RESPONSE BEHAVIOR OF ENTREPRENEURS IN A MAIL SURVEY(*)

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ABSTRACT

As research in new and small businesses increases there is a need for increasing rigor in the area. In an effort to provide a basis for some improvement an examination of item response rates and response quality in a recent survey of new technologically oriented businesses has been done. The results show significant areas of similarity and differences between entrepreneurs and a general population. The application of response quality techniques to obtain additional information from survey data is also discussed.

INTRODUCTION

Empirical inquiry is used to observe phenomena and validate theories in new and small business research just as it is used in other disciplines. Surveys, especially those which use mailed questionnaires, represent a popular vehicle in empirical research. However, judging from published work in the new and small business area, little attention has been paid to the issues of response rate and response quality. In such disciplines as marketing and public opinion research, where surveys also play an important role, it is common practice to explicitly discuss these issues before any further work is reported. Sexton (1988) has noted that research in entrepreneurship is increasing, but that more rigor is required to bring the research up to the level existing in other disciplines.

Paying attention to response rates and biases that may result from non-responses can be considered one of the minimal
requirements for proper mail survey work (Public Opinion Quarterly 1988). However, the fact that a questionnaire has been returned does not guarantee its usefulness (Houston and Ford 1976). The advantages of this survey technique could be offset by the poor quality of answers. The respondents may omit questions partially or completely, not follow instructions in answering questions, or simply give wrong answers. Such response behavior can be a significant source of bias (Mandell and Lundsten 1978) or, on the positive side, could give researchers additional insights at no additional costs in terms of questions asked. It will be shown that findings based on these insights may, in some cases, be more reliable than direct questions.

The purpose of this study is to analyze the response behavior of founders of new, technologically oriented companies, referred to as entrepreneurs in this paper, in a mail survey. The response quality is analyzed with respect to characteristics of questions posed and characteristics of respondents. The results of the study may provide guidelines to improve response quality in empirical research on entrepreneurs. Another purpose is to compare the results of this investigation with those reported in the literature for a more general population and to identify areas for potential generalization. The primary thesis for this work is that, with respect to patterns of response to mail surveys, entrepreneurs will behave in a fashion similar to that exhibited by other subjects studied and reported in the
literature. This would be an indication for the applicability of response behavior findings from other disciplines to survey research in new and small businesses.

BACKGROUND

The majority of the research on response behavior in mail surveys is concerned with response rates and strategies to increase them (Yu and Cooper 1983). Surprisingly, only a few papers have addressed issues of response quality. Three characteristics of response quality have been previously defined (McDaniel and Rao 1980):

1. item omission rate,
2. response error, and
3. completeness of answers.

The purpose of most studies of response quality was to measure whether specific survey strategies like address personalization (Wunder and Wynn 1988), a foot-in-the-door technique (Wynn and McDaniel 1985), or sponsorship declaration (Jones and Linda 1978) can be used to increase the response quality as measured by the three variables. However, only a few techniques, such as monetary inducements (Wotruba 1966), have been found to have a significant influence. The remaining studies of response quality analyzed whether specific respondents are more susceptible to non-responses and whether certain question types lead to more omissions or poor answers (Craig and McCann 1978; Ferber 1966). The respondents were usually classified by sex, age, education,
occupation, and income. The most significant relationships were found for sex, age, and education. In the surveys analyzed female, older, and less educated respondents tended to omit more questions. Questions that required more thought provoked more non-responses. There is also some evidence that personal questions are more often omitted than other questions.

HYPOTHESES

Several hypotheses about the response behavior of entrepreneurs in a mail survey seem worth exploring on the basis of the information found in the marketing and public opinion research literature (Craig and McCann 1978; Ferber 1966). The effect of question complexity on response quality can be examined with two related hypotheses:

\[
H_{1a}: \text{Complex questions, which require more thinking from entrepreneurs, will be omitted more often than simpler questions.}
\]

\[
H_{1b}: \text{Complex questions, which require more thinking from entrepreneurs, will be answered incorrectly or incompletely more often than simpler questions.}
\]

The evidence that responses to personal questions may be omitted more often than other questions (Ferber 1966) leads to another hypothesis:

\[
H_2: \text{Answers to personal questions will be omitted more often than questions about the entrepreneur's firm or environment.}
\]
The analysis of possible effects from the variation in age of respondent seems meaningful for this sample. Other personal characteristics were either very similar for the members of the sample or, in the case of income and related factors, were not measured. Applying the findings of the literature to this sample, the next hypothesis is:

H₃: OLDER ENTREPRENEURS OMIT MORE QUESTIONS THAN YOUNGER ENTREPRENEURS.

Hypotheses H₄ to H₃ are related to the characteristics of the respondents and the questions for purposes of comparison with other, well studied populations. The next hypothesis is quite specific to the study of entrepreneurship. The generation of formal business plans is an area of particular interest in this field (Timmons 1982; Stoner 1983; Robinson and Pearce 1984). The rate of generation of business plans is not particularly high among entrepreneurs (Shuman, Sussman and Shaw 1985), but the analysis of response quality may shed some light on the completeness and depth of the process. Since the survey instrument used in this research included several questions related to the planning process, it is possible to test for a relationship between the development of a formal, written business plan and the capacity of the respondents to answer questions related to planning. This leads to a final hypothesis:
H4: ENTREPRENEURS WHO CLAIM TO HAVE HAD A WRITTEN BUSINESS PLAN OMIT FEWER QUESTIONS RELATED TO THEIR ORIGINAL PLANS FOR THE COMPANY THAN THOSE WITHOUT WRITTEN BUSINESS PLANS.

METHODOLOGY

THE QUESTIONNAIRE

The data used in this work were obtained from a survey carried out to measure and identify parameters related to the impact of social, cultural, political and behavioral factors on the entrepreneurial process. Questionnaires were mailed to senior executives of independent, technologically oriented businesses that were founded since 1980. The questions concerned areas such as respondent's and firm's background, respondent's risk attitudes, respondent's perceptions of the social and political environment, and business planning at the firm's foundation. The sampling frame was Version 2.1 of the CorpTech data base (1). This data base contained information on more than 15,000 technology based firms. Those entries which represented independent firms founded since 1980 were selected for the survey, resulting in a set of 3,000 companies (2). The survey was implemented through self-administered questionnaires which were

(1) CorpTech is a trademark of Corporate Technology Information Systems, Inc., of Wellesley, MA.

(2) Some of the data base entries represented different companies owned by one person and using a common address. Multiple mailings to these people were eliminated so far as possible.
mailed during October, 1987, and returned in the following months. No attempt was made to contact non-respondents. Two hundred fifty questionnaires were returned because of invalid addresses, and ten respondents returned the material with specific refusals to participate. A total of 576 usable responses were received. Deducting the undeliverable questionnaires from the total number mailed a response rate of 20.9% is calculated. For the work reported here only those responses were selected for which the respondent was identified as a founder or co-founder of the firm. This sample consists of 438 responses. The respondents were male (93.2%), married (80.4%), previously involved in the creation of a new venture (57.5%), and educated to the college level or beyond (90.6%). Most of the respondents (83%) were actively involved in the management of their ventures.

QUESTION TYPES

For the purpose of response quality analysis, questions used in this survey have been classified according to two different aspects shown in Table 1.

______________________________
INSERT TABLE 1 ABOUT HERE
______________________________

Generally, questions can be classified according to the required response procedure as "open," "ranking," and "checking" questions. "Open" questions are those which require a specific
piece of information, such as a number, a word or a phrase. "Ranking" questions are those which require the respondent to assign priorities to each of several alternatives, and include both forced and unconstrained types. "Checking" questions are those which require the respondent to indicate, with a check mark or a circled number, which alternative or alternatives are chosen.

Questions of the "open" and "ranking" types are considered to be complex in the sense that they require a higher level of involvement on the part of the respondent. These are the items which require more "thinking" by the respondent or retrieval of some records. On the other side "checking" questions are usually considered to be simple to answer.

A question either inquired about the entrepreneur himself or it related to his business or environment. For purposes of the present discussion the latter two subjects were considered not to be personal in nature.

QUALITY MEASURES

Response Omission

An item omission rate was calculated for the group of questions corresponding to each question type shown in Table 1. This number was obtained by counting the number of missing
responses to questions within the group and dividing by the total number of questions belonging to that group. This rate was determined for each respondent and the averages over the sample were analyzed. For these purposes an omission was considered to have occurred if no entry whatsoever was provided.

**Response Errors and Completeness**

Response errors as defined in the literature were not included in this study. Such errors can only be detected through interviews with respondents or analysis of other information related to them. However, in the interest of preserving confidentiality and increasing participation rate, the respondents' permission for such follow-up procedures was not sought. Therefore, another type of response error was defined and analyzed.

A "syntactic error" occurs when respondents disregard questionnaire instructions in responding to a question (omissions and incomplete answers excluded). Examples of syntactic errors are checking of more than one item when only one is required, or giving of identical rankings to several items within a forced ranking question. Obviously, the analysis of such errors may also lead to important discoveries. This type of error has been named "response syntax error" to distinguish it from the type of response error already defined in the literature. The response syntax error is calculated in the same way as the omission rate,
as the percentage of total answers for each question group which are erroneous.

The completeness of answers was also measured slightly differently than in the literature in order to obtain more reliable results. The literature considers only "open-end, listing-type" questions where the respondent needs "... to exhibit some time, effort and thought in his or her response." (Wunder and Wynn 1988). Applying the same philosophy in the current work, questions were included that required multiple open end responses, ranking or multiple checked answers. For example, ranking of only five factors when seven were given or citing one factor when "... the three most important ..." were required were also considered incomplete answers. Using this approach, twelve questions qualified for the completeness analysis. Other investigators have sometimes used only one question, which may limit the reliability of results they reported.

Answers which were incomplete or improper were counted and the result divided by the number of questions requiring these responses. Completely omitted responses were not included in this calculation since they were counted under the item omission rate category. The resulting fraction, called the incorrectness rate, was analyzed with respect to other factors in the survey. Response syntax errors and response completeness were not considered separately in this paper; any incorrect response
RESULTS

RESPONSE OMISSION

The average omission rate per questionnaire was 4.8%. This figure is at the lower end of the range of omission rates reported in a number of other surveys (Craig and McCann 1978). The low omission rates indicate that there was no general reluctance to answer the questions. Significantly higher omission rates on specific question groups require, therefore, specific explanations. Table 2 shows the occurrence of omitted and incorrectly answered questions as a function of question complexity. A multiple analysis of variance procedure was used to test for significance in the differences of response quality between the types of question complexity. The test result is also shown in Table 2.

The variation between the occurrence rates for complex and simple questions is different for both response quality indicators. Hypotheses \( H_{1a} \) and \( H_{1b} \) are confirmed. Entrepreneurs will answer simple, "multiple choice," questions more often and more reliably than they will respond to questions which require either information not readily at hand or making of relative
choices.

An analysis of variance procedure was also used to test hypothesis $H_2$. The questionnaire used in the survey contained seventeen questions pertaining to personal matters, ten pertaining to the business environment and forty one concerning the firm. The entrepreneurs were more likely to answer personal questions (2.1% omitted) than the "external" ones (12.0% omitted). The difference in these omission rates is significant ($p < .001$). These results do not support hypothesis $H_2$. It should be noted that the personal questions included in the questionnaire were designed to be non-threatening and, therefore, were often not as specific as questions used in the literature cited above (Craig and McCann 1978; Ferber 1965). In addition, the non-personal questions contained most of the complex questions so that the higher omission rate for these questions may result from that fact. It is also probable that the characteristics of entrepreneurs are such that they will respond differently to personal and business related questions. As success oriented business people these respondents may be much more willing to discuss their personal situations than respondents drawn from a general population. Thus the response to the traditional "personal" and "non-personal" questions will be different for the entrepreneurs that for the general population.
In order to test hypothesis $H_3$, a Pearson moment correlation between the item omission rate and age of the respondent was calculated. The results showed that a correlation exists ($p = .029$), but the effect is weak ($r = .091$). Hypothesis $H_3$ is supported by the data.

Five questions specifically addressed planning activities. One of them directly inquired about the existence of a business plan. The respondents were grouped into "planners" and "non-planners" on the basis of the answer to this question:

When you started your current venture did you have a written business plan?  
No  Yes  pages.

For the purpose of this analysis those respondents who checked a "Yes" answer were designated "planners", those who checked "No" were "non-planners" and those who did not answer the questions were not considered. A majority (53.7%) of the respondents reported having a written business plan at the beginning of their current venture. The omission rate of four other questions relating to the initial plans for the venture was analyzed in relationship to the "planner" status. The "planners" averaged a 3.4% omission rate for these questions while the "non-planners" omitted an average of 10.6% of the planning questions. Student's $t$ test showed a significant difference in the groups ($p < .001$). Hypothesis $H_4$ is supported; entrepreneurs who report having developed a business plan tend to answer other, planning related
questions more often than those who report not having plans.

The individual omission rate on all five planning questions may be used as an indication of the real planning effort undertaken by entrepreneurs. The existence of a written business plan is considered important in the entrepreneurial process, but many entrepreneurs operate without one (Shuman, Sussman and Shaw 1985). This finding of the present work shows that those entrepreneurs who did not write a business plan are quite aware of the importance of planning activities. This finding can be utilized in consequent analyses. For example, if the relationship between planning effort at the beginning of the venture and later performance levels is being analyzed, the impact of the total planning function can be assessed. This permits an assessment of the impact of the written business plan vs. the activities of those entrepreneurs who do not "write it down." Some entrepreneurs may have given a lot of detailed thought to their start-up without creating a very formal business plan. This situation can be ascertained by analysis of the quality of response to indirect questions and can show that their performance is related to an informal planning process. This example demonstrates how analysis of response quality can provide additional information and enhance other research work.
This paper has attempted to draw the attention of researchers of new and small businesses to the issue of response quality. Item response rates observed in this study indicate that founders of new, technologically oriented businesses are not reluctant to share information with researchers, but specific data may not be accurately reported or needs to be carefully treated due to a lower response quality. This situation occurs when the entrepreneur is asked for information which is not readily available or when question structure requires too much thinking time for an answer.

Specifically, it seems that entrepreneurs do not like to directly rank items. It is better to have them circle values for different items and then calculate a ranking, although this may not have exactly the same effect or yield the same results. Instead of open questions where a numerical response which falls into a specific range is required, alternative answers should be given so that the right number or range can be circled or checked. Complete elimination of open questions is not recommended since studies in public opinion research have shown that both open and closed questions have their advantages and disadvantages.

This study indicates that entrepreneurs' behavior is not
much different from that of the general population with respect
to the quality of response to certain types of questions in mail
surveys. This is an important result because it allows
researchers in new and small businesses to draw upon the rich
knowledge and extensive experience in survey work of marketing
and public opinion researchers. The study also shows that
entrepreneurs behave differently when questions which address the
essence of the entrepreneur are involved. This result permits
future researchers to determine the boundaries of and shed
additional light on the entrepreneurial process. We hope that
the other researchers in the field of new and small business will
analyze and report response quality in their surveys. Analyses
of the type discussed here could then be extended to other parts
of the population of new and small business founders, managers
and owners, resulting in increased precision of results and new
insights into the entrepreneurial process.

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### TABLE 1
Classification of Question Types

<table>
<thead>
<tr>
<th>Question Category</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complexity</td>
<td>Complex, Simple</td>
</tr>
<tr>
<td>Subject</td>
<td>Personal, Non-personal</td>
</tr>
</tbody>
</table>

### TABLE 2
Average Response Rates

<table>
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<tr>
<th>Quality Measure</th>
<th>Question Complexity</th>
<th>MANOVA p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omission</td>
<td>Complex</td>
<td>.201</td>
</tr>
<tr>
<td></td>
<td>Simple</td>
<td>.036</td>
</tr>
<tr>
<td>Incorrectness</td>
<td>Complex</td>
<td>.278</td>
</tr>
<tr>
<td></td>
<td>Simple</td>
<td>.040</td>
</tr>
<tr>
<td>Count</td>
<td>14</td>
<td>54</td>
</tr>
</tbody>
</table>
MARKETING PLANNING AND RESEARCH
AMONG HIGH TECHNOLOGY ENTREPRENEURS

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ABSTRACT

Although adequate marketing planning and analysis are usually considered to be important activities for any operating company, and are especially critical for new companies, many new, technology based companies do not engage in these activities. An extensive survey of such firms shows that these entrepreneurs rely on their visceral judgments about as often as they engage in formal planning. Their view of formal marketing research is positive and varies in intensity with their involvement in the formal planning process.

The effect of the external financing on the frequency of formal planning is dramatic. Those firms reporting the use of external financing are much more concerned with both business and marketing planning than those which use only internal capital. The pattern of responses to marketing research probes is interesting and yields some insight into the marketing perspectives of the technologically oriented entrepreneur.

INTRODUCTION

The relationship between the formal planning process and the success of business enterprises is an interesting area for study. The association has been discussed in the literature (Bresser and Bishop 1983; Quinn 1980; Shrader, Taylor and Dalton 1984) but the strength of the relationship is not clear. The subject is interesting to investigators studying both established businesses and the start up enterprises associated with entrepreneurship. In the latter case, the relationship should be easier to define since the principals who started the firm and who were involved in initial planning and research may be available and can provide direct information. Further, the results of peripheral influences, such as initial financing methods, are easier to determine for new firms than for those which have been in business for a substantial period of time. This study focuses on the planning behavior of technologically oriented start up companies and investigates the relationship
between this behavior and the growth rates of the firms. The effect of initial financing methods are analyzed and the differences among several external financing methods is explored. Entrepreneurs' attitudes toward formal marketing research, which should be a crucial element of the planning process, are also examined.

Planning

Careful analysis of the business environment and the creation of formal business and marketing plans are usually considered to be basic to the development of sound business strategy (Holt 1987). In fact, the normative academic literature teaches that the development of detailed business and marketing plans is a necessity for the establishment of a new business, if not the essence of entrepreneurship (Burch 1986; Robinson and Pearce 1984; Stoner 1983). Observation of the actual behavior of businesses, however, shows that practice is somewhat at variance with this theoretical perspective (Andrus et al. 1987; Schwab 1975). This does not suggest that any business is begun or operated without some sort of plan, only that the process may be very informal in many instances. Some studies (Teach, Schwartz and Tarpley 1987) indicate that the frequency with which formal planning occurs may vary with the type of business involved; technologically oriented business ventures may be more inclined to make use of the formal process than those involved with other types of endeavors.

Although all technologically oriented firms do not exhibit high growth rates, they offer the potential for substantial growth (Cooper 1987). The rates of growth realized can be associated with many factors, of course, but it has been argued that the size to which a firm will grow is heavily dependent upon its initial organization, direction and background (Birley 1984). This framework leads to an expectation that the growth rates realized by technologically oriented firms are related to the inclination of the founders to undertake a formal planning process.

A consideration of the characteristics and requirements of external sources of capitalization for the embryonic firm suggests that the method of initial financing may be correlated with the use of the formal planning process. Venture capitalists assert that an entrepreneur must have a sensible, promising, written business plan in order to qualify for financing of this type (Gladstone 1983). The authors' personal experience in arranging financing through the avenue of industrial partners indicates a similar requirement for this avenue. Banking relationships may be more flexible since they tend to
be on a more personal basis, but available literature still indicates an emphasis on planning (Howard 1987). Individual investors’ requirements are not as well documented (Henderson 1988). Certain types of financing, such as government programs and the public stock markets, have legal requirements and formats for plans, but the existence of these is probably not indicative of the entrepreneurs’ planning proclivities.

Although research and planning are fundamental to the process of strategy development (Holt 1987), these activities are not always pursued in a systematic manner. The experiences reported by other researchers suggest that a correlation between planning and successful venture initiation may exist (Andrus et al. 1987). Other sources indicate that planning may not be perceived as being important to the entrepreneurial experience (Andrus et al. 1987; Schwab 1975). Technologically oriented entrepreneurs usually have significant formal education and are trained in systematic methods of operations, so they might be expected to make extensive use of the formal planning process.

Marketing Research

A major tool for the proper development of a planning framework and for the successful execution of any new enterprise is marketing research (Hills 1984). Technological entrepreneurs, however, seem to be much more interested in the technical superiority of their product(s) than they are in the marketplace characteristics (Cooper 1986). Models for the development of marketing functions, including the proper use of marketing intelligence, have been developed (Job 1983). There is still a suspicion, however, that entrepreneurs do not place a very high value on formal marketing research (Hills 1984). The importance attached to this information may be related to other factors and activities of the enterprise founders.

The value placed on marketing research may be different for those entrepreneurs who have a high degree of confidence in the success of their ventures. For instance, Edwin Land, who founded Polaroid Corporation, felt that the market research was useful only for evaluating an existing market, not for judging an entirely new concept (Quinn, 1988). It has been shown (Cooper, Dunkelberg and Woo 1988) that most entrepreneurs do have intense confidence in the success of their ventures, but this self perception is not universal. One might expect that an entrepreneur whose confidence level is not especially high would place more value on marketing research as a means of increasing the venture’s chance for success.
The role of marketing research in the planning process is well known (Timmons 1985). Those entrepreneurs who are involved in the formal planning process might be expected to hold marketing research in higher esteem than those who do not use written plans. The value placed on formal research, however, may vary from that accorded the general concept of knowledge of the firm's market. The entrepreneur may believe that formal research has more value for impressing financial sources than for the information gathered. Formal marketing research may not appear to be worth its cost, especially to the entrepreneur who operates without written business or marketing plans.

Several of the issues raised in the above discussion are of interest to those venture capitalists who provide the financing for entrepreneurs (Hills 1984). These financiers are quite knowledgeable about the entrepreneurial process, of course, and make a point of trying to understand the entrepreneurs and their perspectives. They require the development of comprehensive and detailed plans in order to consider the potential of a particular venture, but the final decision is based on the apparent capabilities of the lead entrepreneur (Gladstone 1983). Given their emphasis on this insight, the venture capitalists should have an excellent understanding of the way entrepreneurs view the value of formal marketing research.

Against this framework, a research project to gain some insight into the frequency of formal business and marketing planning among technological entrepreneurs was conducted. The issues discussed here and in the literature lead to a general theme for the investigation.

Technologically oriented entrepreneurs would be expected to be more inclined to carry out formal planning processes than non-technological entrepreneurs. There should be a relationship between the propensity to develop written marketing and business plans and the growth achieved by technologically oriented start up companies. Methods of initial financing should have an effect on the planning propensity. Since these entrepreneurs may be product and technology oriented, they should not place much value on formal marketing research.

These premises were investigated by testing the following hypotheses:
Technologically oriented start up enterprises which experience higher growth rates are started by entrepreneurs who develop written marketing and business plans before the enterprise is initiated.

Entrepreneurs using external sources of financing will exhibit a greater propensity to develop formal business and marketing plans than that shown by entrepreneurs who do not use these sources.

Entrepreneurs using equity financing sources will exhibit a greater propensity for formal planning than those who use debt sources.

Technologically oriented entrepreneurs do not attach much importance to formal marketing research.

The importance which technologically oriented entrepreneurs attach to formal marketing research is correlated with their confidence in the success of their enterprises.

Entrepreneurs who develop written marketing or business plans are more favorably disposed toward marketing research than those who do not.

Venture capitalists can predict the entrepreneurs' attitude toward formal marketing research.

METHODOLOGY

Sample Description
The data used to test the hypotheses were gathered through a survey of senior executives of high technology companies. The sampling frame was Version 2.1 of the CorpTech database. This data base contained information on more than 15,000 technology based firms. Those entries which represented independent firms founded since 1980 were selected for the

CorpTech is a trademark of Corporate Technology Information Systems, Inc., of Wellesley, MA.
survey, resulting in approximately 3,000 companies. The survey was implemented through self-administered questionnaires which were mailed during October, 1987, and the responses were recorded as they were received. No attempt was made to contact non-respondents, although the questionnaires were numbered in order to allow for potential follow-up. Approximately 250 questionnaires were returned because of invalid addresses, and ten respondents returned the material with specific refusals to participate. A total of 576 responses were received, representing a response rate of approximately 19%. For the work reported here those responses which indicated founding dates of 1981 or later, and for which the respondent was identified as an owner or owner-manager and a founder or co-founder of the firm were selected. This sample consists of 362 responses. The geographic distribution of the respondents is shown in Table 1.

| Table 1 |
|-----|-----|-----|-----|-----|
| CA 107 | AZ 11 | UT 6 | ME 2 |
| TX 29 | NJ 11 | WI 5 | AL 1 |
| MA 23 | PA 9 | NH 4 | DC 1 |
| NY 21 | MI 8 | IA 3 | HI 1 |
| IL 19 | OH 8 | MO 3 | LA 1 |
| CO 13 | OR 8 | NM 3 | NE 1 |
| CT 12 | GA 6 | OK 3 | SD 1 |
| FL 12 | MN 6 | TN 3 | VT 1 |
| WA 12 | NC 6 | ID 2 |

The majority of the respondents (67%) identified themselves as being in a computer or computer-related industry and another 15% were identified as manufacturers. The firms were rather small; 97% of the respondents reported employee counts of 100 or fewer, and 95% reported annual sales volumes of $10 million or less.

(2) Some of the data base entries were different companies owned by one person and using a common address. Multiple mailings to these were eliminated as far as possible. Also, companies with addresses in Virginia and Maryland were eliminated since these had been used in a pilot study.
On a personal level the respondents described themselves as male (93%), average age 43, married (77%), and parents of two or three children (52%). They are experienced entrepreneurs; 58% were involved in the creation of another venture. They are well educated; 55% reported an education which included graduate school. Prior to entering the current venture, 50% of the respondents had worked for another firm in the same industry as the present company, while 30% had worked in a different industry.

Analysis Procedure
The responses to several particular questions on the questionnaire were used to test the hypotheses. These questions are given in the appendix. Two specific questions, designated P1 and P2 in the appendix, were asked with regard to the development and use of formal, written business and marketing plans. In the actual questionnaire these two questions did not occupy adjacent positions but were placed among other questions specifically designated as relating to risk and planning or marketing. Those respondents who answered at least one of these questions in the affirmative are called "planners" in this paper. Those who answered both questions negatively are called "non-planners", while those who did not answer the questions were not considered.

The most recent annual sales volume was obtained from the answer to question G1. This number, together with the age of the firm, was used to estimate an average compound growth rate. The estimate was made on a monthly basis, using the time period between the reported founding of the firm and October, 1987. For those firms which had been in business for a year or more, the reported sales volume was divided by 12 to get a monthly average. It was assumed that those which had less than a full year's history were reporting total sales to date, so the reported figure was divided by the age of the company in months. The estimated monthly growth rate obtained in this manner was used to investigate the relationship between the growth rate of technologically oriented start ups and the formal planning process.

The confidence level of the entrepreneur was measured by the responses to questions S1, S2 and S3. An overall index of the confidence level was calculated from the responses to the S2 and S3. The value of this index was obtained by dividing the answer to S3 by the answer to S2. This value represents the entrepreneur's perception of his or her chance of success relative to that of someone with a "business like yours." It was used to investigate the relationship between the entrepre-
neur's level of confidence in the success of the venture and his or her valuation of formal marketing research and planning.

Information on the sources of initial financing was obtained from responses to question F1. For purposes of this study, only the responses to the USED column were considered. Those respondents who marked the USED column for venture capitalists, individual investor, industrial partners or banks were classified as having used external financing. Variations among the individual types of financing were also investigated. Where questions of debt and equity financing arose, those respondents who used bank financing were assumed to be debtors, while those using venture capital were assumed to be selling equity. Financing by individual investors and industrial partners was not considered in these specific cases because of the varied nature of the individual situations.

Attitudes toward marketing research were obtained from responses to questions MR1 through MR6. The directionality of MR4 is opposite to that of the other statements, so this variable was recoded to reverse its directionality. A summary index, composed of the mean of the above six responses, was computed and used as a proxy for the entrepreneur's overall attitude toward the value of formal marketing research.

RESULTS

Planning

The data from this research do not show an overwhelming emphasis on planning functions by technologically oriented entrepreneurs. Of the 358 respondents who could be classified as "planners" or "non-planners", half (50.0%) reported the development of a formal plan before initiating the present venture; of these, 93.9% had developed a written marketing plan and 83.8% had generated a written business plan. Most (77.8%) of the "planners" reported the development of both marketing and business plans, while 16.2% claimed the use of a marketing plan only. The apparent emphasis on marketing is somewhat surprising given the nature and background of the respondents. The frequency of occurrence of planning reported by the sample confirms that reported in the literature (Shuman, Sussman and Shaw 1985).

Sales volume and month and year of foundation were reported by 301 firms in the sample. The average monthly growth rate was 27.4%. Student's t test was used to test the significance of the influence of planning on this growth rate.
Those firms which had developed written business or marketing plans prior to the start of the venture grew significantly (p = .013) more rapidly than those who did not. The "planners" grew at a mean estimated monthly growth rate of 32.5% while the "non-planners" grew at a mean rate of 22.2%. Thus hypothesis H1 is supported; new technologically oriented companies with a formal plan grow more rapidly than those operated in a more intuitive manner. To whatever degree high growth is a proxy for success (Teach, Schwartz and Tarpley 1987), this result suggests that higher degrees of success are achieved by entrepreneurs who carry out a formal planning process.

Respondents to the survey were asked to indicate sources of initial financing used during the formation of their ventures. Nearly all of the respondents (92%) indicated that they had used their own money in the initiation of their ventures, while 24% reported financing from family and friends. The major external sources of financing were banks, venture capitalists, individual investors and industrial partners. The distribution of this financing is shown in Figure 1.

![Figure 1](image)

The emphasis placed on business planning by financing sources (Gladstone 1983) indicates that a different behavior may be expected on the part of those entrepreneurs who use external sources of financing. The "planning" responses were
crosstabulated with the "external financing" responses to examine the joint probabilities for correlation. The results are shown in Table 2. The entrepreneurs who used external sources of financing were more likely to have developed a written marketing or business plan than those who were not externally financed. Chi-squared analysis of these proportions show a significant ($p = .0000$) difference between the distributions. Hypothesis $H_2$ is supported.

| External Financing | Formal Plan | | | |
|--------------------|-------------|-----------------|-----------------|
|                    | No          | Yes             | Margin          |
| No                 | 64.1%       | 35.9% ($^1$)    | 55.3%           |
|                    | 70.9%       | 39.7%           |                 |
| Yes                | 32.5%       | 67.5%           | 44.7%           |
|                    | 29.1%       | 60.3%           |                 |
| Margin             | 50.0%       | 50.0%           | 100.0%          |

External sources of financing vary among themselves in many ways, so it is reasonable to expect some variation in the planning activities shown by users of the various sources. Many factors contribute to the differences among financial sources, including the method of providing financing. Venture capitalists tend to purchase equity in the new venture while banks prefer to participate in debt financing. Individual investor and industrial partner financing may be of either type or may be mixtures of both. A large fraction of the firms (44.2%) reported using one of the four types of external financing investigated. Two thirds of these qualified as "planners", but the distribution of planning activities among firms using different financing sources varied. The distribution is summarized in Figure 2. The venture capital financed firms had the largest percentage of "planners" (87.5%), while only two thirds of those firms obtaining initial financing from banks are classified as such.

$^1$ These figures are to be read as "35.9% of the respondents who did not use external financing did have a written plan; 39.7% of those who had a written plan did not use external financing."
Variations related to the financing sources which usually provide equity financing, venture capitalists, and those which usually use debt, banks, were investigated. The responses of the 96 entrepreneurs who used either equity or debt but not both were analyzed for differences. Debt financing was used by 76% of this group while 24% used equity sources. Chi squared analysis, using Yates' correction, of the data shows that the frequency of planning is not significantly different (p = .0889) between the two groups, so $H_3$ is rejected.

A better understanding of the relationships between technologically oriented entrepreneurs who carry out a formal planning process culminating in written marketing and business plans, high growth firms, and external financing sources is provided by these results. Further work will be needed to examine the relationships between financing and growth in frameworks that are not specifically technologically oriented.

**Market Research**

In order to investigate the entrepreneurs' perception of the value of formal marketing research to their businesses, the executives sampled in the survey reported here were asked to express their interest in marketing research by reacting to the statements given in the appendix as items MR1 through MR6.
Their responses were analyzed on a statement-by-statement basis and on a summary basis using the index described. The mean scores obtained are given in Table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR1</td>
<td>3.1</td>
<td>1.7</td>
<td>353</td>
</tr>
<tr>
<td>MR2</td>
<td>3.8</td>
<td>1.7</td>
<td>354</td>
</tr>
<tr>
<td>MR3</td>
<td>4.0</td>
<td>1.8</td>
<td>354</td>
</tr>
<tr>
<td>MR4</td>
<td>4.2</td>
<td>1.4</td>
<td>354</td>
</tr>
<tr>
<td>MR5</td>
<td>3.7</td>
<td>1.4</td>
<td>353</td>
</tr>
<tr>
<td>MR6</td>
<td>3.7</td>
<td>1.3</td>
<td>351</td>
</tr>
<tr>
<td>INDEX</td>
<td>3.8</td>
<td>1.1</td>
<td>355</td>
</tr>
</tbody>
</table>

Scores of greater than four indicate agreement with a negative statement, thus larger scores indicate lower degree of importance associated with a particular perspective on marketing research. The mean value of the summary index is more than two standard errors less than the neutral value of four, indicating that the entrepreneurs held a significantly (p < .05) favorable attitude toward marketing research. On an item-by-item basis the respondents held that market potential analysis is important (MR1), intuition is not a primary source of market potential estimates (MR2), and marketing research does not too often kill a good idea (MR5) or support a bad one (MR6), but they believed that professional marketing research is not worth the cost (MR4). On the question of the primary use of marketing research to impress financial sources the responses were neutral. Hypothesis H4 is not supported.

A Pearson's correlation analysis of the relationship between the summary marketing research index and the growth rate achieved by the sampled ventures shows that no significant (p = .052, r = -.0943) relationship exists. This is an interesting result in light of the finding that the entrepreneurs' propensity for formal planning correlated with the growth rate achieved.

It seems reasonable that entrepreneurs who perceive their endeavors as containing significant risk might be inclined to value formal marketing research as a method of reducing their exposure. Conversely, entrepreneurs who express a high degree of confidence in the success of their ventures may not perceive
marketing research as being valuable to them. The entrepreneurs surveyed for this work perceived their chances for success as being higher than the chances for success of another business in the field. The respondents estimated their chances for success as an average of 74.1% compared to a mean 43.3% chance for "a business like yours". Although both of these mean values are lower than the corresponding values of 81% and 59%, respectively, reported by Cooper, Dunkleberg, and Woo (1988), the general behavior reported by these authors is confirmed. A relative confidence level was calculated for each of the 341 respondents who answered both questions. The distribution of the levels less than or equal to ten are shown in Figure 3; thirteen respondents' levels exceeded ten, including two with values of greater than 99. The mean of the level values is 4.0, but the pronounced skew in the distribution may make this number misleading. A Pearson correlation coefficient calculation showed no significant correlation ($p = .330, r = .0241$) between the expressed confidence level and the summary marketing research index. This result is unexpected, but may be at least partly explained by a difference between lack of expressed confidence and perception of risk. Hypothesis $H_2$ is not supported by this research.

A comparison of the attitudes toward the value of formal marketing research between those respondents who produced written marketing or business plans and those who did not shows
a significant difference. Table 4 shows a comparison of the means and the significance produced by a Student's t test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>&quot;Plan&quot; Mean</th>
<th>&quot;No Plan&quot; Mean</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR1</td>
<td>2.6</td>
<td>3.7</td>
<td>.000</td>
</tr>
<tr>
<td>MR2</td>
<td>3.5</td>
<td>4.2</td>
<td>.000</td>
</tr>
<tr>
<td>MR3</td>
<td>3.8</td>
<td>4.1</td>
<td>.062</td>
</tr>
<tr>
<td>MR4*</td>
<td>4.1</td>
<td>4.4</td>
<td>.067</td>
</tr>
<tr>
<td>MR5</td>
<td>3.6</td>
<td>3.9</td>
<td>.032</td>
</tr>
<tr>
<td>MR6</td>
<td>3.6</td>
<td>3.8</td>
<td>.215</td>
</tr>
<tr>
<td>INDEX</td>
<td>3.5</td>
<td>4.0</td>
<td>.000</td>
</tr>
</tbody>
</table>

The mean values of the variables MR1, MR2, MR5 and the summary index are significantly different between the two groups. The differences in the mean values of variables MR3 and MR4 are significant only to the 0.10 level, while the mean values of MR6 show no significant difference. The lower mean values reported by the "planners" signify that these respondents were more positively inclined toward marketing research. Of particular interest are the results for variable MR3, which represents the responses to the statement concerning the primary use of formal market research to impress financial sources. The "planners" scores indicated disagreement with the statement, implying a perception of serious value of marketing research. Since there is a high degree of correlation between the "planners" and entrepreneurs using external sources of financing, this result is unexpected. A direct t test analysis of the difference in variable MR3 scores between entrepreneurs using external financing and those not using such sources showed that the externally financed respondents had higher regard for the serious use of formal marketing research information. Those entrepreneurs who did not use external sources of financing were more inclined to believe that the primary purpose of marketing research was to impress financial sources. This research supports hypothesis H₄.

To conclude this analysis, consideration is given to the venture capitalists' perception of the role of formal marketing research in the entrepreneurial process. Hills (1984) analysed the venture capitalists' view of several facets of the process and reported their impression of the value entrepreneurs place
on marketing research. A comparison between relevant parts of the measurement instrument used by Hills and the one used in the present work is shown in the appendix. The differences in wording reflect the different survey subjects. Questions shown in the appendix are worded to be internally consistent; actual questionnaire statements had reverse directionality in some cases.

The mean values of the scores obtained in the two studies are shown in Figure 4. As noted above, large numerical scores indicate less favorable attitudes toward the value of formal marketing research. In all cases the venture capitalists believed that the entrepreneurs would have less confidence in marketing research than the entrepreneurs claimed to have. Hypothesis H1 is rejected and the alternative hypothesis is supported. However, these results must be interpreted with caution since the present sample is composed of technologically based entrepreneurs, most of whom were not involved with venture capitalists, while Hills' study of venture capitalists did not focus on technologically oriented entrepreneurs. It is indicative, however, that a gap in understanding may exist between the entrepreneur working with a market and the venture capitalist who finances the operation.
CONCLUSIONS

This research shows the relationship between formal marketing and business planning, the growth rate achieved by new, technologically based companies and method of financing these companies from a new perspective. It is shown that, although planning among technologically oriented entrepreneurs is not universal, a strong correlation exists between those companies which have developed marketing and business plans and those with high growth rates. The influence of external financing sources on the propensity for planning is also shown. The implications for practitioners of these relationships are clear; entrepreneurs who desire to create technologically based enterprises with high growth potential should develop a formal business plan.

The research shows that technologically based entrepreneurs do value information obtained from formal marketing research. Their perception of this value is greater than anticipated by the venture capital community. The positive correlation between the entrepreneurs' inclination to develop formal business plans and the value placed on formal marketing research is shown.

REFERENCES


Quinn, James Brian (1980), Strategies for Change: Logical Incrementalism, Homewood, IL: Richard C. Irwin, Inc.


APPENDIX

Survey Questions Used in This Research

PLANNING

P1. When you started your current venture did you have a written business plan? 
   ___ No ___ Yes ___ pages.

P2. When you started your current venture, did you have a written marketing plan? 
   ___ Yes ___ No

SIZE AND GROWTH

G1. What was the status of your company at the end of the most recent year of operation? 
   
   Dollar Sales Volume ___

SUCCESS FACTORS

S1. What do you consider to be the most important measure of the success of your new endeavor? 
   ...

S2. With respect to this measure what, in your opinion, are the chances for a business like yours being successful? 
   ___% 

S3. With respect to this measure what, in your opinion, are the chances of your business being successful? 
   ___%
FINANCING

F1. There are several ways in which you might have obtained initial financing for your venture. Please indicate which sources you considered, contacted, and used.

<table>
<thead>
<tr>
<th>Considered</th>
<th>Contacted</th>
<th>Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venture Capitalists</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Investment Clubs</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Institutional Funds</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>My Own Money</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Family &amp; Friends</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Individual Investor</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Industrial Partners</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Banks</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Public Stock Market</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Government Programs</td>
<td>______</td>
<td>______</td>
</tr>
</tbody>
</table>

MARKETING RESEARCH

Please circle the number which best represents your feeling for each of the statements given below:

MR1. It is not usually necessary to place much importance on in-depth market potential analysis (surveys, etc.) for new products (or services).

MR2. One can usually rely primarily on one's own intuitive, informal "feel" for estimating market potential for a new product.

MR3. Formal market research is usually used to impress financial sources rather than to seriously use the information.

(4) In the actual questionnaire each statement was followed by a numerical scale running from 1 to 7. The number 1 was labelled "Strongly Disagree", number 4 "Neutral", and number 7 "Strongly Agree".
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>It is not usually necessary to place much importance on in-depth market potential analysis</strong> (surveys, etc.) for new products (or services).</td>
<td><strong>Entrepreneurs do not place much importance on in-depth market potential analysis.</strong></td>
</tr>
<tr>
<td>2. <strong>One can usually rely primarily on one's own intuitive, informal &quot;feel&quot; for estimating market potential for a new product.</strong></td>
<td><strong>Entrepreneurs primarily rely on their intuitive &quot;feel&quot; for estimating market potential.</strong></td>
</tr>
<tr>
<td>3. <strong>Formal market research is usually used to impress financial sources rather than to seriously use the information.</strong></td>
<td><strong>Entrepreneurs who have an in-depth market analysis usually do so to impress financial sources rather than to use the information themselves.</strong></td>
</tr>
<tr>
<td>4. <strong>Having professional market research done to evaluate new products is not usually worth the added cost.</strong> <em>(Directionality changed for comparison.)</em></td>
<td><strong>Entrepreneurs do not usually consider market potential analysis from professional marketing researchers to be worth the added cost.</strong></td>
</tr>
</tbody>
</table>