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ABSTRACT

Based on mail surveys of professional librarians and library administrators in approximately 300 U.S. public libraries and personal interviews with librarians and administrators in 6 public libraries, this report presents a statistical analysis of data collected on library technology and attitudes toward technological innovation. Areas addressed by the study include: (1) the amount of resistance to technology; (2) correlates of this resistance; (3) librarians' perceptions of the values of technology; (4) the relationship of personal and societal values to each other and to resistance to technology; (5) the identification of a "resistant personality"; (6) the relationship of work, professional, demographic, and sociological variables to resistance; and (7) the present and future status of libraries relative to technology. Low levels of resistance to technology were identified among both librarians and administrators, and use of microforms in libraries was found to be more prevalent than computer-related forms of technology. A comprehensive listing of survey questions and responses is provided, as well as 84 statistical tables and a list of 15 references. The publication concludes with four appendices covering survey procedures, statistical methods for the mail survey, distribution of the resistance to technology index, and the interview survey of library administrators. (ESR)

Final Report: Part II

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RESISTANCE TO TECHNOLOGICAL INNOVATION IN LIBRARIES: RESEARCH REPORT PART II DATA ANALYSIS AND STATISTICAL REPORT

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RESULTS OF THE STUDY: INTRODUCTION

Adoption of innovation is not a static phenomenon; nor is resistance. Not every adoption of a new idea is innovation, nor is every rejection resistance. We are dealing not only with variable motivation, but with complex behavior which is also in a constant state of flux.

1. The Nature of the Study.

The literature on organizational change focuses primarily on the natural tendency for groups and social systems to resist innovation, just as the literature of the behavioral sciences focuses on the dynamics of individual resistance as a barrier to achieving psychological health. In the first instance, research studies and their commentaries reflect an attempt by management as change agent to understand and reduce that resistance so that an organization may assume or resume its movement towards growth through adaptation to change. In the second instance, the therapist as change agent ferrets out an individual's resistance and uses it as a therapeutic tool for disarming the barriers to personal growth. In both instances, it is the change agent who identifies the need for change, the resistant behaviors, and the appropriate intervention mechanisms and strategies.

The traditional approach to the study of resistance to change has been from the perspective and bias of innovators and agents of innovation, not from the perspective of clients whom the change will affect. The objective of this study was to focus on the phenomenon of resistance from the perspective of the client and to understand some of its components and correlates. That which agents of change call resistance may, when described or interpreted by the clients whom the change will effect, be described or interpreted as a totally different phenomenon. Change, after all, in and of itself is neither positive nor negative; it is neutral. Resistance, too, in and of itself is neither productive nor destructive. It is the meaning behind resistant behavior and the ways in which it is manifested that make it significant to the future of an organization.

The literature of librarianship, in contrast, reflects a focus on technological objectives rather than on the behavioral components of innovation. Emphasis is on specific innovations, those currently available and those potential in the future, and on the implications for changes in library service that may result from their introduction. There are studies of effectiveness and efficiency and of the need for more effectiveness and efficiency. User studies seek to understand how a developing library technology affects user information-seeking behavior and the satisfaction of user needs and demands. There is some literature, mostly opinion and observation with little empirical research, on the behavior of librarians toward library users. There is a paucity of literature on the impact of high-velocity technological

change on the librarian, even though it is the librarian who must assimilate and adapt to new technology in order to become the transfer agent between a resource and its user.

This study, then, has no starting place in library research literature. It has attempted to break fresh ground. The starting point was a collection of hypotheses drawn from the experiences of consultants who have been involved in implementing technological changes in libraries, from the observations of librarians and library administrators, from the writings of library commentators and observors, from the literature of technology, and from other disciplines concerned with theory and practice of organizational change such as social and clinical psychology, business administration, and education.

From this diversity of viewpoints came a diversity of approaches to the study, and eventually a set of theories and related hypotheses. A major question in the development of the theoretical constructs about resistance and the devices for measuring them was whether constructs and devices used in other disciplines and under other conditions and with other populations could be effectively adapted to the study of a particular kind of change, e.g., technological, in a particular kind of organization, e.g., libraries, concerned with a specific and distinct population, e.g., librarians. The findings of this study suggest no simple answer. In some ways libraries are like other organizations and affect their professional personnel in ways long recognized in organizational behavior theory. On the other hand, librarians cannot

be "normed" to populations on which assessment measures are standardized. In addition, librarians seem to be particularly sensitive to the tendency to respond with socially acceptable responses, and library administrators reveal a tendency to be uncomfortable with studies that concern attitudes, feelings, and perceptions. These issues will be explored further in connection with specific research questions, methods, and findings of the study.

This study was not primarily about libraries and librarians, nor about technology and its uses. The study was about a human condition and its correlates. It was intended to be an exploration into an aspect of behavior that has been identified by the library profession and recognized as significant, but one that has not been systematically studied. The purpose of the study was twofold: first, to provide a deeper understanding of the phenomenon of resistance to change and to enable decision and policy-makers to act on expanded information; and second, to develop and test a methodology for the study of an aspect of human behavior that affects the workings of the library and for conducting such a study within the library environment, thus providing a basis for expanding research in this area. The study was therefore designed to be of interest and use to (1) library administrators and library educators who make deicsions which will affect the organizational and professional climate and the behavior of the people who live in it; (2) technologists (the innovators) and technology consultants (the agents of change) who see the resistance of librarians as a major hurdle to be overcome;

(3) library researchers who may adapt those elements in the study that produced significant information and may revise those methods that proved to be inappropriate for this population; (4) and above all to librarians themselves as a way toward self-understanding. Librarians have been subjected to such labeling as traditional, apathetic, and resistant to innovation (Nolting, 1969). The results of this study raise some questions about the accuracy of those diagnoses and certainly point up that any dynamic in human behavior is not single-dimensional. Resistance has many facets in its antecedents, its effects on an individual, and its manifestations. In fact, one of the major problems of this study was to develop constructs about resistance that encompassed enough universality to be generalizable over such a diversified but distinctive profession as librarianship.

2. General Overview of the Study.

This study was undertaken to investigate resistance to technological innovation in libraries through an assessment of corroborating attitudes and to study potential factors relating to those attitudes. The twofold research purpose of the study was to distinguish unreasoned resistance to new technology from considered caution or rejection based on consideration of disadvantages versus benefits, and to seek to identify characteristics of personality or of the social system that may be associated with unreasoned resistance where it existed. The end result of the research would be a fund of information that could be helpful to library

policymakers and educators in determining how best to cope with current realities in libraries and how to prepare for the future.

The underlying assumption of the study was that resistance to change exists as a dimension of human behavior. It was further hypothesized and substantiated through the literature and personal contact with primary sources: (1) that this resistance exists in the library community; (2) that the degree of resistance varies among individuals; (3) that the resistance is manifested through specific behaviors; (4) that these behaviors arise from the attitudes of the individuals involved; and (5) that resistant behaviors can therefore be indirectly assessed through an analysis of corroborating self-reported attitudes.

The data for the major portion of the study was obtained through a mail survey of professional librarians working in public libraries. The instrument requested information on demographic characteristics; experience with technology; attitudes toward technology; expectations as to the future of technology in public libraries; work-related perceptions; and personality characteristics. These data could then be analyzed to describe public librarians in terms of demographic characteristics and attitudes and to point out any relationships which might exist between these classes of characteristics. A parallel survey was conducted by means of personal interviews with librarians in a second sample of public libraries. The interview procedure explored most of the questions covered in the mail survey, sometimes in greater detail. Many questions were open-ended, allowing for projective responses and

providing more information on respondents' attitudes and opinions relative to technological change.

Respondents for both the mail survey and personal interviews were sampled from libraries of varying size in locations throughout the country. This method of sampling provided additional information in the form of demographic data on each library and on respondents from that library. Such factors as size and urbanicity of a library, for example, may be related to the amount of exposure its staff has to technological innovation of any type and may therefore be a factor of acceptance or rejection.

3. The Data Collection Process and the Respondent Population.

The study of the state of technology in public libraries and of the attitudes of librarians toward technological innovations was based on four data collection devices:

1. A mail survey of professional librarians employed in a stratified sample of approximately 300 public libraries, representing broad size-of-community classes and urbanization categories. This survey, the major data collection effort of the study, was designed to permit inferences about attitudes toward technology associated with different kinds of libraries and therefore the results of this survey constitute the major portion of this report. The mail survey of professionals was statistically representative with a sample size permitting sub-national estimates.

2. A mail survey of the directors of these same public libraries which served as the primary vehicle for examination of the state of technology in public libraries in the United States. Responses to the administrators' survey reveals the directors' perceptions of staff attitudes toward technological innova-

tions. They also provide some description of the community served and of the library's planning and direction with respect to technological innovation. The mail survey of directors was designed, with respect to sample size and representativeness, to provide statistical evidence at the national level.

3. A personal interview survey of professionals in six public libraries selected on a non-random basis, designed to tap attitudes in greater depth than was possible by a mail questionnaire, and thus to illuminate the findings of the mail survey. Libraries for the personal interview study were selected to represent some diversity in size and location, but the primary criteria were related to notable involvement or lack of involvement in technological developments.

4. Interviews with the directors or administrators of these six public libraries, intended to aid in interpreting the findings of the general survey, not to provide national statistical evidence. (Sampling design is described in Appendix B) [1]

The total analyzed responses for the four survey instruments were 986 librarians (mail survey), 86 librarians (personal interview survey), 211 administrators (mail survey) and 15 administrators (personal interview survey). Basic tabulations and cross tabulations for the mail surveys were developed using data weighted to represent the survey universe. Further analyses, and the personal interview analyses, were conducted using unweighted data. (See Appendix B).

In the instructions for sampling procedures to be applied to the selection of librarians within the sampled libraries, the following definition was provided to specify the respondent population:

[1] Changes in population figures since 1974 are not reflected in these data nor are changes in the number of libraries since that time.

> Professional Librarians--staff members doing work that requires professional training and skill in the theoretical and/or scientific aspect of library work, as distinct from its mechanical or clerical aspect.

The limitations in this definition may have decreased the number of eligible respondents to some degree since media and audiovisual specialists were eliminated.

4. Conceptual Considerations.

There were several conceptual questions to be confronted in the development of this study that reflect the abstract and ambiguous nature of the resistance phenomenon. These issues are of concern for two reasons: the first was the need to clarify the assumptions on which the study would be built; the second was to provide a framework for reading the results that reflects the complexity of the subject of resistance and the difficulties involved in measuring its discrete elements. These questions were raised when the study was designed and as the questionnaire was developed. They are raised again at this point to be considered in reading and deriving meaning from the results.

A. What if resistance doesn't "show"? First was the question of whether resistance to technology really exists in librarians and whether, therefore, the primary assumption of this study was justified.

Behavioral theory and research strongly indicate that human beings, both as individuals and as a collective social organism, will view change as crisis and will to a greater or lesser degree mobilize defensive measures to reduce crisis anxiety. Theoretically, resistance to technological innovation does exist. The library literature and personal observation of administrators and practitioners attest to its existence. The fact that libraries have not made use of existing technologies and have not become a recognized public information resource may be an important indicator of organizational resistance. The question that confounds the researcher, however, is whether this resistance will be evidenced in a study of this nature. If not, where does the explanation lie? In the study design? In the unknown idiosyncracies of the respondents? In the effect of organizational pressure? In the nature of librarianship that may be either uniquely compliant or uniquely and aggressively innovative? There was no way to control for these elements in the study design, but the possibility of their existence cannot be discounted in reading the results.

B. The unique and heterogeneous nature of the subject group. A second issue concerned the subject population of this study and the fact that it is not representative of the general population. We know that within this population there are many more females than males, that each respondent probably has at least one graduate degree, that respondents are strongly effected by their perceptions of their own professionalism or lack of it. Again there were confounding questions. Would the

survey instrument, parts of which were validated against "normal" populations, be appropriate to this unique yet diverse population? Would the respondents in this unique subject group exhibit a particularly strong tendency to give professionally acceptable responses, and if so, how would this factor affect the data?

The survey instrument developed for this study was in part based on items in recognized scales and partly designed specifically for this project. Since the complete instrument had not been previously used and assessed, a rigorous pilot testing procedure was applied and a variety of library-associated groups were used as respondents. (Pilot studies are described in Part I, Appendix A-2 of this Report). The pilot test results suggested that (1) resistance to technology does exist; (2) it is measurable; and (3) the instrument is a valid device for that measurement. There was reason to believe that the results from the larger sample of this study would parallel the results from the pilot groups, unless there were other factors operating such as the setting in which the instrument was administered. The pilot groups were library school faculty and students and practicing librarians and administrators who were attending national conferences. The general survey populations were in their own libraries, with their own colleagues and administrators, a heterogeneous group as contrasted with those surveyed in the pilot studies.

There was no way to determine the extent to which respondents would be influenced by the fact that the instrument was distributed

within the work environment rather than through direct mail contact which might have suggested greater confidentiality. It seemed possible that conducting the study within the library itself might induce a stronger than usual tendency toward social conformity in respondents. As described later in this report, the data from the survey instrument were analyzed to determine if there was a "social desirability" factor operating. A series of questions, one from each of the variables of the study, was analyzed for its "perfect score" content. Questions chosen for this analysis were those most likely to elicit a response that could be predicted to be acceptable. A "perfect score" respondent would never be depressed, always be friendly, have no fears, accept all new technologies, be in control, have no reservations about the work environment or the administrator, and have a highly positive image of librarianship. These kinds of responses would be "professionally determined" as appropriate for librarians and would put the respondent in a personally favorable light. The results of this analysis indicated that there was indeed a tendency for librarians to respond with a greater than expected social acceptability factor which describes as much as 20% of the variance in the results of the analysis. (Results of this analysis are presented in Section 2.3 of this report.

C. The Special Problem of Non-Response and Non-Responsiveness.

A favored behavioral manifestation of organizational resistance is some form of non-response, somewhat similar to the resistant behavior that is characterized by absenteeism and tardiness, non-productivity, or general non-participation in organizational events. The problem of non-response was particularly significant to this study not only because of its effect on the statistical strength of the results, but because non-responsiveness is in itself an aspect of the phenomenon being studied. There was no way to assess the nature or the degree of "resistance to change" as opposed to "resistance to engaging in a research study" that was represented by the non-respondent. Even in the interview phase of the study, where some subjects were more reluctant to participate than others, the non-respondent was not available to the research team for a discussion of non-participation and its implications.

The significance of this limitation in the conduct of the study must be emphasized. The inability to assess the degree of this primary form of resistance, whether to library research in general or to a study of technology in particular, would effectively depress the resistance factor as it would appear in the results by lopping off the most significant end of the resistance continuum.

As a result of the sampling design of the study, there were two stages at which resistance may have been the cause of non-response. One stage, the one at which a recipient of a questionnaire makes the

decision not to complete and return it, is common to all survey studies. The other stage, however, was the result of the method by which subjects for the study were selected and provided another point at which resistance may have affected the response rate.

In designing the sampling strategy, it was decided to use libraries as the first sampling cluster, and then to randomly select librarians from within the sampled libraries. This procedure was chosen because there was no other way to reach the entire population of librarians. Available lists of librarians from which samples might have been derived were specialized in some way and did not account for librarians who are not members of an association, do not subscribe to professional journals, or are no longer associated with a particular library. The only complete universe from which a stratified sample could be obtained consisted of libraries in the United States. Only from the libraries themselves could personnel lists of currently employed public librarians be obtained.

The result was that the library administrator, with whom the initial contact was made, could act as gatekeeper and decide whether the librarians in that system would be given the opportunity to respond to or reject the questionnaire. Non-response, then, may represent some resistance on the part of administrators which may or may not reflect the choice that would have been made by an individual librarian.

Rates of response are described later in this report. These rates do not reflect a significant statistical limitation, but the issue is

an important one in light of the purpose of this study. First, there were some trends relative to geographic area and size of libraries evident in the response patterns. Second, there is reason to believe that non-responding libraries, had they been included in the analysis, may have produced more variance in the results in ways that would have revealed important insights about resistance. Third, some descriptive data has been produced, even by non-response.

These descriptive data emerged from the style, nature, and rationale of refusals by administrators to permit the members of the library system to participate. During the telephone followup with 97 libraries who did not respond to the questionnaire:

25 administrators refused;

52 administrators requested new questionnaires because original packets had been lost;

11 administrators had not decided whether to distribute questionnaires.

There were two principle reasons given by administrators for refusal to participate. The first was that the staff doesn't have time to complete the questionnaire. It is worth noting that the staff could have completed the questionnaires on their own time had the choice been given, but the administrators in these instances chose not to make the choice available. It is also worth noting that there appeared to be no relationship between the activity level within a particular library and the administrative decision to participate or not, i.e., some of the participating libraries were also those with the highest level of

activity. Some administrators willingly completed the administrators' questionnaire but refused to distribute the general instrument to staff members. A few refused on the basis that there is no technology in their library and so the study does not apply to them. It seemed to the investigators that the operating dynamic was not time, but reluctance about some aspect of the study or uneasiness about being surveyed by an academic institution.

The second reason for refusal to participate concerned the psychological dimension of the study and the personal nature of the questions. In one instance, a series of interviews had been set up by the administrator of a library but the interviewers were asked to discontinue the interviews when the administrator became aware of the attitudinal nature of certain questions. The reasons given were that he, the administrator, could not understand how open-ended responses could be quantified, that the staff of the library were progressive and well-trained and therefore represented an atypical situation, and that he did not want to lend credibility to a study for which he could see no purpose. The interviews were, of course, promptly discontinued. Gordon (1961) observed that this kind of reaction can be anticipated in behavioral studies, that some subjects will welcome the probing of their thougnts and ideas while others are reluctant to "discuss the (to him) mystical workings of his mind" (p. 19).

A second example of resistance to the study of attitudes was revealed in a letter from a large urban library system director who

wrote that his library

> ....has had a wide variety of experience over the past 15-20 years with the many facets of automation. We would be interested in responding to any series of questions dealing with the factual details of that broad experience. However, most of the survey seems to relate to opinion based on some sort of emotional reactions, be they positive or negative.
>
> I find it difficult to see the importance or the value of the collection of these kinds of data. With that in mind, I hope you will understand why we prefer not to distribute the personal opinion survey nor to answer the questions addressed to the Director.
>
> We will always be ready to cooperate when hard information is sought, but, please spare us these explorations into the state of our psyche.

While most refusals were not as direct about the nature of the study as these examples, some undercurrent of anxiety nevertheless seemed to exist in many of the refusals. It must be emphasized that 215 administrators of the 298 in the sample did respond and many expressed great interest in the study and support for its purpose. However, the issue of administrator resistance, as it affected the responses to the survey, must be acknowledged and integrated into the reading of the results.

D. The "Catch-All" Nature of the Instrument. The use of a self-report assessment inventory poses some inherent problems for research, particularly where the method of first choice would be a performance or situational test and where the use of a questionnaire is substituted because it is the only feasible method. In most self-

report inventories used today in the assessment of personality, for example, some efforts have been made toward empirical validation, but for the most part, self-report tests have relied principally on content validity in the formulation, selection, and ordering of items. The face validity of the assessment instrument used in this study was thoughtfully reviewed by psychologists, information scientists and library educators in an attempt to refine its content relative to the purpose of the study.

Anastasi (1968) discusses other limitations, all of which are inherent in the self-report process and pose limitations on the accuracy and generalizability of data collected by this method. The most significant limitation is the potential for faking towards socially desirability, not intended as deliberate deception but a response tendency of which the respondent is unaware; this tendency is sometimes manifested as a reversal whereby the respondent consistently gives socially deviant responses. The forced-choice technique was simultaneously developed by Jurgensen (1944), Shipley, Gray and Newbert (1946) and Sisson (1948) as a method by which the socially desirable or "correct" response would be obscured. The use of the forced-choice technique in the Resistance instrument created some conflict for respondents, even to the point where some respondents were critical of the whole study. Its use was predicated on two issues: (1) the use of items from other assessment instruments which included forced-choice items and (2) its recognized effectiveness as a self-

report device.

Another inherent limitation in the questionnaire as a method concerned its situational specificity, the degree to which a response given at a particular moment in time may or may not reflect a more general reality for the respondent. Openness to change is not static; nor is resistance. If a questionnaire might include questions such as "Could you describe a recent event that may have affected your present responses" or "How would you describe your mood at this moment," the response from each individual subject could perhaps be interpreted in its situational context. While this limitation could not be lessened in the present study, it must nevertheless be considered in reading the results. On the other hand, it is just as likely that a positive event may affect response as a negative one, and the statistical analysis would effect an evening-out process. That is, the situationally-specific response may not affect the results statistically. The loss is in understanding, particularly in terms of the present study where it is the antecedents, either psychological, environmental or situational, which are of interest and importance to our understanding of the phenomenon being studied.

The following recognized techniques for minimizing the limitations in a self-report approach to data collection were incorporated to the degree possible in this study: (1) the use of factor analysis as a means of arriving at trait categories; (2) the use of a forced-choice technique where possible; (3) the use of subtle or obscure measures

of the traits being assessed where the correct response is less apparent to the respondent; (4) the use of quasi-projective test items; and (5) the analysis of the social desirability factor.

In addition to the general research concerns relative to the use of the self-report inventory as a research devise, this particular study and its instrument posed an additional set of problems. Because the variables were pulled from various disciplines and the questionnaire items were adapted from other existing instruments, the format of the questionnaire was diverse. Different variables were assessed by different question forms. It was necessary for the respondent to shift from one response pattern to another, from impersonal to personal items and from attitudes to feelings, in going through the questions. This diversity was both an asset and a liability. On the one hand, the questionnaire was varied and interesting; on the other hand, its diversity may have caused some confusion. Its length may have been a problem for some respondents, even though this issue was not raised during the field work process.

The most important question related to the instrument concerned the effort to assess a broad array of complex variables within the limits of one assessment tool. In interpreting the results of the study, it is important to keep in mind that correlational weaknesses may reveal more about the efficacy of a short device to measure certain characteristics than about the characteristics themselves.

5. The Nature of the Methodology.

One of the major decisions in designing this study concerned the methodological approach to the assessment of resistance to change and the delineation of those factors which seem to co-exist with resistance and may, therefore, be its correlates. The problem was that there is a broad array of behavioral and attitudinal variables that may or may not be related to each other but do seem to be related to the resistance phenomenon. They come from a variety of disciplines--behavioral and social psychology, cognitive and educational psychology, organizational theory, sociology, and information science.

There were several possible approaches to the design of the study. One approach was to select one variable from an assortment of possibilities, to develop an in-depth measure of that variable, and to assess a correlation with a second variable, i.e., resistance to technology. There were two problems with this approach. One, there were no precedents on which to chose one or two variables, since the research literature in innovation suggests that no such single variables can be isolated. Two, since there were no strong hypotheses about one or two isolated variables, there was a risk that the one variable selected might be the wrong one and that the study would produce neither significant findings nor indications for further areas to probe.

The research dilemma was this: if a "deep net" with small holes is dropped in an effort to understand the complexity of a narrow set of variables, the net may come up empty. If a "wide net" approach is

used in an effort to span a broad array of variables, the holes will be large and some of the data will drop through. It is unlikely, however, that the net will come up empty.

Since this study had no predecessor in librarianship and few studies exist on resistance to technology in any of the literature, the methodology was developed to enhance its probing nature. It was designed to collect as much data as possible about a broad range of possibilities, and to identify areas that show indications of significance for further investigation. This study, then, was clearly to be broad-based and exploratory. A "wide net" strategy was chosen, and indeed some of the data fell through the holes. But what remained offers much to contemplate.

It was evident that correlations would be low, but it was likely that they would reveal meaningful trends and directions. One reason to anticipate that the findings would be undramatic was that the instrument was designed to assess a broad range of complex attributes and attitudes. A second reason has to do with the historical difficulty in assessments of organizational innovation and the disparity in results from other studies. Such is the burden of all research in the behavioral and social sciences, that human beings are too diversified and non-static to be suitable research subjects. In discussing the results of studies in the innovation literature, Downs (1978) pointed out that "A number of studies find that a given variable is strongly related to innovation while a substantial number of others discover that it is a weak predictor

or entirely unrelated. It is not even uncommon for a variable to be positively related to innovation in one study and negatively related in another" (p. 2). Rogers and Shoemaker (1971), in their compilation of research findings in organizational innovation, found only four propositions out of the 38 they reviewed that were consistently supported.

It was anticipated that, if the correlations were low, that there would be sufficient variation in the extremes of responses related to acceptance or rejection of technology to allow for an analysis of those differences in terms of correlates to explain them. If no such variation were found, an alternative set of correlations would be sought to explain this non-differentiation and to identify the values that librarians associate with innovation.

6. The Research Questions

As its research focus, this study sought to determine the (1) psychological, (2) environmental and (3) demographic factors which are associated with varying kinds and intensities of resistance. If no evidence of resistance to technological innovation were to surface, this study would have sought to determine those attitudinal and belief factors associated with adaptability to and acceptance of innovation.

In terms of its design, this study sought to develop a methodology for looking at human factors that affect professional library services, one which has potential for investigating other behavioral factors.

As its objectives this study sought to (1) determine which of the factors identified are "actionable" in that by some systematic and/or programmatic approaches, resistance to change might be reduced, and to determine which factors are unlikely to be affected by applied approaches and must therefore be considered constraints; (2) provide a set of propositions that evolve from the data that have enough support within this study to warrant further investigation; and (3) determine if there are indications from the data for appropriate intervention strategies.

This study of a phenomenon of human behavior, designed as a first probe, did not lend itself to establishing testable hypotheses. This was not a controlled experiment, and the variables could not be manipulated. Following are the research questions which became the basis for the general mail survey and for the interview phase.

RESEARCH QUESTIONS: Listed below are the major research questions of the study together with a description of items in the instruments that were designed to collected data relevant to the questions.

A. Does resistance to technology exist among librarians as evidenced by the following: (These items were assumed to be the dimensions of a generalized resistant attitude toward technology and represented, for the purpose of this study, the "resistance factor.")

   1 - Denial of the reality of present and future technology.

   2 - Perception of control loss associated with technological events.

3 - Perception of technology as socially harmful.

4 - Perception of technology as professionally detrimental.

5 - Unwillingness to "act," i.e., to spend library budget on technology.

6 - Self-reported work-resistant behaviors and feelings.

7 - Reluctance to probe the subject of technology and feelings toward it.

8 - Inability to recognize the breadth of technological potential.

9 - Negative affective reaction as evidenced by associative responses.

B. If resistance to technology does exist, what are its related attitudes, beliefs and reasons.

1 - Technologists are held in disfavor, viewed as forcing their decisions, talking down to librarians, using complex jargon.

2 - Technology will result in a loss of control of one's environment.

3 - Technology will erode privacy.

4 - Technology will primarily benefit special (elite) groups.

5 - Technology will erode interpersonal relationships.

6 - Technology will replace people in their jobs.

7 - Technology will replace familiar, traditional and valuable library processes.

C. If the results from Question A indicate that there is no evidence of the existence of a "resistance factor," Question B would be discarded and Question C would be substituted accordingly to ask: If resistance to technology does not exist, what are the values (benefits) of technology as seen by librarians:

1 - Advancement of society, generally beneficial.

2 - Benefit to all citizens.

3 - Ability of citizens to keep vigil on big business and government.

4 - Control over the environment; technology seen as an extension of self.

5 - Increase of service to users.

6 - No negative effect on interpersonal relationships.

7 - Mutual and positive relationship between librarians and technologists.

D. Do librarians differentiate personal and societal values regarding the acceptability of technological innovations? (Adoption of technology may be seen as a professional abstraction having little to do with the day-to-day life of the practitioner. The instrument items were differentiated according to those which reflect personal impact and societal impact.) Can two groups, those for whom these values are congruent and those for whom they are divergent, be identified? If so, is there a relationship between this factor and the other variables of this study?

1 - Items relating to attitudes and beliefs about technology which reflect its effect on the person.

2 - Items relative to technology which concern its larger implications to society in general.

E. Is there evidence of a librarian personality profile (i.e. all three variables forming a personality profile)? If so, (1) is it correlated with the resistance-to-technology factor? Or (2) is any one (or a combination of personality variables) related to resistance to technology?

1 - Rigidity items, those adapted from existing scales and those specifically developed for this instrument. (Interview schedule includes items on risk-taking and initiating behaviors).

2 - Locus of control, items from existing scale. (Interview schedule includes specifically designed items related to control/technology).

3 - Gregariousness items designed for this instrument. (Interview instrument includes items to assess opinion leadership).

The following secondary questions were posed:

(1) If a "resistant personality" does emerge, a point of interest from a psychological viewpoint poses this question: Can we determine the interrelationships between these three variables? What is the likelihood that the same person will exhibit all three characteristics? Can these variables be intercorrelated?

(2) If a "resistant personality" does emerge, another secondary question will be asked: Is there a relationship between the "resistant personality" and professional self-perception/organizational environment?

F. Is resistance to technology related to the following work/professional variables?

1 - Self-perceptions about librarianship, i.e., professional self-image. (Interview schedule includes items relative to perceptions of the status of librarianship.)

2 - Organizational environment. (Interview schedule includes a "loyalty to the director" factor.)

G. Is resistance to technology related to the following demographic factors:

1 - Sex

2 - Age

3 - Income

4 - Nature of educational background (i.e., science/humanities)

Personal and Societal Values (See Research Question D)

The development of the construct that defined resistance for this study and identified its components for assessment suggested the possibility that resistance to technology may exist within the same individual in two dimensions: one, a personal dimension where technological innovation might threaten to alter existing behavior patterns and confront established personal values. The other dimension was referred to in the study as "societal," a dimension that goes beyond an individual's personal well-being and produces a fear of social disorder or calamity. It might be possible, then, for an individual to favor an innovation because it brings immediate relief to an immediate problem, but to reject it as ultimately detrimental to the organization, the profession, or to society in general. Conversely, an individual might recognize the general worth of innovation yet reject it for its immediate change effect on the person's own existence. This research question probed whether librarians would tend to exhibit this dual response to technological innovation.

One of the aspects of organizational change that led to the considerations of this research question is that innovation is often introduced into a system at a time when it is most likely to be rejected because it offends either the personal or the social stability of the system's members. Thus, the introduction of innovation is sometimes chosen as the preferred course of action when the system is

operating ineffectively and when the members are demoralized and frustrated, just at the moment when they most long for serenity and stability. Instead of moving eagerly toward change, those affected tend to long for the simplicity of the past, thus diffusing the energy needed to accept the innovation.

On the other hand, an innovation introduced when the system is operating effectively might cause its members to question the logic and administrative judgment that support the implementation of change at this time.

There is sometimes a tendency for people to generalize from their own personal fears and resistances to sweeping social and moral judgments. In this study of librarians, this question probed whether as a professional group faced with inevitable technological change, librarians tend to differentiate between that which is beneficial or harmful to self and one's profession and that which is more general and will affect society at large. The findings might show the reverse, that for the professional librarian, personal and societal values are fused and cannot be disconnected.

Associated Data: Interview Survey (representing a sample of 86 responses from 5 libraries):

A. What is the current state of awareness of librarians relative to technology?

1 - Awareness of breadth of technological potential in library service.

2 - Current awareness reading.

3 - Continuing education, activities and attitudes.

4 - Current work with technologies.

5 - Awareness of professional issues.

B. What are the librarians' perception of the future?

1 - Beliefs about future technologies.

2 - Willingness to commit library resources to technology.

3 - Effect of technology on role of librarian.

From Administrator's Survey (Information reported reflects responses from administrators in the general mail survey who completed the Administrator's Questionnaire):

A. Profile (demographic) of sampled libraries.

B. The current state of technology in libraries.

C. The extent to which present library administrators have been associated with (or responsible for) past technological innovations.

D. Library administrators' perceptions of currently available technologies (whether they have them or not).

E. Administrators view of major problems in connection with currently implemented technologies.

F. The relationship between administrators' perception of the existence of resistance in staff members to the findings of the general survey.

G. Future projections relative to technology, as perceived by administrators.

H. Attitudes toward various futures by administrators.

I. Resistant attitudes toward technology by administrators as evidenced by the following:

1 - Plans for innovation.

2 - Perceived value of innovations.

3 - "No opinion" responses as suggestive of resistance.

4 - "No resistance in staff" responses as suggestive of denial.

5 - Perception of low probability of future technology as suggestive of resistance.

6 - Negative perception of value of various possible technologies as suggestive of resistance.

7 - "Refusal to respond" as indicative of resistance.

The report of the results of this study next describes the analytical methods applied to the survey data, followed by a summary of the major findings. The subsequent sections of the report summarize the findings of each particular survey as follows:

Section 2: Mail survey of librarians

Section 3: Interview survey of librarians

Section 4: Mail survey of administrators

Section 5: Interview survey of administrators

The final section of the study, Part III: Reviews of the Study, is a summary and discussion of the results together with reactions to the study by three outside reviewers.

ANALYSIS DESIGN AND METHODS

(Analysis of data was conducted by Patricia Rathbun and Nancy K. Roderer;
King Research, Inc.; Rockville, Maryland)

1.1 Overview of Data Analysis Methods

In the study design stages, variables used and major research questions to be addressed were specified for each of the survey instruments. Variables used in the two librarian surveys are indicated in Figure 1-1. Surveys of administrators were focussed on general use of and attitudes toward technology, perceived staff resistance, and perceptions about future technology-related events.

Analysis methods were developed around the substantive research questions as specified in the descriptions of findings for each survey (Chapters 2, 3, and 4, and Appendix B). Questions of validity, reliability and generalizability were not addressed directly. Specification of the survey questions associated with each variable and with the research questions was modified during the analysis phase as appropriate, in most cases to eliminate the use of a single question as both a dependent and independent variable; that is, as both an element and a correlate of resistance.

The level of analysis performed varied among the four surveys, with the mail survey of librarians analyzed in the most depth. Because the personal interview results closely parallel those of the mail survey, analysis of the personal interviews of librarians focussed on additional information received. Analysis of the personal interviews was also constrained by the small sample size. A basic analysis of the interview survey was performed, using the research questions developed for it. The 14 interviews with administrators were also briefly analyzed. Results of the analyses performed are presented in Chapters 2, 3, and 4, and Appendix B.

Following is an overview of the data analysis methods utilized and a step by step summary of procedures. For the mail survey of librarians, the major steps adopted in the data analytic sequence in order to follow the research design specified were as follows:

Research Question A

The variables specified as sub-elements in a generalized resistant attitude toward technology were factor analyzed in order to provide a set of theoretically similar variables which could subsequently

Figure 1-1. Variables Used in the Librarian Surveys

Variable	Mail Survey	Personal Interview Survey
Attitudes towards technology, societal	X	X
Attitudes towards technology, personal	X	X
Attitudes towards technologists		X
Perceptions of the future	X	X
Resistance factors	X	X
Work Environment	X	X
Loyalty to administrator		X
Professional self-perception	X	X
Status of librarianship		X
Gregariousness	X	X
Opinion leadership		X
Rigidity	X	X
Risk taking		X
Initiating behavior		X
Locus of control, personal	X	X
Locus of control, technological		X
Demographics	X	X
State of technology	X	X
State of technological awareness		X

be used to create an index representing the respondent's attitude toward technology.

- This index (RESIST) was created by multiplying the factor score coefficients by the variables selected for inclusion.

- In subsequent stages of the analysis sequence, RESIST constitutes the primary measure of the attitude toward technology evidenced by the librarians. It was used in an uncollapsed form for regressions, and was cut into quartiles for the purposes of crosstabulation.

Additional analysis performed for Research Questions B through G were as follows:

Research Question B

- Each set of variables specified as correlates of resistance to technology were first inter-correlated to determine their relationship to each other, and then entered into a multiple regression to determine how much of the variance in the attitude toward technology index (RESIST) they could explain.

Research Question C

- As a degree of resistance to technology was evident in the responses, this research question was deleted.

Research Question D

- The variables measuring personal and societal values were factor-analyzed to determine if they would separate into two discrete groups.

- Due to the fact that librarians do not necessarily differentiate between personal and societal values, rather the values appear interrelated, the focus of the analysis of question D was upon the inter-correlations between the items.

Research Question E

- All variables under each concept specified in research question E were intercorrelated (i.e., items specified as measures of rigidity, locus of control and gregariousness).

- As the items included under each concept were not highly inter-correlated, each theoretical group of variables was entered into a multiple regression as a discrete set (i.e., all the items specified as measures of rigidity, all the items specified as measures of locus of control, all the items specified as measures of gregariousness) in order to predict the variance in the attitude toward technology index (RESIST) discussed earlier.

Research Question F

- The items under question F were inter-correlated and then entered into a multiple regression.

Research Question G

- The demographic variables under research question G were cross-tabulated by the index RESIST (with cutting points established at quartiles).

For the personal interview survey of librarians, parallel procedures were used to develop an index called RESIST which was then cut into quartiles and used for crosstabulations with relevant variables. As stated earlier, additional analyses focussed on variables and questions not included in the mail survey, using crosstabulations to explore the relationship between these variables and RESIST.

1.2 Major Findings

The purpose of this project was to study the phenomenon of resistance to change as it applies to technological innovation in libraries. Goals were to develop an understanding of the degree and nature of resistance in libraries, to

identify causes or correlates, to clarify manifestations and effects, and to assess how much resistance can be offered in the future. In support of these goals, major research questions addressed included:

- Does resistance to technology exist?
- What are its correlates?
- What values of technology are perceived by librarians?
- How are personal and societal values related to each other and to resistance?
- Is there a "resistant personality"?
- Is resistance related to work/professional variables?
- Is resistance related to demographic factors?
- Is resistance related to sociological factors?
- What is the present and future status of libraries relative to technology?

Study results directed at responding to these questions are presented below for the three major surveys conducted. It should be noted that the study performed involved testing of both the concept of resistance and related variables and of questions designed to measure those concepts. Negative results, then, may be attributable to failure in either area and may suggest that more exploration is required in the area.

Mail Survey of Librarians

Analysis of the mail survey of librarians began with the creation of a composite index via a factor analysis of the variables theoretically specified as sub-elements in a generalized resistant attitude toward technology. Responses included in the index are concerned with negative perceptions of technology's future, perceptions of control loss, perceptions of technology as socially harmful, perceptions of technology as socially detrimental, self-reported work resistant feelings, and negative affective reactions as evidenced by associative responses. The index represents a range of resistant attitudes and behaviors,

although it should be noted that findings consistently reflected low levels of resistance.

In considering the correlates of resistance (i.e. the RESIST index) theoretically specified variables were input into a regression in order to determine how much of the variance in the index was explained by the variables. Fifty-eight percent of the variance was explained by the entire group of variables. The most significant variables were those specified as related to attitudes that technology will result in loss of control and privacy, will erode interpersonal relationships, will replace people in their jobs, and will replace familiar, traditional and valuable library processes.

Analysis of both the elements and the correlates of resistance to determine whether a distinction between personal and social characteristics could be discerned was carried out by development of correlation matrices and a factor analysis. Generally, variables theoretically specified as personal were more highly intercorrelated than those specified as societal. Personal variables also predominate in the RESIST index, suggesting a personal rather than societal interrelatedness with attitude toward technology. In factor analyzing all relevant variables, some societal values appear theoretically related to the personal values.

One research question concerned the presence of a "resistant personality" which could be correlated with resistance to technology. Personality characteristics considered were rigidity, locus of control, and gregariousness, each represented by several questions and items. Inter-item correlations were low, so that the RESIST index was compared with the personality concepts by three separate regressions. In each case, no significant relationship between personality variables and the RESIST index could be identified.

Another study hypothesis was that resistance to technology might be related to work/professional variables such as perceptions of quality of training, relevance of continuing library experience, perception of degree of respect accorded to librarianship as a profession, method of deciding upon librarianship as a profession, and subjective perceptions of library work environment. As shown by inter-correlation, there exists little interrelationship

between these variables. Similarly, these variables explain little of the variance in the resistance to technology index, with the exception of feelings regarding promotion to jobs with a higher classification and level of feelings about whether decisions regarding the library are made at the top.

The final research questions dealt with the relationships between the demographic factors specified and the resistance to technology index. The major findings which resulted from the cross-classification of the demographic variables by the resistance index were: females, older individuals, individuals who have worked in the library environment for long periods of time, and individuals whose backgrounds are in the humanities, are more likely to be included in the group which is most resistant to technology. In addition, individuals who work with technological items as part of their job (specifically computer terminals, automated cataloging, and to a slightly lesser degree audiovisual material) are less inclined to be included in the group which is most resistant to technology.

Other demographic variables analyzed were size of library and type of community served. They were essentially unrelated to the resistance to technology index.

An additional investigation dealt with the realtionship between the resistance to technology index, and items theoretically specified as sociological factors. These variables (political leaning, self-reported life style, and religiosity) as measured by the questionnaire items, are unrelated to the resistance to technology index.

During the data analytic component of the research into librarian's attitudes toward resistance to technology, it became apparent that a response set (similar to a social desirability pattern) might be emerging. Further exploration led to construction of a social desirability scale and the resulting separation of respondents into those consistently giving socially desirable responses (88%) and those giving "deviant" responses (12%). Correlations of research variables were significantly higher for the "deviant" group, supporting the hypothesis that a response set might obscure the relationships between questionnaire items and the resistance index.

Interview Survey of Librarians

Results of the interview survey of librarians closely paralleled those of the mail survey, demonstrating similar patterns of resistance and related attributes. Because of the similarity of response and the small sample size, analysis was primarily restricted to development of a RESIST index and exploration of the relationship between this index and variables not covered in the mail survey. Major interview survey variables not covered in the mail survey include several personality factors (risk-taking and initiating behavior, technology directed locus of control, opinion leadership) and work/professional variables (status of librarianship, organizational climate, loyalty to director). A number of additional questions related to the current state of awareness of librarians regarding technology were also included in the interview survey.

The procedure followed in developing a RESIST index for the personal interview respondents was essentially the same as that used for mail survey data. Again, low levels of resistance were identified. Variables which were ultimately included in the index concerned perceptions of control loss, perceptions of technology as socially harmful, and negative affective reactions as evidenced by associative responses.

When the more extensive personality variables utilized in the interview survey were analyzed, the relationship observed with RESIST was conflicting for the variables dealing with risk-taking. Considering work/professional variables, organizational climate expressed in terms of level of supervision of the respondent was found to be correlated with the RESIST index. In the questions concerning loyalty to their director, respondents were generally positive and consistent over behavioral, affective and cognitive dimensions.

In describing the respondents states of awareness of technology, several areas were considered -- activities where librarian might learn about technology, use of technology, and awareness of the technology-related concepts of resource sharing and the National Plan. Participation in on-the-job training and continuing education was indicated. Ninety percent of the respondents indicated

current use of at least one technology, and most of these enjoy the interaction. Attention to technology-related affairs beyond the individual's own library was rare, with few librarians participating in ALA technology-related committees or expressing awareness of the National Plan. Librarians did however report that they do read technology-related library literature, even though they later indicated some difficulties in understanding it.

Mail Survey of Administrators

The survey of administrators provided an indication of the extent of technology in libraries today, and of future plans. Microform collections and equipment are found in most libraries now, with computer-related forms of technology less prevalent. When plans to adopt technologies are also considered, the total number of libraries using or planning to use specific technologies is as follows:

- Microform collections and equipment 84%
- Automated circulation systems 68%
- Computerized cataloging 59%
- On-line system or any terminal access 42%
- Technological aids for service to special clients 45%

All technologies are consistently ranked as highly or very highly effective by most libraries, with higher rankings by libraries where the technology has been in place more than five years.

Problems with currently implemented technologies noted most frequently by administrators include resistance by the public, mechanical difficulties, planning problems, service problems, and cost and funding problems. Staff resistance was cited by 2 percent of the administrators when unprompted. When the topic was addressed specifically, 14 percent of the administrators characterized staff attitudes as resistant or reluctant and an additional 28 percent found their staffs somewhat reluctant. The major manifestations of resistance were verbal resistance and unspoken tenseness, with only scattered actions taken.

A general openness to technological innovation was expressed by administrators in their reactions to specific forecasts relating to networking

and automation. Most such events were seen as both likely and desirable. Two forecast events relating to a national network were also seen as desirable, but less likely. The only events perceived as generally unlikely and undesirable were the demise of the printed book in favor of microform and the replacement of the library as a storehouse with a transfer-of-information center.

SECTION 2

FINDINGS: MAIL SURVEY OF LIBRARIANS

2.1 Descriptive

The data analytic component of the mail questionnaire was conducted in a series of steps which attempted to articulate the theoretical conceptions outlined in the research design with established statistical procedures. A list of research questions were posed for consideration.

The discussion which follows will deal with each of the research questions in turn and will present those responses relevant to the question being entertained.

The first stage in the data analysis sequence was to determine the percentage distributions for each questionnaire item.

Research Question A. Does resistance to technology exist among librarians as evidenced by the following items? (These items are assumed to be the dimensions of a generalized resistant attitude toward technology.)

1 - Negative perception of technology's future (denial)

2 - Perception of control loss

3 - Perception of technology as socially harmful

4 - Perception of technology as professionally detrimental

5 - Unwillingness to "act," i.e., to spend library budget on technology

6 - Self-reported work-resistant feelings

7 - Reluctance to probe the subject of technology and feelings toward it

8 - Inability to recognize the breadth of technological potential

9 - Negative affective reaction as evidenced by associative responses

1 - Negative perception of technology's future (denial).

Q 1. The future of our society depends on the advancement of technology.

Strongly agree	21.9%
Agree somewhat	37.3
I'm in the middle somewhere	22.4
Disagree somewhat	12.5
Strongly disagree	5.7

Q 20a. For each item below, please circle the appropriate number to indicate whether or not you think that item will be developed for general use in this century.

	Yes	No
A terminal in every home	30.0%	70.0%
The use of microform instead of printed materials in many instances	82.7	17.3
A national information network	83.1	16.9
Two-way television transmission between homes/ businesses and libraries	53.6	46.4
Complete automation of cataloging	75.1	24.9

Q 21. The use of technology in libraries will become so complicated that the user will have to be specially trained by the librarian to use it.

Strongly agree	16.0%
Agree somewhat	38.6
I'm in the middle somewhere	14.0
Disagree somewhat	21.7
Strongly disagree	9.7

Q 23. Technology that will really change librarianship is far in the future, certainly not in this century.

Strongly agree	3.9%
Agree somewhat	12.4
I'm in the middle somewhere	12.5
Disagree somewhat	36.5
Strongly disagree	34.7

2 - Perception of control loss.

Q 9. Technology has the potential to control our lives.

Strongly agree	33.0%
Agree somewhat	40.2
I'm in the middle somewhere	10.7
Disagree somewhat	11.3
Strongly disagree	4.8

3 - Perception of technology as socially harmful.

Q 6. Technological advancements have already dehumanized our lives.

Strongly agree	8.3%
Agree somewhat	33.8
I'm in the middle somewhere	21.4
Disagree somewhat	23.2
Strongly disagree	13.4

4 - Perception of technology as professionally detrimental.

Q 13: I went into librarianship to work with books, not machines.

Strongly agree	16.0%
Agree somewhat	24.9
I'm in the middle somewhere	14.1
Disagree somewhat	23.5
Strongly disagree	21.4

5 - Unwillingness to "act," i.e., to spend library budget on technology.

Q 22. How much of the library's future budget do you think should be allocated for technological improvements?

None	1.6%
Less than 10%	24.2
11-25%	62.4
26-50%	10.4
More than 50%	1.4

6 - Self-reported work-resistant feelings.

Q 11c. Please respond to all items below. Circle the code to describe your personal feelings about each of the items.

	Positive	Neutral	Negative
Microform	76.6%	19.1%	4.3%
Computer Terminals	71.7	24.0	4.3
Projectors	84.8	13.3	1.8
Audiovisual Materials	88.0	10.4	1.6
Automated Cataloging	66.1	27.8	6.0

7 - Reluctance to probe the subject of technology and feelings toward it.

Q 60. How do you feel about this questionnaire?

A most fascinating experience	3.3%
Has aroused my curiosity	57.4
Just another questionnaire	25.3
Seems like a useless exercise	5.1
Not interested in the subject	1.6
No feeling about it	7.3

8 - Inability to recognize the breadth of technological potential.

Q 24. Libraries as they exist today will one day be obsolete due to technology.

Strongly agree	8.1%
Agree somewhat	28.9
I'm in the middle somewhere	13.7
Disagree somewhat	30.5
Strongly disagree	18.7

9 - Negative affective reaction as evidenced by associative responses.

Q 19. Check the words that generally apply when you think of technology. Check as many as you think apply. (In coding, negative words are counted as "-1", positive words as "+1" and neutral words as "0". The sum total of all words selected was considered the respondent's overall "score" or view of technology.)

+6 to +10	15.9%
+1 to +5	58.9
0	8.4
-1 to -5	15.3
-6 to -10	.9

Research Question B. If resistance to technology does exist, what are its correlates (elements, reasons, etc.)?

1 - Technologists are held in disfavor, viewed as forcing their decisions, talking down to librarians, using complex jargon.

2 - Technology will result in a loss of control.

3 - Technology will benefit special groups.

4 - Technology will erode interpersonal relationships.

5 - Technology will replace people in their jobs.

6 - Technology will replace familiar, traditional and valuable library processes.

The frequency distributions for the items included in Research Question B are given below.

1 - Technologists are held in disfavor...

Q 3. The technological needs of libraries are best determined by librarians.

Strongly agree	35.2%
Agree somewhat	40.8
I'm in the middle somewhere	13.5
Disagree somewhat	9.4
Strongly disagree	1.2

Q 4. Only those with technological expertise should be making decisions about technological needs in the library.

Strongly agree	5.1%
Agree somewhat	15.0
I'm in the middle somewhere	12.6
Disagree somewhat	31.8
Strongly disagree	35.5

Q 7. Contrary to popular belief professional technologists are easy to understand, don't talk down to people, and are generally compassionate people.

Strongly agree	2.5%
Agree somewhat	20.5
I'm in the middle somewhere	39.9
Disagree somewhat	28.9
Strongly disagree	8.2

Q 10. The language that is used to describe and discuss technology is more complicated than the equipment itself.

Strongly agree	19.7%
Agree somewhat	45.0
I'm in the middle somewhere	18.0
Disagree somewhat	14.3
Strongly disagree	3.0

2 - Technology will result in loss of control.

Q 8. Technology gives us more control over our environment.

Strongly agree	18.9%
Agree somewhat	41.4
I'm in the middle somewhere	19.7
Disagree somewhat	14.5
Strongly disagree	5.5

Q 12. I see technology as an extension of myself that enables me to see and hear better and to work more effectively.

Strongly agree	30.0%
Agree somewhat	43.3
I'm in the middle somewhere	17.3
Disagree somewhat	6.6
Strongly disagree	2.7

3 - Technology will benefit special groups.

Q 5. Technological developments in libraries (such as computerized searches) will primarily benefit special interest groups and privileged classes of users.

Strongly agree	8.9%
Agree somewhat	27.8
I'm in the middle somewhere	11.3
Disagree somewhat	27.7
Strongly disagree	24.4

4 - Technology will erode interpersonal relationships.

Q 15. I think that if technology becomes an important part of the field of librarianship, interpersonal relationships will suffer.

Strongly agree	7.0%
Agree somewhat	18.5
I'm in the middle somewhere	13.3
Disagree somewhat	32.2
Strongly disagree	29.0

5 - Technology will replace people in their jobs.

Q 14. I worry that one day technology will reduce the number of staff in this library.

Strongly agree	7.2%
Agree somewhat	15.1
I'm in the middle somewhere	13.1
Disagree somewhat	37.6
Strongly disagree	26.9

6 - Technology will replace familiar, traditional and valuable library processes.

Q 16. I would rather my library had several new reference librarians than access to an on-line information system.

Strongly agree	12.7%
Agree somewhat	16.8
I'm in the middle somewhere	22.5
Disagree somewhat	26.9
Strongly disagree	21.1

Q 17. Frankly, I would still prefer finding materials through use of the card catalog rather than through the mechanized devices.

Strongly agree	8.5%
Agree somewhat	17.4
I'm in the middle somewhere	19.1
Disagree somewhat	28.0
Strongly disagree	27.1

Research Question C. If resistance to technology does not exist, what are its values (benefits) as seen by librarians?

1 - Advancement of society (generally beneficial)

2 - Benefit to all citizens

3 - Ability of citizens to keep vigil on big business & government

4 - Control over the environment; extension of self

5 - Increase of service to users

6 - No negative effect on interpersonal relationships

7 - Mutual and positive relationship between librarians and technologists

Many of the data items from the survey instrument which measure the amount of value or the benefits of technology as perceived by the responding librarians, have been previously cited in Research Questions A and B. References to them are given below where appropriate.

1 - Advancement of society (generally beneficial).

See Question 1, page 2-2, and Question 19, page 2-4

2 - Benefit to all citizens.

Q 20b. Do you think the development listed will be generally beneficial or potentially harmful? For each item listed, circle the code number for the attitude that is closest to your own.

	Very Beneficial	Somewhat Beneficial	I'm in the Middle	Somewhat Harmful	Potentially Very Harmful
A terminal in every home	21.1%	32.8%	32.3%	9.1%	4.7%
The use of microform instead of printed materials in many instances	25.8	38.7	20.6	11.7	3.3
A national information network	63.1	25.2	8.6	1.4	1.7
Two-way television transmission between homes/businesses and libraries	32.1	34.3	25.7	5.6	2.3
Complete automation of cataloging	52.5	25.0	14.3	5.8	2.3

3 - Ability to keep vigil on big business and government.

Q 2. Technology has enabled private citizens to keep some vigil on the activities of big business and government.

Strongly agree	6.5%
Agree somewhat	33.6
I'm in the middle somewhere	17.0
Disagree somewhat	28.9
Strongly disagree	14.0

4 - Control over the environment; extension of self.

See Question 8, page 2-5, Question 12, page 2-6, Question 9, page 2-2.

5 - Increase of service to users.

See Question 16 and 17, page 2-6 and 2-7.

Q 18. Which of these tasks might technology help a librarian do better? Check all those that you think could benefit from technology.

Total number checked	
1	.5%
2	1.6
3	3.1
4	6.4
5	7.1
6	10.0
7	10.2
8	10.5
9	10.0
10	7.7
11	8.1
12	6.0
13	5.3
14	3.2
15	1.6
16	8.7

Question 21, page 2-2.

6 - No negative effect on interpersonal relationships.

See Question 15, page 2-6.

7 - Mutual and positive relationship between librarians and technologists.

See Question 3,4,7 and 10, page 2-5.

Some resistance to technology does appear to exist among the librarians who responded. However, that resistance seems to be voiced by only a relatively small number of individuals. The great majority of the respondents were in favor of implementing technological innovations in the library environment and elsewhere. They saw it as beneficial to society and to the individual.

Research Question D. The instrument differentiates personal values and societal values. Do librarians differentiate between these and hold differing personal and societal values or do personal and societal attributes correlate with each other? Can two groups--congruent and divergent-- be identified? Is there a relationship between this factor and, for example, rigidity?

The frequency distributions for the items under research question D have been given earlier under research questions A, B and C.

Research Question E. Is there a "resistant personality?" Is it correlated with resistance to technological innovation (i.e., all three variables forming a total personality profile)? Is any one of them (or a combination) related to resistance to technology?

Just as a point of interest from a psychological viewpoint: Can we determine the relationships between these three variables? What is the likelihood that the same person will exhibit all three characteristics? Can these variables be inter-correlated?

The major concepts outlined in research question E are rigidity, locus of control and gregariousness. The frequency distributions for the variables specified as measures of these concepts follow.

FREQUENCY DISTRIBUTIONS (%) FOR DATA ITEMS MEASURING PERSONALITY CHARACTERISTICS

Rigidity

Q 41. I'm the kind of person who likes a great deal of variety in my work. I prefer a job where I have to change frequently from doing one thing to another.

True	88.5%
False	11.5

Q 42. Things that are familiar are always preferable to things that are unfamiliar.

True	24.8%
False	75.2

Q 43. I'd rather have one thing to do at a time and give my full attention to it than have several projects going at the same time.

True	31.4%
False	68.6

Q 44. There is usually one best way to solve most problems if one could only find it.

True	25.4%
False	74.6

Q 45. I would rather tackle a complicated problem than solve several simpler ones.

True	58.9%
False	41.1

Q 54. How important is formal religion in your life?

Very important	22.6%
Moderately important	21.6
Slightly important	17.7
Not at all important	35.4
Can't answer at this time	2.6

Q 55. How would you describe your political leaning?

Very liberal	13.5%
Somewhat liberal	41.8
Middle-of-the-road	26.0
Somewhat conservative	16.8
Very conservative	1.8

Q 56. Would you describe your lifestyle as:

Traditional	15.9%
Moderately traditional	44.0
Somewhat non-traditional	26.1
Non-traditional	8.2
In-between	5.8

Locus of Control

Q 47. Becoming a success is a matter of hard work; luck has little or nothing to do with it. 39.4%

Getting a good job depends mainly on being in the right place at the right time. 60.6%

Q 48. Leadership positions tend to go to capable people who deserve being chosen. 49.4%

It's hard to know why some people get leadership positions and others don't; ability doesn't seem to be the important factor. 50.6%

Q 49. People who don't do well in life often work hard but the breaks just don't come their way. 44.2%

Some people just don't use the breaks that come their way. If they don't do well, it's their own fault. 55.8%

Q 50. What happens to me is my own doing. 74.4%

Sometimes I feel that I don't have enough control over the direction my life is taking. 25.6%

Q 51. Heredity plays the major role in determining one's personality. 12.5%

It is one's experience in life that determines what one is like. 87.5%

Gregariousness

Q 36. How do you think the people who work with you see you?

Friendly and easy to talk to	64.3%
Hard to get to know, shy or aloof	4.0
Somewhere in-between	28.1
Can't tell	2.8
Don't really care	.7

Q 37. With whom do you discuss problems that arise at work?

Someone or several people at work	38.5%
Spouse or family	9.1
Friends outside of work	3.3
Anyone or all of the above depending on the situation	45.2
Don't tend to discuss work problems	3.9

Q 38. Do you socialize with people you work with?

No, work is work and my social life is seperate	6.9%
Yes, but only at work and during the work day	19.5
Occasionally we have some planned social activity that we all attend	33.2
I have made one or two good friends at work	27.5
Our work staff has a strong social feeling that often goes beyond our work time	13.0

Q 39. How do you see yourself in your work situation?

Very able to influence other people	23.3%
Sometimes able to influence others	59.5
Usually refrain from voicing opinions	2.8
A follower rather than a leader	3.4
Somewhere in-between	11.0

Q 40. Big parties:

Are usually fun	28.2%
Are sometimes pleasant and sometimes uncomfortable	54.4
Generally make me uneasy	6.3
Are usually unpleasant for me	1.0
I'd rather be with one other person	4.2
Are something I try to avoid altogether	5.8

Research Question F. Is resistance to technology related to the following work/professional variables?

1 - Self-perceptions about librarianship (professional self-image)

2 - Organizational environment

Is there a correlation between these two variables?

1 - Self-perceptions about librarianship (professional self-image).

Q 30. I believe that I was very well trained to do the kind of work that I'm expected to do in my job.

Strongly agree	36.3%
Agree somewhat	34.1
I'm in the middle somewhere	12.4
Disagree somewhat	12.4
Strongly disagree	4.8

Q 31. If your library has provided any kind of continuing education or, if you have undertaken some professional development on your own, how would you describe your experience?

Generally its been a waste of time	3.0%
Some good experience, some not so good	30.6
Generally its been very helpful to me personally	41.3
Have not had enough experience to decide	12.3
No opinion	12.8

Q 32. Librarianship is being accepted as a respected profession more and more as time goes on.

Strongly agree	19.7%
Agree somewhat	35.2
I'm in the middle somewhere	20.3
Disagree somewhat	20.0
Strongly disagree	4.9

Q 33. Librarianship is more intellectually demanding than many professions.

Strongly agree	22.2%
Agree somewhat	34.6
I'm in the middle somewhere	19.7
Disagree somewhat	18:2
Strongly disagree	5.2

Q 34. Librarianship as a profession is limited in outlook.

Strongly agree	6.4%
Agree somewhat	28.0
I'm in the middle somewhere	16.7
Disagree somewhat	26.7
Strongly disagree	22.2

Q 35. How did you decide on librarianship as a profession? Choose the one closest answer.

Someone I knew or admired suggested it to me	10.2%
A librarian I knew influenced me	12.9
It wasn't my first choice but I couldn't or thought I wouldn't get a job in what I really wanted	8.8
I definitely wanted to be a librarian	35.6
I happened into it without too much deliberation	22.2
None of the above	10.4

2 - Organizational environment.

Q 25. Applicable words were classified as positive (+1) or negative (-1). The sum total of words checked by respondent indicates the degree positive or negative of their overall reaction.

+5	+3	+1	-1	-3	-5
34.8	26.1	14.6	11.5	5.3	7.7

Q 26. Which of the following is true for you? Circle all that apply.

	No	Yes
I feel free to discuss job-related problems with my supervisor	17.5	82.5%
I feel free to discuss personal problems with my supervisor	64.5	35.5
I know how my work is regarded by my supervisor	34.8	65.2
My supervisor provides general rather than close supervision	17.2	82.8
There are group meetings to discuss mutual concerns	36.6	63.4
None of the above are true for me	95.6	4.4

Q 27. Do you feel that your job offers you secure employment?

I feel secure	56.7%
I feel fairly secure	30.5
Sometimes I'm worried	7.2
I definitely don't feel secure	5.6

Q 28. How do you feel about promotions to higher classified jobs?

I am not particularly interested	20.6%
I don't feel I have much chance to get promoted even if I do good work	17.1
I feel I have as much chance to get promoted as the next person but there aren't too many openings	44.4
I feel I have a really good chance to get a higher classified job	17.9

Q 29. In my library decisions are made at the top without consulting the people who are going to do the work.

Strongly agree	24.4%
Agree somewhat	27.8
I'm in the middle somewhere	11.6
Disagree somewhat	18.8
Strongly disagree	17.5

Research Question G. Is resistance to technology related to the following demographic factors:

1 - Sex

2 - Age

3 - Income

4 - Nature of educational background (i.e., science/humanities)

5 - Length of library service

6 - Degree of technology related work

7 - Size of library

8 - Size of staff

9 - Type of community

Which of these shows the highest correlation, etc.? How much of the variance of the resistance "quotient" can be explained by these variables?

1 - Demographic variables.

Q 52. What is your sex?

Male	20.1%
Female	79.9

Q 53. What is your age?

20-29	27.9%
30-39	31.5
40-49	16.4
50-59	17.5
Over 60	6.6

Q 57. What is the approximate annual income of your family?

Less than 10,000	4.8%
10,000-14,999	22.8
15,000-19,999	24.3
20,000-24,999	15.9
25,000-49,999	29.4
Over 50,000	2.8

Q 58. Was your undergraduate work primarily in:

Humanities	74.6%
Sciences	8.0
Other (specify)	14.5
Not applicable	2.9

Q 59. How long have you worked in a library?

Less than 1 year	3.7%
1-5 years	31.1
6-10 years	29.6
11-20 years	22.4
More than 20 years	13.2

Q 11b. How much technology is there in your library? Circle the code to indicate those that you are working with as part of your job.

	Percent Saying 'Yes'
Microform	58.0
Computer Terminal	19.7
Projectors	48.4
Audiovisual Material	62.8
Automated Cataloging	17.6

Size of Library

250+	51.2%
100+	20.4
50+	14.7
25+	13.7

Type of Community

Central City	63.7%
Outside Central City	25.5
Outside OSMSA	10.9

Research Question H. Is resistance to technology related to the following sociological factors:

1 - Political leaning

2 - Self-reported life style

3 - Religiosity

Frequency distributions of responses to these data items are presented on page 2-10.

2.2 Explanatory

Initial examination of the preceeding set of frequency distributions for the variables included as part of Research Question A, would indicate that there exists a small sub-group of librarians who appear resistant to technology as measured by the variables specified. Based upon this observation, it was decided to carry out a series of in-depth analytical techniques designed to provide explanations for the attitudes and behaviors reported by the librarians. As in the previous section, the results will be presented by research question.

Research Question A

Research Question A includes the following variables and question numbers.

Q1	FUTURE	
Q20a	ATERM, AMAT, ANETWORK, ATOWAY, AMATION	
Q21	SPECIAL	
Q23	CHANGE	
Q9	LIVES	
Q6	DHUMANIZ	
Q13	BOOKS	
Q22	BUDGET	
Q11c	CMICRO	
	CCOMP	
	CPROJ	sum of these = ITEMC
	CAVDIO	
	CAUTO	
Q60	FEELINGS	
Q24	OBSOLETE	
Q19	APPLY	

The first technique selected as appropriate for further analysis of Research Question A was factor analysis. This was chosen in order to determine if the variables could be reduced to a smaller number of theoretically similar variables which could subsequently be used to construct a scale of "resistance to

Table 2.1

INTERCORRELATION MATRIX OF ITEMS UNDER
RESEARCH QUESTION A

	FUTURE	ATERM	AMAT	ANETWORK	ATOWAY	AMATION	SPECIAL	CHANGE	LIVES	DEHUMANIZ	BOOKS	BUDGET	ITEMC	FEELINGS	OBSOLETE	APPLY
FUTURE	1.0	.09	.06	.10	.06	.08	.07	.09	.12	.27	.20	.20	.24	.11	.09	-.31
ATERM		1.0	.13	.06	.37	.16	.12	.27	.06	.11	.19	.13	.11	-.07	-.06	.13
AMAT			1.0	.00	.09	.03	.05	.18	.01	.10	.10	.09	.10	-.00	-.09	.07
ANETWORK				1.0	.13	.21	.06	.19	-.05	.03	.04	.10	.11	-.01	-.05	.12
ATOWAY					1.0	.13	.09	.22	.02	.09	.12	.07	.16	-.03	-.07	.16
AMATION						1.0	.06	.12	.11	.04	.06	.12	.11	-.04	-.07	.06
SPECIAL							1.0	.21	.16	.23	.32	.13	.24	-.05	.15	.34
CHANGE								1.0	.05	.12	.31	.15	.21	-.07	.10	.24
LIVES									1.0	.39	.24	.08	.18	-.01	.04	.23
DEHUMANIZ										1.0	.37	.11	.24	-.08	.03	.44
BOOKS											1.0	.19	.33	-.08	.03	.43
BUDGET												1.0	.18	-.09	-.08	.21
ITEMC													1.0	-.13	.02	.40
FEELINGS														1.0	-.06	-.13
OBSOLETE															1.0	.01
APPLY																1.0

technology." As part of the calculations performed prior to the factor analyses, an inter-correlation matrix for all the variables was produced. The correlation coefficients for the variables under Research Question A can be found in Table 2.1. As can be seen in Table 2.1, the items specified as measures of negative perception of technology's future which are correlated include:

- ATERM (20a) and ATOWAY (20a) at .37
- ATERM and CHANGE (Q23) at .27

Single items which correlated across research questions, as expected, include:

- FUTURE (Q1) and APPLY (Q19) (.31)
- SPECIAL (Q21) and BOOKS (Q13) (.32)
- SPECIAL (Q21) and APPLY (Q19) (.34)
- LIVES (Q9) and DEHUMANIZ (Q6). (.39)
- DEHUMANIZ (Q6) and BOOKS (Q13) (.37)
- BOOKS (Q13) and ITEMC (Q11c) (.33)
- BOOKS (Q13) and APPLY (Q19) (.43)
- ITEMC (Q11c) and APPLY (Q19) (.40)

The factoring method[1] utilized was "Quartimax", and the number of factors to be extracted was set at 3. The standard for determining whether a variable could be seen to load on a factor was set at .4. (Additional factor analyses specifying the extraction of 4 and 5 factors were also run.) The Quartimax Rotated Factor Matrix for the 3 factor solution is presented below.

QUARTIMAX ROTATED FACTOR MATRIX (Factor loading)

	FACTOR 1	FACTOR 2	FACTOR 3
FUTURE	.41277	.10379	.35724
ATERM	.10091	.53678	.06641
AMAT	.09063	.21266	-.02453
ANETWORK	.06108	.27397	-.12135
ATOWAY	.07297	.50265*	.03160
AMATION	.07763	.27646	-.12692
SPECIAL	.41613	.14304	.30173
CHANGE	.23196	.48171	.14420
LIVES	.42720	-.05454	.04104
DHUMANIZ	.63416	.00264	.00204
BOOKS	.58522	.21321	.16065
BUDGET	.25937	.21396	-.16478
ITEMC	.47697	-.21618	.01745
FEELINGS	.16070	.06555	.02780
OBSOLETE	.06935	-.14684	.33181
APPLY	.68957	.17273	.00343

[1] All data analysis took place using the University of Maryland Univac 1108 computer and the software package, "SPSS", Statistical Package for the Social Sciences, (version 6).

Only one factor with an eigenvalue above one (2.56) was extracted. In the unrotated factor matrix, this factor (Factor 1) explains 67.6% of the variance in the data.

Based upon an examination of the rotated factor matrix presented above, the following seven variables were selected as the sub-elements in a generalized attitude toward technology and were used to create the index to be discussed in the following section.

Q1	FUTURE (.41)
Q21	SPECIAL (.41)
Q9	LIVES (.42)
Q6	DHUMANIZ (.63)
Q13	BOOKS (.58)
Q11c (summed)	ITEMC (.47)
Q19	APPLY (.68)

B. Creation of the Composit Index "RESIST"

The composit index RESIST was created by multiplying the factor score coefficients derived from the previously mentioned factor analysis by the variables selected. Thus:

FUTURE	was	multiplied	by .14336
SPECIAL	"	"	" .11341
LIVES	"	"	" .13548
DHUMANIZ	"	"	" .26809
BOOKS	"	"	" .20756
ITEMC	"	"	" .13354
APPLY	"	"	" .31222

The total distribution of this index is too lengthy to reproduce here, but can be found in Appendix C. However, the following summary statistics give an indication of the properties of this index. (Low values of the index correspond to those values for questionnaire items theoretically designated as measuring resistance to technology.)

Minimum 2.301	Range 4.978	*MEAN 5.034	Variance .937		
Maximum 7.279	Mode 4.650	*MEDIAN 5.065	S.D. .968	Skewness - .178	

While the observed tendency of respondents in this survey was to respond in ways which generally indicated non-resistant attitudes, it was instructive to look at the correlates of the generalized attitude toward technology contained in Research Question B.

Research Question B

The following variables and question numbers are included in Research Question B.

Q3	(LIBRARY)
Q4	(EXPERT)
Q7	(CONTRARY)
Q10	(LANGUAGE)
Q8	(CONTROL)
Q12	(EXTEND)
Q5	(PRIVLIG)
Q15	(SUFFER)
Q14	(WORRY)
Q16	(ONLINE)
Q17	(CARCAT)

These items are theoretically designated as potential correlates of resistance to technology. As the basic intent of Research Question B was to determine which of the variables specified were in fact correlates of the resistance to technology index discussed earlier on page 2-20, it was decided to run a multiple regression. The correlation matrix for all variables included under Question B is given below in Table 2.2.

As can be seen in Table 2.2, the items specified as measures of "technologists being held in disfavor, viewed as forcing their decisions, talking down to librarians, using complex jargon"... Library (Q3), Expert (Q4), Contrary (Q7), and Language (Q10) are essentially uncorrelated.

The major correlations which emerged from Research Question B include:

Table 2.2

INTERCORRELATION OF ITEMS UNDER
RESEARCH QUESTION B

	LIBRARY	EXPERT	CONTRARY	LANGUAGE	CONTROL	EXTEN	PRIVLIG	SUFFER	WORRY	ONLINE	CARCAT
LIBRARY	1.0	.00	.03	.10	.03	.08	.04	.16	.13	.16	.17
EXPERT		1.0	.11	.01	.04	.11	.11	.04	.06	.01	.01
CONTRARY			1.0	.09	.25	.25	.10	.20	.14	.12	.13
LANGUAGE				1.0	.07	.05	.07	.20	.08	.03	.13
CONTROL					1.0	.37	.11	.23	.10	.14	.17
EXTEN						1.0	.19	.34	.22	.35	.43
PRIVLIG							1.0	.27	.20	.25	.25
SUFFER								1.0	.45	.40	.50
WORRY									1.0	.25	.34
ONLINE										1.0	.45
CARCAT											1.0

- CONTROL (Q7) and EXTEN (Q12) (.37)
- EXTEN (Q12) and SUFFER (Q15) (.34)
- EXTEN (Q12) and ONLINE (Q16) (.35)
- EXTEN (Q12) and CARCAT (Q17) (.43)
- SUFFER (Q15) and WORRY (Q14) (.45)
- SUFFER (Q15) and ONLINE (Q16) (.40)
- SUFFER (Q15) and CARCAT (Q17) (.50)

In addition, a multiple regression was run in order to determine how much of the variance in the attitude toward technology index discussed earlier, was explained by these variables.

The results of this multiple regression are given in Table 2.3.

Table 2.3

REGRESSION OF ITEMS IN RESEARCH QUESTION B UPON THE RESISTANCE TO TECHNOLOGY INDEX

Multiple R	.76
R Square	.58
Adjusted R Square	.58
Standard Error	.63

The R Square of .58 indicates that 58% of the variance in the resistance to technology index was explained by all of the variables under Research Question B.

The simple correlations between each item and the resistance index are given in Table 2.4.

TABLE 2.4

SIMPLE CORRELATIONS BETWEEN ITEMS IN RESEARCH QUESTION B AND THE RESISTANCE TO TECHNOLOGY INDEX

VARIABLE	SIMPLE R
LIBRARY	.20
EXPERT	.05
CONTRARY	.28
LANGUAGE	.15
CONTROL	.31
EXTEN	.59
PRIVLIG	.34
SUFFER	.57
WORRY	.35
ONLINE	.45
CARCAT	.60
(CONSTANT)	

As can be seen, EXTEN (Q12), SUFFER (Q15), CARCAT (Q17) and WORRY (Q14) are the most strongly related to attitude toward technology.

Research Question C

This question was not analyzed as the results of the analysis of the previous two research questions which indicate that 1) a degree of resistance to technology does exist, and 2) is explainable by the items specified under Question B.

Research Question D

The following variables are included in Research Question D.

	Personal
Q12	EXTEN
Q13	BOOKS
Q14	WORRY
Q15	SUFFER
Q16	ONLINE
Q17	CARCAT
Q18	TASKS
Q19	APPLY

	Societal
Q1	FUTURE
Q2	VIGIL
Q3	LIBRARY
Q4	EXPERT
Q5	PRIVLIG
Q6	DHUMANIZ
Q8	CONTROL
Q9	LIVES
Q20a	ATERM
	AMAT
	ANETWORK
	ATOWAY
	AMATION
Q20b	BTERM
	BMAT
	BNETWORK
	BTOWAY
	BMATION
Q21	SPECIAL
Q22	BUDGET
Q23	CHANGE
Q24	OBSOLETE

The methodology employed to provide answers to Research Question D consisted of 1) determining the correlations between the items specified and 2)

factor analysis to determine if the variables specified as measures of personal and societal values would separate into two discrete groups.

The correlation matrix for the variables specified as "personal" is given in Table 2.5.

Table 2.5

INTER-CORRELATION MATRIX FOR "PERSONAL" VARIABLES

	EXTEN	BOOKS	WORRY	SUFFER	ONLINE	CARCAT	TASKS	APPLY
EXTEN	1.0	.36	.21	.34	.35	.44	.37	.49
BOOKS		1.0	.33	.41	.35	.48	.30	.40
WORRY			1.0	.46	.25	.33	.20	.30
SUFFER				1.0	.39	.49	.30	.46
ONLINE					1.0	.44	.27	.35
CARCAT						1.0	.44	.46
TASKS							1.0	.39
APPLY								1.0

The correlation matrix for the variables specified as "societal" is given in Table 2.6.

In order to determine if the items would differentiate into two discrete variables, a factor analysis was run. In the unrotated factor matrix, 3 factors with eigenvalues over 1 were extracted. However, Factor One accounted for 71% of the variance, thus was selected for further analysis. The rotated Factor Matrix is presented in Table 2.7. The letters (P) for personal value and (S) for societal value have been inserted after the factor loadings. The standard for determining factor loading is again 4. As can be seen, the personal and societal values exhibited by the librarians do show a degree of inter-relatedness, particulary with respect to the personal values, however, certain societal values (PRIVLIG (Q 5), DHUMANIZ (Q 6) and SPECIAL (Q21), do appear to be interrelated with the personal values. It was not possible to run a regression to determine how much of the variance in attitude toward technology was explained by this factor, as four of the variables (BOOKS, APPLY, DHUMANIZ and SPECIAL) are components of the index RESIST. It should be noted, however, that the majority of the variables included in the attitude

Table 2.6

INTER-CORRELATION MATRIX FOR SOCIETAL VALUES

	FUTURE	VIGIL	LI-BRARY	EXPERT	PRIV-LIG	DHU-MANIZ	CON-TROL	LIVES	ATERM	AMAT	ANET-WORK	ATOWAY	AMA-TION	BTERM	BMAT	BNET-WORK	BTO-WAY	BMA-TION	SPECIAL	BUDGET	CHANGE	OBSOLETE
FUTURE	1.0	.27	.04	.13	.09	.26	.33	.13	.10	.05	.12	.05	.08	.22	.18	.17	.19	.15	.05	.18	.08	.07
VIGIL		1.0	.03	.14	.07	.17	.27	.11	.04	.04	.08	.13	.01	.04	.10	.12	.09	.05	.01	.07	.04	.01
LIBRARY			1.0	.02	.05	.12	.02	.10	.09	.03	.02	.07	.00	.05	.07	.07	.10	.06	.14	.15	.14	.03
EXPERT				1.0	.11	.00	.05	.04	.00	.05	.00	.02	.00	.01	.06	.01	.03	.06	.04	.05	.05	.08
PRIVLIG					1.0	.29	.09	.16	.11	.04	.02	.09	.03	.15	.11	.14	.23	.16	.23	.11	.11	.02
DHUMANIZ						1.0	.28	.40	.09	.07	.01	.08	.04	.20	.20	.21	.18	.17	.20	.09	.10	.05
CONTROL							1.0	.11	.11	.03	.03	.10	.02	.16	.09	.13	.13	.10	.07	.12	.05	.04
LIVES								1.0	.04	.01	.07	.01	.08	.11	.15	.06	.12	.13	.17	.06	.01	.06
ATERM									1.0	.13	.07	.37	.18	.39	.06	.03	.17	.13	.11	.12	.27	.06
AMAT										1.0	.01	.10	.05	.09	.43	.10	.07	.11	.04	.08	.18	.08
ANETWORK											1.0	.13	.22	.03	.04	.27	.07	.11	.04	.10	.19	.07
ATOWAY												1.0	.13	.19	.07	.07	.37	.08	.09	.05	.23	.06
AMATION													1.0	.06	.02	.07	.07	.47	.05	.11	.14	.09
BTERM														1.0	.23	.26	.52	.24	.19	.13	.21	.01
BMAT															1.0	.25	.21	.22	.15	.15	.07	.02
BNETWORK																1.0	.35	.30	.10	.14	.13	.01
BTOWAY																	1.0	.28	.14	.17	.16	.02
BMATION																		1.0	.17	.21	.11	.03
SPECIAL																			1.0	.14	.19	.14
BUDGET																				1.0	.15	.06
CHANGE																					1.0	.02
OBSOLETE																						1.0

Table 2.7

QUARTIMAX ROTATED FACTOR MATRIX FOR RESEARCH QUESTION D[1]

	FACTOR 1	FACTOR 2	FACTOR 3
EXTEN	.54(P)	.20	.41(P)
BOOKS	.64(P)	.06	.06
WORRY	.50(P)	.09	.12
SUFFER	.72(P)	.05	.07
ONLINE	.54(P)	.10	.04
CARCAT	.69(P)	.20	.02
TASKS	.45(P)	.33	.11
APPLY	.64(P)	.09	.21
FUTURE	.25	.13	.53(S)
VIGIL	.10	.06	.44
LIBRARY	.25	.06	.06
EXPERT	.02	.02	.24
PRIVLIG	.40(S)	.04	.00
DHUMANIZ	.56(S)	.08	.25
CONTROL	.25	.03	.45
LIVES	.34	.10	.12
ATERM	.18	.43(S)	.05
AMAT	.10	.23	.03
ANETWORK	.02	.30	.06
ATOWAY	.11	.44(S)	.00
AMATION	.05	.37(S)	.04
BTERM	.39(S)	.38(S)	.07
BMAT	.31	.19	.15
BNETWORK	.31	.25(S)	.16
BTOWAY	.34	.40(S)	.09
BMATION	.31	.37	.05
SPECIAL	.50(S)	.02	.12
BUDGET	.26	.22(S)	.09
CHANGE	.29	.36	.12
OBSOLETE	.11	.20	.11

[1] Factor 1 accounted for 71% of the variance. Factors 2 and 3 accounted for 16 and 13% of the variance respectively.

toward technology index are personal values, thus indicating a personal rather than societal interrelatedness with attitude toward technology.

Research Question E

The following variables and question numbers are included in Research Question E.

SEEYOU	(Q36)	
ARISE	(Q37)	
SOCIAL	(Q38)	gregariousness
SELF	(Q39)	
PARTY	(Q40)	
CHNGE	(Q41)	
FAMILIAR	(Q42)	
SEVERAL	(Q43)	
ONEWAY	(Q44)	rigidity
TACKLE	(Q45)	
RELIGION	(Q54)	
POLITICS	(Q55)	
LIFE	(Q56)	
LUCK	(Q47)	
LEAD	(Q48)	
BREAKS	(Q49)	locus of control
FAULT	(Q50)	
EXPER	(Q51)	

The items under Research Question E were intercorrelated and the correlation matrices are given in Table 2.8. As can be seen in Table 2.8, the gregariousness items appear unrelated to each other. For rigidity, CHANGE (Q41) and SEVERAL (Q43) are correlated at .32, and POLITICS (Q55) and LIFE (Q56) are correlated at .41. For locus of control, the major correlation is between LUCK (Q47) and LEAD (Q48) at .35.

Table 2.8

CORRELATION MATRICES FOR RESEARCH QUESTION E

CORRELATION MATRIX FOR GREGARIOUSNESS ITEMS

	SEE'YOU	ARISE	SOCIAL	SELF	PARTY
SEE YOU	1.0	.05	-.09	.15	.18
ARISE		1.0	.06	.03	.05
SOCIAL			1.0	-.05	-.12
SELF				1.0	.15
PARTY					1.0

CORRELATION MATIRX FOR RIGIDITY ITEMS

	CHNGE	FAMILIAR	SEVERAL	ONEWAY	RELIGION	POLITICS	LIFE	TACKLE
CHNGE	1.0	-.15	-.32	.00	-.08	-.02	-.02	.05
FAMILIAR		1.0	.21	.18	.17	.03	-.02	-.13
SEVERAL			1.0	.17	.02	-.00	-.02	-.05
ONEWAY				1.0	.12	-.06	-.08	.05
RELIGION					1.0	.01	-.04	-.06
POLITICS						1.0	.41	.03
LIFE							1.0	.06
TACKLE								1.0

CORRELATION MATRIX FOR LOCUS OF CONTROL ITEMS

	LUCK	LEAD	BREAKS	FAULT	EXPER
LUCK	1.0	.35	-.22	.24	-.04
LEAD		1.0	-.20	.20	.06
BREAKS			1.0	-.26	-.01
FAULT				1.0	.03
EXPER					1.0

As the intercorrelations exhibited were moderately low which indicated that the creation of a scale which measured resistance as a personality variable was not warranted, it was decided to determine how much of the variance in the resistance to technology index (RESIST) could be explained by each concept (i.e., rigidity, locus of control, and gregariousness) taken separately. Accordingly, three multiple regressions were run.

The results of the regression of the rigidity items upon the attitude toward technology index (RESIST) are given in Table 2.9.

Table 2.9

REGRESSION OF RIGIDITY ITEMS UPON RESIST

Multiple R	.18
R Square	.03
Adjusted R Square	.02
Standard Error	.95

Thus, the rigidity items failed to predict the variance in the resistance to technology index. The simple correlations between each rigidity item and RESIST are given below in Table 2.10.

Table 2.10

CORRELATIONS BETWEEN RIGIDITY ITEMS AND RESIST

Variable		Simple R
CHNGE	(Q41)	.08
FAMILIAR	(Q42)	.13
SEVERAL	(Q43)	.12
ONEWAY	(Q44)	.06
TACKLE	(Q45)	.13
RELIGION	(Q54)	.03
POLITICS	(Q55)	.00
LIFE	(Q56)	.00

None of the individual rigidity items demonstrated correlations greater than .2, however, of the rigidity items, the best predictors were FAMILIAR (Q42), SEVERAL (Q43), and TACKLE (Q45).

The results of the regression of the locus of control items upon RESIST are given in Table 2.11.

Table 2.11

REGRESSION OF LOCUS OF CONTROL ITEMS UPON RESIST

Multiple R	.20
R Square	.04
Adjusted R Square	.03
Standard Error	.94

Thus, the locus of control items failed to predict the variance in the resistance to technology index. The simple correlations between each locus of control item and RESIST are given below in Table 2.12.

Table 2.12

CORRELATIONS BETWEEN LOCUS OF CONTROL ITEMS AND RESIST

Variable	Simple R
LUCK	.07
LEAD	.10
BREAKS	.14
FAULT	.11
EXPER	.09

As with the rigidity items, there were no correlations above .2, however, BREAKS (Q49) was the best predictor of RESIST.

The results of the regression of the gregariousness items upon RESIST are given in Table 2.13.

Table 2.13

REGRESSION OF THE GREGARIOUSNESS ITEMS UPON RESIST

Multiple R	.18
R Square	.03
Adjusted R Square	.02
Standard Error	.95

As can be seen, the gregariousness items failed to predict the variance in the resistance to technology index. The simple correlations between each gregariousness item and RESIST are given below in Table 2.14.

Table 2.14

CORRELATIONS BETWEEN GREGARIOUSNESS ITEMS AND RESIST

Variable	Simple R
SEEYOU	.04
ARISE	.04
SOCIAL	.06
SELF	.12
PARTY	.14

As in the previous findings with respect to rigidity and locus of control, no correlations above .2 emerged. However, of the gregariousness items, the best predictors of the resistance to technology index were SELF (Q39) and PARTY (Q40).

Research Question F

The following variables and question numbers are included in Research Question F.

TRAINED	(Q30)
EXPERIENCE	(Q31)
RESPECT	(Q32)
INTELLECT	(Q33)
OUTLOOK	(Q34)
DECIDE	(Q35)
JOB	
PERSONAL	
REGARD	(Q26)
GENERAL	
MUTUAL	
NONE	
SECURE	(Q27)
ADVANCE	(Q28)
TOP	(Q29)

The items under Research Question F were intercorrelated and the resultant correlation matrix is presented in Table 2.15.

With the exception of RESPECT (Q32) and INTELLECT (Q33) at .32, the items under self-perceptions about librarianship are uncorrelated. The items under organizational environment are also essentially uncorrelated with the exception of JOB (Q26) and NONE (Q26) at .46.

In order to determine if resistance to technology was related to self-perceptions about librarianship (professional self-image), a multiple regression was run.

Table 2.15

INTER-CORRELATION OF ITEMS UNDER RESEARCH QUESTION F

	TRAINED	EXPERIENCE	RESPECT	INTELLECT	OUTLOOK	DECIDE	JOB	PERSONAL	REGARD	GENERAL	MUTUAL	NONE	SECURE	ADVANCE	TOP
TRAINED	1.0	.02	.12	.10	.01	.10	.07	.09	.15	.00	.05	.03	.06	.01	.08
EXPERIENCE		1.0	.11	.04	.03	.03	.05	.05	.04	.05	.04	.05	.10	.06	.00
RESPECT			1.0	.32	.29	.09	.07	.09	.10	.00	.10	.08	.16	.02	.13
INTELLECT				1.0	.25	.14	.08	.15	.10	.02	.10	.08	.04	.02	.06
OUTLOOK					1.0	.12	.10	.14	.08	.09	.16	.08	.13	.09	.21
DECIDE						1.0	.07	.11	.12	.02	.07	.06	.03	.00	.08
JOB							1.0	.30	.42	.29	.27	.46	.25	.14	.25
PERSONAL								1.0	.31	.17	.16	.16	.19	.13	.24
REGARD									1.0	.28	.27	.29	.22	.18	.23
GENERAL										1.0	.17	.48	.12	.11	.07
MUTUAL											1.0	.28	.14	.12	.25
NONE												1.0	.23	.08	.12
SECURE													1.0	.20	.23
ADVANCE														1.0	.21
TOP															1.0

The results of the regression of the self-perceptions about librarianship upon the resistance to technology index are given in Table 2.16.

Table 2.16

REGRESSION OF SELF-PERCEPTION ABOUT LIBRARIANSHIP ITEMS UPON THE RESISTANCE TO TECHNOLOGY INDEX

Multiple R	.11
R Square	.01
Adjusted R Square	.00
Standard Error	.97

As can be seen, the items specified as measures of self-perceptions regarding librarianship failed to predict the variance in the resistance to technology index RESIST.

The simple correlations between the professional self-image items and RESIST are given below in Table 2.1 .

Table 2.17

CORRELATIONS BETWEEN PROFESSIONAL SELF-IMAGE ITEMS AND RESIST

Variable	Simple R
TRAINED	-.03
EXPERIENCE	.06
RESPECT	-.01
INTELLECT	-.05
OUTLOOK	.05
DECIDE	-.00

Indicating that lack of these variables are essentially uncorrelated with the resistance to technology index.

In order to determine if there was a relationship between organizational environment and the resistance to technology index, a multiple regression was run. The results of the regression of the organizational environment variables upon the resistance to technology index are given in Table 2.18.

Table 2.18

REGRESSION OF ORGANIZATIONAL ENVIRONMENT VARIABLES UPON THE RESISTANCE TO TECHNOLOGY INDEX

Multiple R	.28
R Square	.08
Adjusted R Square	.07
Standard Error	1.08

As can be seen, the variables specified as measures of organizational environment failed to predict the variance in the resistance to technology index.

The simple correlations between the organizational environment variables upon the Resistance to Technology Index are given in Table 2.19.

Table 2.19

CORRELATIONS BETWEEN ORGANIZATIONAL ENVIRONMENT VARIABLES AND RESIST

Variable	Simple R
JOB	.04
PERSONAL	-.02
REGARD	-.01
GENERAL	.04
MUTUAL	.02
NONE	.05
SECURE	.02
ADVANCE	.21
TOP	.16

While the items presented in Table 2.19 are uncorrelated with the Resistance to Technology Index, the best predictors of the variance in the Resistance to Technology Index were ADVANCE (Q28) at .21 and TOP (Q29) at .16.

Research Question G

The following variables and question numbers are included in Research Question G.

SEX (Q52)	BMICRO
AGE (Q53)	BCOMP
INCOME (Q57)	BPROJ (Q11b)
STUDIES (Q58)	BAUDIO
HOWLONG (Q59)	BAUTO

In order to determine if resistance to technology was related to demographic factors such as sex, age, income, etc., it was necessary to establish cutting points for the resistance to technology index RESIST in order to run a series of cross-tabulations. After approval by the principal investigator, these cutting points were established at quartiles. Quartile 1 in the following tables includes the individuals most resistant to technology and Quartile 4 includes the individuals least resistant to technology.

The results of the cross-classification of the variable SEX by the Resistance to Technology Index are given in Table 2.20.

Table 2.20

CROSS-CLASSIFICATION OF THE RESISTANCE TO TECHNOLOGY INDEX BY SEX

	Sex		
RESIST	Male	Female	Totals
** Quartile 1	30 (16.8%)	180 (26.9%)	210
Quartile 2	45 (25.1%)	166 (24.9%)	211
Quartile 3	49 (27.4%)	164 (24.6%)	213
Quartile 4	55 (30.7%)	158 (23.7%)	213
Totals	179 (21.1%)	668 (78.9%)	847 (100%)

$\chi^2 = 9.17$ Significant at .05

** Includes most resistant group.

As can be seen a larger percentage of females are included in the group containing resistant individuals, while a larger percentage of males are included in the group containing non-resistant individuals.

The results of the cross-classification of the variable AGE by the Resistance to Technology Index are given in Table 2.21.

Table 2.21

CROSS-CLASSIFICATION OF THE RESISTANCE TO TECHNOLOGY INDEX BY AGE

	Age					
RESIST	20-29	30-39	40-49	50-59	Over 60	Totals
** Quartile 1	38 (16.2%)	61 (21.3%)	47 (34.1%)	48 (34.5%)	16 (34.0%	210
Quartile 2	61 (26.1%)	64 (22.3%)	30 (21.7%)	42 (30.2%)	13 (27.7%)	210
Quartile 3	55 (23.5%)	86 (30.0%)	36 (26.1%)	24 (17.3%)	11 (23.4%)	212
Quartile 4	80 (34.2%)	76 (26.5%)	25 (18.1%)	25 (18.0%)	7 (14.9%)	213
Totals	234 (27.7%)	287 (34.0%)	138 (16.3%)	139 (16.4%)	47 (5.6%)	845 (100%)

$\chi^2 = 44.95$ Significant at .01

As can be seen in Table 2.21, a larger percent of younger individuals tend to be included in the group which is least resistant to technology and the older individuals tend to be included in the group which is most resistant to technology.

The results of the cross-classification of the variable INCOME by the Resistance to Technology Index are given in Table 2.22.

The results of the cross-classification of the variable, nature of educational background, by the index of Resistance to Technology are presented in Table 2.23. As can be seen, individuals with backgrounds in the humanities are somewhat more inclined to be in the group which is most resistant to technology.

Table 2.22

CROSS-CLASSIFICATION OF THE RESISTANCE TO TECHNOLOGY INDEX BY INCOME

	Income						
RESIST	Less than 10,000	10,000 to 14,999	15,000 to 19,999	20,000 to 24,999	25,000 to 49,999	Over 50,000	Totals
**Quartile 1	9 (24.3%)	46 (23.8%)	56 (26.2%)	37 (28.2%)	56 (22.2%)	6 (31.6%)	210
Quartile 2	7 (18.9%)	56 (29.0%)	59 (27.6%)	29 (22.1%)	56 (22.2%)	3 (15.8%)	210
Quartile 3	14 (37.8%)	47 (24.4%)	50 (23.4%)	24 (18.3%)	74 (29.4%)	3 (15.8%)	212
Quartile 4	7 (18.9%)	44 (22.8%)	49 (22.9%)	41 (31.3%)	66 (26.2%)	7 (36.8%)	214
Totals	37 (4.4%)	193 (22.8%)	214 (25.3%)	131 (15.5%)	252 (29.8%)	214 (25.3%)	846

$\chi^2 = 18.20$ N.S. = Not significant at .05 level.

The variable family income appears unrelated to the Resistance to Technology Index.

Table 2.23

CROSS-CLASSIFICATION OF THE RESISTANCE TO TECHNOLOGY INDEX BY NATURE OF EDUCATIONAL BACKGROUND

RESIST	Humanities	Sciences	Other	Totals
**Quartile 1	170 (27.1%)	9 (12.3%)	23 (18.7%)	202
Quartile 2	159 (25.4%)	20 (27.4%)	27 (22.0%)	206
Quartile 3	140 (22.3%)	29 (39.7%)	39 (31.7%)	208
Quartile 4	158 (25.2%)	15 (20.5%)	34 (27.6%)	207
Totals	627 (76.2%)	73 (8.9%)	123 (14.9%)	823

$\chi^2 = 19.61$ Significant at .01

The results of the cross-classification of the variable, length of library service, and the Resistance to Technology Index are given in Table 2.24.

Table 2.24

CROSS-CLASSIFICATION OF LENGTH OF LIBRARY SERVICE BY THE RESISTANCE TO TECHNOLOGY INDEX

	Length of Service					
RESIST	Less than 1 Year	1-5 Years	6-10 Years	11-20 Years	20+ Years	Totals
** Quartile 1	3 (11.1%)	59 (21.9%)	57 (22.7%)	50 (26.3%)	41 (38.7%)	210
Quartile 2	13 (48.1%)	57 (21.1%)	61 (24.3%)	51 (26.8%)	28 (26.4%)	210
Quartile 3	9 (33.3%)	70 (25.9%)	63 (25.1%)	49 (25.8%)	21 (19.8%)	212
Quartile 4	2 (7.4%)	84 (31.1%)	70 (27.9%)	40 (21.1%)	16 (15.1%)	212
Totals	27 (3.2%)	270 (32.0%)	251 (29.7%)	190 (22.5%)	106 (12.6%)	844

$\chi^2 = 35.15$ Significant at .05

As can be seen in Table 2.24, a high percentage of individuals who have had long term library service are included in the group which shows the most resistance to technology.

The relationship between degree of technology related work and resistance to technology can be seen in Table 2.25.

Table 2.25

PERCENTAGE OF INDIVIDUALS WHO WORK WITH TECHNOLOGICAL ITEMS IN THEIR LIBRARY BY THE RESISTANCE TO TECHNOLOGY INDEX

	Technological Items				
RESIST	Microform	Computer Terminal	Projectors	Audiovisual Materials	Automated Cataloging
**Quartile 1	61.2%	14.2%	50.5%	60.9%	16.6%
Quartile 2	62.9%	26.6%	58.8%	70.5%	24.1%
Quartile 3	63.4%	25.4%	60.8%	74.5%	18.5%
Quartile 4	63.8%	29.6%	50.3%	70.8%	30.1%
	$\chi^2 = 2.8$ N.S.	$\chi^2 = 12.39$ sig. at .01	$\chi^2 = 6.84$ N.S.	$\chi^2 = 9.57$ sig. at .01	$\chi^2 = 11.02$ sig. at .01

As can be seen in Table 2.25, there are relationships between certain types of technological items and resistance to technology (specifically, fewer individuals who work with computer terminals and automated cataloging are included in the group containing resistant individuals).

The results of the cross-classification of size of library by the Resistance to Technology Index are given in Table 2.26.

Table 2.26

CROSS-CLASSIFICATION OF SIZE OF LIBRARY BY THE RESISTANCE TO TECHNOLOGY INDEX

	Size of Library				
RESIST	250+	100-249	50-99	25-49	Totals
**Quartile 1	110 (24.6%)	44 (24.4%)	28 (24.8%)	31 (27.4%)	213
Quartile 2	116 (25.9%)	45 (25.0%)	27 (23.9%)	25 (22.1%)	213
Quartile 3	102 (22.8%)	55 (30.6%)	26 (23.0%)	31 (27.4%)	214
Quartile 4	120 (26.8%)	36 (20.0%)	32 (28.3%)	26 (23.0%)	214
Totals	448 (52.5%)	180 (21.1%)	113 (13.2%)	113 (13.2%)	854

$\chi^2 = 7.50$ N.S.

As can be seen in Table 2.26, size of library is unrelated to the Resistance to Technology Index.

The cross-classification between type of community served and the Resistance to Technology Index is given in Table 2.27.

Table 2.27

CROSS-CLASSIFICATION OF TYPE OF COMMUNITY SERVED AND THE RESISTANCE TO TECHNOLOGY INDEX

	Type of Community			
RESIST	Central City	Outside Central City	Outside SMSA	Totals
**Quartile 1	123 (22.4%)	63 (29.4%)	27 (30.0%)	213
Quartile 2	149 (27.1%)	45 (21.0%)	19 (21.1%)	213
Quartile 3	141 (25.6%)	46 (21.5%)	27 (30.0%)	214
Quartile 4	137 (24.9%)	60 (28.0%)	17 (18.9%)	214
Totals	550 (64.4%)	214 (25.1%)	90 (10.5%)	854

$\chi^2 = 11.15$ N.S.

As can be seen in Table 2.27, type of community served is essentially unrelated to the Resistance to Technology Index.

Research Question H

The following variables and question numbers are included in Research Question H.

POLITICS (Q55)
LIFE (Q56)
RELIGION (Q54)

In order to determine if there was a relationship between these variables and the Resistance to Technology Index, each variable was cross-classified by the collapsed version of RESIST discussed earlier.

The relationship between political leaning and the Resistance to Technology Index is presented in Table 2.28.

Table 2.28

CROSS-CLASSIFICATION OF POLITICAL LEANING BY THE RESISTANCE TO TECHNOLOGY INDEX

	Political Leaning					
RESIST	Very Liberal	Somewhat Liberal	Middle-of-the Road	Somewhat Conservative	Very Conserv.	Totals
** Quartile 1	27 (24.3%)	82 (22.8%)	58 (26.9%)	35 (24.3%)	8 (50.0%)	210
Quartile 2	30 (27.0%)	86 (24.0%)	59 (27.3%)	35 (24.3%)	0 (0)	210
Quartile 3	20 (18.0%)	99 (27.6%)	54 (25.0%)	34 (23.6%)	6 (37.5%)	213
Quartile 4	34 (30.6%)	92 (25.6%)	45 (20.8%)	40 (27.8%)	2 (12.5%)	213
Totals	111 (13.1%)	359 (42.4%)	216 (25.5%)	144 (17.0%)	16 (1.9%)	846

$\chi^2 = .1028$ N.S.

As shown in Table 2.28, there appears to be little relationship between political leaning and the Resistance to Technology Index.

The results of the cross-classification of the importance of formal religion in the individuals by the Resistance to Technology Index are given in Table 2.29.

Table 2.29

RESULTS OF THE CROSS-CLASSIFICATION OF THE RESISTANCE TO TECHNOLOGY INDEX BY THE IMPORTANCE OF FORMAL RELIGION

	Religion				
RESIST	Very Imp.	Mod. Imp.	Slightly Imp.	Not at all Imp.	Totals
**Quartile 1	48 (24.9%)	43 (25.0%)	42 (28.8%)	71 (22.6%)	210
Quartile 2	54 (28.0%)	50 (29.1%)	32 (21.9%)	70 (22.3%)	211
Quartile 3	50 (25.9%)	39 (22.7%)	33 (22.6%)	84 (26.8%)	212
Quartile 4	41 (21.2%)	40 (23.3%)	39 (26.7%)	89 (28.3%)	213
Totals	193 (22.8%)	172 (20.3%)	146 (17.3%)	314 (37.1%)	

$\chi^2 = 8.80$ N.S.

As can be seen in Table 2.29, the importance of religion to the individual is unrelated to the Resistance to Technology Index.

The results of the cross-classification of reported lifestyle by the Resistance to Technology Index are given in Table 2.30.

Table 2.30

CROSS-CLASSIFICATION OF REPORTED LIFESTYLE BY THE RESISTANCE TO TECHNOLOGY INDEX

RESIST	Traditional	Mod. Traditional	Somewhat Non-Traditional	Non-Traditional	Somewhat In Between	Totals
**Quartile 1	42 (31.6%)	82 (22.7%)	48 (21.2%)	23 (29.9%)	15 (30.0%)	210
Quartile 2	34 (25.6%)	96 (26.5%)	54 (23.9%)	16 (20.8%)	11 (22.0%)	211
Quartile 3	32 (24.1%)	97 (26.8%)	51 (22.6%)	17 (22.1%)	16 (32.0%)	213
Quartile 4	25 (18.8%)	87 (24.0%)	73 (32.3%)	21 (27.3%)	8 (16.0%)	214
Totals	133 (15.7%)	362 (42.7%)	226 (26.7%)	77 (9.1%)	50 (5.9%)	848

$\chi^2 = 17.80$ N.S.

As can be seen in Table 2.30, reported lifestyle is unrelated to the Resistance to Technology Index.

2.3 ELABORATION OF AN APPARENT SOCIAL DESIRABILITY RESPONSE SET

During the data analytic component of the research into librarians' attitudes and resistance to technology, there were indications that a response set similar to a social desirability pattern might be emerging. Social desirability as a phenomenon affecting response to a self-report questionnaire is frequently investigated in conjunction with attitude measurement. As the data of this study were analyzed and reviewed, a response set could be described in the librarian questionnaire that seemed to approximate a social desirability response pattern. This phenomenon provided a particularly relevant area for investigation as it had been proposed earlier (Presthus, 1970) that resistance to technological change by librarians may be related to the "quasi-professional" status of librarians. Thus, in order to enhance their appearance of professionalism, the librarians who participated in this study may have chosen to give the response which seemed most consistant with their professional self-image. Before considering whether this phenomenon of social desirability within the professional context of librarianship was occuring, it is useful to examine social desirability in its broader methodological context.

"Social desirability" has been described as "the tendency to give a favorable picture of oneself." (Selltiz, et al, 1976, p. 165)

Cook and Selltiz (1964) have suggested that most persons, when responding to a test that has connotations of respectability, will try to give answers that place them in a favorable light--"well adjusted, unprejudiced, rational...," etc. (p. 39). A concern for this type of response bias generally rests upon at least two assumptions:

> (1) that the respondent is motivated to present an untrue (that is, overly favorable) picture of himself, and
>
> (2) that he knows what responses will be favorably regarded. (Scott, 1968, p. 236)

The major research effects of a social desirability response set have been summarized by Selltiz, et al (1976).

> Edwards (1957) found that the number of people who accept or agree with a given statement on a questionnaire is highly correlated with the "social desirability" of the position presented in the item. Subsequent investigators have confirmed this finding and have demonstrated that individuals differ in the extent to which they tend to give socially desirable responses to questions on which the socially desirable answer is unlikely to be their true position (see, for example, Crowne and Marlowe, 1964). Thus, differences in scores on instruments which ask respondents to indicate their agreement or disagreement with statements that are subject to considerations of social desirability may reflect differences in willingness to admit holding "undesirable" positions, as well as differences in the characteristics the instrument is intended to measure. For example, scores on an attitude test may be influenced not only by individuals' attitudes toward the object in question, but also by their willingness or unwillingness to admit holding opinions they know to be unpopular. Similarly, differences in scores on tests of personality or mental health may reflect differences in willingness to admit to having feelings that are generally considered "neurotic" or to behaving in ways that are socially disapproved, as well as true differences in the feelings and behavior asked about (p. 165).

A situation could arise in which the respondent may be unable or unwilling to present an accurate response to a particular questionnaire item. Selltiz, Wrightsman and Cook (1976) note:

> Not only may people be reluctant to report openly their beliefs, feelings, motivations, plans, and so on; they may be unable to do so.... Even such seemingly simple questions as "Are you shy with strangers?" or "Would you rather go to a party or stay home and read a good book?" require individuals to make judgments about themselves on the basis of many past events (p. 293).

The research of Parry and Crossley (1950) demonstrated how answers to strictly factual questions can also be influenced by the desire to appear respectable. This discussion has been summarized by Katz (1951):

> They found that people consistently exaggerated their registration and voting behavior. The exaggeration varied from thirteen percent who falsely claimed to have voted in the 1948 election to twenty-eight percent who made fictitious claims to voting in local elections. One third of those who reported contributing to the Community Chest were speaking of pious intentions, not actual contributions. Telephone and home ownership were accurately reported. Similarly, car ownership was not appreciably inflated, but ten percent of these reporting a driver's license did not have one. Again, ten percent claimed to have library cards when in fact they had none (p. 168).

Indications of a Social Desirability Response Set

There were two major reasons for suspecting that a methodological factor such as social desirability might be obscuring the precise nature of the variation in the data. The first of these was the relatively low correlations being obtained in the data between various questionnaire

items and the resistance to technology scales. In addition, respondent librarians seemed particularly non-resistant to technology, despite sound theoretical background which indicated that librarians would evidence a great deal of resistance.

The second major indication of the presence of a methodological issue arose upon examination of Question 46 which came to be known as "the matrix which shifted." This set of questions and the pattern of responses which led the research team to pursue the possibility of a social desirability response pattern is shown in Figure 1.

Figure 1. Initial Set of Variables Indicating the Presence of a Socially Desirable Response Set

Q 46-Please read each item below and decide how often, on a scale from 1 to 5 (from "Never" to "Very Often"), you experience the kind of feeling described. Then circle the appropriate number to indicate your response.

	Never		Sometimes		Very often
	1	2	3	4	5
Tired, bored, the day seems to drag on	17.9%	37.1%	37.8%	5.2%	1.9%
Irritable, angry, frustrated	7.6%	45.0%	38.0%	6.55%	2.8%
A longing for the "good old days" of librarianship, whatever that means to you	71.3%	14.5%	9.7%	2.2%	2.2%
Useful, competent, confident	1.5%	1.8%	14.8%	44.4%	37.4%
In general, satisfied with my life	1.7%	4.2%	17.2%	36.0%	40.8%

The tabulations showed that few individuals admitted to being tired, bored or angry, and that most professed feeling useful, competent, confident and satisfied. The respondents shifted from negative to positive response categories depending on the acceptability of the response.

Two major issued were addressed before the procedures for the construction and analysis of the social desirability response set were carried out. First, social desirability has precise methodological connotations as specified in attitude research. However, for the purposes of this study, a social desirability response set was conceptualized as occurring within the specialized context of librarianship, i.e., the "correct" responses are those which are appropriate for a "good librarian." Second was that the items which produced the social desirability scale for librarians may not produce a similar scale for another sample. Babbie (1973) noted that "whether the combination of several questionnaire items results in a scale almost always depends on the particular sample of respondents being studied. Certain items may form a scale among one sample but not among another...." (p. 255).

The survey instrument offered a number of items to which librarians might be inclined to give a professionally "correct" rather than a personally true response if they were influenced by a desire to appear in a favorable light. The items were selected for inclusion in this set if the responses seemed to be in an unrealistically positive direction. In order to identify the existence of this factor, the following question was posed: to what degree did respondents tend to answer all or most of these selected questions in an extreme or

nearly extreme positive direction? The questions which were included in the social desirability scale consisted of Question 46, described above, plus the following. In all of these questions, the largest percentage of responses belonged in the "good librarian" category.

Q 28-How do you feel about promotions to higher classified jobs?

I am not particularly interested.....20.6%

I don't feel I have much chance to get promoted even if I do good work.....17.1%

I feel I have as much chance to get promoted as the next person but there aren't too many openings...44.4%

I feel I have a really good chance to get a higher classified job.....17.9%

Q 35-How did you decide on librarianship as a profession? Choose the one closest answer.

Someone I knew or admired suggested it to me.....10.2%

A librarian I knew influenced me.....12.9%

It wasn't my first choice but I couldn't or thought I wouldn't get a job in what I really wanted.....8.8%

I definitely wanted to be a librarian.....35.6%

I happened into it without too much deliberation.....22.2%

None of the above.....10.4%

Q 36-How do you think the people who work with you see you?

Friendly and easy to talk to.....64.3%

Hard to get to know, shy or aloof.....4.0%

Somewhere in-between.....28.1%

Can't tell.....2.8%

Don't really care..... .7%

Q 42-Things that are familiar are always preferable to things that are unfamiliar.

True.....24.8%

False.....75.2%

Q 60-How do you feel about this questionnaire?

A most fascinating experience.....3.3%

Has aroused my curiosity.....57.4%

Just another questionnaire.....25.3%

Seems like a useless exercise.....5.1%

Not interested in the subject.....1.6%

No feelings about it.....7.3%

The questions were selected: (1) on the basis of their face content, and (2) judgement of the research team that the question lent itself to a "right" (socially desirable) or "wrong" (socially undesirable) response. In order to determine if this particular response set was in fact obscuring the variation in resistance to technology, a series of steps were performed which led to the creation of a social desirability scale. This scale was then used in a series of controlling procedures. These methodological steps are outlined in the following section.

Construction of the Social Desirability Scale

Each variable was dummy coded prior to inclusion in the social desirability scale with "0" representing the socially acceptable or "correct"

response and "1" representing the "incorrect" response. The frequency distribution for these variables follow. (NOTE: Social Desirability 1 through Social Desirability 5 were created from the initial set of variables which provided the indication of the response set. See Figure 1).

Social Desirability 1

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	23228	92.8	92.80
Socially Unacceptable	1.	1797	7.2	100.00
Missing Values	-9999.	662	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 25025 Missing Cases 662

Social Desirability 2

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	22773	90.7	90.70
Socially Unacceptable	1.	2348	9.3	100.00
Missing Values	-9999.	566	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 25122 Missing Cases 566

Social Desirability 3

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	17833	71.3	71.30
Socially Unacceptable	1.	7165	28.7	100.00
Missing Values	-9999.	689	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 24998 Missing Cases 689

Social Desirability 4

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	20490	81.9	81.90
Socially Unacceptable	1.	4541	18.1	100.00
Missing Values	-9999.	656	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 25031 Missing Cases 656

Social Desirability 5

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	19279	76.9	76.90
Socially Unacceptable	1.	5803	23.1	100.00
Missing Values	-9999.	606	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 25082 Missing Cases 606

Social Desirability 6

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	11157	48.9	48.90
Socially Unacceptable	1.	11671	51.1	100.00
Missing Values	-9999.	2859	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 22828 Missing Cases 2859

Social Desirability 7

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	11229	54.1	54.10
Socially Unacceptable	1.	9515	45.9	100.00
Missing Values	-9999.	4944	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 20744 Missing Cases 4944

Social Desirability 8

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	16145	64.3	64.30
Socially Unacceptable	1.	8948	35.7	100.00
Missing Values	-9999.	595	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 25093 Missing Cases 594

Social Desirability 9

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	18544	75.2	75.20
Socially Unacceptable	1.	6116	24.8	100.00
Missing Values	-9999.	1027	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 24660 Missing Cases 1027

Social Desirability 10

	Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
Socially Acceptable	0.	15172	60.7	60.70
Socially Unacceptable	1.	9819	39.3	100.00
Missing Values	-9999.	697	MISSING	100.0
	TOTAL	25687	100.0	

Valid Cases 24991 Missing Cases 697

The responses to these variables were then summed to produce the social desirability scale. The range and frequency distribution for this scale follow.

Social Desirability Scale

Code	Absolute Frequency	Adjusted Frequency (PCT)	Cumulative Frequency (PCT)
0.	773	4.5	4.50
1.	2959	17.3	21.80
2.	4157	24.3	46.00
3.	3211	18.7	64.80
4.	2966	17.3	82.10
5.	1729	10.1	92.20
6.	728	4.2	96.40
7.	466	2.7	99.10
8.	119	.7	99.80
9.	31	.2	100.00
-9999.	8547	MISSING	100.0
TOTAL	25687	100.0	

It is interesting to note that there were no individuals who gave a "perfect" deviant or socially unacceptable response set (obtaining a score of 10). However, 4.5% of the sample gave a "perfect" socially desirable response (obtaining a score of 1), and 46% of the sample gave a "deviant" response on only one or two items.

Prior to using the social desirability scale to determine if the apparent response set might be obscuring the variation between questionnaire items and the resistance to technology indices, each social desirability item and the social desirability scale were correlated with each of the scales and indicators representing attitude toward technology. This correlation matrix is presented in Table A.

While there exists a slight indication of intercorrelation between certain SD variables and the attitude toward technology indicators, (such as -.10 between SD 7 and Scale A, -.20 between SD 3 and Scale B and so forth as shown in the table), none of the items were intercorrelated at a level greater than .3, and none of the resistance to technology factors were correlated with the constructed social desirability scale at a level higher than .17. Therefore, it was reasonable to assume that sufficient evidence of independence existed between the scales to warrant utilization of the SD scale in order to discover if the presence of a response set similar in nature to a social desirability response set, as it is known in attitude research, might be obscuring a portion of the variation in the data.

Results Obtained Using the Social Desirability Scale as a Control Technique

The set of tables which follows demonstrates the cross-classification of demographic items in the questionnarie by the indicators of resistance to technology, controlling for the social desirability response set. In each instance, the non-parametric measure of association, gamma, was used to demonstrate the magnitude of the change in the degree of the relationship.[1]

[1] The interpretation of gamma is essentially the same as the interpretation of a correlation coefficient, i.e., the larger the obtained statistic, the greater the strength of association between the variables or scales. NOTE: The chi-square test of significance was not utilized in the analysis of these data, as the obtained value for chi square is directly dependent upon sample size, and the weighting procedures utilized to insure representativeness resulted in a large number of cases. Therefore, while almost all of the relationships tested were statistically significant, this may be the result of an artifactual condition of the sample size. Gamma, however, is based upon the patterning of internal cell frequencies.

TABLE B-1 Correlation Matrix for Social Desirability Scale Items and Scale By Indicators of Resistance to Technology[1]

	SCALE A	SCALE B	SERVE	TASKS	APPLY
SD1	-.0106 (25025)	.0297 (24590)	.0069 (25025)	.0200 (25025)	-.0085 (24577)
SD2	-.0035 (25122)	-.0146 (24687)	.0102 (25122)	.0150 (25122)	-.0430 (24673)
SD3	-.0973 (24998)	-.2042 (24564)	-.2210 (24998)	-.0717 (24998)	-.2110 (24582)
SD4	-.0385 (25031)	-.0393 (24597)	-.0500 (25031)	-.0126 (25031)	-.0251 (24583)
SD5	-.0432 (25082)	-.0524 (24647)	-.0341 (25082)	-.0327 (25082)	-.0857 (24634)
SD6	-.0212 (22828)	-.0128 (22434)	.0162 (22828)	.0254 (22828)	.0150 (22447)
SD7	-.1065 (20744)	-.2222 (20414)	-.1303 (20744)	-.1137 (20744)	-.1051 (20397)
SD8	-.0493 (25093)	-.0499 (24658)	-.0653 (25093)	-.0234 (25093)	-.0587 (24645)
SD9	-.0093 (24660)	-.1154 (24226)	-.1624 (24660)	-.1275 (24660)	-.1313 (24212)
SD10	-.1086 (24991)	-.1056 (24452)	-.0921 (24991)	-.1146 (24991)	-.1376 (24457)
SD	-.1193 (17140)	-.1739 (16848)	-.1749 (17140)	-.0887 (17140)	-.1651 (16893)

[1] This table was produced before the development of a final RESIST measure by way of factor analysis. Scale A and Scale B were earlier RESIST measures comprising intercorrelated RESIST items.

Table B-2 THE RELATIONSHIP BETWEEN SCALE A AND SEX OF RESPONDENT FOR THOSE INDIVIDUALS GIVING A "SOCIALLY DESIRABLE" RESPONSE SET

	COUNT / ROW PCT / COL PCT / TOT PCT	SEX 1.	2.	ROW TOTAL
SCALE A	1.	600 18.9 13.4 2.7	2,582 81.1 14.4 11.5	3,183 14.2
	2.	2,145 18.0 48.0 9.6	9,765 82.0 54.5 43.6	11,910 53.2
	3.	1,723 23.7 38.6 7.7	5,557 76.3 31.0 24.8	7,279 32.5
	COLUMN TOTAL	4,468 20.0	17,904 80.0	22,372 100.0

GAMMA = .11

Table B-3 THE RELATIONSHIP BETWEEN SCALE A AND SEX OF RESPONDENT FOR THOSE INDIVIDUALS GIVING A "DEVIANT" RESPONSE SET

	COUNT / ROW PCT / COL PCT / TOT PCT	SEX 1.	2.	ROW TOTAL
SCALE A	1.	47 8.3 7.2 1.5	517 91.7 21.3 16.8	564 18.3
	2.	366 21.9 56.5 11.9	1,302 78.1 53.7 42.4	1,668 54.3
	3.	235 28.0 36.3 7.7	606 72.0 25.0 19.7	842 27.4
	COLUMN TOTAL	648 21.1	2,426 78.9	3,074 100.0

GAMMA = -.33

Table B-4 THE RELATIONSHIP BETWEEN SCALE A AND INCOME OF RESPONDENT FOR THOSE WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	INCOME 1.	2.	3.	4.	5.	6.	ROW TOTAL
SCALE A	1.	142	765	871	465	832	72	3,147
		4.5	24.3	27.7	14.8	26.4	2.3	14.1
		13.2	15.8	16.3	12.6	12.3	10.4	
		.6	3.4	3.9	2.1	3.7	.3	
	2.	570	2,819	2,582	1,736	3,831	335	11,872
		4.8	23.7	21.7	14.6	32.3	2.8	53.1
		52.9	58.3	48.5	47.0	56.8	48.7	
		2.5	12.6	11.5	7.8	17.1	1.5	
	3.	365	1,252	1,875	1,496	2,084	280	7,351
		5.0	17.0	25.5	20.3	28.3	3.8	32.9
		33.9	25.9	35.2	40.5	30.9	40.8	
		1.6	5.6	8.4	6.7	9.3	1.3	
	COLUMN TOTAL	1,077	4,835	5,328	3,697	6,747	686	22,370
		4.8	21.6	23.8	16.5	30.2	3.1	100.0

GAMMA = .05

Table B-5 THE RELATIONSHIP BETWEEN SCALE A AND INCOME OF RESPONDENT FOR THOSE WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	INCOME 1.	2.	3.	4.	5.	6.	ROW TOTAL
SCALE A	1.	0	47	263	118	109	0	537
		.0	8.7	49.0	22.0	20.3	.0	17.6
		.0	4.8	31.1	35.1	14.8	.0	
		.0	1.5	8.6	3.9	3.6	.0	
	2.	71	662	430	139	338	27	1,668
		4.3	39.7	25.8	8.3	20.3	1.6	54.7
		52.0	68.9	50.8	41.3	45.8	100.0	
		2.3	21.7	14.1	4.6	11.1	.9	
	3.	66	252	154	79	291	0	842
		7.8	30.0	18.3	9.4	34.5	.0	27.6
		48.0	26.2	18.2	23.6	39.4	.0	
		2.2	8.3	5.1	2.6	9.5	.0	
	COLUMN TOTAL	137	961	848	337	738	27	3,047
		4.5	31.6	27.8	11.0	24.2	.9	100.0

GAMMA = -.07

Table B-6 THE RELATIONSHIP BETWEEN SCALE A AND AGE FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT ROW PCT COL PCT TOT PCT	AGE 1.	2.	3.	4.	5.	ROW TOTAL
SCALE A	1.	611 19.2 9.9 2.7	999 31.4 14.1 4.5	604 19.0 16.4 2.7	747 23.5 18.9 3.3	222 7.0 15.9 1.0	3,183 14.3
	2.	3,405 28.7 55.0 15.3	3,965 33.5 56.0 17.8	2,078 17.5 56.3 9.3	1,786 15.1 45.2 8.0	609 5.1 43.8 2.7	11,843 53.1
	3.	2,176 29.9 35.1 9.8	2,116 29.1 29.9 9.5	1,008 13.8 27.3 4.5	1,420 19.5 35.9 6.4	560 7.7 40.3 2.5	7,279 32.6
	COLUMN TOTAL	6,191 27.8	7,080 31.7	3,690 16.5	3,953 17.7	1,391 6.2	22,305 100.0

GAMMA = -.04

Table B-7 THE RELATIONSHIP BETWEEN SCALE A AND AGE FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT ROW PCT COL PCT TOT PCT	AGE 1.	2.	3.	4.	5.	ROW TOTAL
	1.	114 20.2 13.0 3.7	136 24.1 14.7 4.4	94 16.7 19.6 3.1	99 17.6 19.9 3.2	121 21.4 41.2 3.9	564 18.3
	2.	480 28.8 54.6 15.6	611 36.6 66.2 19.9	176 10.6 36.7 5.7	256 15.3 51.2 8.3	145 8.7 49.6 4.7	1,668 54.3
	3.	285 33.9 32.4 9.3	176 20.9 19.0 5.7	210 25.0 43.7 6.8	144 17.1 28.9 4.7	27 3.2 9.1 .9	842 27.4
	COLUMN TOTAL	879 28.6	922 30.0	480 15.6	499 16.2	293 9.5	3,074 100.0

GAMMA = -.15

Table B-8 THE RELATIONSHIP BETWEEN SCALE A AND LENGTH OF SERVICE FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	LENGTH OF SERVICE 1.	2.	3.	4.	5.	ROW TOTAL
SCALE A	1.	174	705	792	803	683	3,156
		5.5	22.3	25.1	25.4	21.6	14.1
		21.3	9.8	12.0	16.2	24.6	
		.8	3.2	3.5	3.6	3.1	
	2.	484	4,050	4,052	2,325	999	11,909
		4.1	34.0	34.0	19.5	8.4	53.3
		59.5	56.3	61.4	46.8	35.9	
		2.2	18.1	18.1	10.4	4.5	
	3.	156	2,434	1,759	1,837	1,100	7,286
		2.1	33.4	24.1	25.2	15.1	32.6
		19.2	33.9	26.6	37.0	39.5	
		.7	10.9	7.9	8.2	4.9	
	COLUMN TOTAL	813	7,188	6,602	4,965	2,782	22,350
		3.6	32.2	29.5	22.2	12.4	100.0

GAMMA = -.00

Table B-9 THE RELATIONSHIP BETWEEN SCALE A AND LENGTH OF SERVICE FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

COUNT / ROW PCT / COL PCT / TOT PCT	LENGTH OF SERVICE 1.	2.	3.	4.	5.	ROW TOTAL
1.	0	114	119	166	166	564
	.0	20.2	21.1	29.4	29.4	18.3
	.0	15.9	12.9	22.4	28.8	
	.0	3.7	3.9	5.4	5.4	
2.	67	358	642	320	281	1,668
	4.0	21.4	38.5	19.2	16.9	54.3
	55.2	49.8	69.7	43.3	48.8	
	2.2	11.6	20.9	10.4	9.2	
3.	55	246	160	252	129	842
	6.5	29.2	19.0	30.0	15.3	27.4
	44.8	34.3	17.4	34.2	22.4	
	1.8	8.0	5.2	8.2	4.2	
COLUMN TOTAL	122	717	921	738	576	3,074
	4.0	23.3	30.0	24.0	18.7	100.0

GAMMA = -.16

Table B-10 THE RELATIONSHIP BETWEEN SEX AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	SEX 1.	SEX 2.	ROW TOTAL
SERVE	1.	360 9.6 8.1 1.6	3377 90.4 18.9 15.1	3,738 16.7
	2.	2723 21.4 60.9 12.2	9990 78.6 55.8 44.7	12,713 56.8
	3.	1385 23.4 31.0 6.2	4536 76.6 25.3 20.3	5,921 26.5
	COLUMN TOTAL	4468 20.0	17904 80.0	22,372 100.0

GAMMA = -.22

Table B-11 THE RELATIONSHIP BETWEEN SEX AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	SEX 1.	SEX 2.	ROW TOTAL
SERVE	1.	34 3.7 5.2 1.1	876 96.3 36.1 28.5	910 29.6
	2.	465 26.0 71.8 15.1	1325 74.0 54.6 43.1	1,790 58.2
	3.	149 39.8 23.0 4.8	225 60.2 9.3 7.3	374 12.2
	COLUMN TOTAL	648 21.1	2426 78.9	3074 100.0

GAMMA = -.64

Table B-12 THE RELATIONSHIP BETWEEN INCOME AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	INCOME 1.	2.	3.	4.	5.	6.	ROW TOTAL
SERVE	1.	244	827	842	674	1031	68	3,685
		6.6	22.4	22.9	18.3	28.0	1.8	16.5
		22.6	17.1	15.8	18.2	15.3	9.9	
		1.1	3.7	3.8	3.0	4.6	.3	
	2.	626	2892	3007	1893	3792	483	12,693
		4.9	22.8	23.7	14.9	29.9	3.8	56.7
		58.1	59.8	56.4	51.2	56.2	70.3	
		2.8	12.9	13.4	8.5	17.0	2.2	
	3.	208	1117	1478	1130	1924	136	5,992
		3.5	18.6	24.7	18.9	32.1	2.3	26.8
		19.3	23.1	27.8	30.6	28.5	19.8	
		.9	5.0	6.6	5.1	8.6	.6	
	COLUMN TOTAL	1077	4835	5328	3697	6747	686	22,370
		4.8	21.6	23.8	16.5	30.2	3.1	100.0

GAMMA = .06

Table B-13 THE RELATIONSHIP BETWEEN INCOME AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	INCOME 1.	2.	3.	4.	5.	6.	ROW TOTAL
SERVE	1.	71	232	320	144	90	27	883
		8.0	26.3	36.2	16.3	10.2	3.0	29.0
		52.0	24.1	37.7	42.7	12.2	100.0	
		2.3	7.6	10.5	4.7	3.0	.9	
	2.	50	663	432	132	513	0	1,790
		2.8	37.0	24.1	7.4	28.6	.0	58.7
		36.9	69.0	50.9	39.3	69.5	.0	
		1.7	21.8	14.2	4.3	16.8	.0	
	3.	15	66	96	61	135	0	374
		4.1	17.8	25.8	16.2	36.2	.0	12.3
		11.1	6.9	11.4	18.0	18.3	.0	
		.5	2.2	3.2	2.0	4.4	.0	
	COLUMN TOTAL	137	961	848	337	738	27	3,047
		4.5	31.6	27.8	11.0	24.2	.9	100.0

GAMMA = .15

Table B-14 THE RELATIONSHIP BETWEEN AGE AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	AGE 1.	2.	3.	4.	5.	ROW TOTAL
SERVE	1.	778	951	616	882	475	3,702
		21.0	25.7	16.6	23.8	12.8	16.6
		12.6	13.4	16.7	22.3	34.1	
		3.5	4.3	2.8	4.0	2.1	
	2.	3603	4106	2040	2376	588	12,713
		28.3	32.3	16.0	18.7	4.6	57.0
		58.2	58.0	55.3	60.1	42.3	
		16.2	18.4	9.1	10.7	2.6	
	3.	1810	2023	1034	695	328	5,889
		30.7	34.3	17.6	11.8	5.6	26.4
		29.2	28.6	28.0	17.6	23.6	
		8.1	9.1	4.6	3.1	1.5	
	COLUMN TOTAL	6191	7080	3690	3953	1391	22,305
		27.8	31.7	16.5	17.7	6.2	100.0

GAMMA = -.16

Table B-15 THE RELATIONSHIP BETWEEN AGE AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	AGE 1.	2.	3.	4.	5.	ROW TOTAL
SERVE	1.	220	116	186	257	130	910
		24.2	12.8	20.5	28.2	14.3	29.6
		25.0	12.6	38.8	51.4	44.5	
		7.2	3.8	6.1	8.4	4.2	
	2.	512	688	231	211	147	1,790
		28.6	38.5	12.9	11.8	8.2	58.2
		58.2	74.7	48.0	42.3	50.3	
		16.7	22.4	7.5	6.9	4.8	
	3.	147	117	63	31	15	374
		39.3	31.4	16.9	8.3	4.1	12.2
		16.7	12.7	13.2	6.2	5.2	
		4.8	3.8	2.1	1.0	.5	
	COLUMN TOTAL	879	922	480	499	293	3,074
		28.6	30.0	15.6	16.2	9.5	100.0

GAMMA = -.29

Table B-16 THE RELATIONSHIP BETWEEN LENGTH OF SERVICE AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	LENGTH OF SERVICE 1.	2.	3.	4.	5.	ROW TOTAL
SERVE	1.	190	883	996	898	790	3,756
		5.1	23.5	26.5	23.9	21.0	16.8
		23.4	12.3	15.1	18.1	28.4	
		.9	3.9	4.5	4.0	3.5	
	2.	505	4474	3575	2648	1419	12,620
		4.0	35.4	28.3	21.0	11.2	56.5
		62.1	62.2	54.1	53.3	51.0	
		2.3	20.0	16.0	11.8	6.3	
	3.	118	1832	2031	1419	573	5,974
		2.0	30.7	34.0	23.8	9.6	26.7
		14.6	25.5	30.8	28.6	20.6	
		.5	8.2	9.1	6.3	2.6	
	COLUMN TOTAL	813	7188	6602	4965	2782	22,350
		3.6	32.2	29.5	22.2	12.4	100.0

GAMMA = -.06

Table B-17 THE RELATIONSHIP BETWEEN LENGTH OF SERVICE AND SERVICE TO USERS FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	LENGTH OF SERVICE 1.	2.	3.	4.	5.	ROW TOTAL
SERVE	1.	36	109	214	268	282	910
		3.9	12.0	23.6	29.5	31.0	29.6
		29.4	15.2	23.3	36.4	49.0	
		1.2	3.5	7.0	8.7	9.2	
	2.	36	513	572	422	247	1,790
		2.0	28.7	32.0	23.6	13.8	58.2
		29.4	71.5	62.1	57.2	42.9	
		1.2	16.7	18.6	13.7	8.0	
	3.	50	95	135	47	46	374
		13.4	25.5	36.0	12.7	12.4	12.2
		41.2	13.3	14.6	6.4	8.0	
		1.6	3.1	4.4	1.5	1.5	
	COLUMN TOTAL	122	717	921	738	576	3,074
		4.0	23.3	30.0	24.0	18.7	100.0

GAMMA = -.34

Table B-18 THE RELATIONSHIP BETWEEN SCALE B AND SEX FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	SEX 1.	SEX 2.	ROW TOTAL
SCALE B	1.	785 19.0 17.8 3.6	3342 81.0 19.0 15.2	4,127 18.8
	2.	2566 19.6 58.3 11.7	10509 80.4 59.9 47.9	13,075 59.6
	3.	1048 22.1 23.8 4.8	3703 77.9 21.1 16.9	4,751 21.6
	COLUMN TOTAL	4400 20.0	17553 80.0	21,953 100.0

GAMMA = -.06

Table B-19 THE RELATIONSHIP BETWEEN SCALE B AND SEX FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSES

	COUNT / ROW PCT / COL PCT / TOT PCT	SEX 1.	SEX 2.	ROW TOTAL
SCALE B	1.	50 5.4 7.8 1.7	888 94.6 37.4 29.4	939 31.0
	2.	504 30.3 77.8 16.7	1162 69.7 48.9 38.4	1,666 55.1
	3.	94 22.2 14.4 3.1	328 77.8 13.8 10.8	421 13.9
	COLUMN TOTAL	648 21.4	2377 78.6	3,025 100.0

GAMMA = -.45

Table B-20 THE RELATIONSHIP BETWEEN SCALE B AND INCOME FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE RESPONSE"

	COUNT / ROW PCT / COL PCT / TOT PCT	INCOME 1.	2.	3.	4.	5.	6.	ROW TOTAL
SCALE B	1.	294	907	1007	771	1081	68	4,127
		7.1	22.0	24.4	18.7	26.2	1.6	18.9
		27.3	19.3	19.0	21.4	16.6	9.9	
		1.3	4.1	4.6	3.5	4.9	.3	
	2.	630	2829	3218	2054	3755	515	13,002
		4.8	21.8	24.8	15.8	28.9	4.0	59.4
		58.5	60.1	60.6	57.0	57.9	75.0	
		2.9	12.9	14.7	9.4	17.2	2.4	
	3.	153	975	1084	782	1655	103	4,751
		3.2	20.5	22.8	16.5	34.8	2.2	21.7
		14.2	20.7	20.4	21.7	25.5	15.0	
		.7	4.5	5.0	3.6	7.6	.5	
	COLUMN TOTAL	1077	4710	5309	3607	6490	686	21,880
		4.9	21.5	24.3	16.5	29.7	3.1	100.0

GAMMA = .08

Table B-21 THE RELATIONSHIP BETWEEN SCALE B AND INCOME FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	INCOME 1.	2.	3.	4.	5.	6.	ROW TOTAL
SCALE B	1.	71	266	364	116	94	27	939
		7.6	28.3	38.8	12.4	10.1	2.9	31.3
		52.0	28.6	43.0	34.5	13.1	100.0	
		2.4	8.9	12.1	3.9	3.1	.9	
	2.	35	498	433	175	498	0	1,639
		2.2	30.4	26.4	10.7	30.4	.0	54.7
		25.8	53.6	51.1	52.0	68.9	.0	
		1.2	16.6	14.4	5.8	16.6	.0	
	3.	30	165	51	45	130	0	421
		7.2	39.1	12.0	10.8	30.9	.0	14.0
		22.2	17.7	6.0	13.5	18.0	.0	
		1.0	5.5	1.7	1.5	4.3	.0	
	COLUMN TOTAL	137	929	848	337	722	27	2,999
		4.6	31.0	28.3	11.2	24.1	.9	100.0

GAMMA = .10

Table B-22 THE RELATIONSHIP BETWEEN SCALE B AND AGE FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	AGE 1.	2.	3.	4.	5.	ROW TOTAL
SCALE B	1.	672	1138	845	1095	377	4,127
		16.3	27.6	20.5	26.5	9.1	18.9
		10.9	16.5	23.2	28.6	27.8	
		3.1	5.2	3.9	5.0	1.7	
	2.	3412	4378	2258	2159	802	13,008
		26.2	33.7	17.4	16.6	6.2	59.4
		55.4	63.4	62.0	56.3	59.2	
		15.6	20.0	10.3	9.9	3.7	
	3.	2071	1391	536	577	175	4,751
		43.6	29.3	11.3	12.1	3.7	21.7
		33.6	20.1	14.7	15.1	12.9	
		9.5	6.4	2.5	2.6	.8	
	COLUMN TOTAL	6155	6907	3640	3831	1354	21,886
		28.1	31.6	16.6	17.5	6.2	100.0

GAMMA = -.29

Table B-23 THE RELATIONSHIP BETWEEN SCALE B AND AGE FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	AGE 1.	2.	3.	4.	5.	ROW TOTAL
SCALE B	1.	203	110	223	186	217	939
		21.6	11.7	23.8	19.8	23.1	31.0
		24.0	11.9	46.5	38.4	74.1	
		6.7	3.6	7.4	6.1	7.2	
	2.	441	651	242	271	61	1,666
		26.5	39.1	14.5	16.3	3.6	55.1
		52.1	70.6	50.4	56.0	20.7	
		14.6	21.5	8.0	9.0	2.0	
	3.	203	161	15	27	15	421
		48.2	38.3	3.6	6.4	3.6	13.9
		24.0	17.5	3.2	5.5	5.2	
		6.7	5.3	.5	.9	.5	
	COLUMN TOTAL	847	922	480	483	293	3,025
		28.0	30.5	15.9	16.0	9.7	100.0

GAMMA = -.42

Table B-24 THE RELATIONSHIP BETWEEN SCALE B AND LENGTH OF SERVICE FOR THOSE INDIVIDUALS WHO GAVE THE "SOCIALLY DESIRABLE" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	LENGTH OF SERVICE 1.	2.	3.	4.	5.	ROW TOTAL
SCALE B	1.	71	1123	1053	1117	737	4,101
		1.7	27.4	25.7	27.2	18.0	18.8
		9.1	15.8	16.4	23.1	27.2	
		.3	5.1	4.8	5.1	3.4	
	2.	652	4032	3938	2866	1567	13,055
		5.0	30.9	30.2	22.0	12.0	59.7
		83.8	56.7	61.2	59.4	57.9	
		3.0	18.4	18.0	13.1	7.2	
	3.	55	1961	1442	841	405	4,704
		1.2	41.7	30.7	17.9	8.6	21.5
		7.0	27.6	22.4	17.4	15.0	
		.2	9.0	6.6	3.8	1.9	
	COLUMN TOTAL	777	7117	6433	4824	2708	21,860
		3.6	32.6	29.4	22.1	12.4	100.0

GAMMA = -.16

Table B-25 THE RELATIONSHIP BETWEEN SCALE B AND LENGTH OF SERVICE FOR THOSE INDIVIDUALS WHO GAVE THE "DEVIANT" RESPONSE

	COUNT / ROW PCT / COL PCT / TOT PCT	LENGTH OF SERVICE 1.	2.	3.	4.	5.	ROW TOTAL
SCALE B	1.	36	127	246	216	314	939
		3.8	13.6	26.2	23.0	33.4	31.0
		29.4	18.6	26.7	29.2	56.1	
		1.2	4.2	8.1	7.1	10.4	
	2.	50	384	494	507	231	1,666
		3.0	23.1	29.6	30.4	13.9	55.1
		41.2	56.1	53.6	68.7	41.2	
		1.7	12.7	16.3	16.8	7.6	
	3.	36	174	181	15	15	421
		8.5	41.3	43.0	3.6	3.6	13.9
		29.4	25.4	19.7	2.1	2.7	
		1.2	5.7	6.0	.5	.5	
	COLUMN TOTAL	122	685	921	738	560	3,025
		4.0.	22.6	30.4	24.4	18.5	100.0

GAMMA = -.40

It appears that the social desirability scale, as it was utilized here, explains from 18 to 20% of the variance in reported lack of resistance to technology; that is, the more likely one was to give the socially desirable response, the less likely one was to give responses indicating resistance to technology.

In each instance where the socially desirable response set was controlled for, the magnitude of the strength of the observed relationship between the variables being correlated increased, as shown by the value of gamma.

SECTION 3

INTERVIEW SURVEY OF LIBRARIANS

In addition to the mail survey of librarians, personal interviews were conducted with a smaller sample of people. Objectives involved in conducting these interviews included (1) conducting a survey which would parallel the mail survey sufficiently to make some correlational analysis between the two, and (2) obtaining subjective data through more general, open-ended questions, more questions, and probes of responses. The primary value of the interview phase was seen as being in the potential to study the statistical interrelationships between variables and to delve deeper into the variables themselves.

The interview questionnaire items were designed to explore the eight primary variables of this study. They were based, first of all, on the items in the mail survey; however, in many instances the items were changed into open-ended questions which would elicit an opinion, an explanation, or a rationale. Each of the 60 items in the mail survey questionnaire has a counterpart in the interview survey, even if the item is not identical in wording or does not appear in the same order in which it occurs in the mail survey.

In addition, each variable is explored, to a greater or lesser degree, in more depth than is possible in a mail survey. Some of this exploration may occur because many of the items are posed in an open-ended format. For some variables, more dimensions are added; for example, in the rigidity variable, the dimensions of risk-taking and self-starting behavior are added; for the perception of work environment variable, the factor of loyalty to the administrator is added; for the locus of control variable, a section related specifically to technology is included.

The personal interviews were conducted in six public libraries selected purposively. Of the six, five were chosen as heavily involved in, or affected by, technology; the sixth was chosen because of its lack of technological development. Within each sampled library, professionals to be interviewed were selected by the administrator using a random selection method. In all, 86 completed interviews

were obtained. Library directors were included in the sample, which was not the case in the mail survey.

Demographic characteristics of the interview population are quite similar to those of the mail survey population, in terms of age, sex, income and years of library experience. Differences (such as more males in the interview population) could be explained by the inclusion of directors. The similarities between the two support the use of interview responses to further explicate topics covered in the mail questionnaire.

More similarities of response can be seen in the questions relating to other major variables used in this study. One key question, for example, was "Do you believe that the future of our society depends on the advancement of technology?" Mail respondents were distributed according to the following response pattern:

Strongly agree	21.9%
Agree somewhat	37.3
In the middle somewhere	22.4
Disagree somewhat	12.6
Strongly disagree	5.7

The librarians interviewed were not given the scaled response set, and indicated either "yes" (80%) or "no" (20%). It was difficult to determine from their response just how strongly they felt, but there is at least a similar pattern between positive and negative responses in the two survey populations. Other similarities of response were found throughout the two sets of results. The difficulty in scaling noted applied to a number of questions in the personal interview instrument. This, combined with the small sample size, made it inappropriate to analyze the data as completely as the mail survey responses.

One area in which some differences were noted between the mail and personal interview results was the response set identified as socially desirable. This is most clearly illustrated by a group of five questions in the mail survey about the respondent's feelings, four of which were used in exactly the same form in the personal interviews. Results for the two survey groups are given on the following page. In each case, the percentage of socially desirable responses

I _____ feel:		Never	Rarely	Some-times	Often	Usually
tired, bored, the day seems to drag on	mail	17.9*	37.1*	37.8*	5.2	1.9
	interview	12.8*	29.1*	54.7*	3.5	-
irritable, angry, frustrated	mail	7.6*	45.0*	38.0*	6.5	2.8
	interview	3.5*	39.5*	50.0*	7.0	-
useful, competent, confident	mail	1.5	1.8	14.8	44.4*	37.4*
	interview	-	-	7.0	50.0*	43.0*
in general, satisfied with my life	mail	1.7	4.2	17.2	36.0*	40.8*
	interview	-	3.5	10.5	25.6*	60.5*

*Taken as the socially desirable response.

increased slightly for the personal interview population, and respondents consistently avoided the extreme deviant response. Similar patterns can be observed in other questions used to isolate social desirability, although this requires some interpretation of responses to somewhat different questions. Generally, however, it appears that the personal interviews created an atmosphere in which there was less freedom of expression than in the impersonal mail questionnaire.

Open-ended questions on the personal interview instrument were not as useful in eliciting opinions, explanations, and rationales as had originally been hoped. Part of this might have been due to the length of the questionnaire, which must have inhibited at least some respondents. In general, responses were direct and apparently not elaborated upon in any detail. This makes the most significant value of the interviews a function of the additional direct questions asked in the area of the major variables. These areas are emphasized in the analysis of individual research questions below.

Research Question A. Does resistance to technology exist among librarians as evidenced by the following (these items are assumed to be the sub-elements in a generalized resistant position toward technology.)

General items

1 - Negative perception of technolcgy's future (denial)

2 - Perception of control loss

3 - Perception of technology as socially harmful

4 - Unwillingness to "act," i.e., to spend library budget on technology

5 - Self reported work resistant feelings

6 - Reluctance to probe the subject of technology and feelings toward it

7 - Inability to recognize the breadth of technological potential

8 - Negative affective reaction as evidenced by associative responses

The variables related to these subelements closely parallel those used in the mail questionnaire. New questions utilized in the analysis of Research Question A include number 14, 19a, 19b, 3a, 60-7, and 9

General items (Questions asterisked were utilized in the interview and were not included in mail survey)

*Q 14. Can you think of any events in your life that may have influenced your attitude toward technology?

None	8%
Job dealing with technology	17
Educational exposure	16
Interest in science	8
Television	9
Family influence	6
Reading, media	4
Other	32
	100%

Q 2. Do you think technology affects the quality of our life? How?

Less work, more leisure	38%
General improvement	17
More information efficiency	12
Other positive effects	10
Positive and negative aspects	12
Negative effects	9
	98%

"1 - Negative perception of technology's future (denial)"

Q 1. Do you believe that the future of our society depends on the advancement of technology? In what way?

Yes	80%
No	20
	100%
Solutions, service	34%
Means of progress	20
Become a crutch	16
Other	30
	100%

Q 16. Which of the following technologies do you believe will be in general use in this century?

a. A terminal in most libraries, even small ones	72%
b. A terminal in most homes, much as television is in most homes	44
c. The increased use of microform and a decrease in the book as a medium	64
d. A national information network that will link up all kinds of libraries	19
e. Two way television transmission between homes and businesses with libraries	47
f. Complete automation of cataloging and the end of the card catalog for most purposes	72

Q 17. See Research Question B

*Q 19A. Do you believe that technology has changed the role of the librarian? If not, will technology change librarianship in this century?

Has already changed	46%
Will change in future	35
Will not change	19
	100%

*Q 19B. Do you believe that librarians as they exist today will one day become obsolete due to technology?

No	64%
Yes	36
	100%

"2 - Perception of control loss"

Q 2A. Do you think technology give more or less control?

More	66%
Less	28
Both	6
	100%

Q 3a. What do you see as the greatest advantage in technological progress?

Labor saving	37%
Better communication	17
Raises standard of living	14
Research, resources	11
Medical, health	11
Other	10
	100%

*Q 60-7 a. Computers will enable people to have more control over their lives 67%

b. Computers may ultimately control the lives of human beings 33%

"3 - Perception of technology as socially harmful"

Q 2B. Do you think technology makes life better or worse?

Better	92%
Worse	5
Both	3
	100%

Q 4. Do you see the benefits of technology as being basically for the average citizen or for those who are already rich or powerful or educated?

All	30%
Average citizen	25
Rich, powerful and/or educated	28
All, abused by rich, powerful and/or educated	17
	100%

Q 68B. Do you enjoy working with the technologies you use as part of your work?

Yes	86%
No	11
Sometimes	3
	100%

"4 - Unwillingness to "act," i.e., to spend library budget on technology"

Q 18. How much of the library's budget do you think should be allocated for technology? (Assume no budget crunch.)

Less than 10%	13%
11 - 25%	65
26 - 50	19
More than 50%	2
	100%

"5 - Self reported work resistant behaviors"

	Never	Rarely	Sometimes	Often	Usually
Q 21 a.	11	25	47	3	0
b.	3	34	43	6	0
c.	6	16	23	25	16
d.	9	27	42	7	1
e.	0	0	6	43	37
f.	0	3	9	22	52

	Never	Rarely	Sometimes	Often	Usually
Q 22a.	44	28	13	1	0
b.	12	49	23	2	0
c.	41	42	3	0	0
d.	25	36	21	3	1
e.	30	38	11	4	3
f.	46	36	4	0	0
g.	25	37	23	1	0
h.	34	38	14	0	0

"6 - Reluctance to probe the subject of technology and feelings toward it"

Q 20. How, specifically, do you feel about the subject of this study?

A waste of time	5%
Interested in results	93
No feelings	4
Boring	1
An exciting subject	35

"7 - Inability to recognize the breadth of technological potential"

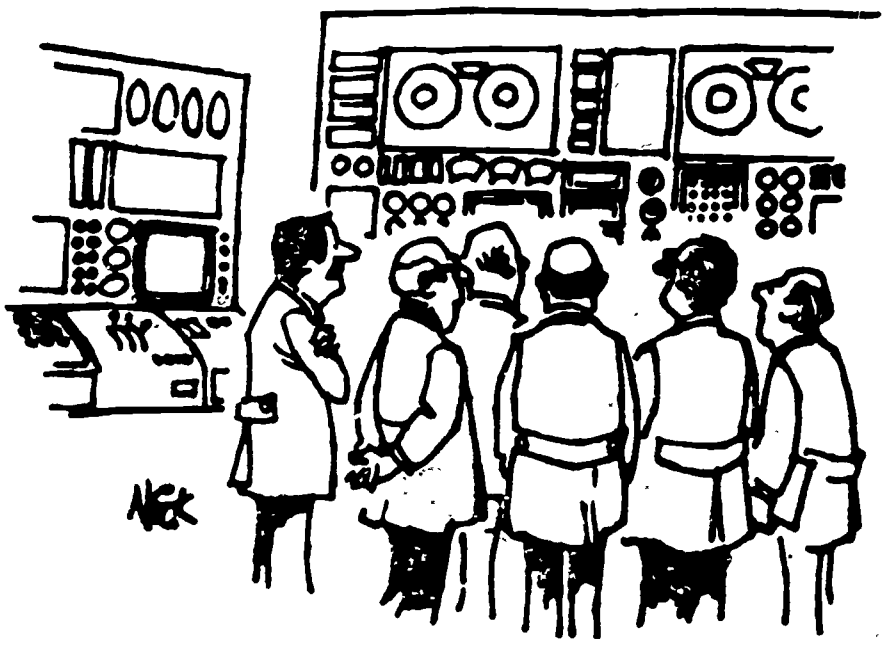
See Research Question C.

"8 - Negative affective reaction as evidenced by associative responses"

*Q 9. Cartoons (See Figures 3-1, 3-2, 3-3.)

Cartoon		Is it funny?	Is there some truth in it?
A	Yes	67%	84%
	No	24	16
	Other	9	-
		100%	100%
B	Yes	54%	67%
	No	42	33
	Other	4	-
		100%	100%
C	Yes	60%	72%
	No	29%	28%
	Other	11	-
		100%	100%

CARTOON A



"...and if any of you have a problem, please remember that my input keyboard is always open."

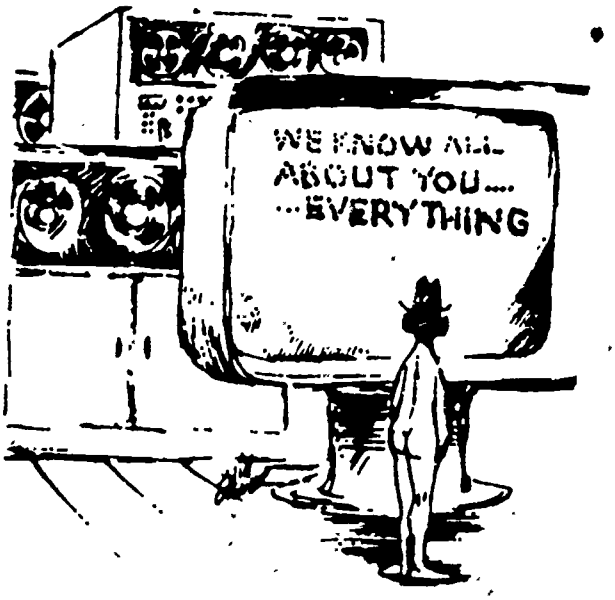
R.J.E. OPENING

WEDNESDAY,

SEPTEMBER 14, 1977

CARTOON B

GRAND OPENING:



OF THE

R.J.E.

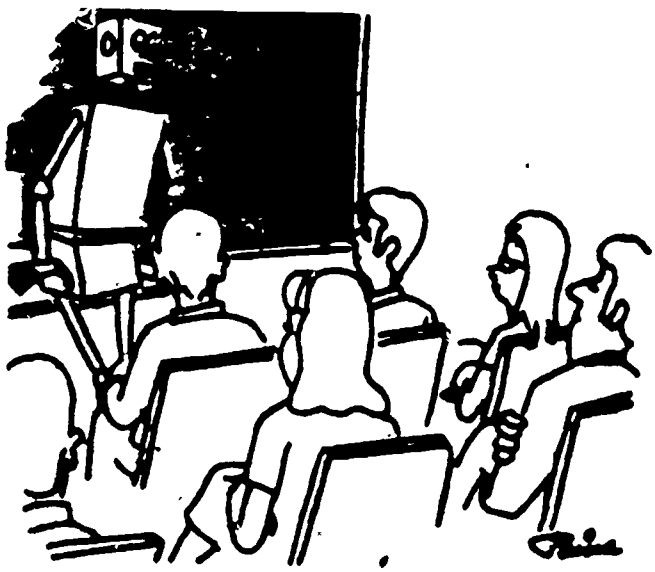
WEDNESDAY,

SEPTEMBER 14, 1977

CARTOON C

VISIT THE R.J.E.

AT G.S.L.I.S.



"Today's topic of discussion will be, The Dehumanizing of Education."

OPENING WEDNESDAY,

SEPTEMBER 14, 1977

10. Please tell me which words apply to you when you think of technology.

Positive Words		Negative Words	
Enjoyable	48%	Dehumanizing	47%
Fantastic	65	Degrading	6
Efficient	96	Distracting	24
Flexible	66	Rigid	43
Manageable	94	Uncomfortable	20
Exciting	79	Depressing	15
Reassuring	37	Limiting	27
Powerful	87	Manipulating	55
Potent	83	Alienating	31
Expansive	98	Interfering	29

Neutral Words

Futuristic	78%
Necessary	92
Expensive	93
Inevitable	86
Mysterious	42
Simple	11
Durable	73
Blind	21
Masculine	28
Feminine	4

Based on these results, the following variables were selected for factor analysis:

Q1	VAR001
Q2	VAR005
Q4	VAR016
Q9A	VAR042
Q9B	VAR046
Q9C	VAR050
Q10	APPLY
Q16	USE

Q18	VAR117
Q19B	VAR122
Q20	STUDY
Q60-7	VAR240
Q68B	VAR265

Five variables in the initial list (Q14, Q19A, Q2A, Q3A, and Q2B) were eliminated because of difficulties in coding, extremely skewed results, or too many missing values.

Following the methodology established in the mail survey, a factor analysis was performed. In the preliminary intercorrelation matrix, the two projective items which were specified as measures of negative affective reaction were correlated at .37. These were the responses to questions 9A and 9B. No other correlations above .30 were found among the elements of the sub-groups. Correlations between sub-group variables above .30 included the following:

VAR016 (Q4) and APPLY (Q10) - .35
VAR117 (Q18) and VAR122(Q19B) - .30
VAR016 (Q4) and VAR240 (Q60-7) - .33
APPLY (Q10) and VAR240 (Q60-7) - .46

The factoring method utilized was "Quartimax," and the number of factors to be extracted was set at three. The standard for determining whether a variable could be seen to load on a factor was set at .40. The Quartimax rotated factor matrix for the 3 factor solution is presented below. Variance accounted for by the three factors respectively was 42, 35 and 23%.

QUARTIMAX ROTATED FACTOR MATRIX

	FACTOR 1	FACTOR 2	FACTOR 3
VAR001	.13874	.09290	.07500
VAR005	.34290	-.04697	.25847
VAR016	.50685	-.18228	-.16214
VAR042	.02260	.90655	.30236
VAR046	.03799	.43017	-.07962
VAR050	-.00111	.23080	-.11585
VAR117	.09859	.15754	.11468
USE	-.01874	-.00505	.62559
APPLY	-.78624	-.13243	-.10997
VAR122	-.07715	.09197	.26042
VAR240	.61641	.14681	-.18163
STUDY	-.08254	.15548	-.29456
VAR265	.01325	-.00717	.32236

The first factor extracted included three variables loading above .40. There were VAR016 (Q4), APPLY (Q10) and VAR240 (Q60-7), which were then used to create a composite index called RESIST. Of the three variables, APPLY was used in the mail survey and was a factor in the RESIST scale created there. The one variable included in that scale and factor analyzed here, VAR001 (Q1), did not load high enough to be part of the personal interview scale. VAR016 and VAR240 come from questions asked only in the personal interviews, Q4 and Q60-7 respectively. They do, however, relate to subfactors also found important in the mail analysis--the perception of technology as socially harmful and the perception of control loss.

The composite index RESIST was created by multiplying the factor score coefficients derived from the factor analysis by the variables selected. Thus

VAR016 was multiplied by .17044

APPLY was multiplied by -.63802 and

VAR240 was multiplied by .25594.

As seen by the factor score coefficients, the three variables were not consistently coded and the biggest component of the composite index, that based on APPLY, was negative. This resulted in the theoretical range of the scale being -13.0 (minimum resistance) to +.5 (maximum resistance). The actual distribution of the index is shown below along with related statistics. As with the RESIST index for the mail survey, this scale is heavily skewed toward the least resistance end. No values between -1.4 and +.5 were observed, indicating that no respondent achieved a score reflecting maximum resistance.

CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
-12.9720	4	4.7	5.1	5.10
-12.3340	4	4.7	5.1	10.30
-11.6960	4	4.7	5.1	15.40
-11.5256	2	2.3	2.6	17.90
-11.0580	5	5.8	6.4	24.40
-10.8875	1	1.2	1.3	25.60
-10.5461	2	2.3	2.6	28.20
-10.4200	5	5.8	6.4	34.60
-10.3757	1	1.2	1.3	35.90
-10.2495	1	1.2	1.3	37.20
-9.9081	2	2.3	2.6	39.70

CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
-9.7819	6	7.0	7.7	47.40
-9.6115	1	1.2	1.3	48.70
-9.5260	1	1.2	1.3	50.00
-9.2701	2	2.3	2.6	52.60
-9.1439	5	5.8	6.4	59.00
-8.6230	2	2.3	2.6	61.50
-8.5059	5	5.8	6.4	67.90
-8.4616	3	3.5	3.8	71.80
-8.3355	1	1.2	1.3	73.10
-7.9940	4	4.7	5.1	78.20
-7.8679	2	2.3	2.6	80.80
-7.8236	2	2.3	2.6	83.30
-7.6974	2	2.3	2.6	85.90
-7.1856	1	1.2	1.3	87.20
-6.5918	1	1.2	1.3	88.50
-6.5475	1	1.2	1.3	89.70
-5.9538	1	1.2	1.3	91.00
-5.9095	1	1.2	1.3	92.30
-5.4419	1	1.2	1.3	93.60
-4.8039	1	1.2	1.3	94.90
-4.6335	2	2.3	2.6	97.40
-3.3574	1	1.2	1.3	98.70
-1.4434	1	1.2	1.3	100.00
99.0000	8	9.3	MISSING	100.0
	86	100.0	100.0	

Mean	-9.053	Maximum	-1.443	Std Dev	2.281
Median	-9.504	Minimum	-12.972	Variance	5.202
Mode	-9.782	Range	11.529	Skewness	.788

The index was next recorded into quarters as shown below and crosstabbed with other survey variables as a part of the analysis of research questions B - H.

RESIST	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PCT)	ADJUSTED FREQUENCY (PCT)
1st quartile	20	23	26
2nd quartile	19	22	24
3rd quartile	17	20	22
** 4th quartile	22	26	28
Missing	8	9	missing
	86	100	100

**The 4th quartile indicates high resistance.

Research Question B. If resistance to technology does exist, what are its correlates (elements, reasons, etc.)? (What do we expect to find in responses to other items?)

1 - Technologists are held in disfavor, viewed as forcing their decisions, talking down to librarians, using complex jargon

2 - Technology will erode privacy

3 - Technology will erode interpersonal relationships

4 - Technology will replace people in their jobs

5 - Technology is inherently sexist

6 - Technology will replace familiar, traditional and valuable library processes

Again, these correlations closely parallel those used in the mail survey analysis. The second area is a new variable group. Tabulations are presented below. Questions not asked in the mail survey are asterisked. The areas of new questions relate to specific effects of technology, concerns caused by technology, and the langueage used by technologists.

"1 - Technologists are held in disfavor, viewed as forcing their decisions, talking down to librarians, using complex jargon"

Q 6. Do you feel that technology is imposed on us by outside experts?

Yes	61%
No	38
Yes and No	1
	100%

Q 6A. In what way?

Ignore librarians needs	19%
Spur artificial needs	14
Oversystematization	13
Other	23
	69%

*Q 7. When you read library journals, do you read any of the "information science" or "library technology" articles?

Yes	83%
No	17
	100%

*Q 7A. If "no," why not?

No interest, time	9%
Get information from job	5
Incomprehensible	1
Other	1
	17%

If "yes," what's your reaction?

Interested	28%
Depends on article	21
Informative	14
Can't understand	5
Other	15
	83%

*Q 7B. Do you understand the language that technologists use?

No	15%
Yes	12
Sometimes	73
	100%

Q 8. Do you believe that technologists make more money than librarians?

No	7%
Yes	59
Depends	20
Librarians are underpaid	14
	100%

"2 - Technology will erode privacy"

*Q 3B. Does technology affect our privacy?

No	13%
Yes	87
	100%

*Q 3C. Does technology allow us to keep vigil on big business and government?

Yes	58%
No	36
Yes and No	6
	100%

"3 - Technology will erode interpersonal relationships"

*Q 11. Has technology caused you any concerns?

Yes	61%
No	39
	100%

What sort of concerns?

Privacy invasion	14%
Job - Specific	16
Personal	15
Societal	10
Other	11
	66%

*Q 11A. Have you changed your feelings about being a librarian because of technological change?

No	90%
Yes	10
	100%

Q 13B. I think that if technology becomes an important part of the field of librarianship, interpersonal relationships will suffer.

No	85%
Yes	15
	100%

Q 15. How would you respond to this statement: Technologists are machine oriented and librarians are people-oriented.

Generally true	44%
Depends, partially true	41
Not true	15
	100%

Q 55. I would rather have a job that:

a. brings me into close, personal involvement with people.	24%
b. where people come and go but where I don't need to be personally involved with them.	10
c. involves some contact with people and some work to do alone and quietly.	62
d. involves work that I can do on my own.	--
e. where I could do my work at home.	4
	100%

"4 - Technology will replace people in their jobs"

Q 11. See 3.

*Q 11B. Do you believe that one day a machine could do your job?

No	81%
Yes	7
Part	10
Other	1
	100%

*Q 11C. Will technology affect your job security?

No	87%
Yes	5
Maybe	8
	100%

"5 - Technology is inherently sexist"

Q 10. (Last two responses.)

Which words apply to you when you think of technology?

Masculine	28%
Feminine	4%

"6 - Technology will replace familiar, traditional and valuable library processes"

Q 11. See 3.

Q 13A. I would rather my library had several new reference librarians than access to an on-line information system.

No	61%
Yes	31
Both	8
	100%

Q 13C. With the advent of technology, I would have more time to provide better service to users.

Yes	78%
No	12
Not necessarily	10
	100%

Q 13D. Frankly, I would still prefer finding materials through use of the card catalog rather than with mechanized devices.

No	69%
Yes	27
Both	4
	100%

17. Would these technologies be beneficial or not (if in general use in this century)?

	Yes	No
a. A terminal in most libraries, even small ones.	99%	1%
b. A terminal in most homes, much as television is in most homes.	82	18
c. The increased use of microform and a decrease in the book as a medium.	60	40
d. A national information network that will link up all kinds of libraries.	98	2
e. Two way television transmission between homes and businesses with libraries.	82	18
f. Complete automation of cataloging and the end of the card catalog for most purposes.	77	23

73. Do you ever secretly long for the "good old days" when libraries were simpler?

No	77%
Yes	10
Other	13
	100%

Because Questions 11A, B, and C introduced several new concepts into the survey, they were crosstabbed with the index RESIST. Gammas ranged from .13 for Question 11C to .20 for 11B, with 11A at .19. Results of the crosstabulation of RESIST with Question 11C are shown in Table 3-1.

Research Question C. If resistance to technology does not exist, what are its values as seen by librarians?

1 - Advancement of society, generally beneficial

2 - Benefit to all citizens

3 - Ability of citizens to keep vigil on big business and government

4 - Control over the environment; extension of self

5 - Increase of service to users

6 - No negative effects on interpersonal relationships

7 - Mutual and positive relationship between librarians and technologists

Table 3-1. RELATIONSHIP OF RESISTANCE INDEX TO PERCEPTIONS OF TECHNOLOGY

	RESIST SCALE				
	1	2	3	4 **	Total
Number of Respondents	20	19	17	22	78
Could a machine do your job one day (Q11B):					
No	90%	79%	76%	77%	81%
Not all	---	10	24	5	9
Probably	5	--	--	9	4
Yes	5	10	--	9	6
Total	100%	100%	100%	100%	100%

Gamma = .20

Many of the data items from the survey instrument which measure the amount of value or the benefits of technology as perceived by the responding librarians have been previously cited in Research Question B. References to them are given below where appropriate. Again, questions differing from those in the mail survey are marked. No analysis of this research question beyond tabulating was done, since the first research question indicated that a degree of resistance to technology does exist, and the second research question suggests its relationship to relevant variables.

"1 - Advancement of society, generally beneficial"

*Q 3. What do you see as the greatest advantages in technological progress?

Labor savings	37%
Better communication	17
Raise standard of living	14
Research, resources	11
Medical, health	11
Other	9
None	1
	100%

**High Resistance

Q 12. If you could, what would you invent to improve your day-to-day living?

Fantasy gadgets	35%
Labor savers	21
Domestic automation	16
More automation in library	9
Unmarketed gadget	7
Cheaper energy	6
Other	6
	100%

"2 - Benefit to all citizens"

Q 17. See Research Question B.

"3 - Ability of citizens to keep vigil on big business and government"

*Q 3C. See Research Question A.

"4 - Control over the environment; extension of self"

Q 5. Which of these activities might technology help a librarian do better:

a.	alphabetizing	93%	i.	cataloging	97%
b.	filing	82	j.	acquiring	99
c.	researching information	98	k.	selecting	54
d.	reproducing	99	l.	servicing	89
e.	answering questions	87	m.	interacting	53
f.	communicating	76	n.	fiscal managing	94
g.	delivering	88	o.	public relations	65
h.	finding	95	p.	corresponding	79

Mean number of responses 13.2

"5 - Increase of service to users"

Q 13A. See Research Question B.

Q 13C. See Research Question B.

Q 13D. With the advent of technology I would have more time to provide better service to users.

Yes	78%
No	12
Not necessarily	10
	100%

"6 - No negative effects on interpersonal relationships"

*Q 11. See Research Question B.

*Q11A. See Research Question B.

Q13B. See Research Question B.

Q 55. See Research Question B.

"7 - Mutual and positive relationships between librarians and technologists"

Q 6. See Research Question B.

Q6A. See Research Question B.

*Q 7. See Research Question B.

*Q7A. See Research Question B.

*Q7B. See Research Question B.

Q 8. See Research Question B.

Q15. See Research Question B.

Research Question D. The instrument differentiates

Personal values: Questions 5, 7, 9, 10, 11, 12, 13, 14, 17, 20, 73

Societal values: Questions 1, 2, 3, 4, 6, 15, 16, 18, 19

Do librarians differentiate these and hold differing personal and societal values or do personal and societal attitudes correlate with each other? Tabulations of the relevant questions have been presented earlier, in Research Question A, B, or C. Because of the similarity of responses to those of the mail questionnaire, it seems likely that analysis of this issue would produce similar results to that of the parallel mail research question. It should be noted that in the creation of the index RESIST, which included both personal and societal values, the first factor produced included one personal (Q10) and one societal (Q4). The second factor included two personal variables (Q9A and 9B).

Research Question E. Is there a "resistant personality?" Is it correlated with resistance to technological innovation (i.e., all three variables forming a total personality profile)? Is any one of them (or a combination) related to resistance to technology? Can the subset be correlated with the major variable?

Just as a point of interest from a psychological viewpoint: Can we determine the relationship between these three variables? What is the likelihood that the same person will exhibit all three characteristics?

1 - Rigidity

Are the following factors correlated with rigidity?

Risk taking behavior
Initiating behaviors

2 - Locus of control (including technology/control)

3 - Gregariousness (including opinion leadership)

Is there a relationship between the "resistant personality" and professional self-perception? Organizational environment?

A number of new questions and concepts were included in the personality variables used in the interview survey. Among these were a series of questions related to risk taking and initiating behaviors (Q40A, 40B, 40C, 40D, 41, 42A, 43, 47, 47B, 47C), locus of control questions specifically dealing with technology (Q60-6, 60-7, 60-8, 60-9), and questions dealing with opinion leadership (Q57A, 57B, 58, 59). These questions are asterisked below and were, on a selected basis, the subject of crosstabulations with the scale resist. Other results pertaining to personality variables compare well with those obtained in the mail survey.

"1 - Rigidity

		True	False
Q 39A-D.	A. I'm the kind of person who likes a great deal of variety in my work. I prefer a job where I have to change frequently from doing one thing to another.	90%	10%
	B. I'd rather have one thing to do at a time and give my full attention to it than having several projects going at the same time.	33	67
	C. There is usually one best way to solve most problems if one could only find it.	36	64
	D. I would rather tackle a complicated problem than solve several simpler ones.	53	47

Q 48. Would you describe your political learning as:

Very liberal	14%
Somewhat liberal	41
Middle-of-the-road	30
Somewhat conservative	15
Very conservative	--
	100%

Q 49. Would you describe your lifestyle as:

Traditional	20%
Moderately traditional	26
Somewhat non-traditional	33
Non-traditional	8
In-between	13

Q 50. How do you feel about:

	Positive	Moderate	Negative
Welfare	27%	52%	20%
Abortion	56	25	19
Capital punishment	16	36	48

Q 51. We are not interested in your religious preference, but could you tell me how important formal religion is in your life. Is it

Very important	22%
Moderately important	24
Slightly important	17
Not at all important	35
Can't answer at this time	1
	100%

Risk taking behavior

*Q 40A-D. Which of the following have you done, have you considered doing, or have not considered at all?

	Done	Considered	No
A. Joining an encounter or sensitivity group.	15%	21%	64%
B. Becoming a vegetarian or an organic food advocate.	9	33	58
C. Changing your life in some major way (such as leaving your job or your home).	22	51	27
D. Are there any other kinds of non-traditional things that you've done or considered doing?	23	17	60

*Q 41. Do you like to gamble?

No	78%
Yes	22
	100%

Do you buy raffle or lottery tickets?

No	78%
Yes	6
Sometimes	16
	100%

*Q 42a. Have you ever threatened to quit a job? If "yes," spoken to the administrator about it?

No	60%	No	16%
Yes	40%	Yes	22%
	100%		40%

*Q 43. Would you accept a promotion even though you don't feel that you have the experience or qualifications for it?

No	58%
Yes	30
Possibly	11
	100%

*Q 47A-C. Which of the following is true for you. (Read pairs)

A.	1.	I would not like to be hypnotized.	56%
	2.	I would like the experience of being hypnotized.	44
B.	1.	I would like to try parachute-jumping.	19%
	2.	I would never want to try jumping out of a plane, with or without a parachute.	81
C.	1.	I enter cold water gradually, giving myself time to get used to it.	54%
	2.	I like to dive or jump right into the ocean or a cold pool.	46

To explain the possible relationships between resistance and aspects of risk taking behavior, the RESIST index was crosstabbed with Questions 40A, 40B, 40C, 40D, 47A, 47B and 47C. Values of gamma above .20 were obtained for RESIST with Questions 40A, 47B, and 47C. These crosstabs are shown in Table 3-2. In the question concerning joining an encounter or sensitivity group, higher values of the resistance scale are associated with higher numbers of people who have not considered that particular type of risk. The relationship is reversed however, for the questions concerning parachute jumping and cold water--the higher the resistance, the more apt respondents are to want to try parachute jumping and to dive right into cold water.

Initiating behavior

*Q 44. Would you prefer to have someone tell you what to do or would you rather organize your own work time?

Organize own time	99%
Both	1
	100%

Table 3-2. Relationship between Resistance Index and Measures of Risk-Taking Behavior

	RESIST SCALE				
	1	2	3	4 **	Total
Number of Respondents	20	19	17	22	78
Joining encounter or sensitivity groups (Q40A)					
Have done	25%	5%	29%	--	14%
Have considered	25	32	6	27%	23
Have not considered	50	63	66	73	63
Total	100%	100%	100%	100%	100%
Gamma = .26					
Parachute jumping (Q47B)					
Would never want to try	95%	84%	71%	82%	83%
Would like to try	5	16	29	18	17
Total	100%	100%	100%	100%	100%
Gamma = .30					
Cold Water (Q47C)					
Enter gradually	50%	53%	47%	32%	45%
Dive or jump right in	50%	47%	53%	68%	55%
Total	100%	100%	100%	100%	100%
Gamma = .21					

*Q45. Who decides how you spend your leisure time? You? Someone else? Joint decision?

Respondent	62%
Joint decision	31
Combination of choices	7
	100%

*Q46. Do you have any hobbies? Have you learned to do something new as a recreational activity in the last three years? If "yes" tell me what it is.

Yes	88%
No	12
	100%

Sewing, crafts, carpentry	13%
Reading, film, plays	8
Music, singing	8
Solitary sports	7
Other, no response	52
	88%

"2 - Locus of Control"

Q 60-1 to 60-5. I'm going to read two statements; then I will ask you what you think.

1.	A.	Becoming a success is a matter of hard work; luck has little or nothing to do with it.	47%
	B.	Getting a good job depends mainly on being in the right place at the right time.	52%
2.	A.	Leadership positions tend to go to capable people who deserve being chosen.	56%
	B.	It's hard to know why some people get leadership positions and others don't; ability doesn't seem to be the important factor.	44%
3.	A.	People who do well in life often work hard, but the breaks just don't come their way.	44%
	B.	Some people just don't use the breaks that come their way. If they don't do well, it's their own fault.	56%
4.	A.	What happens to me is my own doing.	87%
	B.	Sometimes I feel that I don't have enough control over the direction my life is taking.	13%
5.	A.	Heredity plays the major role in determining one's personality.	12%
	B.	It is one's experience in life that determines what one is like.	88%

In these questions, an external locus of control can be associated with part A of questions 3 and 5 and part B of questions 1, 2, and 4.

Technology/control

*Q 60-6 to 60-9.

6.	I make use of the gadgets and tools in my home and I feel that they make life easier and better.	92%
	Gadgets tend to break or not work properly and this leaves me frustrated.	8%
7.	Computers will enable people to have more control over their lives.	66%
	Computers may ultimately control the lives of human beings.	33%
8.	If I were seriously ill, I would want to be kept alive as long as possible by whatever machinery could help me.	7%
	If I were seriously ill, I would want to be allowed to die when the natural time comes.	93%
9.	Sometimes I think human beings have gone too far in trying to control nature.	34%
	I believe that human beings can and should pursue all the technology that we are capable of doing.	65%

In Questions 60-6, 60-7, and 60-9, the majority of respondents selected the statement associated with technological control. In 60-8, however, there is an indication of one area in which respondents feel technology should not intrude.

"3 - Gregariousness"

Q 52. How do you think most of the people who work with you see you?

Friendly and easy to talk to	69%
Hard to get to know, shy or aloof	8
Somewhere in-between	20
Can't tell	2
Don't really care	1
	100%

Q 53a. When you have a problem at work, who do you discuss it with?

A.

Someone at work	43%
Someone at home	30%
Friends	16%
Any one of the above, depending on the problem	51%
Don't discuss problems	6%

B. Do you tend to feel better when you've discussed a problem with someone?

Yes	85%
No	2
Sometimes	13
	100%

Q 54. Do you socialize with people at work?

A.	No, work is work and my social life is separate.	6%
B.	Yes, but only at work and during the work day.	13%
C.	Occasionally we have some planned social activity that we all attend.	29
D.	I have made one or two good friends at work.	38
E.	Our work staff has a strong social feeling that often goes beyond our work time.	14
		100%

Q 55. I would rather have a job that:

A.	Brings me into close, personal involvement with people.	24%
B.	Where people come and go but where I don't need to be personally involved with them.	10
C.	Involves some contact with people and some work to do alone and quietly.	62
D.	Involves work that I can do on my own.	--
E.	Where I could do my work at home.	4
		100%

Q 56. How do you feel about big parties? Are you comfortable with large groups?

Like them	29%
Don't like them	38
Depends	34
	100%

Yes	65%
No	17
Other	18
	100%

Opinion leadership

*Q 57A. Do you see yourself as a leader of opinion?

No	58%
Yes	29
Sometimes	13
	100%

*Q 57B. If you have an idea, do you try to get other people to go along? Do they?

Yes	65%
No	13
Sometimes	16
Other	6
	100%

Frequently	31%
Sometimes	58
	89%

*Q 58. In your present job, have you ever been influential in making something happen? Please tell me about it. (If not, ask about previous jobs)

No	7%
Yes	93
	100%

Specific Responses:

-Policy, programs	40%
-Technical, administrative	32
-Advice about librarianship	5

*Q 59. Do you speak often at staff meetings? (If "yes" or "sometimes"): Do you think that what you contribute is treated as important?

Yes	68%
No	17
Sometimes	14
No meetings	1
	100%

Yes	67%
Sometimes	13
Not very	2
	82%

The first and most direct question on opinion leadership, Q57A, was crosstabulated with the RESIST index. This relationship is shown in Table 3-3. This suggests that higher levels of resistance are associated with a greater tendency on the part of respondents to perceive themselves as opinion leaders.

Table 3-3. Relationship of Resistance Index to Opinion Leadership

	RESIST Scale				
	1	2	3	** 4	Total
Number of Respondents	20	19	17	22	78
See yourself as a leader of opinion (Q57A)					
No	70%	74%	35%	55%	59%
Sometimes	15	10	12	9	12
Yes	15	16	53	36	29
Total	100%	100%	100%	100%	100%

Gamma = .28

Research Question F. Is resistance to technology related to the following work/professional variables?

1 - A. Self perceptions about librarianship (professional self-image)
B. Status of librarianship

2 - A. Organizational Climate
B. Loyalty to Director

Is there a relationship between 1A and 1B? Between 2A and 2B?

New concepts introduced in the interview survey instrument include the status of librarianships and loyalty to the director. There are also several more questions related to professional self-image than in the mail questionnaire. In reviewing the tabulations for individual questions below, similarities with the mail results and the relationships between different measures of the same general concepts can be noted. As before, questions not found in the mail survey are asterisked.

"1A - Self perceptions about librarianship"

Q 36. I will read you a few statements about librarianship. Please tell me whether each statement is "true" or "false".

	True	False
A. Librarianship attracts just average people.	19%	81%
B. Librarianship is being accepted as a respected profession more and more as time goes on.	80	20
C. Librarianship is more intellectually demanding than many professions.	63	37
D. Librarianship as a profession is limited in outlook.	19	81

*Q 37. How do you feel about being a librarian? Have you ever considered going into another profession?

Positively	87%
Ambivalent	2
Negative aspects	11
	100%

No	52%
Yes	48

Business	7%
Teaching	5
Law/Medicine	7
Arts	6
Other	23
	100%

*Q 66. Have you participated in any kind of continuing education or in-service training?

Yes	85%
No	15
	100%

A. If "yes" Library initiated or self initiated?

Library initiated	26%
Self initiated	14
Both	60
	100%

B. What has been your reaction to these experiences?

Worthwhile	58%
Mostly good	25
Not worthwhile	10
Other	7
	100%

*Q 67. If you could have some (or more) professional development training, what would you be interested in? (Specify: note if technology, procedure or service oriented.)

Technology oriented	56%
Procedure oriented	42%
Service oriented	62%

When the status variables of Question 37A, 37B, and 66 were cross tabulated with the RESIST index, no significant relationships were found. Gammas for the three questions respectively were .07, .05, and .15.

"1B. Status of librarianship"

*Q 38. I'm going to give you the names of some professions. Would you tell me if you see librarianship as "higher" or "lower" or the "same" in status"

	Higher	The same	Lower
A. teacher	27%	68%	5%
B. lawyer	2	26	72
C. nurse	40	48	12
D. small business owner	49	42	10
E. information scientist	2	66	32
F. social worker	27	69	4
G. media specialist	17	77	6
H. doctor	2	9	88
I. library school professor	12	54	34
J. psychologist	6	39	55

From this, we see that the majority of the respondents saw librarianship as having the same status as that of a media specialists, social workers, teachers, information scientists and library school professors; and a lower status than doctors, lawyers and psychologists. For the remaining two professions considered, nursing and small business ownership, respondents were divided as to whether librarianship had the same or higher status.

"2A - Organizational climate"

Q 23. Which of the following pairs of words describe your library as you see it:

Open	91%	Closed	9%		
Social	89	Isolating	11		
Tense	21	Pleasant	79		
Participatory	62	Authoritarian	36	In-between	2%
Innovative	70	Traditional	27	In-between	4
People-oriented	74	Task-oriented	22	In-between	4

Q 24. Could you tell me a little about your relationship with your supervisor?

A. Do you discuss work problems with him/her?

Yes	91%
No	4
Rarely	5
	100%

B. Do you know how your supervisor feels about your work?

Yes	63%
No	13
Aren't sure	24
	100%

C. Does your supervisor "supervise" you very closely? Allow you freedom to do your own work in your own way?

Completely free	84%
Work cooperatively	4
Not total autonomy	10
Close supervision	2
	100%

Q 25. To what extent is the staff of your library involved in decision-making?

A lot	8%
Input	26
Discussions only	27
In theory	11
Minimally	20
Other	7
	100%

Q 26. How are new ideas or changes presented to the staff? Rumor? Memo? Meetings? Directives? Consultation with staff?

Meetings	37%
Memo	24
Rumor	13
Consultation	4
Directives	1
All ways	21
	100%

Q 27. In general, how does the administration treat its people?

Well	40%
Fairly well	27
Indifferent	15
Authoritarian	11
Other	7
	100%

Q 28. If people here do a good job, will they get rewarded or promoted?

Both	38%
Rewarded only	11
Promoted only	11
Neither	7
Depends	33
	100%

Q 29. In general, how would you like to see the administration of your library changed?

Climate change (Closer to staff, more innovative, open, more staff input, more administrative cooperation)	55%
Increase staff, benefits, systems	13
Stronger administration	12
Less administration	5
No change	4
Other	11
	100%

To investigate the relationship between resistance and organizational climate, Questions 24C, 25, and 27 were crosstabulated with the RESIST index. The strongest relationship (a gamma of .47) was observed with Question 24C concerning the level of supervision of the respondent. Results in Table 3-4 suggest that higher levels of resistance are associated with greater supervision.

Table 3-4. Relationship of Resistance Index to Organizational Climate

	RESIST Scale				
	1	2	3	4**	Total
Number of Respondents	20	19	17	22	78
Amount of supervision by supervisor (Q24C)					
Completely free	95%	90%	82%	73%	85%
Work cooperatively	--	5	6	4	4
Not total autonomy	5	5	6	18	9
Close supervision	--	--	6	4	3
Total	100%	100%	100%	100%	100%

Gamma = .47

** High Resistance

"2B - Loyalty to director"

*Q 30. If you had a chance to work for the same pay in another library under another director, how would you feel about moving?

Would move	56%
Wouldn't	13
Depends	31
	100%

*Q 31. Is your director the kind of person you really like working for? In what way?

Yes	69%	Open to staff	18
No	16	Human	18
Ambivalent	16		16
	100%	Good image	9
		Remote	9
		Fair, impersonal	7
		Other	23
			100%

*Q 32. How much confidence and trust do you have in him/her as a director?

Quite a bit	62%
A fair amount	25
Not much	5
Other	8
	100%

*Q 33. Directors at times must make decisions which seem to be against the current interests of the staff. When this happens to you as a librarian (or if it were to happen), how much trust do you have that the director's decision is in your interest in the long run?

Have confidence	31%
Some confidence	27
Not much	12
None	4
Other	26
	100%

*Q 34. About how often would you say that the director's decisions are responsible for making things go wrong in the library?

Never or rarely	57%
Occasionally, sometimes	27
Often	10
Other	6
	100%

*Q 35. How much loyalty do you feel toward your director?

A lot, total	54%
Average	24
Not much, none	14
Other	8
	100%

These questions are concerned with the behavioral (Q30), affective (Q31) and cognitive (Q32-35) aspects of loyalty. Responses in the three areas seem consistent, with about two-thirds of the librarians generally expressing loyalty to their director. A small number of respondents (6%) consistently mentioned that they were loyal to the library, not the director.

Research Question G. Is resistance to technology related to the following demographic factors:

1 - Sex

2 - Age

3 - Income

4 - Nature of educational background

5 - Length of library service

6 - Degree of technology related work

7 - Size of library

8 - Kind of library

The demographics of interview survey and mail survey respondents were similar, as shown in the tabulations below compared with those given earlier for the mail questionnaire. Crosstabulations of the RESIST index with the demographics resulted in only one value of gamma over .20, that for educational background. The crosstabulation of RESIST with age, which produced a gamma of .18, is also shown in Table 3-5. As might be expected, lower levels of resistance were associated with M.L.S. degree holders and the younger respondents.

"1 - Sex"

Female	71%
Male	29%
	100%

Table 3-5. Relationship of Resistance Index to Demographics

	RESIST Scale 1	2	3	4 **	Total
Number of Respondents	20	19	17	21	77
Educational background (Q64)					
M.L.S.	83%	84%	88%	68%	80%
No M.L.S.	17	16	12	32	20
Total	100%	100%	100%	100%	100%
Gamma = .25					
Age (Q62)					
20-29	35%	37%	29%	18%	29%
30-39	35	32	29	32	32
40-49	10	21	35	27	23
50-59	15	5	6	18	12
60 & over	5	5	--	5	4
Total	100%	100%	100%	100%	100%
Gamma = .18					

"2 - Age"

62.

20-29	28%
30-39	31
40-49	26
50-59	12
60 or over	3
	100%

"3 - Family Income"

Q 65.

$10,000 - 14,999	22%
$15,000 - 19,999	21
$20,000 - 24,999	19
$25,000 - 49,999	33
Over $50,000	6
	100%

"4 - Educational background"

Q 63. In what field was your undergraduate degree?

Sciences	11%
Humanities	61
Other	28
	100%

Q 64. Do you have a M.L.S? Other masters or advanced certificate? Any post masters work or degree?

M.L.S.--	Yes	82%
	No	18
		100%
Other masters--	Yes	17%
	No	30
	No answer	52
		100%
Post masters--	Yes	23%
	No	77
		100%

"5 - Length of library service"

Q 61C. How long have you been a librarian?

Range	1 to 41 years
Mean	10.4 years
Median	7.4 years
Mode	6.0 years

Q 61D. How long have you been in this library?

Range	1 to 41 years
Mean	7.2 years
Median	5.3 years
Mode	1.0 year

Q 61E. How many different libraries have you worked in?

Range	0-6 libraries
Mean	2.1 libraries
Median	1.8 libraries
Mode	1.0 libraries

"6 - Degree of technology related work"

Q 61. Could you briefly describe your job?

Administrative	51%
Services	27
Processing	22
	100%

"7 - Size of library"

This variable was not coded.

"8 - Type of library"

Administrative	7%
Main	69
Branch	24
	100%

Research Question H. Is resistance to technology related to the following sociological factors:

1 - Political leaning

2 - Self-reported life style

3 - Is resistance to technology related to religiosity

The four questions related to these factors were presented in Research Question E (Questions 48, 49, 50 and 51). Low levels of correlation were found when these variables were compared with the RESIST index.

Research Question I. What is the current state of technology in libraries?

Q 68A. What technologies do you use as part of your work?

None	10%
Audiovisual equipment	32%
Automated office equipment	33%
Online, OCLC	24%
Comcat	23%
Access to data base	14%
Microforms	13%
Other	13%

In analyzing the first two technologies mentioned by respondents, we find audio-visual equipment to be most prevalent in the libraries survey. Also noted frequently were online cataloging systems such as OCLC and computer catalogs.

Research Question J. What is the current state of awareness of librarians regarding technology?

Q5. See Research Question C.

Q7. See Research Question B.

Q66. See Research Question F.

Q67. See Research Question F.

Q68. See Research Question I.

*Q69A. If you use technology as a part of your work, how were you trained? In library school? Special classes or workshops? On the job?

On the job	66%
Library school	27%
Class or workshop	27%

*Q69B. Do you think the training was effective in teaching you how to use the equipment?

Yes	63%
Partly	13
No	8
	84%

*Q70. Are you active in any ALA Committees? (note if technology related)

No	85%	
Yes	15	
Technology related		1%
Not technology related		2
Unknown		12
	100%	

*Q71. Do you have any opinions about the National Plan for libraries?

Not familiar	61%
No, not yet	25
Yes	14
	100%

*Q 72. Do you have any reactions when you hear the phrase "resource sharing"? What does it mean to you? (No reactions: 7%; Reactions: 93%)

Information pooling	38%
Approve	28
Vital to library	4
Inevitable	4
Causes problems	10
Savings, better service	6
Reservations	2
	100%

Librarians were asked about their participation in activities where they might learn about technology (reading library journals, continuing education, training for use of technologies); about their use of, and participation in, technology-related activities; and about their awareness of the technologically-related concepts of resource sharing and the National Plan.

The language of technology appears to pose a barrier for librarians. When asked about the complexity of that language, only 12 percent said they understand it and 15 percent said they don't. The other 73 percent used some terms as "usually," "somewhat," "depends on the amount of jargon," or "very little" to describe their perceptions. One percent said it made them feel inadequate.

Eighty-five percent of the librarians have participated in some kind of continuing education or in-service training (Q66). Reactions are generally favorable, and areas of intent for additional training mentioned were about equally split between technology, procedure, and service-oriented topics (Q67).

Librarians using technology were asked how they were trained, and the predominant response was "on-the job." Several sources were often mentioned, usually combining "on-the-job" with library school and/or special classes (Q69). Training received was perceived as effective by most.

When asked if technology could help librarians to better perform specific tasks, more than 90 percent of the group surveyed included that technology could assist in alphabetizing, researching information, reproducing, finding, cataloging,

acquiring, and fiscal management (Q5). Responses to other activity categories ranged from 53 percent (interacting) to 89 percent (servicing). "Communicating" was not viewed in the technical sense by all, since only 76 percent of the respondents indicated that technology could help there.

Another indication of librarians awareness of technology is their own use of it (Q68). Here only ten percent indicated no current use; technologies frequently mentioned as used included audiovisual equipment, automatic office equipment, automated cataloging, and on-line data base searching. Microforms, automated circulation systems, and automated ordering were mentioned less frequently. Eighty-six percent of the librarians who worked with technology enjoyed the work, generally finding it more efficient. Complaints about working with technology were mainly related to activities taking too long.

Exploring respondent's attitudes towards technology-related concepts of resource sharing and the National Plan (Q71, 72) produced positive reactions to the concept of resource sharing (76%) and little reaction to the National Plan. Sixty-nine percent of the respondents were not familiar with the National Plan.

Research Question K. What is the librarian's perception of the future?

16. See Research Question A.

18. See Research Question A.

19A. See Research Question A.

19B. See Research Question A.

Librarians were about equally divided in the subject of whether or not technology has changed their role to date, but only about 20 percent believe that their role will not have changed by the end of this century. About one-third of the respondents feel that libraries will one day be obsolete due to technology, with this group equally divided in whether the obsolescence will be good or bad.

Considering reactions to specific technologies, a terminal in most libraries, complete automation of the card catalog, and increased use of microform are seen as coming into general use in this century by about two-thirds of

the respondents. Less than half of the respondents expect to see a terminal in most homes or two way television transmission between homes or business and libraries. Finally, only one in five librarians expects to see a national information network linking up all kinds of libraries within the century.

One final variable of interest to this analysis concerns the interviewer's perception of the respondents cooperativeness and interest. Results of these judgments are shown below.

Cooperativeness	
excellent	44%
good	44
fair	9
poor	2
	100%

Interest	
excellent	47%
good	38
fair	12
poor	4
	100%

Comparing these data with the RESIST index, resistance and the level of interest were seen to be correlated at .21. (See Table 3.6). Cooperativeness and RESIST were not highly correlated; gamma = .05.

Table 3-6 RELATIONSHIP BETWEEN RESISTANCE INDEX AND RESPONDENT'S LEVEL OF INTEREST

	RESIST Scale				
	1	2	3	4**	Total
Number of Respondents	20	19	17	22	78
Interest of respondent (interviewer check)					
Excellent	60%	42%	59%	41%	50%
Good	40	53	18	41	39
Fair	--	5	18	18	10
Poor	--	--	6	--	1
Total	100%	100%	100%	100%	100%

Gamma = .21

**High Resistance

SECTION 4

FINDINGS: SURVEY OF LIBRARY ADMINISTRATORS

The survey of library administrators was distributed with the survey of librarians to the sample of approximately 300 public libraries serving 25,000 or more persons. One administrators' questionnaire was included for the director of each library. The overall response rate for directors was just over 70 percent, with 211 questionnaires returned in time for processing. More detailed response statistics are presented in Appendix A of this report.

Questions asked of administrators covered the areas of use of technology in their libraries, attitudes towards these technologies, perceived staff resistance to technology, and perceptions about future technology-related events. The summary of responses presented in the remainder of this chapter is grouped under the major research questions addressed.

Research Question A: Profile of Sample Libraries

Two hundred and eleven questionnaires were used in the analysis of library administrator data. These data were weighted according to the procedures described in Appendix A on the basis of urbanicity and population served to represent the universe of 1,498 public libraries serving 25,000 or more.

The breakdown of libraries by type of community served is shown in Table 4-1. As indicated, small town and county system libraries each comprise about 30 percent of the total and suburban libraries about 20 percent. It should be noted that the categories used are somewhat overlapping; for example, county libraries can serve urban, rural or suburban communities.

Respondents were asked to describe their libraries in terms of staff, number of volumes, and overall budget. These results, which are shown in Tables 4-2 to 4-4, reflect great diversity.

Table 4-1. RESPONSE BY COMMUNITY SERVED (Q6a)

Type of Community	Weighted Frequency	% of Response
Urban	85	5.7
Rural	178	11.9
Inner city	42	2.8
Suburban	311	20.9
Small town	430	28.9
County system	444	29.8
Missing	9	Missing
Total	1498	100.0

Table 4-2. STAFF SIZE (Q6b)

Number of Staff	Professionals Weighted Number of Libraries	% of Response
0-2	305	20.5
3-5	392	26.3
6-10	404	27.1
11-20	223	15.0
21+	165	11.1
Missing	9	Missing
Total	1498	100.0

Number of Staff	Paraprofessionals Weighted Number of Libraries	% of Response
0-2	534	35.9
3-5	380	25.5
6-10	304	20.4
11-20	150	10.1
21+	121	8.1
Missing	9	Missing
Total	1498	100.0

Table 4-2. STAFF SIZE (Q6b) (Cont'd)

Number of Staff	Clericals Weighted Number of Libraries	% of Response
0-5	308	20.7
6-10	308	20.7
11-20	346	23.2
21-30	219	14.7
31-100	247	16.6
100+	61	4.1
Missing	9	Missing
Total	1498	100.0

Table 4-3. LIBRARY SIZE IN VOLUMES (Q6c)

Number of Volume	Weighted Number of Libraries	% of Response
Fewer than 50,000	145	9.8
50,000-99,999	513	34.6
100,000-199,999	467	31.5
200,000-299,999	166	11.2
300,000-999,999	144	9.7
1,000,000+	47	3.2
Missing	16	Missing
Total	1498	100.0

Table 4-4. LIBRARY BUDGETS (Q6c)

Budget in Dollars	Weighted Number of Libraries	% of Response
Less than $100,000	121	8.3
100,000-249,999	401	27.5
250,000-499,999	337	23.1
500,000-999,999	324	22.2
1,000,000-1,999,999	172	11.8
2,000,000+	104	7.1
Missing	39	Missing
Total	1498	100.0

Staff sizes ranged from zero in all three categories to 465 professionals, 200 paraprofessionals, and 660 clericals. The medians of the three groups were 5.9 professionals, 4.1 paraprofessionals, and 15.0 clericals respectively. Estimated staff in the libraries represented in the study is 19,500 professionals, 12,700 paraprofessionals and 42,000 clericals for a total of 74,200 persons. The estimate of professionals is somewhat lower than the 25,700 estimated in the librarian survey portion of this study.

Size of library expressed in volumes ranged from 11,000 to over 6 million, while budget also ranged greatly from $21,000 to about $3.5 million.

Research Question B: What is the Current State of Technology in Libraries?

Table 4-5 indicates the number of libraries using and planning to use six categories of technology. Microfilm collections and equipment are most heavily used and have been used by libraries on the average for about ten years. Technological aids for service to special clients are the second most heavily used technology at this point.

Three of the computer-related technologies mentioned (circulation systems, cataloging, and any on-line system) are currently used by 15-27 percent of the libraries, with a large number of libraries planning to adopt these innovations. Thus the total number of libraries using or planning to use automated circulation systems is nearly 70 percent, with about 60 percent for computer cataloging and 40 percent for on-line systems. Present and planned uses of automated information storage systems is quite low. Some use of other technologies, mainly automated acquisition systems and audiovisual equipment, was noted.

Administrators who had particular technologies in their library were asked to rate their effectiveness. The results shown in Table 4-6 suggest that, overall, about three-quarters of the uses of technology were ranked as high or very high. Most of the remaining rankings were average rather than low or very low. Considering only libraries where the technologies had been in place for more than five years, rankings were slightly higher except for automated circulation systems. Here 68 percent of all library administrators using such a system ranked them as high or very high, but only 52 percent of those who have had circulation systems for more than five years found them highly or very highly effective.

Research Question C: To What Extent Have Present Library Administrators Been Associated With Past Technological Innovations?

Administrators were asked about the major technological changes that had taken place since they assumed their positions. (Average length of time as director was 7.5 years.) Overall, a total of 2041 changes were noted by 992 administrators (66 percent of all administrators), for an average of about two each. Changes most frequently noted were microforms and/or equipment (439 libraries), computerized circulation systems (404 libraries), computerized cataloging (343 libraries), audiovisual equipment and materials (170 libraries) and computer information storage (147 libraries). Comparing these data with those of Table 4-5 suggests that most of the computer technology now in place in libraries was installed under the direction of the current administrator. In the case of computer circulation systems, it appears that more than one system may have been installed in some libraries.

Research Question D: How do Library Administrators Perceive Currently Available Technologies?

Table 4-7 indicates desirability ratings of library technologies by, first, all administrators and, second, administrators of libraries using the particular technology. Rankings by all administrators range from 41 percent high and very high for automated information storage systems up to 84 percent high and very high for automated circulation systems. Desirability ratings by administrators familiar with a particular technology were higher in all areas except computer circulation systems. This seems to reflect the lower levels of satisfaction with circulation systems noted earlier.

Research Question E: What Do Administrators View as Major Problems With Currently Implemented Technologies?

Just over 20 percent of the administrators noted problems encountered in connection with technological innovation. The 448 problems noted are categorized in Table 4-8 and represent a considerable range. Staff resistance was noted specifically by 28 administrators, less than two percent of the administrators responding.

Table 4-5. TECHNOLOGIES USED IN LIBRARIES (Q1a,b,d)

Technology	Weighted Number of Libraries Using	% of All Libraries	Average # of Years Used	Weighted Number of Libraries Planning to Use	% of All Libraries	Total % Using or Planning to Use
1. Automated circulation system	321	21.4	5.0	706	47.1	68.5
2. Computerized cataloging	402	26.8	3.1	488	32.6	59.4
3. On-line system or any terminal access	229	15.3	2.7	393	26.3	41.6
4. Technological aids for service to special clients	531	35.5	6.2	146	9.8	45.3
5. Microform collection and equipment	1174	78.4	9.7	91	6.1	84.5
6. Automated information storage system	42	2.8	4.3	167	11.1	13.9

17

Table 4-6. EFFECTIVENESS RATINGS FOR LIBRARY TECHNOLOGIES (Q1c)

Technology	All Libraries Using Technology						Libraries Using Technology More than 5 Years					
	# of Libraries	Percent Ranking Technology					# of Libraries	Percent Ranking Technology				
		Very High	High	Avg.	Low	Very Low		Very High	High	Avg.	Low	Very Low
1. Automated circulation system	321	24	44	27	4	2	114	25	27	36	8	4
2. Computerized cataloging	402	31	50	19	-	*	42	48	52	-	-	-
3. On-line system or any terminal access	229	24	57	13	6	-	24	24	64	13	-	-
4. Technological aids for service to special clients	531	22	37	29	8	4	138	38	39	23	-	-
5. Microform collection and equipment	1174	41	30	24	4	1	864	48	30	18	2	2
6. Automated information storage system	42	43	36	21	-	-	14	39	52	9	-	-

*Less than 1%.

Table 4-7. RATINGS OF DESIRABILITY OF LIBRARY TECHNOLOGIES (Q1e)

Technology	No. of Admin. in Universe	Desirability Rating (%) for All Administrators: Very High	High	Avg.	Low	Very Low	No Opinion	Weighted No. of libraries with each technology	Desirability Rating (%) for Administrators with Each Technology: Very High	High	Avg.	Low	Very Low	No Opinion
1. Automated circulation system	1498	53	31	6	6	-	4	321	23	44	27	4	2	-
2. Computerized cataloging	1498	37	30	20	7	1	5	402	61	29	9	-	-	1
3. On-line system or any terminal access	1498	30	33	21	10	2	4	229	58	31	11	-	-	-
4. Technological aids for service to special clients	1498	23	34	27	9	4	3	531	44	45	11	1	-	-
5. Microform collection and equipment	1498	49	30	14	4	-	3	1174	57	31	5	7	-	-
6. Automated information storage system	1498	16	25	25	17	7	10	42	56	33	11	-	-	-

Table 4-8. PROBLEMS ENCOUNTERED IN CONNECTION WITH TECHNOLOGY (Q2)

Problem Area	Number of Times Mentioned	% of All Problems
Resistance by the public	81	18
Mechanical problems	69	15
Planning problems	62	14
Service problems, computer down time	58	13
High costs, funding problems	46	10
Staff resistance	28	6
Staff training	22	5
System compatibility	18	4
System error rate	9	2
Other problems	63	14
	448	100

Research Question F: What is the Relationship Between Administrators' Perceptions of the Existence of Resistance in Staff Members to the Findings of the General Survey?

The low level of staff resistance cited above as noted by administrators seems to confirm the findings of the survey of librarians, i.e., that there is little resistance. Questions addressed more specifically to staff resistance suggest more reluctance than resistance, and more than half of the administrators perceived generally accepting attitudes towards technology (Table 4-9). Those sensing resistance indicated that the primary manifestations of it were undercurrents of talk and unspoken tenseness. In no case was it felt that the staff did not seem to function as well as before.

Research Question G: Future Projections, as Perceived by Administrators.

Administrators were asked to consider 12 library-related events and rate their likelihood of occurence within the next ten years. Results are shown in Table 4-11. Forecasts indicated as quite unlikely were the demise of the printed book in favor of microform for most materials and the replacement of the library

Table 4-9. ADMINISTRATORS' PERCEPTIONS OF STAFF ATTITUDES TOWARDS TECHNOLOGY (Q3)

Staff Attitude	Weighted Number of Libraries	% of Libraries
Resistant and stubborn	38	2.5
Very reluctant	176	11.7
Somewhat reluctant	420	28.0
Somewhat accepting	716	47.8
Very accepting	101	6.7
Can't assess	1	.1
No response	47	3.1
	1498	100.0

Table 4-10. MANIFESTATIONS OF RESISTANCE NOTED BY ADMINISTRATORS (Q4)

Manifestation	Number of Libraries	Percent of All Libraries
Staff verbalized negative attitudes strongly	105	7.0
There was an undercurrent of talk that was negative	186	12.4
There was unspoken tenseness (perhaps outbursts) that was probably associated with a projected change	152	10.1
People quit their jobs	5	.3
Staff didn't seem to function as well as before	-	-
Other	89	5.9

Table 4-11. LIKELIHOOD OF LIBRARY RELATED EVENTS OCCURRING IN THE NEXT 10 YEARS (Q5a)

Forecast Event	Likelihood (%) Improbable	Not Very Likely	Can't Decide	May be Probable	Very Probable
A national information network that will embrace all public, academic, and special libraries.	11.0	34.2	2.2	37.1	15.6
Automation of most library functions including all aspects of technical services and delivery processes in most large library systems.	2.0	16.1	1.3	42.4	38.3
The demise of the printed book form in favor of microform for most materials.	53.5	32.5	7.0	2.2	4.8
The end of the library as a storehouse; in its place the library becomes a transfer-of-information center.	23.2	45.2	2.5	19.7	9.3
The library becomes a major educational center whereby taped lectures, computerized instructional packages and electronically stored materials are directly transmitted to learners of all ages.	6.9	24.7	6.4	50.5	11.6
An interlocking network of information transmittal between industry, medical facilities, educational agencies, governments and libraries.	8.9	33.1	2.8	39.8	15.4
A central storage resource for all information.	19.4	32.4	6.4	31.0	10.8
The acceptance of resource sharing by all major public and non-public libraries.	7.4	19.7	1.8	41.6	29.6
A major change in the training/preparation/selection of future professionals.	5.1	18.8	13.1	32.7	30.3
The thrust of future technologies directed toward bringing data to people instead of bringing people to libraries.	6.4	20.6	9.0	48.4	15.6

Table 4-11. LIKELIHOOD OF LIBRARY RELATED EVENTS OCCURRING IN THE NEXT 10 YEARS (Q5a) (Cont'd)

Forecast Event	Likelihood (%) Improbable	Not Very Likely	Can't Decide	May be Probable	Very Probable
The development of interactive capabilities between people where they are and the library i.e., "a terminal in every home".	22.2	27.4	5.7	32.1	12.6
The obsolescence of on-line utilities and the emergence of a whole new system of storage and access.	9.7	17.9	41.3	20.2	10.9

as a storehouse with a transfer-of-information center. More events were considered likely, including automation of technical service functions in libraries, acceptance of resource sharing, a thrust of technology towards bringing data to people rather than people to libraries, changes in training of library professionals, and development of the library as an electronic education center. Opinions on the likelihood of a national information network were split, with a samll balance in support of its likelihood.

Research Question H: Attitudes Towards Various Futures By Administrators

Administrators' perceptions of the desirability of future library-related events, as shown in Table 4-12, were fairly consistent with their perceptions of their likelihood. Examples of this are the demise of the printed book, which was clearly felt to be both unlikely and undesirable, and resource sharing, which was seen as probable and desirable.

Exceptions to this pattern are opinions about a national network, a concept covered in two future events: a national information network embracing all public, academic and special libraries, and an interlocking network of information transmitted between industry, medical facilities, educational activities, governments and libraries. Both of these were viewed as more desirable than likely.

Comparing administrators' perceptions of the likelihood of a particular event with its desirability, we find high correlations. As indicated in Table 4-13, the strongest correlation is in the case of the event the demise of the printed book form in favor of microform. Lower, but still high, correlations are the case for the acceptance of resource sharing by all major public and non-public events and a major change in the training/preparation/selection of future professionals.

Research Question I: Do Administrators Demonstrate Resistance to Technology?

Generally, indications suggest low levels of resistance to technology among administrators. Results for items proposed as indicators of resistance are given in Table 4-14. None of these are straightforward, and it is not really possible to distinguish between resistance and other reasons (including simple disagreement) for giving the same response. Thus it cannot be determined whether or not administrators' patterns of resistance are similar to those of librarians in general.

Table 4-12. DESIRABILITY OF LIBRARY RELATED EVENTS OCCURRING IN THE NEXT 10 YEARS (Q5b)

Forecast Event	Desirability (%) Highly Undesirable	Somewhat Undesirable	Neutral	Somewhat Desirable	Highly Desirable
A national information network that will embrace all public, academic, and special libraries.	.8	2.8	10.1	37.3	48.9
Automation of most library functions including all aspects of technical services and delivery processes in most large library systems.	4.3	5.9	11.6	28.0	50.2
The demise of the printed book form in favor of microform for most materials.	68.3	17.4	7.9	3.1	3.3
The end of the library as a storehouse; in its place the library becomes a transfer-of-information center.	28.1	21.2	23.1	15.9	11.7
The library becomes a major educational center whereby taped lectures, computerized instructional packages and electronically stored materials are directly transmitted to learners of all ages.	5.9	9.2	17.7	36.7	30.5
An interlocking network of information transmittal between industry, medical facilities, educational agencies, governments and libraries.	6.9	2.5	12.7	36.1	41.9
A central storage resource for all information.	10.9	10.4	24.1	27.0	27.6
The acceptance of resource sharing by all major public and non-public libraries.	3.3	2.8	6.5	18.8	68.7
A major change in the training/preparation/selection of future professionals.	3.1	5.4	17.5	41.4	32.6
The thrust of future technologies directed toward bringing data to people instead of bringing people to libraries.	10.9	18.0	24.9	34.6	11.6

Table 4-12. DESIRABILITY OF LIBRARY RELATED EVENTS OCCURRING IN THE NEXT 10 YEARS (Q5b) (Cont'd)

Forecast Event	Desirability (%) Highly Undesirable	Somewhat Undesirable	Neutral	Somewhat Desirable	Highly Desirable
The development of interactive capabilities between people where they are and the library, i.e., "a terminal in every home".	10.0	10.8	22.6	39.6	16.9
The obsolescence of on-line utilities and the emergence of a whole new system of storage and access.	3.9	5.0	74.6	9.8	6.7

Table 4-13. CORRELATION BETWEEN PERCEIVED LIKELIHOOD AND DESIRABILITY OF FUTURE TECHNOLOGICAL EVENTS

Forecast Event	Gamma
A national information network that will embrace all public, academic, and special libraries.	.43
Automation of most library functions including all aspects of technical services and delivery processes in most large library systems.	.55
The demise of the printed book form in favor of microform for most materials.	.88
The end of the library as a storehouse; in its place the library becomes a transfer-of-information center.	.63
The library becomes a major educational center whereby taped lectures, computerized instructional packages and electronically stored materials are directly transmitted to learners of all ages.	.61
An interlocking network of information transmittal between industry, medical facilities, educational agencies, governments and libraries.	.42
A central storage resource for all information.	.68
The acceptance of resource sharing by all major public and non-public libraries.	.30
A major change in the training/preparation/selection of future professionals.	.35
The thrust of future technologies directed toward bringing data to people instead of bringing people to libraries.	.44
The development of interactive capabilities between people where they are and the library, i.e., "a terminal in every home".	.50
The obsolescence of on-line utilities and the emergence of a whole new system of storage and access.	.52

Table 4-14. POTENTIAL INDICATORS OF RESISTANCE TO TECHNOLOGY

Indicator	Survey Results
1. Plans for innovation	Percent not using or planning to use:
	Automated circulation system 31.1%
	Computerized cataloging 40.6%
	On-line system or any terminal access 58.4%
	Technological aids for service to special clients 54.7%
	Microform collection and equipment 15.5%
	Automated information storage system 86.1%
2. Perceived value of innovation	Desirability rating of low or very low for:
	Automated circulation system 6%
	Computerized cataloging 8%
	On-line system or any terminal access 12%
	Technological aids for service to special clients 13%
	Microform collection and equipment 4%
	Automated information storage system 24%
3. No opinion on desirability of innovations	Desirability rating of low or very low for:
	Automated circulation system 4%
	Computerized cataloging 5%
	On-line system or any terminal access 4%
	Technological aids for service to special clients 3%
	Microform collection and equipment 3%
	Automated information storage system 10%
4. "No resistance in staff" response suggesting denial	6.9 percent of administrators identified staff as very accepting of new ideas in technology, 3.1 percent did not respond to question.
5. No perception of staff resistance behavior suggesting denial	See Table 4-15; stronger manifestations observed at higher levels of resistance.
6. Perceptions of low probability of future technology as suggestive of resistance	See Table 4-11; future technologies viewed as unlikely by 2.0 to 23.2 percent of administrators*.
7. Negative perception of value of various possible technologies as suggestive of resistance	See Table 4-12; future technologies viewed as highly undesirable by .8 to 28.1 percent of administrators*.

*Excluding perceptions concerning the demise of the printed book (53.5 percent improbable, 68.3 percent highly undesirable).

Table 4-15. MANIFESTATIONS OF RESISTANCE BY LEVEL OF RESISTANCE (Q3, 4)

Perceived Level of Resistance of Staff	Weighted Number of Administrators Reporting	Percent Administrators Reporting Manifestations*				
		Staff Verbalized Negative Attitudes Strongly	Negative Undercurrent of Talk	Unspoken Tenseness	People Quit	Other
Resistant and stubborn	38	71.8	50.9	47.2	-	-
Very reluctant	176	28.5	46.3	12.1	-	12.8
Somewhat reluctant	420	6.0	18.9	22.6	1.1	15.2
Somewhat accepting	716	.2	.8	2.5	-	.4
Very accepting	101	-	-	-	-	-

*More than one manifestation observed in some libraries.

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APPENDIX A

SURVEY PROCEDURES

i. A mail survey of the directors of a stratified sample of about 300 public libraries, representing broad size-of-community classes and urbanization categories (central city, suburban, and non-SMSA).

ii. A mail survey of professionals employed in the same public libraries.

iii. A personal interview survey of professionals in eight public libraries selected on a non-random basis.

iv. Interviews with the directors of the eight public libraries.

The mail survey of i is the primary vehicle for examination of the state of technology in public libraries in the U.S. Responses to the instrument used in i reveal the directors' perception of staff attitudes toward technological innovations. They also provide some description of the community served and of the library's planning and direction, particularly with respect to technological innovation.

The major data collection effort of the study was the survey of practicing professional librarians in public libraries (ii). This survey was designed to permit inferences about attitudes toward technology associated with different kinds of libraries (for example, libraries differing with respect to size, geographic region, and urbanicity) and therefore constitute the major portion of this report.

The personal interview survey (iii) of professionals in libraries personally selected was designed to tap attitudes in greater depth than is possible by a mail questionnaire, and thus to illuminate the findings of the mail survey. In turn, the interviews with directors (iv) of the eight libraries were intended

to aid in interpreting the findings of iii. The eight directors' interview responses were planned to provide perspective for the analysis of the larger scale mail survey of library directors.

The small collection, iv, of only 8 respondents, was not primarily a statistical data collection, but provided qualitative background. The non-random collection, iii, which reached 86 professionals in eight libraries, may be regarded as providing mini-case studies of the eight libraries. The mail survey of directors (i) was designed, with respect to sample size and representativeness, to provide statistical evidence at the national level. The mail survey of professionals (ii) is statistically representative with a sample size permitting sub-national estimates.

The methods utilized in conducting the two mail and two personal interview surveys are described below.

Methodology--Mail Surveys

The surveys of library directors and library professionals were integrated in design, to maximize the potentials for relating the data collected in the two surveys for analysis. A stratified sample of libraries was selected, for which the Directors were surveyed. The same libraries were used as first stage sampling units (clusters) within each of which a subsample of professionals was selected.

The universe covered by the survey is the U.S. public libraries serving communities or areas in 1974 which had populations of 25,000 or more as of the 1970 Census. The "frame," or master list for sampling, was taken from the public libraries universe listing of the National Center for Education Statistics (NCES). Relatively few new libraries serving populations of this size, if any, have been opened since 1974. The 1500 public libraries which served 25,000 people or more accounted for 70 percent of the books, about 80 percent of audiovisual materials, and 95 percent of the microforms held in 1974 by all 8300 public libraries in the United States. The "larger" libraries accounted for 82 percent of total public library expenditures in 1974. They employed 71 percent of all the full time equivalent (FTE) professional staff, 82 percent of FTE degree-holding professionals, and 88 percent of those holding graduate degrees in the library/media fields. On the basis that serious consideration of innovations is likely to occur earlier in the libraries having financial resources and professional staff with formal advanced education in the field, the libraries serving 25,000 and more people were chosen as the universe for this study.

The NCES universe listing was stratified by urbanization in terms of (a) central cities of Standard Metropolitan Statistical Areas (SMSAs), (b) other locations in SMSAs (roughly "suburban"), and (c) non-SMSA locations. Since libraries serving fewer than 25,000 persons are not included in this study, (c) here comprises smaller cities not within the immediate market area of a

major city. The libraries are also stratified by Region in terms of the four Census groups: Northeast, Great Lakes and Plains, Southeast, and West and Southwest. Size-of-Community served classes used are 25 to 50 thousand, 50 to 100 thousand, 100 to 250 thousand, and 250 thousand and over.

Within Region by urbanization category by size-of-community served strata, a sample of libraries was drawn with probabilities for each size class approximately proportional to the average size in total professional employment, full time plus part time. In effect, one library was drawn for each 100 professional employees. In the largest size class, for which average professional employment was slightly in excess of 100, all libraries were included. Among libraries serving 100 to 250 thousand people, the average number of professionals per library was 24, so one library in four was selected. Similarly, sampling ratios of one-in-six for libraries of 50 to 100 thousand and one-in-twelve for libraries of 25 to 50 thousand were established.

The resultant sample was 304 libraries. In the course of the survey, corrections to the sample were made to reflect consolidations, closings, and corrections of errors (e.g., in population served) in the frame. The final library sample consisted of 298 libraries, of which 151 were in central cities, 80 in other SMSA locations, and 67 in non-SMSA locations.

The sample of librarians was planned with the intent that the proportion of total professional employees included in the sample would be equal for the different size classes, approximately one-in-twelve. To this end, eight professionals per sample library were specified for libraries serving 50 thousand and over, and all professionals in the sample libraries were specified for libraries of 25 to 50 thousand.

Methodology - Personal Interviews

In addition to the mail survey of libraries, personal interviews were conducted with a smaller sample of librarians and administrators. Objectives involved in conducting these interviews included (1) conducting a survey which would parallel the mail survey sufficiently to make some correlational analysis between the two, and (2) obtaining subjective data through more general, open-ended questions, more questions, and probes of responses. The primary value of the interview phase was seen as being in the potential to study the statistical interrelationships between variables and to delve deeper into the variables themselves.

The administrator interview questionnaire focussed on the identification of existing technology and of problems encountered and on the administrator's assessment of the general acceptance of technology by the staff.

The librarian interview questionnaire items were designed to explore the eight primary variables of this study. They were based, first of all, on the items in the mail survey; however, in many instances the items were changed into open-ended questions which would elicit an opinion, an explanation, or a rationale. Each of the 60 items in the mail survey questionnaire has a counterpart in the interview survey, even if the item is not identical in wording or does not appear in the same order in which it occurs in the mail survey. In addition, each variable is explored, to a greater or lesser degree, in more depth than is possible in a mail survey. Some of this exploration may occur because many of the items are posed in an open-ended format. For some variables, more dimensions are added; for example, in the rigidity variable, the dimensions of risk-taking and self-starting behavior are added; for the perception of work environment variable, the factor of loyalty to the administrator is added; for the locus of control variable, a section related specifically to technology is included.

The personal interviews were conducted in six public libraries selected purposively. Of the six, five were chosen as heavily involved in, or affected by, technology; the sixth was chosen because of its lack of technological development. One of the five involved in technology withdrew from participation in the middle

of the interview phase. Within each sampled library, professionals to be interviewed were selected by the administrator using a random selection method. In all, 86 completed librarian interviews and 14 administrator interviews were obtained. Library directors were included in the librarian sample, which was not the case in the mail survey.

APPENDIX B

STATISTICAL METHODS FOR MAIL SURVEY

B.1 Sample Design

The Universe of Public Libraries and Library Professionals

According to the Library General Information Survey, LIBGIS I, (National Center for Education Statistics, 1978), the population of library professionals in 1974 was 44,945, of whom 28,971 were employed on a full-time basis. The combined full-time equivalent (FTE) was 36,132. Of the total, 17,500 did not hold degrees, 9,100 held the Bachelor's Degree only, and 26,600 held a graduate degree.

These librarians worked in 8,307 public libraries, of which 6,797 served communities of less than 25,000 population. Those libraries serving small communities had more than one-third of the total library professionals (including about 7,000 of those with less than a Bachelor's degree). Only 55 of those libraries had as many as ten FTEs, and 1,738 others had as few as two FTEs. In terms of resources, the libraries serving fewer than 25,000 had 29 percent of the volumes of books, 21 percent of the audiovisual materials, and five percent of the microforms in the libraries as a group.

Survey Frame and Stratification

For the survey of library professionals, this study was limited to libraries serving at least 25,000 on the assumption that serious consideration of new technologies will generally be achieved first in larger libraries. The sample was stratified by region, urbanization (associated with density of population), and size of community served. Four standard census regions were used. Three classes as to urbanization were defined: central cities of Standard Metropolitan Statistical Areas (SMSAs), other communities in SMSAs, and communities outside SMSAs. Size of community classes were 25,000 to 50,000; 50,000 to 100,000; 100,000 to 250,000; and over 250,000 population.

Table I ESTIMATED SAMPLE DISTRIBUTION

Strata (4 Regions are grouped)	Libraries	Professionals	Sampling Rate		Expected Sample Size	
	Total	Total	Libraries	Professionals per library	Libraries	Professionals
Libraries serving 250,000 or more	(114)	(11,999)	All	8	(114)	(912)
Central Cities	91	10,176			91	728
Other SMSA	23	1,823			23	184
Other than SMSA	0	0			0	0
Libraries serving 100,000-250,000	(220)	(5,257)	1/4	8	(55)	(440)
Central Cities	133	3,625			33	264
Other SMSA	50	1,075			13	104
Other than SMSA	37	557			9	72
Libraries serving 50,000-100,000	(436)	(6,181)	1/6	8	(73)	(584)
Central Cities	131	2,021			22	176
Other SMSA	147	2,681			25	200
Other than SMSA	158	1,479			26	208
Libraries serving 25,000-50,000	(740)	(6,043)	1/12	All	(62)	(504)
Central Cities	96	994			8	83
Other SMSA	297	2,690			25	224
Other than SMSA	347	2,359			29	197
Total					304	2,440
Central Cities					(154)	(1,251)
Other SMSA					(86)	(712)
Other than SMSA					(64)	(477)

Sampling Rates

Stratification by all three of the variables mentioned was regarded as important in order that each of those variables be represented with good precision in the sample. Sampling rates were established to achieve high precision in the aggregate results, and yet to permit comparisons among some of the important strata.

Within-library sampling was established at eight professionals per library in the sample, except for those libraries serving 25,000 to 50,000 people. For those libraries, the mean number of professionals is eight, and therefore all professionals were sampled.

Libraries were sampled at rates as follows:

Size of population served	Sampling Rate
250,000 and over	All libraries
100,000 to 250,000	1/4 of the libraries
50,000 to 100,000	1/6 of the libraries
25,000 to 50,000	1/12 of the libraries

These rates, together with the within-library rates, were intended to result in each sampled professional "representing" approximately the same number (roughly 12) professionals in the frame.

Sampling Technique

The sampling frame from the National Center for Education Statistics is arranged within regions (four classes), by urbanization (three classes), and within those twelve classes by groups according to population served in order from the largest to the smallest. The size classes which were included with certainty are broken down as follows: Over one million: 500,000 to one million; and 250,000 to 500,000; the frame includes two classes below 25,000 (10,000 to 25,000 and less than 10,000) which were not sampled.

In the physical listing of this frame, the three size categories to be sampled were treated as if they appeared continuously on one list, and a systematic sample were taken with the appropriate interval: four for communities of 100,000 to 250,000; six for those of 50,00 to 100,000; and twelve for those of 25,000 to 50,000. In each case, an independent random start were determined, using random sampling numbers from Kendall and Smith's tables.

A starting point in the tables was chosen by taking the numeric analogs of the first three letters in PITTSBURGH, i.e., the 16 thousand, the 9th row and the 20th column in the Kendall and Smith Tables. The first one-digit number with the range 1-4 was the random start for libraries serving 100,000 to 200,000 people; the first digit thereafter within the range 1-6 was the random start for libraries serving 50,000 to 100,000; and the first two-digit number within the range 01-12 was the random start for libraries serving 25,000 to 50,000 people. The random starts were 2, 2, and 12. The sample selections among libraries serving 100,000 to 250,000 people thus were numbers 2, 6, 10, 14, 18, and so forth from the list, continuing from one of the twelve groups of such lists to the next as if they were physically continuous. Similarly, the 2nd, 8th, 14th, 20th, 26th, etc. libraries were selected among those serving 50,000 to 100,000 people. The 12th, 24th, 36th, 48th, etc. were selected from those serving 25,000 to 50,000 people. Sample libraries were then indicated in the right hand margin of the listing of libraries.

B.2 Responses

Administrators

The aggregate response to the survey of library directors was 215, of which 4 were received too late to use in computer tabulation, from the sample of 298 libraries (See Table 2). The nonparticipation, 28 percent, included 8 percent overt refusals, and 20 percent more who did not cooperate within the time available for survey follow ups. Nonparticipation was slightly higher in the West and Southwestern Region, in the other-than-SMSA libraries, and in libraries serving fewer than 100,000 persons, than they were in the other groups. The differences from the national average were rarely more than 5 percentage points for any categories. The libraries serving 100,000 to one-fourth million people, with nonresponse of only 18 percent, seemed to be significantly more responsive than other categories of libraries. (See Table 3)

Libraries

A total of 986 blue questionnaires were received in time to be analyzed. Table 4 indicates the size of various categories of Librarian questionnaires - those received in time to be analyzed, those received late, refusals, and other nonrespondents. Table 5 shows the percentages of nonresponding libraries, by each of the three stratification variables. The 986 responses used in analysis are broken down by individual strata in Table 6.

The number of potential clients originally estimated, based on LIBGIS I data and assuming that the prescribed sampling strategy was applied within libraries, was an average of approximately eight potential respondents from each library serving a population of 50,000 or more for a total of 1,840 potential respondents. A somewhat smaller number was expected from libraries serving 25,000 - 50,000. The total number of librarians anticipated was therefore, an approximation and the problem of specifying an exact number is further complicated by the fact that the data used in sampling reported on "library professionals," i.e., librarians, media and audiovisual specialists, etc., while this survey attempted to collect data only

from "professional librarians". The following definition of "professional librarians" was provided.

> "Professional Librarians--staff members doing work that requires professional training and skill in the theoretical and/or scientific aspect of library work, as distinct from its mechanical or clerical aspect."

The difference in definition may have decreased the number of eligible respondents to some degree since media and audiovisual specialists have been eliminated.

Table 2 RESPONSE ANALYSIS, MAIL SURVEY OF LIBRARY ADMINISTRATORS

Strata (population served/ urbanicity) (All Regions Combined)	Potential Resp.	Completed & used	Rec'd. too late	Refused	Other Nonresp.
Libraries serving 250,000 or more					
Central Cities	87	65	2	7	13
Other SMSA	15	9	0	0	6
Other than SMSA	--	--	-	-	--
TOTAL	102	74	2	7	19
Libraries serving 100,000-250,000					
Central Cities	33	26	0	2	5
Other SMSA	13	11	0	0	2
Other than SMSA	9	8	0	0	1
TOTAL	55	45	0	2	8
Libraries serving 50,000-100,000					
Central C[illegible]	22	13	0	2	7
Other SMS.	25	22	0	0	3
Other than SMSA	26	12	1	3	10
TOTAL	73	47	1	5	20
Libraries serving 25,000-50,000					
Central Cities	9	3	0	2	4
Other SMSA	27	19	0	4	4
Other than SMSA	32	23	1	4	4
TOTAL	68	45	1	10	12
TOTAL					
Central Cities	151	107	2	13	29
Other SMSA	80	61	0	4	15
Other than SMSA	67	43	2	7	15
	298*	211	4	24	59

*Original sample based on 1974 list was 304. Changes since that time reduce the number of potential respondents to 298.

Table 3 RATES OF NONRESPONSE, MAIL SURVEY OF LIBRARY ADMINISTATORS

	Potential Response	% of Nonresponse
By Population Served		
Class		
250,000 and More	102	25%
100,000 to 249,999	55	18%
50,000 to 99,999	73	34%
25,000 to 49,999	68	32%
	298	28%
By Urbanization		
Category		
Central City	151	28%
Other SMSA	80	24%
Other than SMSA	67	33%
	298	28%
By Geographic Region		
Region		
North Atlantic	66	27%
Great Lakes & Plains	79	25%
Southeast	84	27%
West & Southwest	69	32%
	298	28%

Table 4 RESPONSE ANALYSIS, MAIL SURVEY OF LIBRARIANS

Strata (all regions combined)	Maximum potential Resp.	Completed & used	Rec'd. too late	Refused	Other Nonresp.
Libraries serving 250,000 or more					
Central Cities	696	452	18	8	11
Other SMSA	120	53	0	0	7
Other than SMSA	-	-	-	-	-
TOTAL	816	505	18	8	18
Libraries serving 100,000-249,999					
Central Cities	264	118	2	2	6
Other SMSA	104	53	1	1	2
Other than SMSA	72	30	0	1	0
TOTAL	440	201	3	4	8
Libraries serving 50,000-99,999					
Central Cities	176	42	1	3	4
Other SMSA	200	75	0	0	4
Other than SMSA	208	28	8	3	8
TOTAL	584	145	9	6	16
Libraries serving 25,000-49,999					
Central Cities	94	16	0	2	3
Other SMSA	243	70	1	4	3
Other than SMSA	212	49	0	4	11
TOTAL	549	135	1	10	17
All Libraries					
Central Cities	1,230	628	21	15	24
Other SMSA	667	251	2	5	16
Other than SMSA	492	107	3	8	19
TOTAL	2,389	986	31	28	59

Table 5 RATES OF NONRESPONSE, MAIL SURVEY OF LIBRARIANS

	Number of Libraries Surveyed	Response		Nonresponse percent (libraries)
		Libraries	Librarians	
By Population Served				
250,000 and more	102	76	505	26
100,000 to 249,999	55	43	201	22
50,000 to 99,999	73	51	145	30
25,000 to 49,999	68	41	135	40
	298	211	986	29
By Urbanization Category				
Central City	151	112	628	26
Other SMSA	80	59	251	26
Other than SMSA	67	40	107	40
	298	211	986	29
By Geographic Region				
North Atlantic	66	49	249	26
Great Lakes and Plains	79	55	243	30
Southeast	84	56	224	33
West and Southwest	69	51	270	26
	298	211	986	29

Table 6 DISTRIBUTION OF RESPONSES BY REGION, MAIL SURVEY OF LIBRARIANS

Strata	Librarian Responses Processed: Region 1	Region 2	Region 3	Region 4	Total
Libraries serving 250,000 or more					
Central Cities	86	100	102	164	452
Other SMSA	30	9	0	14	53
Other than SMSA	-	-	-	-	-
TOTAL	116	109	102	178	505
Libraries serving 100,000-249,999					
Central Cities	14	29	42	33	118
Other SMSA	17	3	22	11	52
Other than SMSA	7	3	17	3	30
TOTAL	38	35	81	47	190
Libraries serving 50,000-99,999					
Central Cities	23	11	4	4	42
Other SMSA	21	21	9	24	75
Other than SMSA	0	9	16	3	28
TOTAL	44	41	29	31	145
Libraries serving 25,000-49,999					
Central Cities	2	14	0	14	16
Other SMSA	35	29	6	0	70
Other than SMSA	14	15	6	0	49
TOTAL	51	58	12	14	135
All libraries					
Central Cities	125	154	148	201	628
Other SMSA	103	62	37	49	251
Other than SMSA	21	27	39	20	107
TOTAL	249	243	224	270	986

B.3 Weighting Procedures

It is well recognized that the attitudes of librarians in different kinds of libraries - as to size, urbanization, region, and other factors - are in general different. They also differ in willingness to respond to surveys, whether by mail or by personal interview. For this reason, good survey practice incorporates emphasis on follow-up efforts to secure participation of initial non-respondents; to the extent practicable within operational constraints of time and cost. In the mail surveys of library administrators and librarians, a first round of telephone followups was carried out, and the project timetable as established precluded further followups.

The survey response attained of 72% of libraries is adequate for analysis, but it does have inherent risks which call for caution in analysis. If different groups within the population responded as different rates and those groups were significantly different in any of the substantive information - factual or attitudinal - sought by the survey, the unweighted use of raw returns could be misleading - biased - with respect to those particular substantive items. Accordingly, KRI examined the response patterns for the surveys.

As shown in Table 2, the libraries serving 100,000 or more people responded at a distinctly higher rate than those serving smaller populations. Libraries located outside Standard Metropolitan Statistical Areas (SMSAs) were very noticeably under-represented in the response. Libraries in the Southeastern U.S. responded somewhat less well than those in the other regions.

In light of these variations, KRI made the professional judgment that it was important to weight the mail survey returns. At the library level (i.e., for the Administrator's survey), the appropriate weights are the ratio of the number of libraries in the population within a weighting-stratum to the number of libraries responding and included in the tabulations for that stratum. The weighing strata for libraries were formed by grouping size of population served by urban category cells. The weighting strata for librarians are size of population served (4 classes) by urban category (3 classes) by Region (4), and some of the 48 cells for which small frequencies reported were combined to reduce the variance of estimates associated

with small cells. The estimation factors for librarians were the ratios of the estimated numbers of librarians for each cell in the base year (from the 1974 NCES Public Libraries Survey) to the number of responses received and tabulated. Weights established were based on the basis for tabulations and some cross tabulation of mail data presented in this report. Weighting was eliminated when performing analytical calculations in order to reduce the confounding effects of large sample size on tests of significance.

Administrators

Results of the administrator's survey were weighted throughout to compensate for disproportionate sampling and differing response rates among the strata. Also based on these factors, the original 44 strata used in sampling were collapsed into six groups with similar characteristics. The six groups were as follows:

1. All libraries serving 250,000 or more.
2. Central city libraries serving 100,000-249,999.
3. Other libraries serving 100,000-249,999.
4. All libraries serving 50,000-99,999.
5. Central city and other SMSA libraries serving 25,000-49,999.
6. Other than SMSA libraries serving 25,000-49,999.

One stratification variable, region, does not enter into these categories because sampling within regions was proportionate and response rates did not vary significantly by region. Other strata for which small frequencies were reported are combined to reduce the variance of estimates.

Data involved in the calculation of weights for the six groupings of strata are shown in Table 7. N is the final adjusted number of libraries in the universe in that particular strata, and n is the number of Administrator's questionnaires received in time to process. The third column shows the weighting factors which result from dividing N by n.

Table 7 WEIGHTING FACTORS, ADMINISTRATOR'S SURVEY

Combined Strata	N	n	Weight
All libraries serving 250,000 or more	102	74	1.38
Central city libraries serving 100,000-249,999	133	26	5.12
Other libraries serving 100,000-249,999	87	19	4.58
All libraries serving 50,000-99,999	436	47	9.28
Central city and other SMSA libraries serving 25,000-49,999	393	22	17.86
Other than SMSA libraries serving 25,000-49,999	347	23	15.09
	1498	211	

Libraries

As indicated, sampling procedures for librarians were designed to result in each sampled professional representing approximately the same number of professionals in the frame. Imprecise data on the numbers of librarians in the actual sample libraries and differing response rates led to higher representation of some strata in the data analyzed. To compensate for these factors and to expand survey results to the total population of librarians, appropriate weights were developed and applied to the survey results received. Weights were applied to develop basic tabulations but eliminated in development of the resistance scale and related cross tabulations.

Again, as with administrators, the original 44 sampling strata were colloped into a smaller set based on response patterns. Strata for which small frequencies were reported were combined to reduce the variance of estimates. The groupings of strata used were:

1. Central city libraries serving 250,000 or more - North Atlantic region.

2. Central city libraries serving 250,000 or more - Great Lakes and Plains region.

3. Central city libraries serving 250,000 or more - Southeast region.

4. Central city libraries serving 250,000 or more - West and Southwest region.

5. All libraries serving 100,000-249,999 plus non-central city libraries serving 250,000 or more - North Atlantic and Great Lakes and Plains regions.

6. All libraries serving 100,000-249,999 plus non-Central city libraries serving 250,000 or more - Southeast and West and Southwest regions.

7. All libraries serving 50,000-99,999.

8. All libraries serving 25,000-49,999.

After establishing these groupings, weights were calculated using the data shown in Table 8. The universe size of each group, N, represents the number of FTE librarians, media and audiovisual specialists, and other professional staff in 1974 as reported by LIBGIS I. Estimates within regions for libraries serving over 100,000 not reported by NCES, were derived from totals for those size categories and the totals for the four geographic regions. In total, there were 25,687 FTE librarians in libraries included in the survey, i.e., serving over 25,000.

The second column of Table 8 indicates the number of responses received in each of the stratification groups. The weight used for each group was calculated as $N \div n$, and the results range from 15.15 to 35.83, reflecting the variable level of representation of the different groups. If the distribution of responses vary by the various strata, as would be expected, application of these weights leads to representation of the true distributions over the universe of libraries.

Table 8 WEIGHTING FACTORS, LIBRARIANS' SURVEY

Combined Strata	N	n	Weight
Central city libraries serving 250,000 or more - North Atlantic region	2771	86	32.22
Central city libraries serving 250,000 or more - Great Lakes and Plains region	2676	100	26.76
Central city libraries serving 250,000 or more - Southeast region	1625	102	15.93
Central city libraries serving 250,000 or more - West and Southwest region	2485	164	15.15
All libraries serving 100,000-249,999 plus non-central city libraries serving 250,000 or more - North Atlantic and Great Lakes and Plains regions	3520	112	31.43
All libraries serving 100,000-249,999 plus non-Central city libraries serving 250,000 or more - Southeast and West and Southwest regions	2656	142	18.70
All libraries serving 50,000-99,999	5195	145	35.83
All libraries serving 25,000-49,999	4760	135	35.26
	25,687	986	

APPENDIX C

DISTRIBUTION OF RESISTANCE TO TECHNOLOGY INDEX

FILE LIBRARY (CREATION DATE = 07 Feb 70)

RESIST

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	2.3015	1	.1	.1	.10
	2.3216	1	.1	.1	.20
	2.4753	1	.1	.1	.40
	2.5155	1	.1	.1	.50
	2.6589	1	.1	.1	.60
	2.7126	1	.1	.1	.70
	2.7625	1	.1	.1	.80
	2.8131	1	.1	.1	.90
	2.8576	1	.1	.1	1.10
	2.8759	1	.1	.1	1.20
	2.9260	1	.1	.1	1.30
	2.9358	2	.2	.2	1.50
	2.9415	1	.1	.1	1.60
	2.9422	1	.1	.1	1.80
	2.9499	1	.1	.1	1.90
	2.9902	1	.1	.1	2.00
	2.9912	1	.1	.1	2.10
	3.0192	1	.1	.1	2.20
	3.0502	1	.1	.1	2.30
	3.0854	1	.1	.1	2.50
	3.0864	1	.1	.1	2.60
	3.1027	1	.1	.1	2.70
	3.1272	1	.1	.1	2.80
	3.1435	1	.1	.1	2.90
	3.1936	1	.1	.1	3.00
	3.2039	1	.1	.1	3.20
	3.2048	1	.1	.1	3.30
	3.2127	1	.1	.1	3.40
	3.2137	1	.1	.1	3.50
	3.2254	1	.1	.1	3.60
	3.2671	1	.1	.1	3.70

3.2744	1	.1	.1	3.90
3.2852	1	.1	.1	4.00
3.3173	1	.1	.1	4.10
3.3192	1	.1	.1	4.20
3.3269	1	.1	.1	4.30
3.3266	1	.1	.1	4.40
3.3276	1	.1	.1	4.50
3.3393	1	.1	.1	4.70
3.3619	1	.1	.1	4.80
3.3903	1	.1	.1	4.90
3.3967	1	.1	.1	5.00
3.4151	1	.1	.1	5.20
3.4297	1	.1	.1	5.30
3.4555	1	.1	.1	5.40
3.4606	1	.1	.1	5.50
3.4720	1	.1	.1	5.60
3.4772	1	.1	.1	5.70
3.4798	1	.1	.1	5.90
3.4806	1	.1	.1	6.00
3.4827	1	.1	.1	6.10
3.5243	2	.2	.2	6.30
3.5258	1	.1	.1	6.40
3.5390	1	.1	.1	6.60
3.5441	1	.1	.1	6.70
3.5469	1	.1	.1	6.80
3.5903	1	.1	.1	6.90
3.5942	1	.1	.1	7.00
3.5952	1	.1	.1	7.10
3.5961	1	.1	.1	7.30
3.5978	1	.1	.1	7.40
3.5978	1	.1	.1	7.50
3.6074	1	.1	.1	7.60
3.6084	1	.1	.1	7.70
3.6097	1	.1	.1	7.90
3.6143	1	.1	.1	8.00

3.6191	1	.1	.1	8.10
3.6196	1	.1	.1	8.20
3.6356	1	.1	.1	8.30
3.6397	1	.1	.1	8.40
3.6402	1	.1	.1	8.50
3.6522	1	.1	.1	8.60
3.6603	2	.2	.2	8.80
3.6623	1	.1	.1	9.00
3.6753	1	.1	.1	9.10
3.6791	1	.1	.1	9.30
3.6875	1	.1	.1	9.40
3.7035	1	.1	.1	9.50
3.7051	1	.1	.1	9.60
3.7095	1	.1	.1	9.70
3.7179	1	.1	.1	9.80
3.7194	1	.1	.1	10.00
3.7223	1	.1	.1	10.10
3.7226	1	.1	.1	10.20
3.7363	1	.1	.1	10.30
3.7408	1	.1	.1	10.40
3.7492	1	.1	.1	10.50
3.7525	1	.1	.1	10.70
3.7532	1	.1	.1	10.80
3.7718	1	.1	.1	10.90
3.7754	1	.1	.1	11.00
3.7822	1	.1	.1	11.10
3.7832	2	.2	.2	11.40
3.7919	1	.1	.1	11.50
3.7930	1	.1	.1	11.60
3.7939	1	.1	.1	11.70
3.7956	1	.1	.1	11.80
3.8017	2	.2	.2	12.10
3.8140	1	.1	.1	12.20
3.8149	1	.1	.1	12.30
3.8169	1	.1	.1	12.40

3.8819	1	.1	.1	12.50
3.8844	1	.1	.1	12.60
3.8865	1	.1	.1	12.70
3.8880	1	.1	.1	12.80
3.8886	1	.1	.1	13.00
3.8874	1	.1	.1	13.10
3.8874	1	.1	.1	13.20
3.8813	1	.1	.1	13.30
3.8689	1	.1	.1	13.50
3.8703	1	.1	.1	13.60
3.8772	1	.1	.1	13.70
3.8784	1	.1	.1	13.80
3.8872	1	.1	.1	13.90
3.8892	1	.1	.1	14.10
3.8922	1	.1	.1	14.20
3.9047	1	.1	.1	14.30
3.9197	1	.1	.1	14.40
3.9255	2	.2	.2	14.60
3.9293	1	.1	.1	14.80
3.9323	1	.1	.1	14.90
3.9353	1	.1	.1	15.00
3.9343	1	.1	.1	15.10
3.9372	1	.1	.1	15.20
3.9570	1	.1	.1	15.30
3.9652	1	.1	.1	15.50
3.9824	1	.1	.1	15.60
3.9846	1	.1	.1	15.70
3.9889	1	.1	.1	15.80
3.9903	1	.1	.1	15.90
3.9927	1	.1	.1	16.00
3.9935	1	.1	.1	16.20
3.9946	1	.1	.1	16.30
3.9967	1	.1	.1	16.40
4.0005	1	.1	.1	16.50
4.0034	1	.1	.1	16.40

4.0056	1	.1	.1	16.70
4.0123	1	.1	.1	16.80
4.0315	1	.1	.1	17.00
4.0321	1	.1	.1	17.10
4.0389	1	.1	.1	17.20
4.0511	1	.1	.1	17.30
4.0522	1	.1	.1	17.40
4.0609	2	.2	.2	17.70
4.0619	1	.1	.1	17.80
4.0656	1	.1	.1	17.90
4.0689	1	.1	.1	18.00
4.0723	1	.1	.1	18.10
4.0742	1	.1	.1	18.30
4.0746	1	.1	.1	18.40
4.0819	1	.1	.1	18.50
4.0849	1	.1	.1	18.60
4.1017	1	.1	.1	18.70
4.1041	1	.1	.1	18.90
4.1144	1	.1	.1	19.00
4.1164	1	.1	.1	19.10
4.1300	1	.1	.1	19.20
4.1444	1	.1	.1	19.30
4.1611	1	.1	.1	19.40
4.1735	1	.1	.1	19.60
4.1749	1	.1	.1	19.70
4.1946	1	.1	.1	19.80
4.1951	1	.1	.1	19.90
4.1966	1	.1	.1	20.00
4.2024	1	.1	.1	20.10
4.2043	1	.1	.1	20.30
4.2070	1	.1	.1	20.40
4.2077	1	.1	.1	20.50
4.2147	1	.1	.1	20.60
4.2165	1	.1	.1	20.70
4.2160	1	.1	.1	20.80

4.2175	1	.1	.1	21.00
4.2202	1	.1	.1	21.10
4.2245	1	.1	.1	21.20
4.2287	1	.1	.1	21.30
4.2327	1	.1	.1	21.40
4.2365	1	.1	.1	21.50
4.2475	1	.1	.1	21.70
4.2590	1	.1	.1	21.90
4.2661	1	.1	.1	21.90
4.2666	1	.1	.1	22.00
4.2665	1	.1	.1	22.10
4.2676	1	.1	.1	22.20
4.2719	1	.1	.1	22.40
4.2779	1	.1	.1	22.50
4.2850	1	.1	.1	22.60
4.2905	1	.1	.1	22.70
4.2933	1	.1	.1	22.80
4.2990	1	.1	.1	23.00
4.2994	1	.1	.1	23.10
4.3001	1	.1	.1	23.20
4.3070	1	.1	.1	23.30
4.3146	1	.1	.1	23.40
4.3152	1	.1	.1	23.50
4.3153	1	.1	.1	23.70
4.3221	1	.1	.1	23.80
4.3237	1	.1	.1	23.90
4.3290	1	.1	.1	24.00
4.3299	1	.1	.1	24.10
4.3378	1	.1	.1	24.20
4.3399	1	.1	.1	24.40
4.3413	1	.1	.1	24.50
4.3441	1	.1	.1	24.60
4.3473	1	.1	.1	24.70
4.3496	1	.1	.1	24.80
4.3625	1	.1	.1	24.90

4.3712	1	.1	.1	25.10
4.3724	1	.1	.1	25.20
4.3732	1	.1	.1	25.30
4.3778	1	.1	.1	25.40
4.3810	2	.2	.2	25.40
4.3830	2	.2	.2	25.60
4.3835	1	.1	.1	26.00
4.3924	1	.1	.1	26.10
4.4012	2	.2	.2	26.20
4.4062	1	.1	.1	26.50
4.4099	1	.1	.1	26.60
4.4140	1	.1	.1	26.70
4.4145	1	.1	.1	26.80
4.4234	1	.1	.1	26.90
4.4243	1	.1	.1	27.00
4.4249	1	.1	.1	27.30
4.4403	1	.1	.1	27.30
4.4409	1	.1	.1	27.40
4.4424	1	.1	.1	27.50
4.4504	1	.1	.1	27.60
4.4523	1	.1	.1	27.90
4.4634	1	.1	.1	27.90
4.4735	1	.1	.1	28.00
4.4771	1	.1	.1	28.10
4.4790	1	.1	.1	28.20
4.4812	1	.1	.1	28.30
4.4837	1	.1	.1	28.50
4.4846	1	.1	.1	28.60
4.4895	1	.1	.1	28.70
4.4925	1	.1	.1	28.80
4.5015	1	.1	.1	28.90
4.5058	1	.1	.1	29.00
4.5067	1	.1	.1	29.20
4.5070	1	.1	.1	29.30
4.5073	1	.1	.1	29.40

4.5146	2	.2	.2	29.40
4.5156	1	.1	.1	29.70
4.5165	1	.1	.1	29.90
4.5165	1	.1	.1	30.00
4.5166	1	.1	.1	30.10
4.5231	1	.1	.1	30.20
4.5263	1	.1	.1	30.30
4.5291	1	.1	.1	30.40
4.5345	1	.1	.1	30.40
4.5366	1	.1	.1	30.70
4.5367	1	.1	.1	30.80
4.5454	2	.2	.2	31.00
4.5593	1	.1	.1	31.10
4.5597	1	.1	.1	31.30
4.5647	1	.1	.1	31.40
4.5672	2	.2	.2	31.40
4.5695	1	.1	.1	31.70
4.5709	1	.1	.1	31.90
4.5714	1	.1	.1	32.00
4.5760	1	.1	.1	32.10
4.5761	1	.1	.1	32.20
4.5783	1	.1	.1	32.30
4.5794	1	.1	.1	32.40
4.5816	1	.1	.1	32.40
4.5824	1	.1	.1	32.70
4.5824	1	.1	.1	32.80
4.5896	1	.1	.1	32.90
4.5905	1	.1	.1	33.00
4.5936	1	.1	.1	33.10
4.6030	1	.1	.1	33.30
4.6065	1	.1	.1	33.40
4.6134	1	.1	.1	33.50
4.6145	1	.1	.1	33.60
4.6201	1	.1	.1	33.70
4.6319	1	.1	.1	33.80

4.6344	1	.1	.1	34.00
4.6397	1	.1	.1	34.10
4.6424	1	.1	.1	34.20
4.6436	1	.1	.1	34.30
4.6442	1	.1	.1	34.40
4.6447	1	.1	.1	34.50
4.6449	1	.1	.1	34.70
4.6491	1	.1	.1	34.90
4.6501	5	.5	.6	35.40
4.6511	1	.1	.1	35.50
4.6521	1	.1	.1	35.60
4.6536	1	.1	.1	35.70
4.6599	1	.1	.1	35.90
4.6656	1	.1	.1	35.90
4.6693	1	.1	.1	36.10
4.6693	1	.1	.1	36.20
4.6712	1	.1	.1	36.30
4.6721	1	.1	.1	36.40
4.6722	1	.1	.1	36.50
4.6729	1	.1	.1	36.70
4.6730	1	.1	.1	36.80
4.6740	1	.1	.1	36.90
4.6772	1	.1	.1	37.00
4.6809	1	.1	.1	37.10
4.7064	1	.1	.1	37.20
4.7172	1	.1	.1	37.40
4.7221	1	.1	.1	37.50
4.7233	1	.1	.1	37.60
4.7241	1	.1	.1	37.70
4.7246	1	.1	.1	37.80
4.7351	2	.2	.2	38.10
4.7264	1	.1	.1	38.20
4.7275	1	.1	.1	38.30
4.7309	1	.1	.1	38.40
4.7326	1	.1	.1	38.50

4.7356	1	.1	.1	38.60
4.7414	1	.1	.1	38.90
4.7465	1	.1	.1	38.90
4.7530	1	.1	.1	39.70
4.7758	1	.1	.1	39.10
4.7760	1	.1	.1	39.70
4.7827	2	.2	.2	39.50
4.7846	1	.1	.1	39.60
4.7847	1	.1	.1	39.70
4.7866	1	.1	.1	39.80
4.7883	1	.1	.1	39.90
4.7931	1	.1	.1	40.00
4.7932	1	.1	.1	40.20
4.7986	1	.1	.1	40.30
4.8163	1	.1	.1	40.40
4.8164	1	.1	.1	40.50
4.8282	1	.1	.1	40.60
4.8294	1	.1	.1	40.70
4.8347	1	.1	.1	40.90
4.8366	1	.1	.1	41.00
4.8391	1	.1	.1	41.10
4.8451	1	.1	.1	41.20
4.8462	1	.1	.1	41.30
4.8469	1	.1	.1	41.50
4.8494	1	.1	.1	41.60
4.8592	1	.1	.1	41.70
4.8599	1	.1	.1	41.80
4.8606	1	.1	.1	41.90
4.8672	1	.1	.1	42.00
4.8774	1	.1	.1	42.20
4.8789	1	.1	.1	42.30
4.8795	1	.1	.1	42.40
4.8805	1	.1	.1	42.50
4.8807	1	.1	.1	42.60
4.8844	1	.1	.1	42.70

4.8823	1	.1	.1	42.30
4.8819	1	.1	.1	43.00
4.8933	1	.1	.1	43.10
4.8963	1	.1	.1	43.20
4.8950	2	.2	.2	43.40
4.8993	1	.1	.1	43.60
4.9051	1	.1	.1	43.70
4.9063	1	.1	.1	43.80
4.9074	1	.1	.1	43.90
4.9094	1	.1	.1	44.00
4.9169	1	.1	.1	44.10
4.9192	2	.2	.2	44.40
4.9211	1	.1	.1	44.50
4.9218	1	.1	.1	44.60
4.9297	2	.2	.2	44.90
4.9316	1	.1	.1	45.00
4.9326	1	.1	.1	45.10
4.9395	1	.1	.1	45.20
4.9411	1	.1	.1	45.30
4.9513	1	.1	.1	45.40
4.9540	1	.1	.1	45.60
4.9616	1	.1	.1	45.70
4.9622	1	.1	.1	45.80
4.9622	1	.1	.1	45.90
4.9623	1	.1	.1	46.00
4.9654	1	.1	.1	46.10
4.9721	1	.1	.1	46.30
4.9795	1	.1	.1	46.40
4.9855	1	.1	.1	46.50
4.9894	1	.1	.1	46.60
4.9922	1	.1	.1	46.70
4.9929	1	.1	.1	46.80
4.9951	1	.1	.1	47.00
5.0016	1	.1	.1	47.10
5.0053	1	.1	.1	47.20

5.0025	1	.1	.1	47.30
5.0124	1	.1	.1	47.40
5.0151	1	.1	.1	47.50
5.0168	1	.1	.1	47.70
5.0202	1	.1	.1	47.80
5.0221	1	.1	.1	47.90
5.0230	1	.1	.1	48.00
5.0247	1	.1	.1	48.10
5.0266	1	.1	.1	48.20
5.0344	1	.1	.1	48.40
5.0347	1	.1	.1	48.50
5.0350	1	.1	.1	48.60
5.0402	1	.1	.1	48.70
5.0465	1	.1	.1	48.90
5.0508	2	.2	.2	49.10
5.0536	1	.1	.1	49.20
5.0549	1	.1	.1	49.30
5.0556	1	.1	.1	49.40
5.0625	1	.1	.1	49.50
5.0634	1	.1	.1	49.60
5.0636	1	.1	.1	49.90
5.0642	1	.1	.1	49.90
5.0649	1	.1	.1	50.00
5.0660	1	.1	.1	50.10
5.0662	1	.1	.1	50.20
5.0677	1	.1	.1	50.40
5.0670	1	.1	.1	50.50
5.0731	3	.3	.4	50.80
5.0741	1	.1	.1	50.90
5.0750	1	.1	.1	51.10
5.0794	1	.1	.1	51.20
5.0804	1	.1	.1	51.30
5.0855	1	.1	.1	51.40
5.0864	1	.1	.1	51.50
5.0949	1	.1	.1	51.40

5.0936	1	.1	.1	51.90
5.1066	1	.1	.1	51.70
5.1084	1	.1	.1	52.00
5.1091	1	.1	.1	52.10
5.1110	1	.1	.1	52.20
5.1117	1	.1	.1	52.30
5.1142	1	.1	.1	52.50
5.1179	1	.1	.1	52.60
5.1187	1	.1	.1	52.70
5.1257	2	.2	.2	52.90
5.1285	1	.1	.1	53.00
5.1294	1	.1	.1	53.20
5.1334	1	.1	.1	53.30
5.1393	1	.1	.1	53.40
5.1460	1	.1	.1	53.50
5.1595	1	.1	.1	53.60
5.1695	1	.1	.1	53.70
5.1698	1	.1	.1	53.90
5.1792	1	.1	.1	54.00
5.1835	1	.1	.1	54.10
5.1909	2	.2	.2	54.30
5.1918	1	.1	.1	54.40
5.1983	1	.1	.1	54.60
5.1997	1	.1	.1	54.70
5.1999	1	.1	.1	54.90
5.2004	1	.1	.1	54.90
5.2045	1	.1	.1	55.00
5.2085	1	.1	.1	55.20
5.2117	1	.1	.1	55.30
5.2128	1	.1	.1	55.40
5.2161	1	.1	.1	55.50
5.2199	1	.1	.1	55.60
5.2207	1	.1	.1	55.70
5.2218	1	.1	.1	55.90
5.2227	1	.1	.1	56.00

5.2223	1	.1	.1	56.10
5.2314	1	.1	.1	56.20
5.2349	1	.1	.1	56.30
5.2382	1	.1	.1	56.40
5.2411	2	.2	.2	56.70
5.2524	1	.1	.1	56.80
5.2620	1	.1	.1	56.90
5.2654	1	.1	.1	57.00
5.2691	1	.1	.1	57.10
5.2691	1	.1	.1	57.20
5.2699	1	.1	.1	57.40
5.2718	1	.1	.1	57.50
5.2726	1	.1	.1	57.60
5.2727	4	.4	.5	58.10
5.2363	1	.1	.1	58.20
5.2883	1	.1	.1	58.30
5.2920	1	.1	.1	58.40
5.2930	1	.1	.1	58.50
5.2974	1	.1	.1	58.70
5.2996	1	.1	.1	58.80
5.2999	1	.1	.1	58.90
5.3025	1	.1	.1	59.00
5.3033	1	.1	.1	59.10
5.3045	1	.1	.1	59.20
5.3056	1	.1	.1	59.40
5.3112	1	.1	.1	59.50
5.3175	1	.1	.1	59.60
5.3185	1	.1	.1	59.70
5.3225	1	.1	.1	59.80
5.3245	1	.1	.1	60.00
5.3268	1	.1	.1	60.10
5.3296	1	.1	.1	60.20
5.3325	1	.1	.1	60.30
5.3333	2	.2	.2	60.50
5.3343	2	.2	.2	60.80

5.3352	1	.1	.1	60.90
5.3361	1	.1	.1	61.00
5.3371	1	.1	.1	61.10
5.3446	1	.1	.1	61.20
5.3525	1	.1	.1	61.40
5.3536	1	.1	.1	61.50
5.3553	1	.1	.1	61.60
5.3562	1	.1	.1	61.70
5.3572	1	.1	.1	61.80
5.3580	1	.1	.1	61.90
5.3638	1	.1	.1	62.10
5.3641	1	.1	.1	62.20
5.3677	1	.1	.1	62.30
5.3718	1	.1	.1	62.40
5.3774	2	.2	.2	62.40
5.3815	1	.1	.1	62.80
5.3852	1	.1	.1	62.90
5.3861	1	.1	.1	63.00
5.3862	1	.1	.1	63.10
5.3869	1	.1	.1	63.20
5.3898	1	.1	.1	63.30
5.3957	1	.1	.1	63.50
5.3967	1	.1	.1	63.60
5.3970	1	.1	.1	63.70
5.3975	2	.2	.2	63.90
5.4017	1	.1	.1	64.10
5.4113	1	.1	.1	64.20
5.4167	1	.1	.1	64.30
5.4215	1	.1	.1	64.40
5.4265	2	.2	.2	64.60
5.4343	1	.1	.1	64.90
5.4344	1	.1	.1	64.90
5.4354	1	.1	.1	65.00
5.4336	1	.1	.1	65.10
5.4336	1	.1	.1	65.20

5.4510	1	.1	.1	65.70
5.4430	1	.1	.1	65.50
5.4477	1	.1	.1	65.40
5.4511	1	.1	.1	65.70
5.4514	1	.1	.1	65.90
5.4563	1	.1	.1	65.90
5.4530	1	.1	.1	66.00
5.4775	1	.1	.1	66.20
5.4843	1	.1	.1	66.30
5.4867	1	.1	.1	66.40
5.4871	1	.1	.1	66.50
5.4903	1	.1	.1	66.60
5.4935	1	.1	.1	66.70
5.4996	1	.1	.1	66.90
5.4996	1	.1	.1	67.00
5.5021	1	.1	.1	67.10
5.5119	1	.1	.1	67.30
5.5123	1	.1	.1	67.30
5.5214	1	.1	.1	67.40
5.5227	1	.1	.1	67.60
5.5372	1	.1	.1	67.70
5.5406	1	.1	.1	67.80
5.5418	1	.1	.1	67.90
5.5443	1	.1	.1	68.00
5.5485	1	.1	.1	68.10
5.5572	1	.1	.1	68.30
5.5601	1	.1	.1	68.40
5.5714	1	.1	.1	68.50
5.5812	1	.1	.1	68.60
5.5813	1	.1	.1	68.70
5.5850	2	.2	.2	69.00
5.5856	1	.1	.1	69.10
5.5977	1	.1	.1	69.30
5.6014	1	.1	.1	69.70
5.6016	1	.1	.1	69.40

5.6102	1	.1	.1	69.40
5.6112	1	.1	.1	69.70
5.6120	1	.1	.1	69.80
5.6121	1	.1	.1	69.90
5.6130	1	.1	.1	70.00
5.6135	1	.1	.1	70.10
5.6147	1	.1	.1	70.30
5.6254	1	.1	.1	70.40
5.6261	1	.1	.1	70.50
5.6322	1	.1	.1	70.60
5.6330	1	.1	.1	70.70
5.6350	1	.1	.1	70.90
5.6390	1	.1	.1	71.00
5.6335	1	.1	.1	71.10
5.6416	1	.1	.1	71.20
5.6435	1	.1	.1	71.30
5.6439	1	.1	.1	71.40
5.6474	1	.1	.1	71.50
5.6566	1	.1	.1	71.70
5.6525	1	.1	.1	71.80
5.6533	1	.1	.1	71.90
5.6548	1	.1	.1	72.00
5.6568	1	.1	.1	72.10
5.6656	1	.1	.1	72.20
5.6724	1	.1	.1	72.40
5.6746	1	.1	.1	72.50
5.6761	1	.1	.1	72.60
5.6769	1	.1	.1	72.70
5.6918	1	.1	.1	72.80
5.6956	1	.1	.1	73.00
5.6976	1	.1	.1	73.10
5.7043	1	.1	.1	73.20
5.7060	1	.1	.1	73.30
5.7080	1	.1	.1	73.40
5.7156	1	.1	.1	73.50

5.7215	1	.1	.1	73.70
5.7246	1	.1	.1	73.80
5.7253	1	.1	.1	73.90
5.7281	1	.1	.1	74.00
5.7293	1	.1	.1	74.10
5.7351	1	.1	.1	74.20
5.7363	1	.1	.1	74.40
5.7388	1	.1	.1	74.50
5.7393	1	.1	.1	74.60
5.7447	1	.1	.1	74.70
5.7490	1	.1	.1	74.80
5.7615	1	.1	.1	74.90
5.7676	2	.2	.2	75.20
5.7755	1	.1	.1	75.70
5.7800	1	.1	.1	75.40
5.7866	1	.1	.1	75.50
5.7899	1	.1	.1	75.60
5.7982	1	.1	.1	75.80
5.7995	1	.1	.1	75.90
5.8103	1	.1	.1	76.00
5.8118	1	.1	.1	76.10
5.8222	1	.1	.1	76.20
5.8310	1	.1	.1	76.30
5.8329	1	.1	.1	76.50
5.8361	1	.1	.1	76.60
5.8399	1	.1	.1	76.70
5.8418	1	.1	.1	76.80
5.8424	1	.1	.1	76.90
5.8515	1	.1	.1	77.00
5.8696	1	.1	.1	77.20
5.8723	1	.1	.1	77.30
5.8773	1	.1	.1	77.40
5.8792	1	.1	.1	77.50
5.8872	1	.1	.1	77.60
5.8893	1	.1	.1	77.90

5.8821	1	.1	.1	77.90
5.8836	1	.1	.1	78.00
5.8924	1	.1	.1	78.10
5.8958	1	.1	.1	78.20
5.8967	1	.1	.1	78.30
5.9057	1	.1	.1	78.50
5.9136	1	.1	.1	78.60
5.9149	1	.1	.1	78.70
5.9164	1	.1	.1	78.80
5.9215	1	.1	.1	78.90
5.9223	1	.1	.1	79.00
5.9225	1	.1	.1	79.20
5.9326	2	.2	.2	79.40
5.9415	1	.1	.1	79.50
5.9444	1	.1	.1	79.60
5.9444	1	.1	.1	79.70
5.9473	1	.1	.1	79.90
5.9523	1	.1	.1	80.00
5.9556	1	.1	.1	80.10
5.9572	1	.1	.1	80.20
5.9713	1	.1	.1	80.30
5.9715	1	.1	.1	80.40
5.9741	1	.1	.1	80.60
5.9770	1	.1	.1	80.70
5.9849	2	.2	.2	80.90
5.9857	2	.2	.2	81.10
5.9859	1	.1	.1	81.30
5.9867	1	.1	.1	81.40
5.9876	2	.2	.2	81.60
5.9930	1	.1	.1	81.70
5.9962	1	.1		81.90
5.9970	1	.1	.1	82.00
6.0041	1	.1	.1	82.10
6.0069	1	.1	.1	82.20
6.0129	1	.1	.1	82.30

6.0157	1	.1	.1	82.40
6.0163	1	.1	.1	82.40
6.0165	1	.1	.1	82.70
6.0270	1	.1	.1	82.80
6.0309	1	.1	.1	82.90
6.0349	1	.1	.1	83.00
6.0377	1	.1	.1	83.10
6.0402	1	.1	.1	83.30
6.0436	1	.1	.1	83.40
6.0490	1	.1	.1	83.50
6.0491	1	.1	.1	83.60
6.0569	2	.2	.2	83.90
6.0578	1	.1	.1	84.00
6.0598	1	.1	.1	84.10
6.0604	1	.1	.1	84.20
6.0681	1	.1	.1	84.30
6.0683	1	.1	.1	84.40
6.0685	1	.1	.1	84.50
6.0692	1	.1	.1	84.70
6.0694	1	.1	.1	84.90
6.0809	1	.1	.1	84.90
6.0827	1	.1	.1	85.00
6.0838	1	.1	.1	85.10
6.0877	1	.1	.1	85.20
6.0876	1	.1	.1	85.40
6.0991	1	.1	.1	85.50
6.1011	1	.1	.1	85.60
6.1025	1	.1	.1	85.70
6.1070	1	.1	.1	85.80
6.1096	2	.2	.2	86.10
6.1123	1	.1	.1	86.20
6.1213	1	.1	.1	86.30
6.1290	1	.1	.1	86.40
6.1316	1	.1	.1	86.50
6.1319	1	.1	.1	86.70

6.1375	1	.1	.1	86.90
6.1425	2	.2	.2	87.00
6.1639	1	.1	.1	87.10
6.1747	1	.1	.1	87.20
6.1836	1	.1	.1	87.40
6.1845	1	.1	.1	87.50
6.1860	1	.1	.1	87.60
6.1933	1	.1	.1	87.70
6.1953	1	.1	.1	87.80
6.1961	1	.1	.1	87.90
6.1967	1	.1	.1	88.00
6.2107	1	.1	.1	88.20
6.2125	2	.2	.2	88.40
6.2164	1	.1	.1	88.50
6.2204	1	.1	.1	88.60
6.2232	1	.1	.1	88.80
6.2345	1	.1	.1	88.90
6.2352	1	.1	.1	89.00
6.2538	1	.1	.1	89.10
6.2577	1	.1	.1	89.30
6.2645	1	.1	.1	89.40
6.2664	1	.1	.1	89.50
6.2674	1	.1	.1	89.60
6.2828	1	.1	.1	89.70
6.2836	1	.1	.1	89.80
6.2935	1	.1	.1	89.90
6.3058	1	.1	.1	90.00
6.3136	1	.1	.1	90.20
6.3163	1	.1	.1	90.30
6.3180	1	.1	.1	90.40
6.3190	1	.1	.1	90.50
6.3276	1	.1	.1	90.60
6.3364	1	.1	.1	90.70
6.3376	1	.1	.1	90.80
6.3470	1	.1	.1	91.00

6.3499	1	.1	.1	91.10
6.3547	1	.1	.1	91.20
6.3621	1	.1	.1	91.30
6.3672	1	.1	.1	91.50
6.3710	1	.1	.1	91.60
6.3789	1	.1	.1	91.70
6.3798	1	.1	.1	91.80
6.3364	1	.1	.1	91.90
6.3921	1	.1	.1	92.00
6.3972	1	.1	.1	92.10
6.4192	1	.1	.1	92.30
6.4251	1	.1	.1	92.40
6.4271	1	.1	.1	92.50
6.4334	1	.1	.1	92.60
6.4400	1	.1	.1	92.70
6.4634	1	.1	.1	92.90
6.4642	1	.1	.1	93.00
6.4692	1	.1	.1	93.10
6.4750	1	.1	.1	93.20
6.4766	1	.1	.1	93.30
6.4825	1	.1	.1	93.40
6.4863	1	.1	.1	93.40
6.4913	1	.1	.1	93.70
6.5026	1	.1	.1	93.90
6.5243	3	.3	.4	94.10
6.5276	1	.1	.1	94.30
6.5365	1	.1	.1	94.40
6.5394	1	.1	.1	94.50
6.5440	1	.1	.1	94.60
6.5446	1	.1	.1	94.70
6.5527	1	.1	.1	94.80
6.5635	1	.1	.1	95.00
6.5703	1	.1	.1	95.10
6.5739	1	.1	.1	95.20
6.5748	3	.3	.4	95.60

6.5827	1	.1	.1	95.70
6.5863	1	.1	.1	95.80
6.5861	1	.1	.1	95.90
6.5891	1	.1	.1	96.00
6.5924	1	.1	.1	96.10
6.6160	3	.3	.4	96.50
6.6161	1	.1	.1	96.60
6.6189	1	.1	.1	96.70
6.6239	1	.1	.1	96.80
6.6331	2	.2	.2	97.10
6.6460	2	.2	.2	97.30
6.6716	1	.1	.1	97.40
6.6873	1	.1	.1	97.50
6.6902	1	.1	.1	97.70
6.7295	1	.1	.1	97.80
6.7325	1	.1	.1	97.90
6.7402	1	.1	.1	98.00
6.7421	1	.1	.1	98.10
6.8250	1	.1	.1	98.20
6.8492	1	.1	.1	98.40
6.8949	2	.2	.2	98.60
6.9382	1	.1	.1	98.70
6.9390	2	.2	.2	98.90
6.9593	1	.1	.1	99.10
7.0024	1	.1	.1	99.20
7.0083	1	.1	.1	99.70
7.0304	1	.1	.1	99.40
7.0717	1	.1	.1	99.50
7.1359	1	.1	.1	99.60
7.1436	1	.1	.1	99.90
7.2793	2	.2	.2	100.00
999.0000	132	13.4	MISSING	100.0
TOTAL	986	100.0	100.0	

FILE LIBRARY (CREATION DATE = 07 FEB 79)

MEAN	5.034	STD ERR	.070	MEDIAN	5.065
MODE	4.650	STD DEV	.968	VARIANCE	.937
KURTOSIS	-.524	SKEWNESS	-.178	RANGE	4.977
MINIMUM	2.301	MAXIMUM	7.278		
VALID CASES	854	MISSING CASES	132		

APPENDIX D

INTERVIEW SURVEY OF LIBRARY ADMINISTRATORS

A purposive sample of six library systems was identified by the principal investigator, in each of which library administrators and a sample of library professionals were to be interviewed. In one library system, the director and six staff members were interviewed, at which point the library curtailed cooperation. Among the other five systems, a total of 14 administrators were interviewed. Three of those were supervisors of branches which had no professional subordinates. The number of library systems by number of administrators replying were:

Number of Replies	Number of Library Systems
5	2
2	1
1	3

The library administrators' interviews were focused on identifying existing technologies, citing problems encountered, if any, and assessing the general acceptance of technology by their library staffs, including ways in which the administrators perceived that staff members' resistance was manifested.

The administrators' reports of size of population served ranged from 15,000 (one branch) to 850,000; while professional staff ranged from 1 to 135. The collection sizes reported were from 30 thousand to 1.2 million. Budgets were not reported by one of the branch administrators, but among those reported, the range was from $18 thousand to $7.5 million.

The six library systems reported technologies now in use. One library system included reports from two separate well-equipped centers so seven "library" reports are tabulated below.

Technology	Mentioned in Question or Volunteered	Number of Libraries Reporting	Maximum Years in Service
Microform Collection & Equipment	Mentioned (e)	7	15
Technological Aids for Service to Handicapped or Other Special Clientele	Mentioned (d)	6	20
On-Line System or Any Kind of Terminal	Mentioned (c)	5	5
Any Kind of Computerized Cataloguing	Mentioned (b)	4	4
Automated Information Storage System	Mentioned (f)	4	10
Automated Circulation System	Mentioned (a)	2	5
Telefax	Voluntered	2	5
Videotape Recorder	Voluntered	2	2
Audiovisual Equipment	Voluntered	1	2
Photocopying Equipment	Voluntered	1	-
TWX	Voluntered	1	-
Word Processing Equipment	Voluntered	1	-
Microcomputer	Voluntered	1	1
Microfilm Catalog	Voluntered	1	-

The library administrators reported relatively few problems encountered with technological innovations. The ones mentioned most were delays in deliveries of hardware and debugging by vendors and the cost of hardware. The third difficulty mentioned more than once concerned training staff to use new technology effectively. Isolated observations were recorded of equipment breakdowns, of low utilization, and of political-territorial problems.

As to the general willingness of staff to accept new ideas, no system reported unwillingness to accept, or overt non-cooperation. However, some administrators from three of the systems reported that staff demonstrated resistance to new ideas through

--negative undercurrent	(1)
--unspoken tension	(1)
--hostile, or get angry, lash out	(1)
--projects just don't go well	(1)
--passive resistance (to using new machines)	(1)
--objections to "bugs" when system first introduced	(1)

The interviews with administrators of the six library systems seemed on the whole to be very positive with respect to technology. The seven "libraries" may be fairly clearly ranked in terms of extent of use of technology at this time, with ranks 3 through 6 rather close.

The administrators' perceptions of staff expressions of some resistance to technology ranged from no such expressions reported by three library centers and a number of branch administrators to a variety of expressions reported by some administrators even though they say the staff is generally accepting of these innovations. Of the 13 administrators with subordinators, six reported some kinds of expressions of resistance by members of their staff, though some of these were a single type of expression and were qualified as being expressed by only a few people. Seven administrators reported no expressions of resentment at all. Two systems were entirely in each group, and the two systems with five responding administrators had respondents in both groups.

The number of respondents reported here from a non-random sample of library systems is, of course, entirely inadequate for generalizing. The information from these library systems suggests the general character of response that may be found from a larger survey (such as the related mail survey). These survey responses suggest some possible approaches to analysis of the associated interviews from 81 library professionals from those same libraries.