 EA 2 LA  
MEAN 3.2745 2.9853  
STD DEV 1.2435 1.3658  
S.E.M. 0.1330 0.1656  
SAMPLE SIZE 102 68  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000

Wants of Privacy for V-24 Use

\*\*\*\*\*  
\* 40 \* VARIABLE NUMBER 4  
\*\*\*\*\*  
STATISTICS P VALUE DF  
T (SEPARATE) -0.88 0.380 134.6  
T (POOLED) -0.90 0.371 168  
F (FOR VARIANCES)  
LEVENE 0.57 0.453 1, 168  
GROUP 1 EA 2 LA  
MEAN 2.8431 3.0147  
STD DEV 1.1752 1.2870  
S.E.M. 0.1164 0.1561  
SAMPLE SIZE 102 68  
MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000

Figure E-14. Hotelling's  $T^2$  test for differences in needs-wants-concerns in V-24 usage between early adopters and late adopters.



DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* NA \*  
\*\*\*\*\*

MAHALANOBIS D SQUARE 1.1770  
HOTELLING T SQUARE 86.7881  
F VALUE 28.7642 P VALUE 0.000  
DEGREES OF FREEDOM 3, 367

DIFFERENCES ON SINGLE VARIABLES

Desire for Convenient Location for V-24

\*\*\*\*\*  
\* 38 \* VARIABLE NUMBER 2 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 3.4356 2.2761  
STD DEV 1.2761 1.1765  
S.E.M. 0.1270 0.0719  
T (SEPARATE) 7.95 0.000 167.9 SAMPLE SIZE 101 269  
T (POOLED) 8.25 0.000 367 MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 0.11 0.743 1, 367

Need of a Telephone on V-24

\*\*\*\*\*  
\* 39 \* VARIABLE NUMBER 3 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 3.2745 2.7956  
STD DEV 1.3435 1.2875  
S.E.M. 0.1330 0.0778  
T (SEPARATE) 3.11 0.002 174.3 SAMPLE SIZE 102 274  
T (POOLED) 3.17 0.002 374 MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 0.66 0.416 1, 374

Wants of Privacy for V-24 Use

\*\*\*\*\*  
\* 40 \* VARIABLE NUMBER 4 GROUP 1 EA 3 NA  
\*\*\*\*\*  
STATISTICS P VALUE DF MEAN 2.8431 2.7883  
STD DEV 1.1752 1.2863  
S.E.M. 0.1164 0.0777  
T (SEPARATE) 0.39 0.695 196.7 SAMPLE SIZE 102 274  
T (POOLED) 0.38 0.707 374 MAXIMUM 5.0000 5.0000  
MINIMUM 1.0000 1.0000  
F (FOR VARIANCES)  
LEvene 1.43 0.233 1, 374

Figure E-15. Hotelling's  $T^2$  test for differences in needs-wants-  
concerns in V-24 usage between early adopters and nonadopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* LA \*  
\* NA \*  
\*\*\*\*\*

|                      |         |         |       |
|----------------------|---------|---------|-------|
| MAHALANOBIS D SQUARE | 0.7180  |         |       |
| HOTELLING T SQUARE   | 38.9902 |         |       |
| F VALUE              | 12.8956 | P VALUE | 0.000 |
| DEGREES OF FREEDOM   | 3, 333  |         |       |

DIFFERENCES ON SINGLE VARIABLES

Desire for Convenient Location for V-24

\*\*\*\*\*  
\* 38 \* VARIABLE NUMBER 2 GROUP 2 LA 3 NA  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF   | MEAN   | STD DEV | S.E.M. | SAMPLE SIZE | MAXIMUM | MINIMUM |
|--------------|------------|---------|------|--------|---------|--------|-------------|---------|---------|
| T (SEPARATE) | 5.37       | 0.000   | 96.7 | 3.2059 | 1.2954  | 0.1576 | 68          | 5.0000  | 1.0000  |
| T (POOLED)   | 5.70       | 0.000   | 334  |        |         |        |             |         |         |

F (FOR VARIANCES)  
LEvene 0.01 0.927 1, 334

Need of a Telephone on V-24

\*\*\*\*\*  
\* 39 \* VARIABLE NUMBER 3 GROUP 2 LA 3 NA  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF   | MEAN   | STD DEV | S.E.M. | SAMPLE SIZE | MAXIMUM | MINIMUM |
|--------------|------------|---------|------|--------|---------|--------|-------------|---------|---------|
| T (SEPARATE) | 1.04       | 0.302   | 98.6 | 2.5853 | 1.3659  | 0.1656 | 68          | 5.0000  | 1.0000  |
| T (POOLED)   | 1.07       | 0.283   | 340  |        |         |        |             |         |         |

F (FOR VARIANCES)  
LEvene 0.21 0.647 1, 340

Wants of Privacy for V-24 Use

\*\*\*\*\*  
\* 40 \* VARIABLE NUMBER 4 GROUP 2 LA 3 NA  
\*\*\*\*\*

|              | STATISTICS | P VALUE | DF    | MEAN   | STD DEV | S.E.M. | SAMPLE SIZE | MAXIMUM | MINIMUM |
|--------------|------------|---------|-------|--------|---------|--------|-------------|---------|---------|
| T (SEPARATE) | 1.30       | 0.197   | 102.8 | 3.0147 | 1.2870  | 0.1561 | 68          | 5.0000  | 1.0000  |
| T (POOLED)   | 1.30       | 0.195   | 340   |        |         |        |             |         |         |

F (FOR VARIANCES)  
LEvene 0.03 0.873 1, 340

Figure E-16. Hotelling's  $T^2$  test for differences in needs-wants-concerns in V-24 usage between late adopters and nonadopters.

DIFFERENCES AMONG GROUP MEANS USING ALL VARIABLES  
FOR THE FOLLOWING GROUPS

\*\*\*\*\*  
\* EA \*  
\* LA \*  
\*\*\*\*\*

|                      |         |         |       |
|----------------------|---------|---------|-------|
| MAHALANOBIS D SQUARE | 0.3296  |         |       |
| HOTELLING T SQUARE   | 13.2078 |         |       |
| F VALUE              | 6.5507  | P VALUE | 0.002 |
| DEGREES OF FREEDOM   | 2, 163  |         |       |

DIFFERENCES ON SINGLE VARIABLES

Feelings of Being Comfortable

| *****            |            |         |       | * 25 * VARIABLE NUMBER 2 |        | GROUP 1 EA |        | 2 LA |  |
|------------------|------------|---------|-------|--------------------------|--------|------------|--------|------|--|
| *****            |            |         |       |                          |        |            |        |      |  |
|                  | STATISTICS | F VALUE | DF    | MEAN                     |        |            |        |      |  |
| T (SEPARATE)     | 3.41       | 0.001   | 134.7 | 4.1111                   |        |            | 3.4706 |      |  |
| T (POOLED)       | 3.47       | 0.001   | 165   | 1.1238                   |        |            | 1.2395 |      |  |
|                  |            |         |       | 0.1130                   |        |            | 0.1503 |      |  |
|                  |            |         |       | SAMPLE SIZE              | 59     |            | 68     |      |  |
|                  |            |         |       | MAXIMUM                  | 5.0000 |            | 5.0000 |      |  |
|                  |            |         |       | MINIMUM                  | 1.0000 |            | 1.0000 |      |  |
| F(FOR VARIANCES) |            |         |       |                          |        |            |        |      |  |
|                  | LEvene     | 1.33    | 0.250 | 1, 165                   |        |            |        |      |  |

Influence of the First Impression Upon the Future V-24 Usage

| *****            |            |         |       | * 26 * VARIABLE NUMBER 3 |        | GROUP 1 EA |        | 2 LA |  |
|------------------|------------|---------|-------|--------------------------|--------|------------|--------|------|--|
| *****            |            |         |       |                          |        |            |        |      |  |
|                  | STATISTICS | F VALUE | DF    | MEAN                     |        |            |        |      |  |
| T (SEPARATE)     | 2.37       | 0.020   | 110.2 | 4.2500                   |        |            | 3.9104 |      |  |
| T (POOLED)       | 2.53       | 0.012   | 165   | 0.9361                   |        |            | 1.3112 |      |  |
|                  |            |         |       | 0.0936                   |        |            | 0.1602 |      |  |
|                  |            |         |       | SAMPLE SIZE              | 100    |            | 67     |      |  |
|                  |            |         |       | MAXIMUM                  | 5.0000 |            | 5.0000 |      |  |
|                  |            |         |       | MINIMUM                  | 1.0000 |            | 1.0000 |      |  |
| F(FOR VARIANCES) |            |         |       |                          |        |            |        |      |  |
|                  | LEvene     | 10.63   | 0.001 | 1, 165                   |        |            |        |      |  |

Figure E-17. Hotelling's  $T^2$  test for differences in first impressions on the first few trials between early adopters and late adopters.

## VITA

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