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ENTREPRENEURSHIP AND SMALL-ENTERPRISE DEVELOPMENT

SECOND ANNUAL REPORT

Submitted to

**The United States Agency for International Development
Washington, D.C. 20523**

By:

**McBer and Company
137 Newbury Street
Boston, Massachusetts 02116**

March 25, 1986

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INTRODUCTION

The Entrepreneurship and Small Enterprise Development Project, financed by the United States Agency for International Development (USAID) is a four-year effort with three main goals: to identify the personal characteristics that help facilitate success in entrepreneurs in developing countries; to develop methods for selecting entrepreneurs with high-success potential; and to develop improved methods of training existing and potential entrepreneurs. The project is intended to improve the state of the art in selecting and training entrepreneurs. The project is assisted by collaboration from the ILO and UNIDO, and by the advice of a Technical Review Committee organized by the National Science Foundation (NSF). On-site experimentation has taken place in a minimum of three countries in Asia, Latin America, and Africa.

The basic strategy of this project is to investigate the personal entrepreneurial characteristics (PECs) that facilitate entrepreneurial success, using the resulting knowledge to develop better ways to select and train entrepreneurs in developing countries. The project encompasses four main tasks:

- Task I: Conduct research to identify and validate PECs that facilitate entrepreneurial success in developing countries.
- Task II: Use the PECs to identify and develop selection instruments (surveys, tests, interview procedures, application forms) that can be used to screen potential entrepreneurs.
- Task III: Identify and assess behavioral training approaches that can be used to improve entrepreneurial effectiveness.
- Task IV: Disseminate the project's findings to interested groups around the world, through publications and annual network meetings.

The project is being implemented collaboratively by McBer and Company, of Boston, Massachusetts, and Management Systems International, of Washington, D.C. (hereafter referred to in this report as McBer and MSI, respectively). McBer is responsible for Tasks I and II, and MSI, for Task III. Task IV is a joint responsibility.

This report covers activities performed by McBer, under Tasks I, II, and IV, for the period from October 1, 1984 through March 1, 1986. The activities performed by MSI will be covered in a separate report.

In this report we will make reference to several other documents prepared for this project:

Entrepreneurship and Small Enterprise Development: First Annual Report, November 2, 1986.

Entrepreneurship and Small-Business Development: Further Analyses of Phase I Data (Report prepared by Dr. Joseph DuCette, February 28, 1986, and included as Attachment A)

Manual for Selection and Impact Measures, August, 1985.

The report begins with an overview of main project activities and results over the past seventeen months. This is followed by a systematic discussion of project activities for each of the main project tasks that were identified in the project's First Annual Report. We then discuss some changes in the project's direction, that were recommended by USAID and the project's Technical Review Committee. We then present a work plan for the remainder of the project.

OVERVIEW OF PROJECT ACTIVITIES AND RESULTS

Since the submission of the First Annual Report, significant progress has been made on all four of the major tasks for this project.

Task I, Identifying and Validating Personal Entrepreneurial Characteristics, was essentially completed. The required number of interviews with successful and less successful entrepreneurs in Ecuador, India, and Malawi, were conducted, transcribed, and, if necessary, translated. Half of the interviews in each country were subjected to a process of thematic analysis, to identify competencies (PECs) and more specific indicators of each competency. Next, a sample of transcripts from each country were systematically coded to identify the number of times each competency occurred in each transcript. The results of the coding were then subjected to statistical analysis to determine whether there were significant differences between successful and less successful entrepreneurs, among entrepreneurs in the three countries, and among entrepreneurs in different types of businesses (manufacturing, marketing/trading, and service). Additional, secondary data analyses were also performed.

On the basis of the results, a core set of 13 competencies was identified to serve as the basis for selection instruments and entrepreneurial training modules. Two additional PECs, Achievement Motivation and Pre-startup Association with Other Entrepreneurs, were added on the basis of research outside of this project.

Later, following a Project Review Meeting in December, 1985, additional statistical analyses were performed to further clarify the relationships among PECs, entrepreneur background variables, and entrepreneur business variables.

Identification of the core PECs permitted substantial progress on Task II, Developing and Validating Selection Instruments Based on the PECs. Five different selection instruments were developed, together with a manual providing detailed instructions on administration and scoring of each instrument.

Three of the instruments were developed to assess the 13 core competencies. The first, the Focused Interview, is a simplified version of the Behavioral Event Interview that was used in the research for Task I of this project. Another instrument, the Self Rating Questionnaire, provides for self ratings on behaviors associated with each of the core competencies. The Business Situations Exercise presents a series of hypothetical situations an entrepreneur might face, together with pairs of alternative actions. One of the actions in each pair is based on use of a core competency.

Besides these three instruments developed to measure the core competencies, two other instruments were developed. One was an Information Interview, designed to provide background data on the entrepreneur or potential entrepreneur and his or her business. The other, the Picture Story Exercise, is a projective test that has been used extensively to measure Achievement Motivation. Persons taking the test are asked to write a brief story about each of six pictures portraying one or a few people in various situations. A new and simplified coding system was developed for use with the Picture Story Exercise in this project. The instruments were presented to the in-country research contractors from Ecuador, India, and Malawi, and revised to take into account feedback from these sources.

All of these instruments were pilot-tested in India and Malawi. Subsequently, all instruments were administered to the validation sample according to the original research plan. The initial results, based on a dozen entrepreneurs in each country, indicated that of the three instruments designed to assess the core competencies, only one, the Focused Interview, showed promise in differentiating successful from less successful entrepreneurs. The Business Situations Exercise and the Self Rating Questionnaire showed little likelihood of differentiating successful from less successful entrepreneurs.

At a Project Review Meeting, in December of 1985, USAID and the Technical Review Committee suggested some changes in the direction and scope of the validation study. We decided to

retain only the two instruments that appeared promising on the basis of the pilot studies: the Focused Interview and the Information Interview. These two instruments were revised to provide additional data requested by USAID and the Technical Review Committee.

The core competencies identified in Task I were also used in Task III, by MSI, as the basis for entrepreneurship training modules. Two McBer consultants worked with MSI staff to help develop a new entrepreneurship training program. One McBer consultant attended the first week of a three-week workshop in Cranfield, England, which was attended by trainers from Ecuador, India, and Malawi. At this workshop, which followed the Annual Network Meeting, the new training program was presented and revised. After further revisions, the program is now being field tested by MSI.

Continued progress was made in the development of a network for the dissemination of results. The first annual network meeting was held in July, 1985, in Oxford, England. Representatives of the in-country research and training teams from each of the participating countries attended, as well as representatives of UNIDO, the ILO, and the NSF, together with other interested persons from around the world.

PROGRESS ON MAIN PROJECT TASKS

We turn now to a systematic review of progress against the main project tasks that were set forth in the First Annual Report. These tasks are outlined in Exhibit I. The tasks for which there was significant activity by McBer and Company are discussed below.

Task IE. Interview Entrepreneurs; Transcribe and Translate Interviews

At the time of submission of the First Annual Report, this task had been completed in India and was underway in Ecuador and Malawi. This task has since been completed.

Task IF. Analyze Interview Transcripts to Identify Personal Entrepreneurial Characteristics (PECs)

At the time of the submission of the First Annual Report, this process had been begun with the data from India. We have since completed this task. A detailed description of the process of thematic analysis is presented below. The thematic analysis yielded a core competency model, which is displayed in Table 1. Twenty competencies were found in all three countries where the interviews were conducted; two additional, country-specific competencies were identified in Malawi and Ecuador.

The next step was a systematic coding of interview transcripts to validate the competencies and determine whether they could differentiate successful from less successful entrepreneurs. The coding process is described in detail later in this section.

The initial statistical analyses were aimed at determining which of the competencies discriminated successful from less successful entrepreneurs and whether there were differences in competency frequency by country and by type of business.

Subsequently, USAID and the Technical Review Committee requested more extensive analyses of the relationships among competencies, entrepreneur background variables, and entrepreneur business variables. These analyses are described in detail later in this section and in "Entrepreneurship and Small-Business Development: Further Analyses of Phase I Data," a report prepared by Dr. Joseph DuCette, which is included in this project report as Attachment A. Because these analyses greatly exceeded the scope of the original analyses planned for Task IF, they will subsequently be referred to as Task IG, from this point forward in this report.

The analyses in Task IG demonstrated that the competencies discriminated successful from less successful entrepreneurs. Entrepreneur background variables, for the most part, did not. The competencies also showed significant differences by country, with entrepreneurs from India usually showing higher frequencies than entrepreneurs from Ecuador and Malawi. Only a few of the competencies showed differences by type of business (manufacturing vs. marketing/trading vs. service), and these were differences that might have been expected.

The Process of Thematic Analysis

When the First Annual Report was being prepared, this task was well underway. Most of the data had been collected, and interviews were being transcribed. We had received a sufficient number of interview transcripts from India, to begin the process of thematic analysis and to identify possible PECs. Each member of a five person McBer analysis team individually read six to eight transcripts and noted any skills, behaviors, motives, or ways of approaching problems that seemed to contribute to effectiveness in the situations described by the entrepreneurs. Next, at a three-day "concept formation" meeting, these themes were shared and discussed, and themes that were noticed to occur with some frequency were formulated into a preliminary competency model, which was included at the end of the First Annual Report. Nineteen competencies were identified, each with two to seven more specific behavioral indicators.

At this stage the goal was to cast a broad net, and to include all themes potentially related to effectiveness, whether or not these themes appeared to differentiate the successful from the less successful entrepreneurs. Three competencies (Persuasion, Use of Influence Strategies, and Expertise) were included even though they did not appear to occur more frequently among the more successful entrepreneurs. We decided to track all potentially relevant types of expertise, although most of these occurred at a very low frequency in the transcripts that we had analyzed at that point.

The thematic analysis was also guided by McBer's experience in competency analyses of over 150 jobs. We compared the themes we had noted in the transcripts of the Indian entrepreneurs with more than one hundred frequently occurring themes from previous research, to be sure that we were not overlooking potentially important themes. In a few cases we included themes that had emerged often in previous research, but which we had seen only a few times in the Indian entrepreneurs' transcripts. For example, under Systematic Planning, we included the behavioral indicator, "plans by breaking a large task down into subtasks." Once again, the purpose was to include everything that might possibly relate to entrepreneurial effectiveness, and to be able to track the frequency of such behaviors systematically in the next phase of the research.

As soon as we received a sufficient number of transcripts from Malawi and Ecuador, the process of thematic analysis was repeated for the interview transcripts from those two countries. But rather than develop separate, independent competency models for those countries, we were able to build upon what we had learned from our preliminary analysis of the data from India. The members of the analysis teams for Malawi and Ecuador were instructed to look for any new themes that had not previously been identified for the Indian entrepreneurs. Most of the themes identified in the Malawi and Ecuador transcripts had already been included in the Preliminary Competency Model for India. But several new behavioral indicators and competencies were identified. These were added to the Preliminary Competency Model for India, to form a Core Competency Model, which was used as the basis for coding the data from all countries.

The Core Competency Model, together with two additional competencies found only in a single country, is displayed in Table 1.

Systematic Coding of Interview Transcripts

The next step was to use the Core Competency Model as a codebook and to systematically code interview transcripts, to determine how often each of the competencies was demonstrated.

The original plan for the data analysis had been to use half of the interview transcripts from each country for thematic analysis, while retaining the remaining transcripts for systematic coding to cross-validate the Core Competency Model.

We decided to modify this plan because of two problems and issues that became apparent during the thematic analysis. The first problem was that a few transcripts, especially from Ecuador, had to be eliminated from the analysis because they did not meet the criteria for inclusion in the study. Some people were interviewed who were managing a business but who were not a partner or owner and had not been involved in starting the business. In a few other cases there was no indication as to whether the entrepreneur had been nominated as successful or less successful. This was especially true in Ecuador, where, because of the changing political and economic climate at the time of the interviews, it was very difficult to obtain nominations of successful entrepreneurs.

Another serious problem concerned the level of detail in the behavioral event interviews. To be useful for thematic analysis or coding, an interview transcript had to contain detailed accounts of the entrepreneur's thoughts and actions in starting the business and in four critical events encountered afterwards. Some of the transcripts, however, contained very sketchy descriptions of these events; the interviewers simply did not probe for sufficient detail.

There are a number of possible reasons for the inadequate probing. The section of the interview involving the critical incidents was preceded by a fairly lengthy section on the entrepreneur's background. By the time they reached the critical incidents section of the interview, some interviewers, sensing impatience in some entrepreneurs, may have limited their probing. Another possibility is that the assertiveness required for probing the Behavioral event interview was counter to some interviewers' personalities or to their sense of culturally appropriate behavior. In addition, it is possible that some of the interviewers simply failed to appreciate the importance of detailed accounts of critical events, even though this was stressed in feedback to them following their initial interviews. Finally, some interviewers may, for whatever reason, have lacked the commitment and motivation required to probe the incidents thoroughly. The problem occurred in all three countries, although it was greatest in Ecuador, where, due to logistical problems, many of the originally trained interviewers had been replaced with others who were not trained by McBer.

TABLE 1
THE CORE COMPETENCY MODEL

I. THE ACHIEVEMENT CLUSTER

1. Initiative
 - a. Does things before being asked or forced to by events
 - b. Acts to extend the business into new areas, products, or services
2. Sees and Acts on Opportunities
 - a. Sees and acts on new business opportunities
 - b. Seizes unusual opportunities to obtain financing, land, work space, or assistance
3. Persistence
 - a. Takes repeated or different actions to overcome an obstacle
 - b. Takes action in the face of a significant obstacle
4. Information Seeking
 - a. Does personal research on how to provide a product or service
 - b. Consults experts for business or technical advice
 - c. Seeks information or asks questions to clarify a supplier's needs
 - d. Personally undertakes market research, analysis, or investigation
 - e. Uses contacts or information networks to obtain useful information
5. Concern for High Quality of Work
 - a. States a desire to produce or sell a top or better quality product or service
 - b. Compares own work or company's work favorably to that of others

TABLE 1 (SECOND PAGE)
THE CORE COMPETENCY MODEL

6. Commitment to Work Contract

- a. .Makes a personal sacrifice or expends extraordinary effort to complete a job
- b. Accepts full responsibility for problems in completing a job for customers
- c. Pitches in with workers or works in their place to get job done
- d. Expresses a concern for satisfying the customer

7. Efficiency Orientation

- a. Looks for or finds ways to do things faster or at less cost
- b. Uses information or business tools to improve efficiency
- c. Expresses concern about costs vs. benefits of some improvement, change, or course of action

II. THE THINKING AND PROBLEM SOLVING CLUSTER

8. Systematic Planning

- a. Plans by breaking a large task down into subtasks
- b. Develops plans that anticipate obstacles
- c. Evaluates alternatives
- d. Takes a logical and systematic approach to activities

TABLE 1 (THIRD PAGE)
THE CORE COMPETENCY MODEL

9. Problem Solving

- a. Switches to an alternative strategy to reach a goal
- b. Generates new ideas or innovative solutions

III. THE PERSONAL MATURITY CLUSTER

10. Self Confidence

- a. Expresses confidence in his or her own ability to complete a task or meet a challenge
- b. Sticks with his or her own judgment in the face of opposition or early lack of success
- c. Does something that he or she says is risky

11. Expertise

- a. Had experience in the same area of business
- b. Possesses strong technical expertise in area of business
- c. Had skill in finance before starting business
- d. Had skill in accounting before starting business
- e. Had skill in production before starting business
- f. Had skill in marketing/selling before starting business
- g. Had skill in other relevant business area before starting business

12. Recognizing Own Limitations

- a. Explicitly states a personal limitation
- b. Engages in activities to improve own abilities
- c. States learning from a past mistake

TABLE 1 (FOURTH PAGE)
THE CORE COMPETENCY MODEL

IV. THE INFLUENCE CLUSTER

13. Persuasion

- a. Convinces someone to buy a product or service
- b. Convinces someone to provide financing
- c. Convinces someone to do something else that he would like that person to do
- d. Asserts own competence, reliability, or other personal or company qualities
- e. Asserts strong confidence in own company's products or services

14. Use of Influence Strategies

- a. Acts to develop business contacts
- b. Uses influential people as agents to accomplish own objectives
- c. Selectively limits the information given to others
- d. Uses a strategy to influence or persuade others

V. THE DIRECTING AND CONTROLLING CLUSTER

15. Assertiveness

- a. Confronts problems with others directly
- b. Tells others what they have to do
- c. Reprimands or disciplines those failing to perform as expected

16. Monitoring

- a. Develops or uses procedures to ensure that work is completed or that work meets standards of quality
- b. Personally supervises all aspects of a project

TABLE 1 (FIFTH PAGE)
THE CORE COMPETENCY MODEL

VI. THE ORIENTATION TO OTHERS CLUSTER

17. Credibility, Integrity, and Sincerity

- a. Emphasizes own honesty to others (e.g., in selling)
- b. Acts to ensure honesty or fairness in dealing with others
- c. Follows through on rewards and sanctions (to employees, suppliers)
- d. Tells customer he or she cannot do something (e.g., complete a task) even if it means a loss of business

18. Concern for Employee Welfare

- a. Takes action to improve the welfare of employees
- b. Takes positive action in response to employees' personal concerns
- c. Expresses concern about the welfare of employees

19. Recognizing the Importance of Business Relationships

- a. Sees interpersonal relationships as a fundamental business resource
- b. Places long-term good will over short-term gain in a business relationship
- c. Emphasizes importance of maintaining cordiality or correct behavior at all times with the customer
- d. Acts to build rapport or friendly relationships with customer

20. Provides Training for Employees

TABLE 1 (SIXTH PAGE)
THE CORE COMPETENCY MODEL

VII. ADDITIONAL COMPETENCIES

21. Building Capital (Malawi Only)
 - a. Saves money in order to invest in business
 - b. Reinvests profits in business

22. Concern for Image of Products and Services (Ecuador Only)
 - a. Expresses a concern about how others see his or her product, service, or company
 - b. Expresses awareness that clients spread knowledge of the product or company by word of mouth

Because a significant proportion of the transcripts were sketchy, we decided to alter the original cross-validation plan and to use the best available transcripts both for thematic analysis and for coding. Although the coding would not constitute an independent validation of the Core Competency Model, it would permit determination of the frequency of occurrence of the competencies in successful and less successful entrepreneurs and in the three types of businesses. We also knew that in the next phase of the study, the validation of selection instruments developed to assess the competencies would provide another, better opportunity to validate the competency model.

The next step was to select the transcripts to be systematically coded. We eliminated all transcripts with fewer than 25 double-spaced typewritten pages. We also eliminated transcripts of persons who were not owners or partners of the businesses they were managing and persons who were not identified as successful or less successful. Because they were available, the 54 transcripts from India which met the above criteria were coded first. For Ecuador and for Malawi, we attempted to select 36 transcripts such that for each country there were 12 transcripts for each type of business, evenly divided between the successful and less successful groups.

One difficulty we had not anticipated was that some of the entrepreneurs with multiple businesses or activities could not clearly be assigned to one of the three types of businesses. For example, a surprising number of businesses involved both manufacturing and trading. A total of 128 transcripts were coded.

Five coders were used, three of whom had participated in the thematic analysis. The fourth had extensive experience coding behavioral event interview transcripts in other McBer projects. The coders were trained by using the same process that we have used at McBer in other competency coding projects. The coders were trained to count as demonstrations of a competency only behavior or thoughts that occurred in specific past situations where the actor was clearly the entrepreneur. After a detailed review of the competencies and behavioral indicators, the coders independently coded one transcript and then met to review and discuss their coding. This process was repeated several times, until the coders reached a satisfactory (75%) level of agreement. The transcripts from Ecuador were in Spanish and were coded by two coders who were fluent in Spanish.

The process of coding involved noting and bracketing each separate instance in the transcript of a demonstration of one of the behavioral indicators of the Core Competency Model. The coders noted the number and letter of the behavioral indicator in

the left margin of the transcript. The coders then recorded the page number of each demonstration of each behavioral indicator on a coding sheet, so that the number of demonstrations of each element of the model could be entered on data sheets. For each entrepreneur the competency data consisted of a profile of the number of times each competency was demonstrated in the interview. These competency frequencies were used as the basis for statistical analyses involving competencies.

Coding of Background Data

Besides analyzing the interview transcripts for demonstrations of competencies, we tabulated the responses to the questions in the initial part of the interview dealing with background information about the entrepreneur and the business. Several problems emerged here.

First, although we had provided detailed interview guides, not all of the specified questions were asked in each interview. Second, it was very difficult for some entrepreneurs, especially those in Malawi, to answer questions about sales and profits, especially from previous years. Many of the entrepreneurs in Malawi did not have written business records and did not clearly differentiate business and personal transactions. When pressed to provide answers, they would first resist and then offer some figure to satisfy the interviewer. But the accuracy of the figures, according to the staff of the University of Malawi's Centre for Social Research, was often questionable.

The responses to the questions on background information were coded to permit comparisons by group (successful vs. less successful) and type of business.

Statistical Analysis of the Competency Data

The primary research question of interest in this study was whether the core competencies differentiated the successful and less successful entrepreneurs. Secondary questions were whether the competencies differed by type of business and whether the demonstration of the core competencies differed across the three countries studied.

Table 2 displays mean competency frequencies for the successful and less successful groups in each country, while Table 3 displays the competency frequencies for the three types of businesses in each country.

The research design was factorial, with Success Level (Superior or Average), Type of Business (Manufacturing, Marketing, or Service), and Country (India, Malawi, or Ecuador) as Independent Variables, and Competency Frequencies for the Core Competencies as Dependent Variables.

A multivariate analysis of variance (MANOVA) was selected as the most appropriate statistical technique for this type of research design. The plan was first to test for overall effects across competencies and then to follow up significant overall effects using the method of simultaneous confidence intervals.

The MANOVA revealed that none of the interaction effects among the three independent variables approached significance. The main effect of Success Level (Superior or Average) approached significance ($F = 1.47$, $p = .11$) by the Wilks' Lambda criterion. Although this effect was not quite statistically significant, we decided to conduct follow-up analyses of each competency, for the following reasons. First, the Core Competency Model was constructed so as to include any themes that might possibly differentiate the successful and less successful groups of entrepreneurs. Thus several competencies were included which had been observed during the thematic analysis primarily in one or two countries. Second, three competencies were included even though there was no evidence during the thematic analysis that they would differentiate entrepreneurs by success level. These three competencies (Expertise, Persuasion, and Use of Influence Strategies) may be helpful to anyone starting or running a business; they were noted often enough during the thematic analysis that we thought it important to track their frequency. Third, as has been noted earlier, there was some question about the validity of the designation of Success Level for the entrepreneurs in the sample from Ecuador. The inclusion of the data from Ecuador probably generated some "noise" in the data, which detracted from the chances of detecting overall significant differences by Success Level.

The method of simultaneous confidence levels was used to conduct follow-up tests of the effect of Success Level for each competency. This method minimizes the possibility of spurious effects arising from multiple comparisons and significance tests. Statistically significant differences, at the 95% level of confidence, were found for the following competencies:

- Sees and Acts on Opportunities
- Concern for High Quality of Work
- Commitment to Work Contract
- Efficiency Orientation
- Systematic Planning
- Recognizing the Importance of Business Relationships

As can be seen in Table 2, in each case the difference favored the more successful entrepreneurs.

The MANOVA revealed a statistically significant overall effect for the second independent variable, Type of Business ($F = 1.56$, $p = .026$, by the Wilks' Lambda criterion). Follow-up

tests, using the method of simultaneous confidence intervals for each competency, showed statistically significant effects for three competencies:

Concern for High Quality of Work
Monitoring
Concern for Employee Welfare

Inspection of the means in Table 3 shows that Concern for High Quality of Work was demonstrated more often in Manufacturing and Service businesses than in Marketing businesses. The same pattern of results was found for Monitoring and Concern for Employee Welfare.

The MANOVA also revealed a statistically significant overall effect for the third independent variable, Country ($F = 3.27$, $p < .001$, by the Wilks' Lambda criterion). The follow-up tests, again using simultaneous confidence intervals, showed significant effects for each of the following competencies:

Initiative
Sees and Acts on Opportunities
Persistence
Information Seeking
Systematic Planning
Problem Solving
Self Confidence
Expertise
Persuasion
Use of Influence Strategies
Monitoring
Credibility, Integrity and Sincerity

Inspection of the competency means in Tables 2 and 3, by country, shows that the means for India are almost always higher than those from Ecuador and Malawi.

Although differences between countries were not of primary interest in this project, some observations may help to explain the differences. First, the country differences are confounded with differences in interviewing skill and thoroughness on the part of the in-country research teams. As has been noted previously, there is evidence that the interviewers from Ecuador were not as skilled as those from India and Malawi. The transcripts from Ecuador were shorter than those from the other two countries. Thus it is likely that the competency frequencies found for these entrepreneurs represent an underestimate of their true capacity in relation to the entrepreneurs from India and Malawi.

Second, the businesses of the entrepreneurs in Malawi tended to be smaller and less technologically sophisticated than in the other two countries. The Malawian entrepreneurs had less education than those sampled in India and Ecuador.

TABLE 2
COMPETENCY FREQUENCY BY SUCCESS LEVEL

<u>Competency</u>	<u>Avg.</u>	<u>Sup.</u>
Initiative		
India	1.00	2.46
Malawi	0.38	1.24
Ecuador	0.76	0.50
Sees and Acts on Opportunities		
India	0.78	1.73
Malawi	0.19	0.52
Ecuador	0.12	0.36
Persistence		
India	1.15	2.09
Malawi	0.38	0.62
Ecuador	0.65	0.50
Information Seeking		
India	1.74	3.45
Malawi	1.19	1.00
Ecuador	0.59	0.64
Concern for High Quality of Work		
India	0.70	1.64
Malawi	0.38	0.76
Ecuador	0.71	1.93
Commitment to Work Contract		
India	1.48	2.42
Malawi	1.06	1.81
Ecuador	0.82	1.29
Efficiency Orientation		
India	0.59	1.58
Malawi	0.56	1.48
Ecuador	0.41	0.43
Systematic Planning		
India	1.37	2.39
Malawi	0.56	1.24
Ecuador	0.88	0.50
Problem Solving		
India	0.70	1.91
Malawi	0.31	0.52
Ecuador	0.88	0.50

TABLE 2 (SECOND PAGE)

COMPETENCY FREQUENCY BY SUCCESS LEVEL

<u>Competency</u>	<u>Avg.</u>	<u>Sup.</u>
Self Confidence		
India	1.11	2.58
Malawi	0.19	0.43
Ecuador	0.82	0.43
Expertise		
India	1.89	1.94
Malawi	0.63	1.29
Ecuador	0.82	0.64
Recognizing Own Limitations		
India	1.11	1.55
Malawi	0.75	0.76
Ecuador	0.47	1.21
Persuasion		
India	2.33	3.24
Malawi	1.00	0.95
Ecuador	0.82	0.29
Use of Influence Strategies		
India	1.41	1.70
Malawi	0.69	0.67
Ecuador	0.24	0.21
Assertiveness		
India	1.07	1.76
Malawi	0.69	1.29
Ecuador	1.29	1.71
Monitoring		
India	0.30	1.10
Malawi	0.29	0.36
Ecuador	0.56	0.95
Credibility, Integrity, and Sincerity		
India	1.07	1.64
Malawi	0.81	0.62
Ecuador	0.24	0.79
Concern for Employee Welfare		
India	0.48	0.73
Malawi	0.13	0.19
Ecuador	0.59	0.57

TABLE 2 (THIRD PAGE)
 COMPETENCY FREQUENCY BY SUCCESS LEVEL

<u>Competency</u>	<u>Avg.</u>	<u>Sup.</u>
India	0.70	1.39
Malawi	0.63	1.86
Ecuador	0.59	1.29
Provides Training for Employees		
India	0.27	0.42
Malawi	0.06	0.19
Ecuador	0.00	0.21

ADDITIONAL COMPETENCIES

<u>Competency</u>	<u>Avg.</u>	<u>Sup.</u>
Building Capital (Malawi only)	0.38	0.95
Concern for Image of Products and Services (Ecuador only)	0.65	1.00

TABLE 3
COMPETENCY FREQUENCY BY TYPE OF BUSINESS

<u>Competency</u>	<u>Manf</u>	<u>Mktg</u>	<u>Svce</u>
Initiative			
India	2.22	1.86	1.38
Malawi	1.10	0.47	1.11
Ecuador	0.62	0.70	0.63
Sees and Acts on Opportunities			
India	1.35	1.64	1.10
Malawi	0.97	0.64	0.33
Ecuador	0.38	0.10	0.13
Persistence			
India	2.43	1.07	1.14
Malawi	0.20	0.73	0.67
Ecuador	0.62	0.50	0.63
Information Seeking			
India	3.04	2.29	2.19
Malawi	1.80	0.87	0.89
Ecuador	0.69	0.30	0.88
Concern for High Quality of Work			
India	1.30	0.71	1.14
Malawi	1.30	0.00	0.89
Ecuador	1.31	0.90	1.63
Commitment to Work Contract			
India	1.70	1.43	2.48
Malawi	2.70	0.73	1.67
Ecuador	1.15	0.90	1.63
Efficiency Orientation			
India	1.39	0.71	0.52
Malawi	1.60	0.60	1.56
Ecuador	0.23	0.50	0.63
Systematic Planning			
India	2.32	1.82	1.96
Malawi	1.30	0.33	1.67
Ecuador	0.77	0.50	0.38
Problem Solving			
India	1.74	1.00	1.14
Malawi	0.60	0.60	0.11
Ecuador	0.46	1.00	0.75

TABLE 3 (SECOND PAGE)
 COMPETENCY FREQUENCY BY TYPE OF BUSINESS

<u>Competency</u>	<u>Manf</u>	<u>Mktg</u>	<u>Svce</u>
Self Confidence			
India	1.96	1.43	1.95
Malawi	0.50	0.07	0.56
Ecuador	0.62	0.70	0.63
Expertise			
India	2.22	1.36	1.90
Malawi	1.10	0.93	1.00
Ecuador	1.00	0.70	0.38
Recognizing Own Limitations			
India	1.91	0.50	1.29
Malawi	1.10	0.53	0.67
Ecuador	0.85	0.50	1.13
Persuasion			
India	2.86	3.48	3.21
Malawi	1.60	1.13	0.33
Ecuador	0.46	0.60	0.75
Use of Influence Strategies			
India	1.26	2.00	1.33
Malawi	1.10	0.47	0.56
Ecuador	0.15	0.20	0.38
Assertiveness			
India	1.22	0.64	2.14
Malawi	1.10	1.07	1.11
Ecuador	1.62	2.00	0.63
Monitoring			
India	0.61	0.29	0.90
Malawi	1.20	0.33	1.22
Ecuador	0.46	0.20	0.25
Credibility, Integrity, and Sincerity			
India	1.30	1.57	1.33
Malawi	1.10	0.27	1.00
Ecuador	0.62	0.60	0.13
Concern for Employee Welfare			
India	0.91	0.29	0.52
Malawi	0.30	0.13	0.11
Ecuador	0.77	0.10	0.88

TABLE 3 (THIRD PAGE)
 COMPETENCY FREQUENCY BY TYPE OF BUSINESS

<u>Competency</u>	<u>Manf</u>	<u>Mktg</u>	<u>Svce</u>
Provides Training for Employees			
India	0.48	0.43	0.19
Malawi	0.20	0.00	0.00
Ecuador	0.23	0.00	0.00
Recognizing Importance of Business Relationships			
India	0.78	1.86	0.67
Malawi	1.10	1.47	1.56
Ecuador	0.92	0.70	1.13

ADDITIONAL COMPETENCIES

<u>Competency</u>	<u>Manf</u>	<u>Mktg</u>	<u>Svce</u>
Building Capital (Malawi only)	0.50	0.73	1.00
Concern for Image of Products and Services (Ecuador only)	0.92	0.70	0.75

Analyses of Relationships Among Competencies

For conceptual and training purposes, it may be useful to distinguish many different competencies, but we did expect to find numerous relationships among the core competencies.

Pearson correlations among all pairs of competencies were computed. All but one of these correlations were positive, and most were in the range of .20 to .50. The highest correlations all involved Self Confidence ($r = .63$ with Initiative, $.60$ with Persistence, and $.64$ with Information Seeking). Only thirteen correlations were .50 or higher.

To test for the possibility that the correlations among competencies might be an artifact of the length of the interview, we conducted analyses to control for this variable. The number of words per transcript was estimated by counting the number of words on two sample pages, computing an average number of words per page, and multiplying by the number of pages. Pearson correlations of number of words per transcript with the 20 competency scores ranged from .05 to .36; the mean correlation coefficient was .20. Next, the correlations among all possible pairs of competencies were recomputed, with number of words per transcript partialled out. Most of these partial correlations were only slightly lower than the corresponding correlations without number of words partialled out. For example the partial correlations of Self Confidence with the variables mentioned above were .62 with Initiative, .60 with Persistence, and .62 with Information seeking. Eleven of the partial correlations remained .50 or higher.

Several factor analyses were conducted on the competency scores. An initial analysis revealed four factors with eigenvalues greater than 1. Subsequently, analyses were run to extract 2, 3, and 4 factors. A 2-factor solution with varimax rotation provided the clearest factor structure. The first factor seems to reflect a proactive self confidence, while the second factor reflects a systematic task orientation. The rotated factor structure matrix, showing the correlations between the competencies and the two factors, is displayed in Table 4.

Discriminant Analyses

A discriminant function analysis was conducted to test the extent to which the 20 competency scores could differentiate successful from less successful entrepreneurs. The discriminant analysis program selected variables by minimizing Wilks' Lambda. This stepwise procedure stopped after ten competency scores were entered into the analysis. At this point, the canonical correlation was .50 ($p < .0002$). When the results of this program were used to attempt classification of the sample into successful

and less successful groups, 81.4 % of the less successful group, 65.2% of the successful group, and 72.7% overall were correctly classified.

A second discriminant analysis was conducted to test the power of the competency scores to add to the differentiation that could be achieved only from the background information about the entrepreneur. This discriminant analysis was programmed to select first any of the entrepreneur background variables reduced Wilks' Lambda by at least .001 and then to select any competency scores that led to further reductions. The entrepreneur background variables used in this analysis were highest level of education completed, number of previous jobs held, number of businesses started, number of other family members who own businesses, and number of hours worked per week.

Table 5 provides of summary of the results of this analysis. Three of the background variables met the criterion for entry into the analysis and were entered in order: number of previous jobs held, number of businesses started, and number of other family members who own businesses. Yet none of these variables reduced Wilks' Lambda significantly on entry into the analysis. And after these three variables had been entered, a significance test of the Mahalanobis distance between the two criterion groups was not significant ($F = 1.84$, $p = .14$).

After the three background variables had been entered, the program allowed nine competency scores to be added: Recognizing the Importance of Business Relationships, Concern for High Quality of Work, Sees and Acts on Opportunities, Assertiveness, Use of Influence Strategies, Concern for Employee Welfare, Monitoring, Provides Training for Employees, and Persuasion. In each case the F value associated with the reduction of Wilks' Lambda on entry of the variable was highly significant.

With all variables in the analysis, the canonical correlation was .50 and highly significant ($p = .0006$). Notice that this canonical correlation is no larger than the one obtained in the first discriminant analysis, with only the competency scores.

When the results of the discriminant analysis were used to classify the entrepreneurs, 63.8 percent of the successful group and 78.0 percent of the less successful group were correctly classified. Overall, 70.3 percent of the entrepreneurs were correctly classified. Notice that these classification results are no better than the results obtained in the first discriminant analysis, with only the competency scores.

As a further test of the power of the entrepreneur background variables to discriminate the successful and less successful groups of entrepreneurs, we ran a third discriminant

analysis, using only the five background variables. As in the previous analysis, only three of these variables met the tolerance requirement for entry. With these three variables in the analysis, the canonical correlation was only .21 and not statistically significant. A classification analysis showed that only 56 percent of the entrepreneurs were correctly classified.

The results of these discriminant analyses indicate that it is the competency scores and not the entrepreneur background variables that provide the power to discriminate between the successful and less successful groups of entrepreneurs.

TABLE 4

VARIMAX ROTATED FACTOR STRUCTURE MATRIX FOR COMPETENCY SCORES

<u>Competency</u>	<u>Factor 1</u>	<u>Factor 2</u>
Initiative	.75	.31
Sees and Acts on Opportunities	.49	.07
Persistence	.59	.37
Information Seeking	.47	.46
Concern for High Quality of Work	.12	.65
Commitment to Work Contract	.24	.62
Efficiency Orientation	.13	.69
Systematic Planning	.43	.61
Problem Solving	.55	.37
Self Confidence	.64	.52
Expertise	.35	.41
Recognizing Own Limitations	.58	.03
Persuasion	.69	.17
Use of Influence Strategies	.44	.33
Assertiveness	.33	.29
Monitoring	.06	.75
Credibility, Integrity, Sincerity	.41	.42
Concern for Employee Welfare	.27	.28
Recognizing the Importance of Business Relationships	.15	.27
Provides Training for Employees	.42	.12

TABLE 5

SUMMARY TABLE FOR DISCRIMINANT ANALYSIS INCLUDING ENTREPRENEUR
BACKGROUND VARIABLES (ENTERED FIRST) AND COMPETENCY SCORES

<u>Step</u>	<u>Variable Entered</u>	<u>Wilks' Lambda</u>	<u>Sig.</u>
1	Number of Previous Jobs	.985051	.1692
2	Number of Businesses Started	.970996	.1589
3	Number of Other Family Members Who Own Businesses	.957444	.1439
4	Recognizing the Importance of Business Relationships	.885104	.0044
5	Concern for High Quality of Work	.846813	.0010
6	Sees and Acts on Opportunities	.815277	.0003
7	Assertiveness	.801759	.0003
8	Use of Influence Strategies	.787808	.0003
9	Concern for Employee Welfare	.776777	.0003
10	Monitoring	.769080	.0004
11	Provides Training for Employees	.762267	.0006
12	Persuasion	.751482	.0006

Statistical Analysis of Background Variables About the Business

In the introductory part of the interview, entrepreneurs were asked a number of questions about their businesses. The entrepreneurs' responses were used to create the following business variables:

- Number of years the business has been operating
- Sales volume in the last complete year
- Percent increase/decrease in sales over the past three years
- Earnings of the business in the last complete year
- Percent increase/decrease in earnings over the past year
- Number of product changes over the past three years
- Number of business locations
- Number of employees
- Sources of financing

The data for all but two of these variables were treated as interval, for purposes of statistical analysis. Responses to the question about number of product changes were coded as zero, one, two, or three or more, and were treated as nominal data for purposes of statistical analysis. Similarly, responses to the question about sources of financing were coded for presence/absence of each of the following sources: own funds, banks, relatives, friends, investors, government programs, partners, and other. Each source of financing was therefore considered as a separate business variable.

Some problems with the data for the business variables should be mentioned. There was some missing data because interviewers failed to ask all of the questions about the business in each interview. Some entrepreneurs were reluctant to provide answers to the questions regarding sales and earnings. Comparisons between countries on sales and earnings figures are complicated by the presence of rapid changes in the value of money within and between countries.

The background data on the business were first analyzed for differences between the successful and less successful entrepreneurs. Because of the problem of random missing data, the data were analyzed using separate univariate analyses for each business variable, rather than a multivariate approach involving all the variables.

When the data were aggregated across the three countries, statistically significant differences, favoring the more successful group, were found for two of the business variables. The percentage of increase in sales over the past three years was significantly greater for the more successful group, as was the number of business locations.

When these comparisons were repeated within each country, only a few significant differences emerged. In India, the average number of employees was higher for the more successful entrepreneurs (29.56 vs. 18.39). In Ecuador, the percentage increase in earnings over the past year was higher for the less successful entrepreneurs. (This was not entirely surprising in light of the problems mentioned earlier regarding the problems with the selection of successful and less successful groups in Ecuador.) In Malawi, the more successful entrepreneurs had a larger percentage increase in sales and higher earnings than the less successful groups. These findings must be interpreted cautiously in view of the small number of Malawian entrepreneurs who provided any answers to these questions.

The background business data were also analyzed for differences by type of business. The only statistically significant differences that emerged were for sources of financing. In India, entrepreneurs with marketing and service businesses were more likely than those with manufacturing businesses to use their own funds. In Ecuador, entrepreneurs in manufacturing and marketing businesses were more likely than those in service businesses to have obtained financing from banks. In Malawi, bank financing was more common for marketing businesses than for manufacturing or service businesses.

Inter-relationships Among Business Variables and Success Rating

Some of the background business variables reflect, at least in part, the success of the business. Therefore, we decided to examine the correlations of these variables with each other and with the dichotomous designation of the entrepreneur as successful or less successful. These correlations, which are displayed in Table 7, are mostly positive but low in magnitude. Note that these correlations are probably somewhat diminished as a result of aggregating the data from the three countries, since local conditions affect the meaning of these variables. For example, businesses studied in India tended to be much larger than those in Malawi. The highest correlations among the business variables involve number of employees ($r = .41$ with sales volume in the last year and $r = .42$ with number of business locations). The dichotomous success level variable showed low positive correlations with three of the business variables ($r = .21$ with number of employees, and $r = .22$ with change in sales volume over the past three years); correlations with the other business variables were essentially zero.

Statistical Analyses of Background Data on the Entrepreneur

In addition to questions about the business, the introductory part of the interview contained some specific questions about the entrepreneur's background. These questions were used to derive the following variables:

- Number of previous jobs held
- Number of businesses previously started
- Number of other family members who own businesses
- Number of hours worked per week
- Highest level of education
- Father's occupation
- Mother's occupation
- Whether hours worked now is less, the same or more than before becoming an entrepreneur

Once again, univariate analyses were conducted for each of these variables. For purposes of statistical analysis, data for the first group of variables above were treated as interval and data for the second group of variables as nominal.

No statistically significant differences between successful and less successful entrepreneurs emerged when the data were aggregated across the three countries. Comparisons within countries revealed only one significant difference: the more successful entrepreneurs in Malawi had held more jobs before becoming entrepreneurs.

When the same background variables were broken down by type of business, there was a similar absence of statistically significant differences. There were no significant differences when the data were aggregated across countries. When analyses were conducted within countries, the only significant differences occurred for father's occupation. In Ecuador, the entrepreneurs in marketing businesses were more likely than those in manufacturing or service businesses to have entrepreneur fathers. And in Malawi, the entrepreneurs with service businesses were more likely than those with manufacturing or marketing businesses to have entrepreneur fathers.

TABLE 6

CORRELATIONS AMONG BUSINESS OUTCOME VARIABLES AND SUCCESS LEVEL

<u>Variable</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
1. No. of Yrs. in Business							
2. Sales Vol. Last Yr.	.13						
3. Percent Increase in Earnings Last 3 Yrs.	.17	-.20					
4. No. of Bus. Locations	.10	.18	-.28				
5. No. of Employees	.08	.41	.17	.42			
6. Change in Sales Vol. in Last 3 Yrs.	-.15	-.06	.08	.14	.13		
7. No. of Product Changes	.00	.05	-.11	.08	.16	.20	
8. Success Level	.02	-.05	-.01	.18	.21	.22	.06

Task IIA. Develop Selection Instruments

The first step in developing the selection instruments was to identify the core competencies or PECs to be assessed in the selection instruments. In selecting the PECs to be used as the basis for selection instruments, we wanted to draw primarily from the competencies found in the entrepreneurs studied in the initial research in Task I. In selecting from the Core Competency Model, we used the following criteria:

1. Evidence that the competency differentiates successful from less successful entrepreneurs
2. Evidence that the competency occurs with sufficient frequency to justify assessing its presence in existing or potential entrepreneurs
3. Opportunity for demonstration of the competency before starting the business or attaining a managerial position
4. Content validity of the competency and its behavioral indicators as skills needed in starting or running a business.

The last criterion is important because our research uncovered some competencies which did not differentiate successful from less successful entrepreneurs but which were demonstrated frequently and did help the entrepreneurs to accomplish their objectives. Some of these competencies (including Initiative, Persistence, Problem Solving, Self Confidence, Persuasion, Use of Influence Strategies, and Assertiveness) are ones which researchers at McBer and Company have repeatedly found to distinguish outstanding performers in a wide variety of jobs. Although these competencies did not statistically differentiate the more successful entrepreneurs in the present study, it is likely that these competencies do differentiate entrepreneurs non-entrepreneurs. Indeed, these competencies are traits which other researchers have often identified as especially characteristic of entrepreneurs.

The competencies which were used as the basis for the development of selection instruments were as follows:

Initiative
Sees and Acts on Opportunities
Persistence
Information Seeking
Concern for High Quality of Work
Commitment to Work Contract
Efficiency Orientation
Systematic Planning
Problem Solving
Self Confidence
Persuasion
Use of Influence Strategies
Assertiveness

Besides these competencies, we decided to include two additional PECs which have shown promise in predicting entrepreneurial success elsewhere. The first of these is achievement motivation, the desire to do things to a high standard of excellence. The concept of achievement was developed by David McClelland and forms a central theoretical construct in the literature on entrepreneurship. Indeed, achievement motivation training is a key component of many widely used entrepreneurship training programs today.

In the context of the present research, achievement motivation may be regarded as an underlying personality trait that is expressed behaviorally through competencies in the Achievement Cluster, such as Initiative, Sees and Acts on Opportunities, Persistence, Information Seeking, Concern for High Quality of Work, Commitment to Work Contract, and Efficiency Orientation.

The second additional PEC is pre-startup exposure to other entrepreneurs. Gene Ward, in his doctoral dissertation, showed that entrepreneurs were more likely than non-entrepreneurs to have had personal associations and friendships with other entrepreneurs. The research for this project did not specifically address the question of differential association with other entrepreneurs, although there was no evidence that the more successful entrepreneurs whom we interviewed had more family members who were operating their own businesses. It is possible, however, that personal acquaintance with entrepreneurs helped influence many of the persons we studied to start out on their own.

To summarize, the PECs identified for use in the development of selection instruments are listed below:

Initiative
 Sees and Acts on Opportunities
 Persistence
 Information Seeking
 Concern for High Quality of Work
 Commitment to Work Contract
 Efficiency Orientation
 Systematic Planning
 Problem Solving
 Self Confidence
 Persuasion
 Use of Influence Strategies
 Assertiveness
 Achievement Motivation
 Pre-Startup Exposure to Other Entrepreneurs

We did not necessarily anticipate that all of these PECs would prove effective when used in entrepreneurial selection instruments. But we reasoned that we could easily delete from the selection instruments items based on any PECs that proved ineffective.

Considerations in the Development of Selection Instruments

The next step was to develop selection instruments to assess the PECs we had identified. The primary application of such instruments would be to aid in making decisions about the allocation of resources: who should receive money or training to start or grow a business. For this application an instrument need only provide a summary score reflecting overall entrepreneurial potential. But in entrepreneurship training programs it is also important to be able to give people feedback about their strengths and weaknesses on particular competencies and to identify particular competencies as areas for development. Thus for training applications, it was also important that the instruments provide separate scores on each of the key competencies and PECs.

Another major consideration was that the tests provide valid assessments of entrepreneurial potential. When people know that the results of a test will be used to decide who will receive a loan or grant, there is a strong tendency to "fake" responses and to present a socially desirable picture of oneself. Faking and social desirability are two threats to the validity of competency-based selection instruments.

A final consideration in developing selection tests was ease of administration and scoring. To be of practical use for application in diverse locations around the world, the tests would have to be easy to administer and score.

Because these various considerations work against each

other, there is no single test format that is ideal. Respondent measures, such as paper and pencil tests in which people choose their answers from several provided alternatives, are subject to faking and social desirability effects. Operant measures, which provide a consistent stimulus and require persons to generate a unique response, are less susceptible to these effects but are more difficult to administer and score. In addition, we were uncertain about the problems we might encounter using a single test format in diverse cross-cultural settings. Certain test formats might not work in certain countries or cultures.

For these reasons we decided to develop a variety of selection instruments with different formats, in the hope that at least one instrument would prove to be both valid and practically useful.

Each of the instruments is described below. The instruments themselves, together with detailed instructions for administration and scoring, appear in "Manual for Selection and Impact Measures," McBer and Company, August, 1985, which was prepared for this project.

Information Interview

The information interview, the first instrument to be administered, is meant to provide background information about the entrepreneur and the business and to set the stage for the administration of the other selection instruments. There is one form for persons who have already started businesses and another form for persons who are contemplating entrepreneurship. Both forms include background questions about the entrepreneur: educational and technical training, previous business and entrepreneurial experience, age, marital status, occupations of parents, entrepreneurial activity by other family members, pre-startup acquaintances with entrepreneurs, and reasons for starting the business. Note that the only PEC to be assessed in this instrument is pre-startup association with other entrepreneurs.

The form for existing entrepreneurs also includes a section on the size and volume of the business. This section includes questions on sales, profits, income, and number of employees. There is also a question requiring the entrepreneur to rate how well the business is doing compared to the previous year and to three years ago. This section provides the basis for a measure of business success, to be used in the validation of the selection instruments.

The information interview takes about 30 minutes to administer.

Focused Interview

The focused interview, a simplified version of the behavioral event interview that was used in the research phase of the project, asks the interviewee to describe what he or she did in five previously experienced situations. The types of situations are specified as follows:

- (1) a time when you accomplished something on your own
- (2) a time when you had to get somebody to do something
- (3) a time when you had difficulty getting something done
- (4) a time when you were pleased with something you accomplished
- (5) another time when you were pleased with something you accomplished

Specific follow-up questions are provided for each of these main probes, to insure that an untrained interviewer can elicit enough information to provide opportunity for demonstration of the targeted PECs.

After probing for details of the interviewee's behavior and thoughts in each situation, the interviewer uses a checklist made up of definitions of the 13 core competencies to note whether or not there was evidence of each competency. The checklist is then converted to a competency profile, with competency strength being a function of the number of situations in which the person presented evidence of each competency.

This type of selection instrument is one that McBer and Company has developed for a variety of selection applications, including selection of entry-level engineers and programmers, high potential mid-level and senior-level managers, and entering college and graduate students. Because scores depend on what the person has actually done in recent job-related situations, this type of selection instrument has high potential validity. The specific evidence it provides about the demonstration of each targeted competency is constitutes useful diagnostic information. The focused interview also minimizes faking and social desirability effects.

The disadvantages of this instrument concern ease of administration and scoring. The interview must be individually administered and scored, a process that takes a full hour. Administration and scoring require some training. Inaccurate scoring is a potential threat to the validity of the test.

Symlog Scoring of the Focused Interview

On an experimental basis we included an additional scoring form for the Focused Interview. The additional scoring form is

based on one originally developed by Professor R. F. Bales, at Harvard University, for the assessment of interpersonal behavior. The scoring form requires the interviewer to rate how often the interviewee expressed each of 26 concerns related to interpersonal relations. Examples of these concerns include "being popular, liked, and admired," "dissatisfied with others' work," and "inability to do things, giving up." The concerns are selected to tap three underlying personality dimensions: Power (dominant vs. submissive), Affiliation (friendly vs. aloof), and Achievement (task-focused vs. emotional). The Symlog Rating Form yields three overall scores corresponding to the above dimensions.

The Symlog Rating Form takes only about 10 minutes to complete and score. The Achievement score can be regarded as a behavioral manifestation of Achievement Motivation, one of the PECs targeted for assessment with the selection instruments.

Self Rating Questionnaire

The Self-Rating Questionnaire consists of 70 items describing typical behaviors.. The instructions are to rate how well each statement describes you on a 5-point scale from "very well" to "not at all." Sixty-five of the items are based on the 13 core competencies targeted for assessment. For example, one item in the Initiative Scale requires rating this statement: "I do things before it is clear that they must be done." The remaining five items form a social desirability scale, which is used to correct for the tendency of some people to rate themselves overly favorably. Like the Focused Interview, the Self Rating Questionnaire yields a profile of scores on each of the targeted competencies.

The primary advantage of the Self Rating Questionnaire is that it is easy to administer and score. It can be administered in 30 minutes to a group of individuals.

The main disadvantage of the Self Rating Questionnaire is that it is highly subject to social desirability and faking effects. As was mentioned above, a correction factor is built into the test. But it is unlikely that this instrument will be useful in situations where the test outcome will be used to determine who gets a loan or admission to a desirable training program. Instead, we anticipate that this instrument will be most useful in the context of an entrepreneurship training course, with participants taking the test in order to target their own training needs. Here there would be no incentive to portray oneself in an overly favorable light.

The Business Situations Exercise

This 52-item questionnaire contains brief descriptions of 20 situations that an entrepreneur might face. Following each situation are several items, each consisting of a pair of alternative thoughts or actions. Here is a sample situation, followed by one item:

You have visited a potential customer to see if he has a need for the service you offer. The potential customer tells you very bluntly that he doesn't think you can provide what he wants.

1. Which would you do?
 - a. Tell the person that your service can precisely meet his needs and how this is so.

or

- b. Thank the person for his time and indicate that you hope to be of service in the future.

The person taking this test selects the alternative that more closely describes what he or she would do in that situation. For each item, one of the alternatives is based on use of a targeted competency.

Like the Focused Interview and the Self Rating Questionnaire, the Business Situations Exercise provides a profile of scores on the 13 targeted competencies. Thus this test is potentially helpful in providing diagnostic information to entrepreneurs or potential entrepreneurs about their strengths on the targeted competencies.

In its written form the Business Situations Exercise is easy to administer and score. It can be administered in group settings in 35 minutes. And unlike the other instruments it can measure an aptitude for competencies which the person has had limited opportunity to demonstrate in real-life situations.

But the Business Situations Exercise is not without disadvantages. It is potentially subject to faking, since the more desirable alternatives can usually be recognized. Because of the amount of material describing each situation and the alternatives, the test imposes reading or listening burdens on the test taker. When the test is administered orally, test takers must remember the situation and both alternatives in order to make a meaningful choice for each item. Finally, the decision-making process in the hypothetical situations is artificial, since the information about each situation is limited

to two or three sentences.

The Picture Story Exercise

The Picture Story Exercise is an instrument developed by McBer and Company to measure three basic motives: Achievement, Affiliation and Power. This instrument is based on the Thematic Apperception Test, developed at Harvard by Henry A. Murray.

The Picture Story Exercise consists of six pictures depicting one or more persons in a variety of situations. Persons taking this test are asked to look briefly at each picture and then to write a brief story based on the picture. It is assumed in projective tests like this one that the stories people write will reflect some of their own underlying motivations.

McBer and Company has developed an elaborate scoring system for the Picture Story Exercise. But it was clear that this scoring system, which requires extensive training to master, would not be practical for potential users of the test.

Therefore, we developed for this project a simplified scoring system analogous to the one developed for the Focused Interview. Nine themes (behaviors or thoughts) were identified: three associated with each of the three motives. These nine themes are the basis of a checklist to be completed for each story. The person administering the test (or the scorer) checks those themes that are present in each story. The scores for each motive are summed across stories to yield overall scores for Achievement, Affiliation, and Power.

A two-hour practice session was conducted to test whether naive persons could be trained to use this coding system reliably. Four McBer administrative and secretarial staff were trained as coders. At the end of this session the four coders achieved satisfactory inter-coder reliability and agreement with expert coders.

Recall that Achievement Motivation was one of the PECs targeted for assessment. The Achievement score and its strength relative to the other two motive scores were the important measures to be derived from the Picture Story Exercise.

The Picture Story Exercise is relatively easy to administer and score. With literate subjects, it can be administered in written form, although it must be individually scored. It is less test-like than the other measures and therefore potentially more fun to complete. Since it is not obvious what answers are "correct," effects due to faking and social desirability are lessened.

But the Picture Story Exercise does have some disadvantages. First, it measures only one of the targeted PECs. Second, some instruction or training is required to achieve reliable scoring. Third, there is considerable evidence that scores on the Picture Story Exercise are susceptible to situational influences. In a situation that the test taker sees as competitive, Achievement Motivation scores are likely to be elevated over what would be obtained in a more neutral situation.

Besides providing an additional selection instrument, the Picture Story Exercise helped to fulfill one of the research goals of the project: to link the extensive research on achievement motivation in entrepreneurs to the findings generated in the research phase of this project, on competencies observed in critical situations encountered by entrepreneurs.

General Comments on the Battery of Selection Instruments

The battery of selection instruments included three instruments designed to assess each of the targeted competencies: the Focused Interview, the Self-Rating Questionnaire, and the Business Situations Exercise. There were also two measures of Achievement Motivation: the Picture Story Exercise and the Symlog coding of the Focused Interview. The Information Interview included several questions about pre-startup contact with other entrepreneurs. Thus the selection instruments provided ways to assess each of the PECs we had identified for assessment.

We realized that all of these instruments might not work well enough to be of practical use in selecting entrepreneurs. But by testing a variety of instruments, we hoped to identify the those with the greatest potential. Similarly, it was not clear that all of the PECs would show concurrent and predictive validity. But it would be a simple matter to delete from each instrument the items used to assess any PECs that we might decide to drop from the selection process.

To supplement the assessment of the PECs, the Information Interview included a number of background questions about the entrepreneur and the business. The second section of the Information Interview included a set of questions to be used to assess the success of the business.

Task IIB. Identify the Validation Samples

The sampling plan for the cross validation was the same for each country: 90 existing entrepreneurs, including 45 successful and 45 less successful entrepreneurs who were not interviewed in the initial research; 30 start-up entrepreneurs in business for less than six months, and 30 potential entrepreneurs -- persons who had expressed an interest in starting a business but had not

yet done so. Within each group the sample was to be divided equally among manufacturing, marketing/trading, and service types of businesses.

To identify the successful and less successful existing entrepreneurs, a process of converging nominations was developed. The first step was for the in-country research contractors to identify banks, business associations, ministries of trade and finance, and other organizations that would be able to identify successful and less successful entrepreneurs. The in-country research organizations would approach these organizations to obtain nominations of successful entrepreneurs in each of the three types of businesses. Each successful entrepreneur selected for the validation sample would have to have been nominated by at least two different sources. The less successful entrepreneurs would be matched as far as possible for type of business.

To insure that the sample selection followed this plan, we developed special forms for summarization of the nomination data on each entrepreneur, to be completed by the in-country research contractors and returned to McBer.

The overall sampling plan was presented to the in-country research contractors from the three countries, at the Annual Network Meeting at Oxford, in July of 1985. Individual meetings were held with each of the in-country research teams to discuss implementation and to identify the geographical regions within each country from which the samples would be drawn.

Task IIB. Administration of the Selection Instruments

The battery of selection instruments was presented to the in-country research contractors from the three countries at the Annual Network Meeting held at Oxford, England, in July of 1985. A full day of training in the administration and scoring of these tests was provided. At least two representatives of the in-country research contractor in each of the three participating countries were present. Comments at the training session led to minor revisions of items on some of the instruments.

The first assignment for the in-country research contractors was to administer the entire test battery to 12 existing entrepreneurs in a pilot project to identify any further revisions that might be needed in the administration or scoring of the instruments.

Administration of the Selection Instruments in Malawi

Reports about the pilot administration were received first from Malawi. There were no serious problems in administering any of the instruments, although the process was time consuming. Because the instruments had to be administered orally in Chichewa

to most subjects, the whole process took an average of five hours. There was some difficulty in administering the Picture Story Exercise, because many persons limited their responses to descriptions of what they saw in the pictures. But no further revisions were indicated for any of the tests.

We therefore decided to proceed with the administration of the instruments to the full validation sample in Malawi. At this writing, this process is completed.

When the data from the pilot administration were scored and returned to McBer, we got the first indications as to the effectiveness of the selection instruments in discriminating successful from less successful entrepreneurs. The entrepreneurs for the pilot sample were selected on the basis of availability; they had not been nominated as successful or less successful. However, they were asked to rate on 5-point scales how well their business was doing compare to a year ago and to three years ago. On the basis of these ratings we identified four relatively successful entrepreneurs (all of whom were doing "much better" than three years ago and at least "a little better" than one year ago) and six less successful entrepreneurs (all of whom were doing either "a little worse than" or "much worse than" three years ago).

These small numbers do not permit statistical analysis, since an extreme value in either group can have a large effect on the mean. But inspection of the mean overall scores on each instrument did give an indication of which instruments would be most likely to differentiate the successful and less successful groups. There appeared to be no difference between the successful and less successful entrepreneurs on the Self Rating Questionnaire of the Business Situations Exercise. Indeed, the overall scores on these instruments were slightly higher for the less successful entrepreneurs. The Focused Interview showed greater promise; the mean score for the successful entrepreneurs was 17.5, as compared to 14.0 for the less successful group. The Symlog Rating Achievement Score was higher for the successful group (6.0 vs. 4.0), as was the Power Score (5.3 vs. 4.4), while the Affiliation Score was lower (0.25 vs. 1.8). The Picture Story Exercise scores were all slightly higher for the more successful group (3.0 vs. 2.0 for Achievement, 3.0 vs. 2.7 for Affiliation, and 2.8 vs 2.0 for Power).

Administration of the Selection Instruments in India

In India the pilot sample consisted of 12 entrepreneurs in manufacturing businesses: 6 persons nominated as "top performers" and 6 nominated as "average performers." Each entrepreneur was nominated by a single agency or organization. The Focused Interview was administered individually, and the entrepreneur was then handed the other instruments to complete on his or her own.

The in-country research organization, EDII, experienced difficulty in obtaining the completed instruments from the entrepreneurs. As a result, the pilot results were delayed for several weeks.

The in-country research team encountered problems in administering some of the instruments. In the Focused Interview the wording of some questions created some misunderstandings for the Indian entrepreneurs. For example, in India, words like "accomplishment" and "on your own" are commonly used to refer to childhood rather than adult activities. To eliminate these problems, we asked the Indian research team to paraphrase the questions in language that is consistent with Indian spoken English.

The in-country research team also discovered some problems with the strategy that was suggested for probing the incidents. This strategy called for asking an initial probe to elicit an incident, listening to the account of the incident, and then asking a series of follow-up questions to fill in any gaps omitted in the initial account of the incident. The interviewers found it difficult and artificial to ask the follow-up questions. To eliminate these problems, we gave the Indian research team the flexibility to ask the follow-up questions at any appropriate point during the recounting of an incident.

As in Malawi, the Indian entrepreneurs showed resistance to taking the Picture Story Exercise. Many wrote only one or two sentences in response to each picture. Others wrote more but limited their stories to physical descriptions of what they saw in the pictures. Unless people write stories of at least 75 words that involve fantasy, the Picture Story Exercise does not yield valid assessments of motivation. Because of these problems, we decided to drop the Picture Story Exercise from the battery of selection instruments.

The Information Interview created resistance because of its eight-page length. It was difficult to get the entrepreneurs to complete and return this instrument. Since the background information on the entrepreneur and the business is critical to this study, we decided to have this instrument administered orally, in conjunction with the Focused Interview.

A final issue raised by the Indian in-country research team was the length of the whole battery of instruments. Half of the entrepreneurs who were approached about participating in the pilot study refused for this reason. Clearly, the battery of instruments needed to be reduced for the larger validation study. Fortunately, the data from the pilot sample provide some clear direction regarding which instruments to drop.

Mean scores for the successful and less successful groups

were computed for each instrument and for various items from the Information Interview. Once again, the number of entrepreneurs are too small to permit statistical analyses. Inspection of the means, however, is instructive.

As in Malawi, the Focused Interview showed the greatest promise of differentiating entrepreneurs by success level. The mean total score for the more successful group was 39.5, as compared with 24.8 for the less successful group. The more successful group scored higher on 12 of the 13 competency scores. This group also scored higher on all three Symlog rating scores (6.40 vs. 3.75 for Achievement, 8.20 vs. 3.75 for Affiliation, and 6.40 vs. 2.50 for Power).

The Picture Story Exercise showed no ability to differentiate the more successful entrepreneurs. The Achievement score was actually lower in the more successful group. But this result is not meaningful because of the poor quality of the data obtained with this instrument.

Neither the Self Rating Questionnaire nor the Business Situations Exercise differentiated the more successful entrepreneurs. On both of these instruments the two groups had virtually identical overall scores. In view of the similar, disappointing results with the pilot sample from Malawi, it seemed doubtful that these instruments would prove useful for selection. They may yet be of value in training programs, where they can be used to help students or trainees to understand and recognize the competencies. But we decided to drop these instruments from the validation study.

A formal Project Review was held just after the receipt of the pilot data from India, in December of 1985. Following this meeting, it was decided to revise the Information Interview and the Focused Interview, in order to provide additional data of interest to USAID and the Technical Review Committee, and to drop the remaining instruments from the battery to be administered for the validation study in India. These revisions have been completed, and a consultant has been sent to India to train the E.D.I. staff to administer and code the revised instruments.

Administration of the Selection Instruments in Ecuador

Translation of the selection instruments into Spanish for use in Ecuador was delayed until after the pilot administration of the instruments in Malawi. When this piloting indicated that all instruments could be administered and that no major revisions of the instruments were indicated, the instruments and manual for their administration were translated into Spanish.

Pilot testing of the instruments was delayed in Ecuador. In the meantime, at the Project review held in December of 1985,

USAID and the Technical Review Committee recommended that we focus our resources and effort on strengthening the validation process in India. Accordingly, a decision was made to postpone the validation effort in Ecuador, at least until after analysis of the results from India and Malawi.

Task IVA. Develop a Network for Disseminating Results

Since the inception of the project, McBer and Company has continued to respond to inquiries about the project and to visits from representatives of countries interested in replicating the research in their countries and in applying the results.

Task IVC. Hold Annual Network Meeting

The first annual network meeting was held at Oxford, England, in July of 1985. Among the participants were representatives of USAID, the National Science Foundation, McBer and Company, Management Systems International, the ILO, UNIDO, the in-country research contractors (EDII, FUNDEC, and the University of Malawi's Centre for Social Research), the in-country training contractors (EDII, FUNDEC) and other interested groups.

McBer and MSI presented project findings for the first day and a half of the three-day meeting. The remaining time was spent in working sessions to introduce the in-country research and training contractors to the selection instruments and training materials to be used in the next steps for Tasks II and III.

IVF. Publish Articles Based Upon the Project's Findings

Dr. Harvey Leibenstein prepared and presented a paper, "Entrepreneurship, Entrepreneurial Training, and Economics," analyzing the concept of personal entrepreneurial characteristics in terms of the economic theory of entrepreneurial behavior.

CHANGES IN THE DIRECTION AND SCOPE OF THE PROJECT

Since the submission of the earlier work plan, two events have led to significant changes in the direction and scope of the project: a change of project management at USAID and a formal project review, held in December of 1985. After the project review, USAID and McBer and Company agreed to the following changes in the direction of the project:

- o Additional statistical analyses should be conducted on the data from Task I, to examine all relationships among competency variables, entrepreneur background variables, and entrepreneur success variables.
- o The data collection in Task II should provide more

research data to demonstrate the validity of the PECs.

- o Additional data should be collected to provide insight into how the entrepreneurs acquired key PECs.
- o Additional background data on the entrepreneurs should be collected in Task II, to permit analyses relating the competencies to additional social, cultural, and economic variables.
- o The Information Interview and the Focused Interview should be revised for Task II, and the remaining instruments (the Self Rating Questionnaire, the Picture Story Exercise, and the Business Situations Exercise) should be dropped, since they had failed to show promise in discriminating superior from average performing entrepreneurs during pilot testing in India and Malawi.
- o The primary research effort for Task II should be in India. Data collection for Task II was already well underway in Malawi, so it was not feasible to make changes in the selection instruments being used there. And since we had encountered difficulties in the data collection for Task I in Ecuador, it was decided to make no further effort to collect Task II data in Ecuador.
- o To strengthen the data base in India, the sample of existing entrepreneurs should be taken entirely from the manufacturing sector, rather than divided among manufacturing, marketing, and service types of businesses.
- o To strengthen the Task II data collection effort, a consultant should be in India to train the local research team in interviewing and coding, to provide coaching and feedback on the initial interviews, and to monitor the process for selecting the samples.
- o The longitudinal validation analysis for Task II should be scaled back, since significant changes in business success over time are not likely to be observed in a period of less than two years, and since the project must be completed before this period would have elapsed. The only longitudinal followup will be done with the potential entrepreneurs. It is reasonable to expect that many potential entrepreneurs might actually start a business within 9 months of enrolling in an entrepreneurship training program or applying for a loan.

- o To assist in the more thorough and rigorous statistical analyses of the Task I and Task II data, a statistical consultant should be hired.

These changes in the direction of the project necessitate changes in the subtasks and a reallocation of resources. The changes in the main subtasks under Tasks I, II, and IV, from the previous work plan are listed below.

CHANGES FROM PREVIOUS WORK PLAN

Task IG: Thoroughly analyze all relationships among PECs, entrepreneur background variables, and entrepreneur business variables.
This is a new task, which has been completed, pending review by USAID and the Technical Review Committee.

Task IIA: Develop Selection Instruments.
The instruments will be revised based on input from the project's Technical Review Committee, prior to use in India.

Task IIB: Identify the Validation Samples.

The sample for Malawi was drawn according to the original work plan. There will be no sample from Ecuador. The sample from India will include 60 existing superior entrepreneurs, 60 existing average entrepreneurs, and 30 potential entrepreneurs. All existing entrepreneurs will be drawn from manufacturing businesses. A consultant on site will monitor the selection of the sample.

Task IIC: Administer the Selection Instruments.

Additional training, coaching, and monitoring will be provided in India, by a consultant who will be on site for the first three weeks of the data collection effort. The selection instruments used in India will be the Information Interview and the Focused Interview. The selection instruments will not be administered in Ecuador.

Task IID: Conduct a Concurrent Validation Analysis

Rigorous and thorough analyses of all relationships among variables will be conducted for the data from India and Malawi.

Task IIE: Conduct a Longitudinal Validation Analysis

The only longitudinal followup will be with the

potential entrepreneurs. We will simply determine, 9 to 12 months after the administration of the selection instruments, whether or not they have started businesses.

Task IIF: Prepare Manuals and Scoring Keys for Selection Instruments.

Since the two selection instruments have been revised for use in India, and other revisions would be needed to use them in any other countries, we do not plan to make further revisions in the manuals and scoring keys until and unless follow-on projects focusing on specific selection applications in specific countries are developed.

Task IVE: Hold Second Annual Network Meeting.

There is no point in holding a second network meeting until the data from Task II have been completely analyzed, and until Management Systems International has had a chance to test its competency-based entrepreneurship training program. This will not be until some time in 1987. The meeting will be held, if in the judgment of USAID, such a meeting would have merit. The timing and content of the meeting would have to be coordinated with Management Systems International, USAID, and the Technical Review Committee.

Task IVF: Publish Articles Based on the Project's Findings

This task is unchanged.

Task IVG: Prepare Final Report

This task is unchanged.

Task IVH: Hold Third Annual Network Meeting.

This task will be eliminated, since there would be no reason to hold more than one additional network meeting.

WORK PLAN FOR THE REMAINDER OF THE PROJECT

For purposes of planning the remaining work for the project, the tasks and subtasks to be completed by McBer and Company are as follows:

Task IG: Thoroughly analyze all relationships among PECs, entrepreneur background variables, and entrepreneur business variables.

1. Complete any additional analyses requested by USAID after review of additional analyses reported by Dr. DuCette.

Task IIA: Develop selection instruments

1. Complete the revision of the Information Interview and Focused Interview for administration in India, taking into account the recommendations of the project's Technical Review Committee.
2. Adjust the wording of the revised selection instruments, to take into account recommendations on cultural appropriateness, offered by E.D.I.I., the research contractor in India.

Task IIB: Identify the validation samples

1. Plan the revised sample selection in India with E.D.I.I., the research contractor in India. The sample will include 120 existing entrepreneurs, all in manufacturing businesses (60 nominated as superior and 60 as less effective entrepreneurs, all of whom have been in business at least 3 years) and 30 potential entrepreneurs (people who have not yet started a business but who have either applied for a business loan or applied for admission to an entrepreneurship training program).
2. Select the sample for India

Task IIC: Administer the selection instruments

1. Train the E.D.I.I. staff to administer and code the Information Interview and the Focused Interview, as amended.
2. Provide coaching and feedback to the E.D.I.I. staff administering the instruments.
3. Collect data in India.

Task IID: Conduct a Concurrent Validation Analysis

1. Plan the data entry for the data from Malawi.
2. Enter the data from Malawi.
3. Conduct a thorough analysis of relationships among competency measures obtained from the selection instruments used in Malawi, entrepreneur background variables, and entrepreneur business variables.
4. Plan the data entry and for the data from India.

5. Enter the data for India.
6. Conduct a thorough analysis of relationships among competency measures obtained from the selection instruments used in India, entrepreneur background variables, and entrepreneur business variables.
7. Conduct appropriate analyses of the combined data from India and Malawi, examining relationships among variables assessed in both samples.

Task IIE: Conduct a Longitudinal Validation Analysis

1. Arrange for followup contacting of Malawian potential entrepreneurs by a research contractor in Malawi, to determine whether they have started businesses.
2. Collect followup data from potential entrepreneurs in Malawi.
3. Enter followup data on Malawian potential entrepreneurs.
4. Conduct statistical analyses relating business startup to background variables, competency measures, and other variables derived from the selection instruments used in Malawi.
5. Arrange for followup contacting of Indian potential entrepreneurs by E.D.I.I., to determine whether they have started businesses.
6. Collect followup data from potential entrepreneurs in India.
7. Enter followup data on Indian potential entrepreneurs.
8. Conduct statistical analyses relating business startup to background variables, competency measures, and other variables derived from the selection instruments used in India.
9. Conduct appropriate analyses of the combined followup data from India and Malawi, examining relationships among variables assessed in both samples.

Task IVA: Develop a network for disseminating results

1. Respond to inquiries about the project from interested persons and groups in the international development community.

Task IVD: Prepare Year II Interim Report

1. Prepare annual report.
2. Prepare work plan.

Task IVE: Hold Second Annual Network Meeting

1. Plan the meeting.
2. Hold the meeting.

Task IVF: Publish articles based on the project's findings

1. Prepare an article based on Phase I results and submit it for publication in an appropriate journal.
2. Prepare an article based on the validation data and submit it for publication in an appropriate journal.

Task IVG: Prepare final report

ATTACHMENT A.
ENTREPRENEURSHIP AND SMALL-BUSINESS DEVELOPMENT:
FURTHER ANALYSES OF PHASE I DATA

By Dr. Joseph DuCette

Entrepreneurship and Small-Business Development:
Further Analyses of Phase I Data

Introduction and Review of Previous Analyses

This report presents a series of statistical analyses of data collected by McBer and Company through its contract with the United States Agency for International Development. The essential purpose of this contract was to identify and validate a set of personal entrepreneurial characteristics that could subsequently be used for selection and training of entrepreneurs in developing countries. Phase I of this project involved extensive interviews of entrepreneurs in Ecuador, India and Malawi. The data derived from these interviews included a set of core competencies as well as a variety of demographic and business data on the entrepreneurs. The purpose of these interviews was to determine if a set of variables could be discovered which would discriminate entrepreneurs who had been designated as either successful or average. A detailed description of the project can be found in McBer's initial proposal to USAID, as well as the progress reports submitted at the end of the first and second years of the contract. A complete listing of the variables used in all analyses, including the competencies discovered and the demographic and business data, is included in Appendix A of this report.

The data from Phase I of the project have been submitted to a variety of statistical analyses. These analyses are described in detail in the 1985 progress report. Each of these analyses will be briefly described here as an introduction to the further analyses that will be presented in this report.

A. Factorial MANOVA on the twenty competency scores that were common to the three countries included in the study.

A three factor MANOVA was conducted for the competency scores. The factors in this analysis were Group (successful versus average entrepreneurs), Country (India, Ecuador and Malawi) and Type of Business (Manufacturing, Marketing and Service). This analysis produced a marginally significant effect for the group variable, a significant effect for Country and a significant effect for Type of Business. None of the interactions were significant. Of primary interest was the fact that successful entrepreneurs were superior to average entrepreneurs on six of the 20 competencies. These competencies were:

- Sees and Acts on Opportunities
- Concern for High Quality of Work
- Commitment to Work Contract
- Efficiency Orientation
- Systematic Planning
- Recognizing the Importance of Business Relationships

The main effects for country (with India being almost always superior to the other two countries) and Type of Business (with manufacturing and service industries being higher than marketing) were not considered to be of primary interest in the overall purpose of the data analysis or of the contract.

B. Correlations Among the Competencies.

Pearson correlations were computed across the entire sample to ascertain if relationships existed among the competencies. These correlations were generally positive and significant, ranging from .2 to .6. To determine if these correlations were influenced by the length of the interview, the correlation between the number of words in the interview and the frequency of the competencies was computed. In general, these correlations were also positive and significant. Since this was the case, the correlation between interview length and competency scores was partialled out of the between competency correlations. These first order partials were somewhat lower than the original correlations, although neither the pattern nor the significance of the correlations was noticeably affected.

C. Factor Analysis of the Competencies.

Several types of factor analyses were computed on the competencies. After varimax rotation, it was determined that the best factor solution contained two factors. The first factor was interpreted as reflecting a proactive self confidence (competencies 1,3,9,10,13), while the second was interpreted as reflecting a systematic task orientation (competencies 5,6,7,8,16).

D. Discriminant Analysis.

A stepwise discriminant analysis was conducted to differentiate between the successful and average entrepreneurs across type of business and country. This analysis indicated that the two groups could be differentiated and that 72.7% of the sample could be successfully classified into their group of origin. After this discriminant analysis was conducted, several variations of this analysis were attempted, using the background variables in conjunction with the competencies. None of the background variables entered significantly into the classification equation.

E. Analysis of the Background Data.

A series of analyses were computed using the demographic data on the entrepreneurs as well as the various indices of business success to ascertain if these variables could differentiate between the successful and the average entrepreneurs. In general, these analyses were insignificant, indicating that simple demographic variables or indices of business success could not discriminate between the two groups of entrepreneurs.

In summary, the analyses reported by McBer indicate that discrimination between successful and average entrepreneurs is best achieved by an investigation of personal entrepreneurial characteristics. Demographic data (eg. number of previous jobs held, father's occupation etc) do not contribute significantly to this discrimination. In making this conclusion, McBer recognized that some problems exist in the data collection phase of the project, and that some of the data only marginally meet the assumptions for parametric analyses as sophisticated as MANOVA or discriminant analysis. The purpose of the present set of analyses, therefore, is to ascertain if alternate statistical methods

can replicate or elaborate the original findings. Underlying all of the analyses will be the primary question of this study: what variable or set of variables best differentiates between the successful and average entrepreneurs. In addition to this general question, several additional questions will guide the analyses to be presented. These questions are:

- (1) Is there any evidence that experience as an entrepreneur influences the competencies?
- (2) What are the relationships among the various indicators of business success?
- (3) Within the limitations of the present data set, is there some alternative measure of business success that can either replace or validate the success rating?
- (4) Is there more than one pattern of competencies which can predict business success?

Data Description and Univariate Analyses

Before alternative multivariate techniques were applied to the data set, it was decided to analyze the data in a less sophisticated manner to obtain a more basic understanding of these data and their properties. As a first step in this process, each of the 20 competencies were submitted to a data description program across the entire sample, and then individually by country. While these data were also presented in the McBer report, they are presented here since they represent one of the essential components in the analyses that will follow. The means and standard deviations for each competency by group (successful versus average) are presented in Table 1.

There are several aspects of these data that should be mentioned. First, all of the distributions, both across countries and within countries, are positively skewed. Of the 60 distributions investigated (20 competencies for each of the three countries), 53 of these exceed the value of +1 on the skewness test (where the value of -1 to +1 is considered an acceptable range). Clearly, positively skewed distributions would be expected in data of this type since most subjects obtain low frequencies while a few subjects obtain higher scores. (As an indication of this, the modal score in 55 of the 60 distributions was zero, with the remaining five having a mode of one.) Since all of the distributions are skewed in the same direction, the non-normality of the distributions is less troubling. It is still the case, however, that the distributions are not normal and that some distributions are highly skewed.

A second aspect of the data that should be mentioned is that any analysis using country as a factor will have some problem meeting the homogeneity of variance assumption. This is largely due to the typically higher means and standard deviations in the Indian sample. As before, this problem is typical in data of this type, since larger variances usually correspond to higher means. These factors are mentioned before the statistical analyses are presented since both non-normality of distributions and lack of homogeneity of variance can affect the validity of parametric tests, especially the more sophisticated ones.

Table 1
Means and Standard Deviations for the 20
Competencies for Successful and Average Entrepreneurs

<u>COMPETENCY</u>	<u>SUCCESSFUL</u>		<u>AVERAGE</u>	
	\bar{X}	s	\bar{X}	s
1. Initiative	1.65	2.32	.78	1.07
2. Sees and Acts on Opportunities	1.06	1.53	.44	.75
3. Persistence	1.29	1.96	.81	1.08
4. Information Seeking	2.08	2.92	1.29	1.67
5. Concern for High Quality of Work	1.41	1.88	.63	1.08
6. Commitment to Work Contract	1.97	2.11	1.20	1.48
7. Efficiency Orientation	1.29	2.26	.54	.88
8. Systematic Planning	1.71	2.01	.85	1.45
9. Problem Solving	1.16	1.46	.66	1.17
10. Self Confidence	1.43	2.02	.80	.99
11. Expertise	1.48	1.23	1.27	1.20
12. Recognizing Own Limitations	1.22	1.63	.85	1.74
13. Persuasion	1.88	2.59	1.59	2.04
14. Use of Influence Strategies	1.07	1.67	.90	1.62
15. Assertiveness	1.57	1.81	1.05	1.34
16. Monitoring	.88	1.22	.37	.74
17. Credibility, Integrity and Sincerity	1.16	1.44	.78	1.15
18. Concern for Employee Welfare	.54	.90	.42	.70
19. Recognizing Importance of Business Relationships	1.48	1.68	.66	.90
20. Provides Training for Employees	.30	.63	.14	.39

Since many of the assumptional problems in the data result from the higher means and standard deviations within the Indian sample, and since variation between countries is largely irrelevant (and perhaps misleading as the 1985 progress report points out), it was decided to attempt all analyses in two ways. The first way is to use the data without any form of transformation, a method which is parallel to the analyses performed by McBer. The second method was to transform the data in a way that would minimize the assumptional problems without seriously distorting the data. Of all the transformations available, it was decided that the most straight-forward and preferable method was to standardize all competency scores within country. This transformation eliminates all variation in the data due to country, eliminates all problems with lack of homogeneity of variance, although it does not affect the problem with skewed distributions. While techniques are available to normalize distributions, these techniques, of necessity, alter data sets in ways that can be misleading. Since all distributions are positively skewed, the decision was made to perform no additional transformations other than standaridization within country.

As a first step in data analysis, t-tests between successful and average entrepreneurs across country were computed for each of the 20 competencies. It is recognized that these analyses are inappropriate due to alpha compounding and because separate t-tests do not consider correlations among the dependent variables. In addition to the application of a two group MANOVA or a two group discriminant analysis, a method of handling the problem of making multiple t-tests on a set of data is to compute Hotellings T^2 . This analysis is similar to the two group discriminant analysis reported in the 1985 progress report, although Hotellings T^2 makes fewer assumptions about the data and is generally more robust against violations to normality or homogeneity of variance. The results of the separate t-tests for both the untransformed data and the standardized data are reported in Table 2. It is evident from Table 2 that the successful entrepreneurs had significantly higher frequencies on 10 of the 20 competencies using both sets of data. (The exact competencies that significantly differentiate the two groups vary somewhat between the two analyses, although the pattern is essentially identical in both cases.) It is also evident from Table 2 that the successful entrepreneurs have higher frequencies of all 20 of the competencies using the untransformed data, and are higher on 19 of 20 using the standardized data. This fact is reflected in the Hotellings T^2 which was significant in both analyses ($T^2 = 40.75$, $p = .039$ for the untransformed data; $T^2 = 42.79$, $p = .027$ for the standardized).

To ascertain if the demographic and business data could differentiate the two groups, similar analyses were computed on these variables. Of these t-tests, only two were significant, and then only slightly beyond the .05 level. For both analyses, the Hotellings T^2 was insignificant. Moreover, when the demographic and business data were added to the competency scores, the two groups were no longer significantly different.

Multiple Regressions

A series of multiple regression analyses were conducted on the data. Consistent with the univariate analyses already presented, the essential purpose of these analyses was to ascertain if the competencies can differentiate the successful

Table 2

Results of t-test Analyses Between Successful
And Average Entrepreneurs on the 20 Competencies
For Untransformed and Standardized Data

<u>COMPETENCY</u>	<u>UNTRANSFORMED DATA</u>		<u>STANDARDIZED DATA</u>	
	t	Sig. of t	t	sig. of t
1	2.79	.006**	2.91	.004**
2	2.96	.004**	3.06	.003**
3	1.76	.081	1.45	.149
4	1.93	.055*	1.31	.193
5	2.92	.004**	3.01	.003**
6	2.40	.018*	2.42	.017*
7	2.53	.013*	2.15	.034*
8	2.81	.006**	3.12	.002**
9	2.14	.034*	1.74	.084
10	2.31	.023*	1.70	.092
11	.96	.339	.91	.365
12	1.24	.219	1.45	.149
13	.71	.479	-.14	.889
14	.60	.550	.18	.855
15	1.84	.068	1.95	.053*
16	2.91	.004**	2.50	.014**
17	1.66	.099	1.81	.073
18	.76	.447	.87	.386
19	3.49	.001**	3.73	.000**
20	1.85	.066	1.92	.058

NOTE: All t values use the mean for the Successful group minus the mean for the average group as the numerator; all t values are separate variance estimates
*p<.05 **p<.01

from the average entrepreneurs. All data meeting the assumptions for parametric analyses (i.e. interval scales) were considered as potential predictors in these analyses.

The first analysis that was conducted attempted to predict the rating variable from the competency scores. Since the success rating is a dichotomy (where 1 = the average entrepreneurs and 2 = the successful) this analysis is an analogue to the two group discriminant analysis conducted previously and to the main effect for group analyzed in the three factor MANOVA. Multiple regression analyses were conducted using forward, backward and stepwise inclusion. The tolerance level for inclusion was set at .01. Since all of these methods produced identical results, only the stepwise solution will be presented. The results of the two stepwise analyses are presented in Table 3.

It is evident from Table 3 that three competencies enter significantly into the regression equation. These are: Competency 19-- Recognizing the Importance of Business Relationships; Competency 2-- Sees and Acts on Opportunities; and, Competency 16-- Monitoring. These results are essentially consistent with the t-test results presented in Table 1. In those analyses, Competency 19 was the one competency with the highest value of t, and competency 2 was the variable with the next highest value. Competency 16 was also highly significant, although not in exactly the order presented in the multiple regressions. In the full regression models produced, the competencies with the next highest Beta weights were Competency 14, Competency 5 and Competency 11, although none of these reached statistical significance. The complete regression output is contained in Appendix B.

In order to ascertain if a different pattern of variable inclusion would be obtained by adding country as a variable in the predictor list, dummy codes for country were created and were added to the original predictor list. Neither the pattern nor the multiple R were affected by this inclusion.

As a final set of analyses, background and business data were added to the predictor list and various combinations and types of multiple regressions were conducted. None of these analyses indicated that any of the additional variables would be added to the regression equation over and above the competencies already mentioned.

Factor Analysis of the Standardized Competency Scores

A factor analysis of the standardized competency scores was conducted as an attempt to reduce the data set, and to ascertain if the factor pattern was different using the standardized data as contrasted to the untransformed data used in the McBer analysis. A Principal Factoring with Iteration method was used followed by a varimax rotation. This analysis produced two factors with eigenvalues greater than one. The rotated factor matrix is presented in Table 4. Using a cutoff criterion of .4, Factor I consists of the following competencies:

- Competency 4: Information Seeking
- Competency 5: Concern for High Quality of Work
- Competency 7: Efficiency Orientation
- Competency 10: Self Confidence

This factor seems to reflect a goal-directed work ethic, coupled with self confidence.

Table 3

Stepwise Multiple Regressions Using Rating as the Criterion
And the Competency Scores as Predictors

A. Untransformed Data

Step	Variable Entered	F to Enter	Sig.	Beta	r	R
1	Competency 19	11.13	.001	.21	.28	.28**
2	Competency 2	5.39	.021	.20	.24	.34**
3	Competency 16	5.08	.026	.19	.28	.39**

B. Standardized Data

1	Competency 19	12.78	.000	.30	.30	.30**
2	Competency 2	10.09	.001	.28	.27	.37**
3	Competency 16	8.44	.002	.25	.26	.41**

** $P < .01$

Table 4

Rotated Factor Matrix on the
Standardized Competency Scores

Competency	Factor I	Factor II
1	.27	.40*
2	.11	.18
3	.02	.65*
4	.76*	.27
5	.67*	-.05
6	.32	-.00
7	.42*	.04
8	.28	.14
9	.29	.59*
10	.55*	.39
11	.00	.09
12	.11	.38
13	.03	.43*
14	.19	.11
15	.03	.26
16	.22	.17
17	.06	.13
18	.11	.20
19	.10	-.04
20	.01	.22

NOTE: Competencies with factor loadings greater than .4
are indicated by an asterisk

The competencies that load at the .4 level or beyond on Factor II are:

- Competency 1: Initiative
- Competency 3: Persistence
- Competency 9: Problem Solving
- Competency 13: Persuasion

This factor seems to reflect an analytic, action-oriented personality.

Factor scores were created for all subjects on the two factors listed above. The successful and average entrepreneurs were then compared on their mean scores on these two factors. These data are presented in Table 5. It is evident from Table 5 that the successful entrepreneurs were superior to the average entrepreneurs on both factors.

Factor Analysis of Business Data

A factor analysis of the variables relating to business success was conducted to ascertain if these variables could be reduced to a smaller set. The variables entered into the factor analysis were the following:

- C Sales Volume in Last Year
- D1 Change in Sales Volume
- D2 % Increase or Decrease in Sales
- E Earnings Last Year
- F1 Change in Earnings
- F2 % Increase or Decrease in Earnings
- G Number of Product Changes
- H Number of Business Locations
- I Number of Employees

A Principal Factoring with Iteration method of factor analysis, followed by a varimax rotation, was employed. Two factors with eigenvalues greater than one were obtained. The rotated factor matrix is presented in Table 6. Factor I can be interpreted as reflecting the current size of the business, while Factor II seems to reflect recent growth. Factor scores for both factors were created and correlated with the competency scores. These correlations are contained in Table 7. It is evident from Table 7 that none of the correlations with Factor I are significant. For Factor II, however, .10 of the 20 correlations are significant at the .05 level. Of these correlations, all are positive indicating that higher scores on the competencies correspond to higher levels of recent growth in business. It should be recognized, however, that even the significant correlations typically account for less than 10% of the variance.

Experience in Business and Personal Entrepreneurial Competencies

A series of analyses were conducted to investigate the effect that business experience has on entrepreneurial competencies as well as on the other business variables. Pearson correlations were computed between the number of years the entrepreneur had been in business and the remaining variables. None of the correlations with the background or business data were significant. Of the 20

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Table 5

Means and Standard Deviations of Factor Scores
For Successful and Average Entrepreneurs

	\bar{X}	sd	t Value	Sig. of t
<u>Factor I</u>				
Successful	.376	2.19	2.63	.010
Average	-.436	1.23		
<u>Factor II</u>				
Successful	.421	1.36	3.52	.001
Average	-.317	1.01		

NOTE: Separate Variance t-test was used due to lack of homogeneity of variance

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Table 6

Rotated Factor Matrix on the
Business Variables

VARIABLE	Factor I	Factor II
Sales Volume Last Year	.79**	.01
Change in Sales Volume	.04	.68**
% Change in Sales	-.01	.42**
Earnings Last Year	.91**	-.16
Change in Earnings	.02	.40**
% Change in Earnings	-.02	.01
Number of Product Changes	.01	.06
Numer of Locations	.29	-.08
Number of Employees	.45**	.08

NOTE: Variables with factor loadings greater than .4
are indicated by an asterisk

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Table 7
Correlations Between Competency Scores and Factor
Scores Derived from the Business Variables

COMPETENCY	FACTOR I	FACTOR II	
1	-.05	.23*	
2	-.02	.25*	
3	.11	.21*	
4	-.08	.40**	
5	.04	.26*	
6	-.12	.22	
7	-.03	.14	
8	.06	.28*	
9	.01	.31**	
10	.01	.29*	
11	.04	.13	
12	.02	.23*	
13	-.01	.24*	
14	-.08	.16	
15	.06	.00	
16	.05	.02	
17	-.03	.19	
18	-.00	.14	
19	-.08	.05	*p<.05
20	.07	.08	**p<.01

correlations with the competency scores, 19 were negative (indicating that entrepreneurs who had been in business longer had lower frequencies), although only three of these were significant at the .05 level. In general, these correlations accounted for less than 5% of the variance. However, since a consistent pattern did emerge, the original t-test analyses (Table 2, p.6) between the successful and average entrepreneurs were reanalyzed as analyses of covariance using length of time in business as the covariate. None of the original results were affected by this modification.

Additional Analyses

Several additional analyses were conducted on the data which will not be described in detail since they contribute very little to the analyses already presented. Each will be briefly described below:

A. Discriminant Analysis on the Standardized Competency Scores

As an attempt to see if standardizing the competency data within country affected the results, a stepwise and a direct discriminant analysis was conducted using the successful and the average entrepreneurs as the a priori groups. The results of both analyses were identical to the results reported by McBer.

B. MANOVA on the Standardized Competency Scores

A two factor MANOVA was conducted on the 20 competency scores using the Rating variable (successful versus average entrepreneurs) and the Type of Business (Marketing, Manufacturing and Service) as factors. The main effect for success level was marginally significant ($p = .086$) while the main effect for Type of Business was significant at the .05 level ($p = .016$). The interaction was not significant. These are essentially the same results reported by McBer. The competencies found to significantly discriminate between the two groups of entrepreneurs were the same as those reported by McBer.

C. Other Factor Analyses on the Competency Scores

In addition to the Principal Factoring with Iteration method of factor analysis presented in this report (PA-2 in the terms used by the SPSS statistical package), several other methods were attempted as well as oblique rotations of the factors extracted (rather than the varimax rotation reported here). These methods did not produce identical results. It was decided to report the results of the PA-2 analysis because this analysis seems to be preferred in current discussions and because the factor structure obtained seemed simple and interpretable. A comparison of the factor structure reported by McBer and the one presented here shows that the results are different (essentially the only analysis on which the two reports are in disagreement). It should be remembered that the factor analysis presented in this report used data standardized within countries while the McBer analysis used untransformed data. It is possible that the difference between the two, therefore, is in the **factoring method used**, in the data analyzed, or in both. Since the factor scores did not present any different picture than the other analyses, and since individual competencies rather than composites will be the unit of interest in future studies, the issue of obtaining the "correct" factor structure does not seem to be critical.

Summary and Conclusions

Throughout the analyses presented in this report, as well as in the 1985 progress report from McBer, it is evident that the personal entrepreneurial competencies carry the major power in differentiating between the successful and the average entrepreneurs. This is demonstrated in all of the analyses presented in this report. Specifically:

- a. Successful entrepreneurs are significantly different from average entrepreneurs on 10 of the 20 competencies, and significantly different overall when the 20 competencies are treated as a unit (as demonstrated by the significant Hotelling's T^2). The background and business data do not discriminate between the two groups.
- b. In differentiating between the successful and the average entrepreneurs through multiple regression, only a subset of the competencies enter significantly into the regression equation. None of the background or business data contribute significantly to this equation.
- c. Factor scores derived from the competencies significantly differentiate the successful from the average entrepreneurs.
- d. The correlations among the background data and the measures of business success are generally low and insignificant.

As one attempt to elaborate the finding that it is higher competency scores that characterize successful entrepreneurs, a summary of four different analyses on the competencies are presented in Table 8. In this table the results of the MANOVA and the discriminant analysis reported by McBer, and the t-test analyses and the multiple regression analysis presented in this report are summarized. For the discriminant analysis, t-tests and multiple R, the order of entry or the level of significance is indicated by a number. (For example, competency 19 is the first variable entered into the discriminant analysis and the stepwise multiple regression, and is the most significant variable using t-tests.) For the MANOVA, variables that differentiate the successful from the average entrepreneurs are indicated by an "X".

Several comments can be made about Table 8. First, while the order of the variables differs somewhat between analyses, a fairly consistent picture emerges. Competency 2 (Sees and Acts on Opportunities), Competency 5 (Concern for High Quality of Work), Competency 16 (Monitoring) and Competency 19 (Recognizing the Importance of Business Relationships) appear in at least three of the four analyses, and would have appeared in all four if a more liberal alpha level had been chosen. It is interesting that these competencies occur in three different clusters in the McBer's Core Competency Model (#2 and #5 in the Achievement Cluster; #16 in the Directing and Controlling Cluster; and #19 in the Orientation to Others Cluster). Moreover, these competencies characterize successful entrepreneurs in essentially the same way in three different countries. It would seem that a finite set of characteristics or traits underlie successful entrepreneurship in a variety of contexts, and that these characteristics are not strongly affected by the entrepreneur's background, expertise or business experience.

Table 8

Summary of Different Analyses on the Competency Scores Contrasting Successful from Average Entrepreneurs

<u>COMPETENCY</u>	<u>DISCRIMINANT ANALYSIS</u>	<u>MANOVA</u>	<u>t-TESTS</u>	<u>MULTIPLE R</u>
1. Initiative			5	
2. Sees and Acts on Opportunities	3	X	2	2
3. Persistency				
4. Information Seeking				
5. Concern for High Quality of Work	2	X	4	
6. Commitment to Work Contract		X	7	
7. Efficiency Orientation		X	8	
8. Systematic Planning		X	2	
9. Problem Solving		X		
10. Self Confidence				
11. Expertise				
12. Recognizing Own Limitations				
13. Persuasion	9			
14. Use of Influence Strategies	5			
15. Assertiveness	4		9	
16. Monitoring	7		6	3
17. Credibility, Integrity and Sincerity				
18. Concern for Employee Welfare	6			
19. Recognizing Importance of Business Relationships	1	X	1	1
20. Provides Training for Employees	8			

A second comment about Table 8 is that some of the competencies do not differentiate between the two groups in any of the analyses presented (Competencies #3, 4, 10, 11, 12 and 17). Of these, however, #3, 4, and 10 were found to load highly on one of the two factors extracted from the competencies, and each of these factors significantly discriminated between the two groups. Overall, therefore, most of the competencies are used somewhere in the data analysis.

On the basis of the results presented in this report, as well as the results presented in the 1985 progress report by McBer, it can be concluded that Phase I of the project has provided a base on which to develop both selection models and training techniques for entrepreneurs in developing countries. The collection of further data and the refinement of the instruments projected for the next phase of the study should enhance and elaborate the model of entrepreneurial competence proposed by McBer.

Appendix A

Variables and Data Codes Used
In All Analyses

<u>Variable</u>	<u>Data Code</u>
Rating	1= Average 2= Successful
Country	1= India 2= Ecuador 3= Malawi
Type of Business	A1 1= Manufacturing 2= Marketing 3= Service
Number of Years in Business	B
Sales Volume in Last Year	C
Change in Sales Volume	D1 0= Decrease 1= No Change 2= Increase
Percentage Change in Sales	D2 0= Decrease 1= No Change 2= Increase
Earnings Last Year	E
Change in Earnings	F1 0= Decrease 1= No Change 2= Increase
Percentage Change in Earnings	F2 0= Decrease 1= No Change 2= Increase
Number of Product Changes	G
Number of Business Locations	H
Number of Employees	J
Source of Finances	K1 = Own Funds K2 = Banks K3 = Relatives K4 = Friends K5 = Investors K6 = Government Project K7 = Partners K8 = Others

0 = No
1 = Yes

Appendix B
Complete Regression Equations

B1. Regression Equation Using Standardized Competency Scores as Predictors and Success Level as the Criterion

Variables in Equation	BETA	Sig.
Comp 19	.25	.0035
Comp 2	.23	.0072
Comp 16	.18	.0347

Variables Not in Equation

Comp 1	.11	.20
Comp 3	.02	.76
Comp 4	.01	.86
Comp 5	.11	.25
Comp 6	.06	.53
Comp 7	.05	.57
Comp 8	.12	.20
Comp 9	.02	.75
Comp 10	.02	.82
Comp 11	-.03	.73
Comp 12	.06	.51
Comp 13	-.08	.32
Comp 14	-.08	.33
Comp 15	.12	.17
Comp 17	.04	.62
Comp 18	-.04	.62
Comp 20	.10	.25

B2. Regression Equation Using Untransformed Competency Scores and Dummy Code for Country

Variables in Equation

Comp 19	.21	.0157
Comp 2	.20	.0208
Comp 16	.19	.0259

Variables Not in Equation

Country	-.05	.59	Comp 11	-.10	.26
Comp 1	.06	.52	Comp 12	.02	.82
Comp 3	.01	.95	Comp 13	-.13	.42
Comp 4	.03	.76	Comp 14	.09	.15
Comp 5	.12	.19	Comp 15	-.03	.29
Comp 6	.02	.85	Comp 17	-.06	.74
Comp 7	.07	.49	Comp 18	.08	.50
Comp 8	.05	.46	Comp 20	.03	.36
Comp 9	.02	.61	Interaction	.03	.76
Comp 10	-.11	.82			