



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

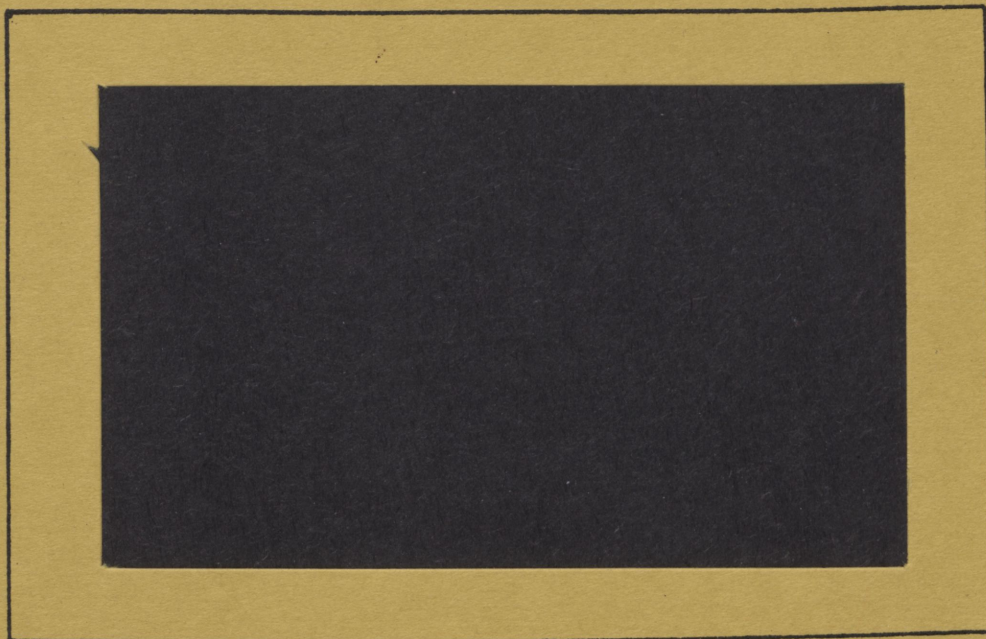
Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Farmers

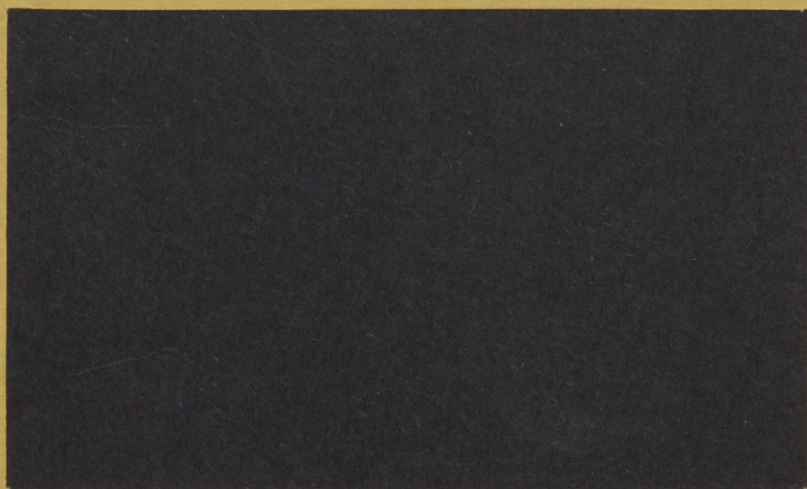


SCHOOL OF
AGRICULTURAL ECONOMICS
AND
EXTENSION EDUCATION

WITHDRAWN
APR 22 1980
AGRICULTURAL ECONOMICS



ONTARIO AGRICULTURAL COLLEGE
UNIVERSITY OF GUELPH
Guelph, Ontario, Canada



A COMPARISON OF BEHAVIOURAL AND ECONOMIC
CHARACTERISTICS OF SELECTED COMMERCIAL AND LIMITED
RESOURCE FARMERS

by

Donald J. Blackburn, George L. Brinkman,
Herbert C. Driver and Trevor D. Wilson

79/12

School of Agricultural Economics and Extension Education
Ontario Agricultural College
University of Guelph

ISSN 0318-1804

April, 1979

AEEE/79/2

FOREWORD

This study, which compared selected behavioural and economic characteristics of commercial and limited resource farmers, was an extension (fifth phase) of a four-phase project which was designed to identify a broad range of policy instruments for improving the farm performance and general well-being of limited resource farmers.

The overall project was conducted under a special three-year contract funded by the Small Farms Development Program of Agriculture Canada and carried out with the cooperation and additional support from the Ontario Ministry of Agriculture and Food. The report was prepared by an interdisciplinary team in Agricultural Economics and Extension Education at the University of Guelph. The report draws heavily on M.Sc. thesis material, prepared as part of this project, by Trevor Wilson. It also utilized material prepared by Gerald Bouma, Richard Ellis, Kathleen Morten-Gittens, Terry Stringer, and Michael Trant, whose M.Sc. theses were previously prepared as part of this project.

ACKNOWLEDGEMENTS

This study was undertaken with financial support provided by Agriculture Canada, through the Small Farm Development Program, and continuing research support provided by the Ontario Ministry of Agriculture and Food through the University of Guelph research contract.

Appreciation is extended to Jim McKenzie and Ralph Cotterill, Small Farm Development Division, Food Production and Marketing Branch, Agriculture Canada, and Herb Crown, Director, Rural Development Branch, Ontario Ministry of Agriculture and Food, for their support and cooperation. The help and assistance, during field work in Bruce, Grey, and Renfrew Counties, of Mack Bolton, Barry Tolton, Bruce Ward, and Dave Little of the Extension Branch, and Wil Hermans of the Rural Development Branch, O.M.A.F., are particularly acknowledged and appreciated. The assistance of Bruce McCorquodale, Lorne Small, and Rob Lindsay, of the Farm Management Information System, Extension Branch, O.M.A.F., in accessing CANFARM information was also greatly appreciated.

The authors also wish to acknowledge the contributions of Trevor Wilson through his M.Sc. thesis research, the help of James Houghton during computer analyses, and the earlier contributions of Gerald Bouma, Richard Ellis, Kathleen Morten-Gittens, Terry Stringer, and Michael Trant in this project. We are also grateful for the cooperation and assistance by farmer respondents in this study. The authors, however, accept full responsibility for the data and their interpretation as herein reported. Any errors or omissions are the complete responsibility of the authors.

TABLE OF CONTENTS

	Page
FOREWORD	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vii
THE NATURE OF THE STUDY	1
Introduction and Background	1
Objectives of the Study	8
Sample and Data Collection	9
Procedures for Analysis	11
Limitations	13
BEHAVIOURAL AND ECONOMIC COMPARISONS	14
Behavioural Characteristics	14
Behavioural Nature	14
Value Orientations	14
Basic Needs	19
Self Concepts	24
Perceptions and Inclinations	25
Aspirations	25
Satisfaction with Farming	29
Community Attachment	30
Encourage Children to Enter Farming	31
Factors Limiting to Income	32
Utility of Potential Agricultural Programs	35
Program Suggestions	38
Social Participation	39
Professional Contacts	39
Organizational Participation	42
Use of Agricultural Mass Media	44
Utilization of Government Programs	44
Social-Demographic Factors	48
Age	48
Formal Education	48
Number of Dependents	48
Farming Experience	50
Summary	50
Management Ability Score	51
Technical Practices Score	52

	Page
Economic Characteristics	53
Measures of Income	53
Gross Farm Sales	53
Net Farm Income	53
Assets and Liabilities	56
Total Farm Assets	56
Percent Equity	58
Economic Efficiency Ratios	58
Capital Turnover	58
Cost Control Index	60
Viability Target Incomes	60
Target 2	62
Target 3	62
Target 4	63
Achievement of Income Targets	63
Summary of Farmer Characteristics	64
SUMMARY OF FINDINGS	68
CONCLUSIONS AND IMPLICATIONS	71
Conclusions	71
Implications	74
BIBLIOGRAPHY	78
APPENDICES	82
A. Management Ability Score	83
B. Technical Practices Score	87

LIST OF TABLES

	Page
1. Distribution of Commercial Farmer Respondents By County and Farm Type	10
2. Comparison of Farmer Groups by Value Orientation Scores . . .	16
3. Comparison of Farmer Groups by Basic Needs	21
4. Comparison of Farmer Groups by Achievement Motivation Scores	23
5. Comparison of Farmer Groups by Self Concept Scores	26
6. Comparison of Farmer Groups by Aspirations	28
7. Comparison of Farmer Groups by Satisfaction With Farming.	30
8. Comparison of Commercial with Limited Resource Farmers by Community Attachment	31
9. Comparison of Commercial and Limited Resource Farmers by Encouragement of Children to Start Farming	32
10. Comparison of Farmer Groups By Their Perception of Various Factors as Being Limiting to Income	34
11. Comparison of Farmer Groups By Their Perception of the Usefulness of Agricultural Programs	36
12. Comparison of Commercial with Limited Resource Farmers by Suggestions for Agricultural Programs	38
13. Comparison of Farmer Groups by Professional Contacts Per Year	40
14. Comparison of Farmer Groups by Organizational Participation	43
15. Comparison of Farmer Groups By Their Use of Agricultural Mass Media	45
16. Comparison of Commercial and Limited Resource Farmers By Government Programs Applied For	46
17. Comparison of Farmer Groups By Use of Nine Government Programs.	47
18. Comparison of Farmer Groups By Selected Social-Demographic Characteristics	49

	Page
19. Comparison of Farmer Groups By Management Ability Scores	52
20. Comparison of Farmer Groups By Technical Practice Scores	53
21. Comparison of Farmer Groups By 1976 Farm Incomes	55
22. Comparison of Farmer Groups By Farm Assets and Percent Equity	57
23. Comparison of Farmer Groups By Capital Turnover and Cost Control Indices	59
24. Comparison of Farmer Groups By Target Incomes	61
25. Comparison of Farmer Groups By Highest Income Target Achieved	64
26. Average Behavioural and Economic Factor Values for Commercial, Receptive and Unreceptive Groups	65

LIST OF FIGURES

	Page
1. Limited Resource Farmer Classification System	3
2. Conceptual Framework.	5

A COMPARISON OF BEHAVIOURAL AND ECONOMIC
CHARACTERISTICS OF SELECTED COMMERCIAL AND LIMITED RESOURCE FARMERS

THE NATURE OF THE STUDY

Introduction and Background

The purpose of this study was to measure a number of economic and behavioural characteristics of selected commercial farmers in Ontario and compare them with limited resource farmers.

This study was undertaken in conjunction with a four phase project begun in 1975 designed to identify policy instruments for improving the general well-being of limited resource farmers. The former project utilized farmer respondents from two Ontario Counties -- Grey and Renfrew. These counties had been selected initially because they have large farm populations with a high proportion of limited resource farmers.

The first phase of the study produced a classification system for limited resource farmers, based on a number of economic and human characteristics.^{1/} Limited resource farmers were defined as those whose gross sales in 1971 were less than \$15,000. It was found that there were three main groups of limited resource farmers:

1. Farm focus farmers
2. Mixed focus farmers.
3. Non-farm focus farmers.^{2/}

^{1/} Brinkman, G.L., Driver, H.C. and Blackburn, D.J., A Classification of Limited Resource Farmers Based On Behavioural and Economic Characteristics School of Agricultural Economics and Extension Education, University of Guelph. AEEE/77/3. May 1977 (Revised March, 1979).

^{2/} See Figure 1 for definitions

The farm and mixed farm focus farmer groups were further sub-categorized. Figure 1 shows a breakdown and characterization of the respondents found in the classification.^{1/}

Phase two studies collected more in-depth economic and behavioural data from farmers identified in the first phase as planning to continue in agriculture and having a dependence on agriculture as a source of income^{2/}. Farmers classified as retirement age or non-farm focus were deleted from the sample. The specific objectives of the second phase were:

1. To collect and analyze farm business data of limited resource farms whose operators plan to stay in agriculture;
2. To determine economic, social and humanisitic expectations of limited resource farmers who plan to stay in agriculture;
3. To ascertain these farmers' perceptions of what constitutes success, failure or satisfactory farm performance;
4. To identify what farmers consider as satisfactory and acceptable ways and means of achieving expectations;
5. To ascertain the use of currently available advisory services as aids to adjustment processes.

Seventy-eight limited resource farmers in the two counties were interviewed as part of this phase using two separate interview schedules. To allow for rising community incomes, limited resource farmers were redefined as those farmers grossing less than \$25,000 in 1975. The interview schedules were designed to gather economic and behavioural data.

^{1/} Brinkman et al Op. cit. p. 50.

^{2/} Blackburn, D.J., Brinkman, G.L., and Driver, H.C., Farm Business, Behavioural and Participation Characteristics of Limited Resource Farmers School of Agricultural Economics and Extension Education, University of Guelph. AEEE/78/4 April, 1978 (Revised March, 1979).

Limited Resource Farmer Classification System

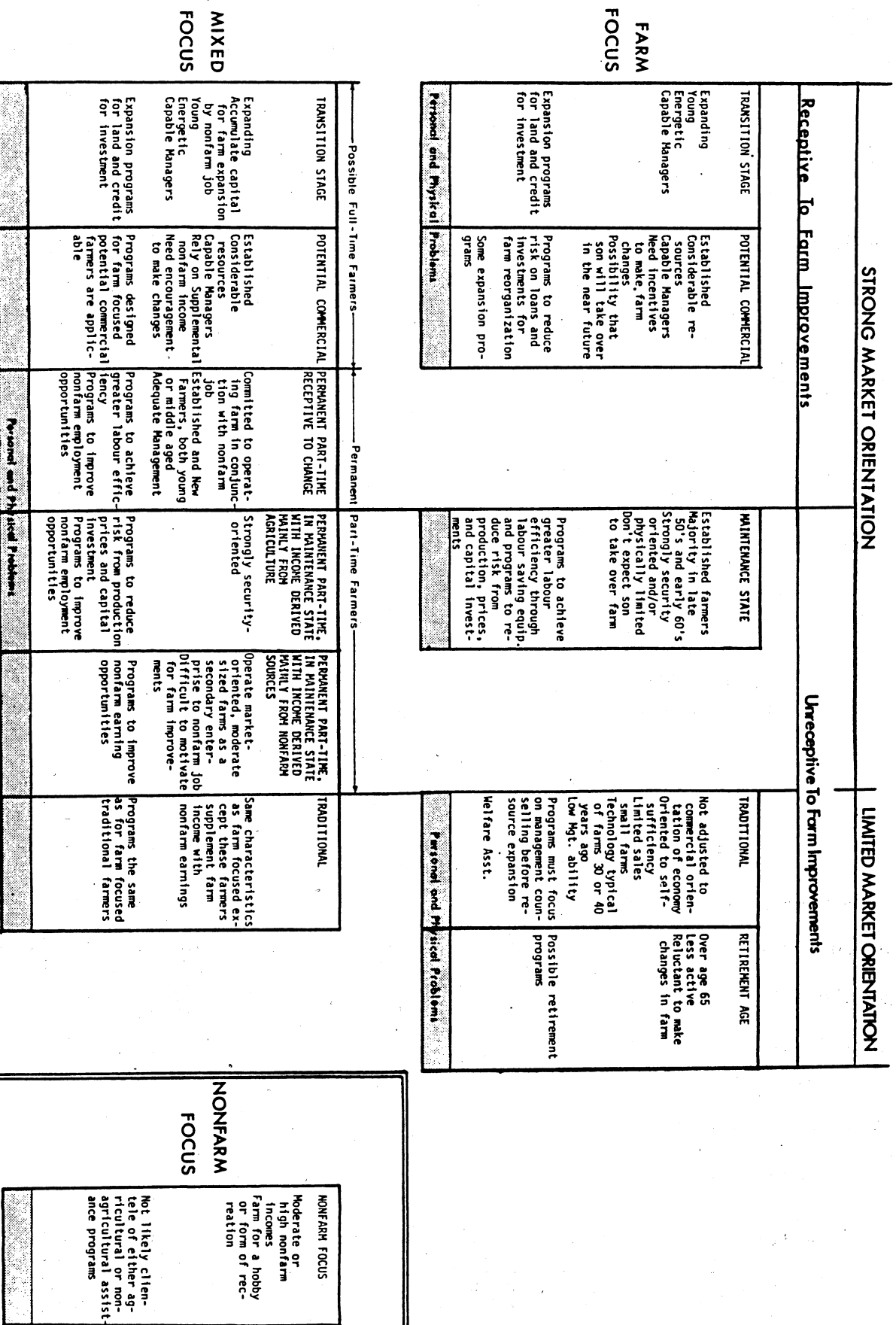


Figure 1

A major premise underlying these studies was that there are a number of behavioural and situational characteristics that determine an individual's actions. One purpose was to study the effect of a number of these characteristics on farmers' management performance. The studies were guided by a schematic representation shown in Figure 2. This figure depicts possible interrelationships among the social, psychological, economic, physical and managerial resources of farmers.^{1/}

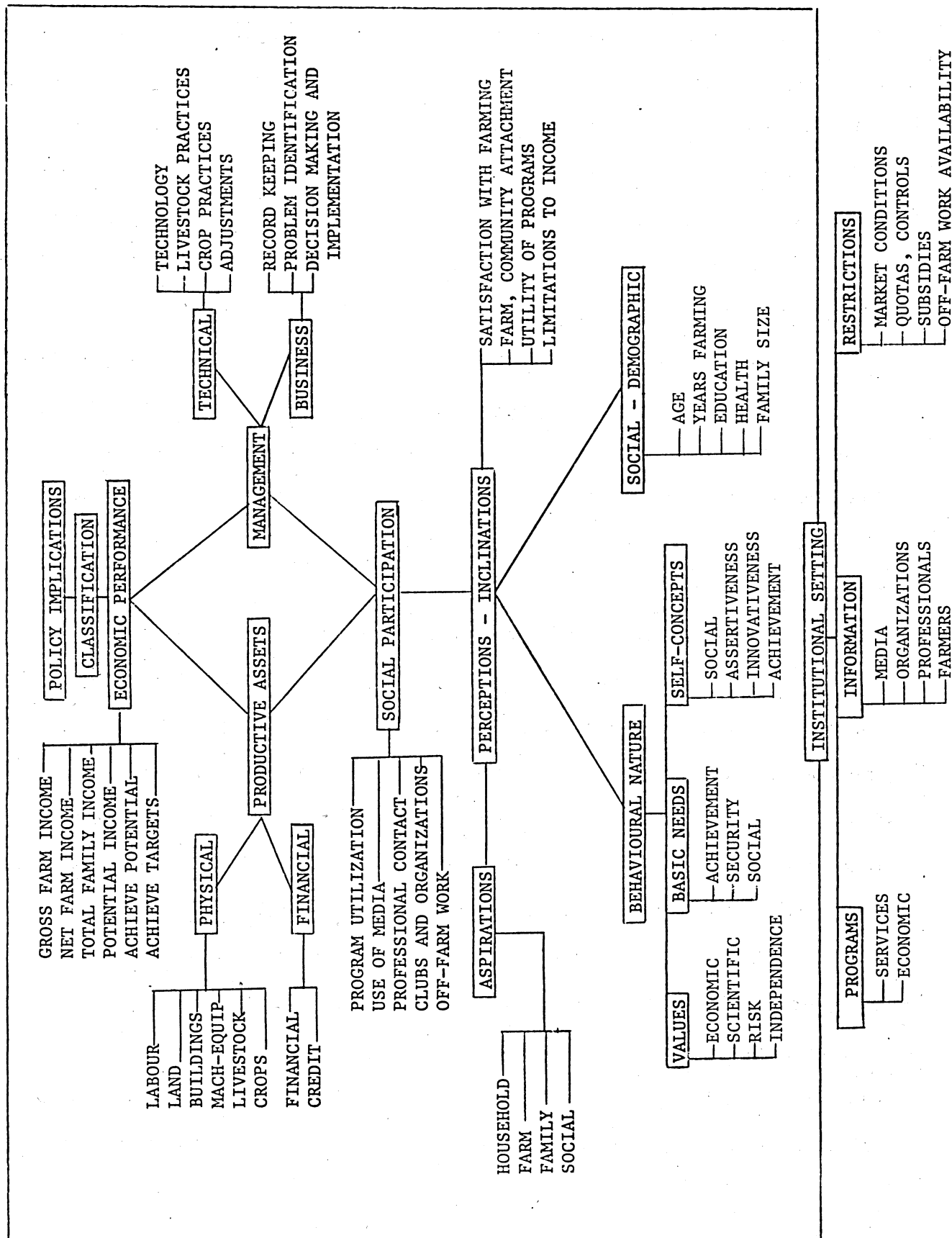
As a result of these studies, economic and behavioural factors likely to affect adjustments were identified. Present and potential levels of economic achievement were evaluated. This information, combined with the social demographic data (gathered from these farmers as part of the phase one study), enabled various characteristics of these farmers to be determined.

While the sample was not homogeneous with respect to the characteristics studied, the general picture of the limited resource farmer that emerged was that he generally did not possess the characteristics that promoted improvements in efficiency and welfare within the existing agricultural institutional setting. The sample was subdivided into receptive and unreceptive farmers. In general, the receptive group possessed characteristics more favourable to agricultural adjustment than the unreceptive group.

Work on the third and fourth phases of the project was intended to provide an in-depth analysis of prototype farms selected from groups of limited resource farmers planning to stay in agriculture and to determine the appropriateness and effectiveness of forms of advisory services and policies likely to be used by various groups of limited resource farmers.

^{1/} Blackburn et al Op. cit. p. 20

CONCEPTUAL FRAMEWORK



The need for the particular study reported in this publication arose directly from the findings of the phase two studies. To assist in the interpretation of this data and to provide a more complete understanding of the farming sector, it was considered desirably to collect similar information from a sample of commercial farmers. An analysis of the economic and behavioural characteristics of a wide cross-section of farmers should provide some additional insight concerning the management factor in farming. In particular, it should be possible to identify the human factors generally associated with better managerial performance in agriculture. Comparable data from farmers in a wide range of economic circumstances should prove useful in formulating policies for the agricultural sector in general, as well as in designing policies specifically for limited resource farmers.

A review of the literature indicates that the management factor often explains much of the variation in income levels and efficiency typically found in inter-farm comparisons. There are a number of behavioural characteristics of farmers that have been studied which have been found to generally distinguish good management from poor management. For example, good agricultural management is generally associated with contemporary value orientations and attitudes, high aspirations, high rates of social participation and the use of advanced farming technology.

From the phase two studies of the overall project, while dealing specifically with limited resource farmers, some comparisons could be made of farmers' characteristics by dividing the sample into two groups -- receptive and unreceptive. The groups were distinguished by their apparent receptivity to farm improvements. The receptive group generally had larger farms,

higher gross sales and higher net farm incomes. In comparison to the un-receptive group, they generally possessed those behavioural and economic characteristics which the literature would indicate as being associated with a more progressive style of management. However, the question remains as to how limited resource farmers compare with a sample of commercial farmers in Ontario.

Specific questions of concern are:

1. To what extent do limited resource and commercial farmers differ with respect to such psychological characteristics as values, basic needs, self-concept and aspirations.
2. Do limited resource and commercial farmers have different perceptions of the usefulness of government programs and of the importance of factors limiting their income?
3. Are there differences in the levels of social participation between limited resource and commercial farmers?
4. Do limited resource and commercial farmers generally have different social demographic characteristics such as age, farming experience, education and family size?
5. Do limited resource and commercial farmers generally differ with respect to advanced farming technology and in management practices used?
6. Do the higher levels of gross income and capital investment of commercial farms make them more viable farm units than those operated by limited resource farmers?

Objectives of the Study

The objectives of the study were to determine a number of economic and behavioural characteristics of selected commercial farmers and to compare them with those of receptive and unreceptive limited resource farmers. Since the receptive group of farmers generally appeared to possess characteristics more favourable to promoting improvements in incomes and general well-being when compared to the unreceptive group, it was expected that a number of their behavioural and economic characteristics would closely resemble those of commercial farmers. On the other hand, it would be expected that there would be dissimilarities in the characteristics of commercial and unreceptive farmers.

The economic and behavioural variables examined in this study were:

A. Social - Psychological Factors

1. Value Orientations
2. Aspirations
3. Self Concept
4. Basic Needs
5. Achievement Motivation
6. Satisfaction with Farming
7. Perceived Limitations to Income
8. Perceived Usefulness of Potential Agricultural Programs

B. Levels of Social Participation

1. Professional Contacts per Year
2. Organization Participation
3. Use of the Agricultural Mass Media
4. Participation in Government Programs

C. Social Demographic Factors

1. Age
2. Education
3. Family Size
4. Farming Experience

D. Technological and Management Factors

1. Management Ability Score
2. Technical Practices Score

E. Economic Factors

1. Measures of Farm Income
2. Farm Assets and Liabilities
3. Economic Efficiency Ratios
4. Income Targets Required to Reach Various Levels of Viability

Sample and Data Collection

The previous limited resource farm research had defined limited resource farmers as those with less than \$25,000 in gross farm sales in 1975. Farmer respondents had been interviewed in Grey and Renfrew counties. It was the intention in this study to collect information from commercial farmers in the same counties.

Respondents were initially selected from 1976 CANFARM membership lists. These records were made available for research purposes on the basis that records of individual farms were confidential and that published farm averages should contain five farms or more.

Using the assumption that gross farm sales are unlikely to change greatly in a one year period, respondents for this study were classed as commercial farmers if they had gross sales of more than \$25,000 in 1976. An attempt was made to gain a balanced representation of farms of different commodity types. Farms were initially selected from Grey and Renfrew counties. To gain an adequate representation of beef farmers, however, it was necessary to include a number of beef farms in Bruce county. This

county adjoins Grey county on the western side.

All interviewing work was carried out by a research assistant. The Agricultural Representatives in the three counties initially sent out introductory letters to the farmers. Interview appointments were made by telephone. The length of interviews ranged from one to two and one-half hours (with an average time of one hour and twenty-five minutes). Interviewing commenced on the 17th of June, 1978, and was completed on the 20th of July, 1978.

Thirty-nine interviews were completed. Table 1 shows the representation from the three counties and the various commodity types.

TABLE 1 DISTRIBUTION OF COMMERCIAL FARMER RESPONDENTS BY COUNTY AND FARM TYPE

<u>Farm Type</u>	<u>County</u>			<u>Total</u>
	<u>Grey</u>	<u>Bruce</u>	<u>Renfrew</u>	
Dairy	7	0	9	16
Beef	3	7	1	11
Pigs	5	0	2	7
Mixed Beef and Pigs	<u>2</u>	<u>2</u>	<u>1</u>	<u>5</u>
TOTAL	17	9	13	39

The previous phases had analyzed data gathered from three separate interview schedules. Because this study utilized only one interview, it was necessary to be somewhat selective in the characteristics to be measured. It was not possible to replicate the previous methodology in its entirety. An effort was made by the research team to include for measurement those

characteristics where meaningful comparisons could be made and to delete those measurements felt to be only marginally useful.

Because CANFARM data were made available for the research project, it was necessary to collect only a limited amount of economic data in the interview schedule itself. This allowed the major portion of the interviewing time to be concerned with the collection of behavioural data. Since the project was carried out to make comparisons, similar data collection instruments were used to collect information in farm interviews. Only minor adjustments were made.

Procedures for Analyses

Data from the interview schedules, together with economic data taken from CANFARM records, were coded and punched onto data processing cards. Seven cards were required to record the behavioural and economic data for each respondent. Computer output was mostly in the form of frequencies and percentages so that tables could be constructed to compare the characteristics of commercial and limited resource farmers.

The 78 limited resource farmers surveyed in 1976 were placed in one of two categories consisting of 25 receptive farmers and 53 unreceptive farmers. The characteristics of the commercial farmers were compared to those of both groups of limited resource farmers. A Kruskal-Wallis procedure^{1/} was used to test for significant differences in the characteristics of the three farmer groups.

^{1/} A reference text for this statistical procedure is Gibbons, J.D., Non-parametric Methods for Quantitative Analysis, New York: Holt, Rinehart and Winston (1976).

This statistical test was selected since it can be used to compare data expressed in ordinal scale values from three or more populations.

The Kruskal-Wallis test pools data from the populations and ranks the observations from low to high values. If the populations are similar, it would be expected that the mean of the ranks in any group would be approximately equal to the means of the ranks in another group. In an extreme case where all of the commercial farmers ranked higher in the total sample than all of the receptive farmers who, in turn, ranked higher than all of the unreceptive farmers, the rankings would be as follows:

Unreceptive limited resource	n=53	Ranks 1-53	Mean=27
Receptive limited resource	n=25	Ranks 54-78	Mean=66
Commercial	n=39	Ranks 79-117	Mean=98

If the groups were similar, the average rank for each group would be 59, i.e. $(1 + 117)/2$, using 117 ranks.

A comparison between the two groups of limited resource farmers was not available for some of the behavioural characteristics. In these cases, the commercial group of farmers were compared to the total sample of limited resource farmers using a Mann-Whitney test.^{1/} This test also uses a ranking procedure and is suitable for use with nonparametric data. It tests for differences between two populations.

^{1/} Ibid.

Limitations

The major limitation of the study was the relatively small number of respondents. A sample size of thirty-nine commercial farmers is minimal as a basis for making comparisons.

The intention of the study was to collect data from a group of commercial farmers. It was not assumed that this was a representative sample. Therefore, care should be exercised in generalizing the results to all commercial farmers.

The main aim of the study was to compare the characteristics of commercial farmers to data collected two years previously. It is possible that the behavioural characteristics of the commercial farmers may have changed somewhat during this period. However, the researchers felt that it is unlikely that these characteristics would have changed very much in this short period.

The study analyzed economic data for only one time period. These data are subject to bias resulting from such things as the unique market and climate situations which existed in 1976.

BEHAVIOURAL AND ECONOMIC COMPARISONS

Behavioural Characteristics

Behavioural Nature

Value orientations, basic socio-psychological needs, and self-concepts of respondents were included under this heading.

Value Orientations: Value orientations are defined as an organized system of values within an individual that determine desired ends of behaviour and prescribes norms or socially acceptable means of attaining them. Values considered to be at opposing poles of four continua were examined in this study. These value continua were:

1. Economic vs. Social -- a continuum representing priority placed on financial success, growth in the farm business, etcetera, compared to priority placed on time spent with family and friends and involvement in the community;
2. Scientific vs. Traditional -- a continuum representing an orientation toward use of modern methods, research information, scientific methods, where decisions were based solely on what had been done before and using primary reference groups as information sources;
3. Risk vs. Non-Risk -- a continuum representing an orientation toward acceptance of risk in decision making and a willingness to make changes involving some elements of uncertainty, as opposed to an orientation toward risk aversion or an unwillingness to make changes that involve elements of risk;
4. Independence vs. Group Action -- a continuum representing a preference for making decisions without seeking the advice of others and for working alone, as opposed to a preference for working in groups and sharing decision making or seeking advice of others.

Each of the four continua were represented by five groups of paired opposing statements. For example, in the economic-social category, five statements placing priority on economic advancement were paired with five statements placing priority on family and friends. The respondents were asked to choose one of the two statements that best represented their own

feelings or which was most important to them.

Scores of "zero" or "one" were assigned to respondent's answers indicating value preferences. A "one" was given to answers indicating economic, (and scientific, traditional, non-risk, and group action) choices. In this way a total score was calculated by adding points for all five statements in each category. For example the economic-social continuum would be made up as follows:

Score-0 : 0 economic statements, 5 social statements
Score-1 : 1 economic statement, 4 social statements
Score-2 : 2 economic statements, 3 social statements
Score-3 : 3 economic statements, 2 social statements
Score-4 : 4 economic statements, 1 social statement
Score-5 : 5 economic statements, 0 social statements

An individual with a total score of "zero" was considered to be strongly socially oriented while an individual with a score of "five" was strongly economically oriented. The other three continua were scored in the same manner.

Table 2 contains data which compare the three groups of farmers by their value orientation scores in the four aforementioned areas. The commercial farmers were significantly different from the unreceptive limited resource farmers at a one percent level of probability in all of the four value orientation areas studied. It would seem that these two groups were located at opposite ends of four continua. The receptive limited resource group were located somewhere along these continua. Their economic and independence value orientations were similar to those of the commercial farmers. However, their scientific orientation was more similar to that of the unreceptive farmers. Their orientation towards risk acceptance appeared to be somewhat intermediate (i.e. acceptance of a moderate amount of risk).

TABLE 2. COMPARISON OF FARMER GROUPS BY VALUE ORIENTATION SCORES

FARMER GROUP							
Value Orientations	Limited Resource ^a						
	Commercial		Receptive		Unreceptive		
	N	%	N	%	N	%	
<u>Economic Value Score</u>							
Low Economic	0	8	20%	6	24%	22	42%
(High Social)	1	8	20	5	20	18	34
	2	10	26	10	40	6	11
	3	9	23	1	4	6	11
(Low Social)	4	1	3	2	8	1	2
High Economic	5	3	8	1	4	0	0
		39	100%	25	100%	53	100%
Average Score		1.90		1.64		0.98	
Average Rank (N=117)		R ₁ = 70.27		R ₂ = 64.64		R ₃ = 48.05	
		R ₁ -R ₂ =5.63		R ₂ -R ₃ =16.59		R ₁ -R ₃ =22.22	***
<u>Scientific Value Score</u>							
Low Scientific	0	0	0%	1	4%	6	11%
(High Traditional)	1	0	0	3	12	8	15
	2	0	0	5	20	6	11
	3	3	8	5	20	15	29
(Low Traditional)	4	21	54	7	28	12	23
High Scientific	5	15	38	4	16	6	11
		39	100%	25	100%	53	100%
Average Score		4.31		3.04		2.70	
Average Rank (N=117)		R ₁ = 82.58		R ₂ = 51.82		R ₃ = 45.04	
		R ₁ -R ₂ =37.06	***	R ₂ -R ₃ =6.78		R ₁ -R ₃ =37.54	***
<u>Risk Value Score</u>							
Low Risk	0	0	0%	7	28%	28	53%
(High Non-Risk)	1	4	10	8	32	16	30
	2	15	39	5	20	6	11
	3	11	28	3	12	2	4
(Low Non-Risk)	4	8	20	1	4	1	2
High Risk	5	1	3	1	4	0	0
		39	100%	25	100%	53	100%
Average Score		2.67		1.44		0.72	
Average Rank (N=117)		R ₁ = 87.65		R ₂ = 56.96		R ₃ = 38.88	
		R ₁ -R ₂ =30.69	***	R ₂ -R ₃ =18.08	**	R ₁ -R ₃ =48.77	***
<u>Independence Value Score</u>							
Low Independence	0	0	7%	18	5%	3	6%
(High Group)	1	9	23	4	16	6	11
	2	14	36	8	32	15	28
	3	5	13	5	20	15	28
(Low Group)	4	4	10	1	4	10	19
High Independence	5	0	0	2	8	4	8
		39	100%	25	100%	53	100%
Average Score		1.74		1.96		2.66	
Average Rank (N=117)		R ₁ = 47.67		R ₂ = 52.68		R ₃ = 70.32	
		R ₁ -R ₂ =5.01		R ₂ -R ₃ =17.64	*	R ₁ -R ₃ =22.65	***

*** Significant at .01

** Significant at .05

* Significant at .10

^aSource: Blackburn et al. (op. cit.)p. 28.

Economic-Social

The average economic orientation scores (1.90 for the commercial, 1.64 for the receptive, and 0.98 for the unreceptive group) were low on the 0 - 5 measurement scale for economic orientation. However, the economic scores of the commercial farmers were significantly higher than the scores of the unreceptive limited resource farmers ($p < 0.01$). It can be concluded that the commercial farmers placed a higher emphasis on such aspects as financial success and farm growth. Unreceptive limited resource farmers, on the other hand, had a significantly higher social orientation. The receptive limited resource farmers, whose average score fell between those of the other groups, were not significantly different from either.

Scientific Traditional

The average scientific scores were 4.31 for the commercial group, 3.04 for the receptive group and 2.70 for the unreceptive group. The scores of the commercial farmers were significantly higher than the scores of both limited resource farmer groups ($p < 0.01$). The commercial farmers, therefore, generally indicated a higher orientation towards the use of modern production methods, research information and the like.

Risk - Non-Risk

The average risk scores were 2.76 for the commercial farmers, 1.44 for the receptive farmers and 0.72 for the unreceptive farmers. The risk scores of the commercial farmers were significantly greater ($p < 0.01$) than the scores of both limited resource farmer groups. In addition, the scores of the receptive group were significantly greater than the scores

of the unreceptive group ($p < 0.05$).

The commercial farmers appeared to have a stronger orientation towards acceptance of risk in decision making and a willingness to make farm changes involving elements of uncertainty. The unreceptive resource group, on the other hand, indicated an orientation towards risk aversion. The orientation of the receptive limited resource group appeared to be somewhat between the two extremes (i.e. acceptance of a moderate amount of risk).

Independence-Group Action

The average independence scores were 1.74 for the commercial group, 1.96 for the receptive group and 2.66 for the unreceptive group. The scores of the unreceptive farmers were significantly greater than the scores of both the receptive farmers ($p < 0.10$) and of the commercial farmers ($p < 0.01$).

Both the commercial and receptive limited resource farmers scores reflected an orientation towards group action (e.g. seeking the advice of others, collective action in agricultural marketing). The unreceptive limited resource group scores generally were indicative of an orientation towards independence in decision making and a preference for working alone.

In summary, the commercial group generally possessed those value orientations often associated with a progressive style of management (such as a belief in the importance of science and orientations towards risk, achievement and economic success). The unreceptive limited resource farmers generally expressed more traditional values, while the receptive limited

resource farmers were somewhat in between.

Basic Needs: Past research in the social and psychological fields has established that people experience various needs which are motivating forces in their behaviour. Maslow^{1/} has provided an interesting way of interrelating many human motives. He arranges the motives in a hierarchy ranging from low to high. Motives lowest in the hierarchy will be aroused first and must be satisfied or they will be dominant. However, once they are satisfied to a large degree, motives on the next highest level become the primary energizers and directors of behaviour. This implies that the hungry man will not philosophize, and similarly, the lonely man will have difficulty focusing on self-actualization and the like. Maslow suggested that lowest order needs include survival and safety, with sex, love, acceptance and affiliation needs being next highest. At the upper level would be found self-esteem and achievement types of needs. In this study an attempt was made to focus on security, affiliation (social) and achievement needs.

Although the measurement of basic needs or motives is more difficult than that of many other characteristics, their measurement was considered important for several reasons. Basic needs are likely very fundamental to human behaviour and thus play an important part in the formulation of aspirations and values. Although aging may contribute to changes, basic needs can be expected to change far more slowly over time than will specific values and thus may be a more dependable predictor of behaviour.

^{1/} A.H. Maslow, Motivation and Personality. Harper and Row, 1970.

The forced choice format used to measure value orientations was used to indicate which of three basic needs (security, affiliation, achievement) was predominant for each respondent. Six phrases were utilized in total. Each of the three needs was represented by two of the phrases. A scale was formed by matching one phrase with each of the phrases in the other two need categories. This produced six paired phrases from which the respondent was to choose the one of the two phrases that represented the need that was most important to him.

The question was scored by allotting one point for each of the phrases chosen by the respondent. The points were added for each of the three need categories giving a total Achievement score, Affiliation (social) score, and Security score. These scores (on a scale of 0 - 4) were then used to provide an indication of which predominated among these three needs for each respondent.

Data in Table 3 show the distribution of respondents with respect to the aforementioned measurer of social, security, and achievement needs. The social needs scores of the commercial farmers were significantly higher than those of the unreceptive farmers ($p < 0.05$) but no other significant differences were found.

Because of the measurement device and scoring system used, it is possible to measure only the predominant needs by this technique. It appeared that the social needs of the commercial farmers were higher than those of the unreceptive farmers. It is not, however, possible to draw any conclusions concerning the relative strengths of the achievement and security needs of the groups.

TABLE 3. COMPARISON OF FARMER GROUPS BY BASIC NEEDS

FARMER GROUP								
		Limited Resource ^a						
		Commercial		Receptive		Unreceptive		
		N	%	N	%	N	%	
<u>Social Need</u>								
Low Social	0	2	5%	3	12%	7	13%	
	1	6	15	4	16	11	21	
	2	6	15	5	20	10	19	
	3	5	13	3	12	14	26	
High Social	4	20	52	10	40	11	21	
		39	100%	25	100%	53	100%	
Average Score		2.90		2.52		2.21		
Average Rank (N=117)		R ₁ = 68.78		R ₂ = 59.92		R ₃ = 51.37		
		R ₁ -R ₂ =8.86		R ₂ -R ₃ =8.55		R ₁ -R ₃ =17.41**		
<u>Achievement Need</u>								
Low Achievement	0	6	15%	3	12%	3	6%	
	1	9	23	3	12	13	24	
	2	14	36	9	36	17	32	
	3	6	15	5	20	11	21	
High Achievement	4	4	11	5	20	9	17	
		39	100%	25	100%	53	100%	
Average Score		1.82		2.24		2.19		
Average Rank (N=117)		R ₁ = 52.15		R ₂ = 63.88		R ₃ = 61.74		
		R ₁ -R ₂ =11.73		R ₂ -R ₃ =2.14		R ₁ -R ₃ =9.59		
<u>Security Needs</u>								
Low Security	0	13	33%	8	32%	11	21%	
	1	11	28	8	32	15	28	
	2	9	23	5	20	14	26	
	3	3	8	3	12	10	19	
High Security	4	3	8	1	4	3	6	
		39	100%	25	100%	53	100%	
Average Score		1.28		1.24		1.60		
Average Rank (N=117)		R ₁ = 54.69		R ₂ = 54.08		R ₃ = 64.49		
		R ₁ -R ₂ =0.59		R ₂ -R ₃ =10.41		R ₁ -R ₃ =9.80		

Achievement Motivation

Need for achievement was considered a most important factor because of its possible relationship to managerial decision making. For this reason, a second method for measuring need for achievement was used that involved a graphic rather than verbal test. The respondents were shown a drawing containing various lines and scribbles. After seeing the drawing for two seconds they were asked to reproduce what they saw as closely as possible on a blank sheet of paper. The drawings obtained from the respondents were scored according to the system presented by Aronson^{1/}.

The Aronson scoring system was based primarily on the property of 'discrete-fuzzy' lines. That is, "the major distinction perceived was that the drawings of 'highs' (high achievers) contained a preponderance of single, unattached discrete lines, while those of the 'lows' (low achievers) seemed more overlaid, fuzzier". Need for achievement score was also derived to a lesser extent from certain additional configurations including: space (amount of page filled), diagonal configurations, S-shaped lines, and multi-wave lines.

Table 4 contains data comparing the three groups by their achievement motivation scores measured by the Aronson Technique. The mean score for the commercial farmers was 6.5 compared to average scores of 4.8 and 3.6 for the receptive and unreceptive groups, respectively. The scores of the commercial farmers were significantly higher than those of the unreceptive farmers at a one percent probability level. The scores of the

^{1/} E. Aronson. Motives in Fantasy, Actions and Society. Van Nostrand. 1968.

TABLE 4. COMPARISON OF FARMER GROUPS BY ACHIEVEMENT MOTIVATION SCORES

	FARMER GROUP		
	Commercial N	Limited Resource ^a	
		Receptive N	Unreceptive N
<u>Score</u>			
-5			1
-4			1
-3	1		
-1	2		1
0	1	1	4
1		1	6
2	2	2	4
3	2	3	10
4	3	7	5
5	7	2	3
6	2	3	3
7	7	2	5
8	2	1	4
9	1	1	2
10	2		1
11	1		
12	2		
14		1	
15	2		
16	1		
17	<u>1</u>		
	39	24	50
Average Score	6.5	4.8	3.6
Average Rank (N=113)			

*** Significant at .01 probability

^aSource: Blackburn et al., op. cit., p.33

receptive farmers were located approximately midway between these two groups and were not statistically different from either of the other groups.

On the basis of this test, it is concluded that the commercial farmers generally possessed a higher achievement motivation than the limited resource farmers, particularly the unreceptive farmers.

Self Concepts: The perception of self or image a person holds about himself and his abilities and talents is likely to affect the way he reacts to the world around him and therefore the decisions he makes. In order to examine this phenomenon of self-concept, four characteristics were identified and measured. These included sociability (likeability or friendliness); assertiveness (leadership ability); achievement orientation (how determined to succeed or get things done, conscientiousness); and innovativeness (try new things).

To measure each of these characteristics, the respondents were asked to react to either four or five relevant phrases for each characteristic. They were asked to choose the category, from a five point scale, that most closely represented how well each of several phrases described them. The respondent was then given a score depending on each response (ranging from four for "very definitely describes me" to zero for "very definitely does not describe me"). These scores were accumulated to yield a total score for each farmer for each of the four characteristics.

Table 5 contain data which indicate the distribution of respondents according to their self-concept scores in the areas of sociability, assertiveness, achievement and innovativeness. The statistical analysis was unable to detect any large differences in the self-concept scores of the three groups. It was expected that the commercial farmers would have a higher self-concept than limited resource farmers, particularly the unreceptive group. The results here do not confirm this. The only difference noted was between unreceptive and receptive limited resource farmers in the innovativeness self-concepts where unreceptive were significantly lower.

It seems apparent that most farmers tended to feel relatively self-confident in themselves with respect to the farm characteristics measured.

Perceptions and Inclinations

This section examines such areas as the respondents' aspirations, their satisfaction with farming and their attachment to the community, their perceptions of things that limited their farm income, and the potential utility of selected programs.

Aspirations: Aspirations were measured in four areas: household (a desire to attain a more up-to-date home, greater comforts and holidays); farm aspirations (a desire to improve the farm business through better quality crops and livestock, larger farm size and so on), social aspirations (a desire to participate in community groups and activities toward the attainment of a more prosperous and viable community and toward establishment of mutually agreeable relationships with other community members); and family aspirations (a desire to improve the environment and opportunities for their children and family).

TABLE 5. COMPARISON OF FARMER GROUPS BY SELF-CONCEPT SCORES

Social Self- Concept Score		FARMER GROUP					
		COMMERCIAL		LIMITED RESOURCE			
				Receptive		Unreceptive	
		N	%	N	%	N	%
Low	0- 3	0	0%	0	0%	0	0%
	4- 7	2	5	1	4	2	4
Medium	8-10	15	38	7	28	17	32
	11-13	19	49	10	40	20	55
High	14-16	3	8	7	28	5	9
		39	100%	25	100%	53	100%
Average Score		10.6		11.9		10.9	
Average Rank (N=117)		R ₁ = 54.04		R ₂ = 67.32		R ₃ = 58.73	
		R ₁ -R ₂ =13.28		R ₂ -R ₃ =8.59		R ₁ -R ₃ =4.69	
Assertiveness Self- Concept Score							
		N	%	N	%	N	%
Low	0- 3	2	5%	0	0%	2	4%
	4- 7	8	20	8	32	16	30
Medium	8-10	19	49	8	32	33	42
	11-13	10	26	6	24	13	24
High	14-16	0	0	3	12	0	0
		39	100%	25	100%	53	100%
Average Score		8.8		9.8		8.4	
Average Rank (N=117)		R ₁ = 59.69		R ₂ = 64.00		R ₃ = 56.13	
		R ₁ -R ₂ =4.31		R ₂ -R ₃ =7.87		R ₁ -R ₃ =3.56	
Achievement Self-Concept Score							
		N	%	N	%	N	%
Low	0- 4	0	0%	0	0%	0	0%
	5- 8	0	0	0	0	0	0
Medium	9-12	0	0	1	4	7	13
	13-16	23	59	14	56	32	61
High	17-20	16	41	10	40	14	26
		39	100%	25	100%	53	100%
Average Score		16.1		16.5		15.1	
Average Rank (N=117)		R ₁ = 65.36		R ₂ = 63.26		R ₃ = 52.31	
Innovativeness Self-Concept							
		N	%	N	%	N	%
Low	0- 3	0	0%	0	0%	0	0%
	4- 7	4	10	1	4	14	26
Medium	8-10	12	31	9	36	18	34
	11-13	18	46	9	36	18	34
High	14-16	5	13	6	24	3	6
		39	100%	25	100%	53	100%
Average Score		11.0		11.5		9.6	
Average Rank (N=117)		R ₁ = 64.58		R ₂ = 70.12		R ₃ = 49.65	
		R ₁ -R ₂ =5.54		R ₂ -R ₃ =20.47**		R ₁ -R ₃ =14.93*	

** Significant at .05

* Significant at .10

^aSource: Blackburn et al., op. cit., p. 35

These aspirations were measured using a series of phrases representing each of the areas specified. Each respondent was asked how important each of these statements were to him, taking into consideration the amount of time, energy and capital resources that he was allocating to achieve them. The respondents were to choose any answer from a five point scale (that included very important, important, indifferent (neutral), unimportant, and very unimportant) and an aspiration score was determined by allocating scores of four through to zero for answers ranging from "very important" through to "very unimportant" respectively and accumulating the total score for each aspiration area.

Table 6 contains data comparing the three farmer groups by their scores with regard to household, farm, social and family aspirations. With the exception of family aspirations where the commercial and receptive groups were approximately equal, it again appeared that the commercial and unreceptive groups were located at opposite ends of continua. The aspirations of the commercial group were generally higher. The household and social aspirations of the receptive group appeared similar to those of unreceptive farmers, their farm aspirations were intermediate between the two extremes and their family aspirations were approximately equal to those of commercial farmers.

These results are consistent with the findings of other studies. For example, Rushing's study^{1/} compared the goals and aspirations of

^{1/} W.A. Rushing, "Class Differences in Goal Orientations and Aspirations Rural Patterns", Rural Sociology, Vol. 35, No. 3 (1970).

TABLE 6. COMPARISON OF FARMER GROUPS BY ASPIRATIONS

FARMER GROUP						
	Commercial		Limited Resource			
	N	%	Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Household Aspiration Score</u>						
2 - 6	4	10%	7	28%	17	32%
7	3	8	7	28	17	32
8 - 11	32	82	11	44	19	36
	39	100%	25	100%	53	100%
Average Score	8.6		7.2		7.0	
Average Rank (N=117)	R ₁ = 75.69		R ₂ = 53.88		R ₃ = 49.13	
	R ₁ -R ₂ =21.81**		R ₂ -R ₃ =4.75		R ₁ -R ₃ =26.56***	
<u>Farm Aspiration Score</u>						
9 - 18	3	8%	7	28%	26	49%
19 - 20	5	13	6	24	15	28
21 - 26	31	79	12	48	12	23
	39	100%	25	100%	53	100%
Average Score	21.6		20.4		18.5	
Average Rank (N=117)	R ₁ = 79.31		R ₂ = 60.26		R ₃ = 43.46	
	R ₁ -R ₂ =19.05*		R ₂ -R ₃ =16.80*		R ₁ -R ₃ =35.85***	
<u>Family Aspiration Score</u>						
6 - 10	11	29%	7	28%	26	49%
11 - 12	13	33	6	24	15	28
13 - 16	15	38	12	48	12	23
	39	100%	25	100%	53	100%
Average Score	11.7		11.4		11.2	
Average Rank (N=117)	R ₁ = 64.54		R ₂ = 68.10		R ₃ = 50.63	
	R ₁ -R ₂ =3.56		R ₂ -R ₃ =17.47*		R ₁ -R ₃ =13.91	
<u>Social Aspiration Score</u>						
3 - 7	2	6%	5	20%	17	32%
8 - 11	6	15	9	36	23	43
12 - 17	31	79	11	44	13	25
	39	100%	25	100%	53	100%
Average Score	13.3		11.0		9.1	
Average Rank (N=117)	R ₁ = 78.87		R ₂ = 57.76		R ₃ = 44.96	
	R ₁ -R ₂ =21.11**		R ₂ -R ₃ =12.80		R ₁ -R ₃ =33.91***	

*** Significant at .01

** Significant at .05

* Significant at .10

^aSource: Ellis, op. cit., pp. 250, 315, 318, 321, 324.

affluent farmers to those of farm workers. He found that even when the goals aspired to were the same, the level aspired to was higher among the high status group. Taylor's study^{1/} compared the aspirations of successful and unsuccessful farm families. He found that the successful families generally had higher aspirations. Both groups had high aspirations regarding their children's schooling. This is consistent with the finding above that the family aspirations of the commercial and receptive farmers were approximately equal. It will be seen later that the aforementioned farmers were generally younger than the unreceptive farmers and would be more likely to have young families.

Satisfaction with Farming: Table 7 shows data which compare the farmer groups by their expressed satisfaction with farming. Satisfaction scores were computed by scoring responses of "very satisfied" as 3, through to 0 for responses of "very dissatisfied".

All three groups expressed a fairly high degree of satisfaction. The unreceptive farmer group generally appeared the least satisfied, (however, eighty-three percent of this group were at least slightly satisfied with farming).

In terms of rankings, the commercial and receptive groups were similar. Both groups were significantly more satisfied with farming than the unreceptive farmers (at a one percent probability level). It is concluded that the unreceptive group, although generally fairly satisfied

^{1/} G.W. Taylor "An Analysis of Certain Social and Psychological Factors Differentiating Successful from Unsuccessful Farm Families", Rural Sociology. Vol. 27 (1962).

with farming, were somewhat less satisfied than the other two groups.

TABLE 7. COMPARISON OF FARMER GROUPS BY SATISFACTION WITH FARMING

	FARMER GROUP					
	Limited Resource ^a					
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Satisfaction Level</u>						
Very satisfied	29	74%	18	72%	20	38%
Slightly satisfied	8	21	7	28	24	45
Slightly dissatisfied	2	5	0	0	5	9
Very dissatisfied	0	0	0	0	4	8
	39	100%	25	100%	53	100%
Average Score	2.7		2.7		2.1	
Average Rank (N=117)	R ₁ = 48.77		R ₂ = 48.84		R ₃ = 71.32	
	R ₁ -R ₂ =0.07		R ₂ -R ₃ =22.48***		R ₁ -R ₃ =22.55***	

*** Significant at .01

^aSource: Blackburn et al., op. cit., p. 38

Community Attachment: A two-way comparison was made of the degree of community attachment felt by commercial farmers and the aggregated limited resource group as shown in Table 8. This showed there was no significant difference between the two groups. Both groups expressed a high degree of attachment to their communities.

TABLE 8. COMPARISON OF COMMERCIAL WITH LIMITED RESOURCE FARMERS
BY COMMUNITY ATTACHMENT

<u>Community Attachment</u>	<u>COMMERCIAL</u>		<u>LIMITED RESOURCE^a</u>	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
I would never consider leaving	6	15%	21	27%
I might leave if I had to but I would really prefer not to	21	54	36	46
It would depend on how good my opportunities were elsewhere	8	21	13	17
I would leave if I had a good opportunity elsewhere	4	10	6	8
I would really like to leave if I had any other opportunity	$\frac{0}{39}$	$\frac{0}{100\%}$	$\frac{2}{78}$	$\frac{2}{100\%}$
Average Rank (N=117)	$R_1 = 63.13$		$R_2 = 56.94$	
	$ R_1 - R_2 = 6.19$		$p = 0.32$	

^aSource: Blackburn et al., op. cit., p. 39.

Encourage Children to Enter Farming: A two-way comparison between the commercial group and the aggregated limited resource group was also made with respect to their desire to see their children enter farming. These data are shown in Table 9.

TABLE 9. COMPARISON OF COMMERCIAL AND LIMITED RESOURCE FARMERS
BY ENCOURAGEMENT OF CHILDREN TO
START FARMING

	FARMER GROUP			
	Commercial		Limited Resource	
	N	%	N	%
<u>Degree of Encouragement</u>				
Yes	15	38%	20	26%
Maybe	19	49	9	11
No	<u>5</u>	<u>13</u>	<u>49</u>	<u>63</u>
	39	100%	78	100%
Average Rank (N=117)	R ₁ = 42.64		R ₂ = 67.18	
	R ₁ -R ₂ =24.54***			

*** Significant at .01 probability

^aSource: Stringer, T.M., "Participation Patterns and Policy Preferences of Limited Resource Farmers", University of Guelph, M.Sc. thesis (1977), p. 132.

The attitudes of the two groups were significantly different ($p < 0.01$). The commercial farmers generally expressed a greater desire to see their children become farmers. Only thirteen percent of the commercial farmers said they would definitely not encourage their children as compared to sixty-three percent of the limited resource farmers who expressed this attitude. This may be indicative of the higher level of farming satisfaction felt by commercial farmers as compared to limited resource farmers in general. It may also be a reflection of their higher expected future earnings.

Factors Limiting to Income: Respondents were asked the degree to which they felt availability of land to rent or buy, credit, buildings and

equipment information on advanced agricultural practices, off-farm work, and formal education were limiting their ability to increase their total family income. Scores were computed by scoring a response of "very limiting" as 3, through to 0 for a "not limiting" response.

A comparison of the three farmer groups, as outlined in Table 10, showed that none of these factors was generally considered to be either very or moderately limiting to incomes. With the exception of the availability of off-farm work, there were no significant differences in the perceptions of the three groups.

In the area of off-farm work as limiting, the average scores were zero for the commercial farmers compared to scores of 0.3 and 0.5 for the receptive and unreceptive groups, respectively. The difference between the perceptions of the commercial group and those of the unreceptive limited resource group was significantly different ($p < 0.01$). The latter group considered work availability to be more limiting than commercial farmers, (despite the fact that seventy-nine percent of the unreceptive farmers perceived work availability as non-limiting). However, none of the commercial farmers indicated that availability of off-farm work limited their incomes.

TABLE 10. COMPARISON OF FARMER GROUPS BY THEIR PERCEPTION OF VARIOUS FACTORS AS BEING LIMITING TO INCOME

Availability of Land	FARMER GROUPS					
	Commercial		LIMITED RESOURCE			
	N	Z	Receptive		Unreceptive	
			N	Z	N	Z
Very limiting (3)	2	5%	3	12%	6	11%
Mod. limiting (2)	3	8	5	20	6	11
Sl. limiting (1)	9	23	5	20	2	4
Not limiting (0)	25	64	12	48	39	74
	39	100%	25	100%	53	100%
Average Score	0.5		1.0		0.6	
Average Rank (N=117)	R ₁ = 60.43		R ₂ = 49.28		R ₃ = 62.54	
	R ₁ -R ₂ = 11.15		R ₂ -R ₃ = 13.26		R ₁ -R ₃ = 2.11	
Availability of Credit	N	Z	N	Z	N	Z
Very limiting (3)	1	3%	1	4%	1	2%
Mod. limiting (2)	2	5	2	8	3	6
Sl. limiting (1)	6	15	2	12	1	2
Not limiting (0)	30	77	19	76	48	90
	39	100%	25	100%	53	100%
Average Score	0.3		0.4		0.2	
Average Rank (N=117)	R ₁ = 55.87		R ₂ = 54.94		R ₃ = 63.22	
	R ₁ -R ₂ = 0.93		R ₂ -R ₃ = 8.28		R ₁ -R ₃ = 7.35	
Buildings and Equipment	N	Z	N	Z	N	Z
Very limiting (3)	1	3%	2	8%	9	17%
Mod. limiting (2)	6	15	6	24	10	19
Sl. limiting (1)	13	33	5	20	9	17
Not limiting (0)	19	49	12	48	25	47
	39	100%	25	100%	53	100%
Average Score	0.7		0.9		1.1	
Average Rank (N=117)	R ₁ = 63.38		R ₂ = 58.72		R ₃ = 55.91	
	R ₁ -R ₂ = 4.66		R ₂ -R ₃ = 2.81		R ₁ -R ₃ = 7.47	
Availability of Ag. Info.	N	Z	N	Z	N	Z
Very limiting (3)	1	3%	0	0%	2	4%
Mod. limiting (2)	0	0	3	12	2	4
Sl. limiting (1)	6	15	5	20	7	13
Not limiting (0)	32	82	17	68	42	79
	39	100%	25	100%	53	100%
Average Score	0.5		0.4		0.3	
Average Rank (N=117)	R ₁ = 61.82		R ₂ = 53.18		R ₃ = 59.67	
	R ₁ -R ₂ = 8.64		R ₂ -R ₃ = 6.49		R ₁ -R ₃ = 2.15	
Formal Education	N	Z	N	Z	N	Z
Very limiting (3)	1	3%	0	0%	2	4%
Mod. limiting (2)	4	10	3	12	8	16
Sl. limiting (1)	14	36	5	20	5	10
Not limiting (0)	20	51	17	68	36	70
	39	100%	25	100%	53	100%
Average Score	0.6		0.4		0.5	
Average Rank (N=117)	R ₁ = 52.64		R ₂ = 61.14		R ₃ = 60.56	
	R ₁ -R ₂ = 8.50		R ₂ -R ₃ = 0.58		R ₁ -R ₃ = 7.92	
Off-Farm Work	N	Z	N	Z	N	Z
Very limiting	0	0%	1	4%	5	9%
Moderately limiting	0	0	1	4	4	8
Slightly limiting	0	0	2	8	2	4
Not at all limiting	39	100	21	84	42	79
	39	100%	25	100%	53	100%
Average Score	0.0		0.3		0.5	
Average Rank (N=117)	R ₁ = 66.50		R ₂ = 57.44		R ₃ = 54.22	
	R ₁ -R ₂ = 9.06		R ₂ -R ₃ = 3.22		R ₁ -R ₃ = 12.28***	

* Significant at .01

^a Source: Blackburn et al., op. cit., p. 40

For the total sample of farmers (i.e. commercial and both groups of limited resource farmers, the availability of buildings and equipment was the factor perceived as most limiting to income. Fifty-two percent of all respondents felt this factor was limiting to some extent (i.e. very, moderately or slightly limiting). Thirty-seven percent of the total felt their own formal education was a limiting factor and thirty-five percent perceived the availability of land to rent or buy to be somewhat limiting. The proportions indicating limitations of the availability of agricultural information (22 percent), of credit (16 percent) and of off-farm work (15 percent) were generally lower than indicated for the previous factors.

Utility of Potential Agricultural Programs: One measure of policy preferences involved respondents' perception of the utility of various potential policy instruments. A series of hypothetical programs were presented to the respondents to determine, in a cursory way, what types of additional programs they would consider useful in their operation. The hypothetical programs included:

1. A production advice program.
2. A management advice program.
3. Retirement planning advisory program.
4. Direct transfer payment program to make up the difference between cost of production and returns.
5. Indirect subsidies like credit arrangements and training programs, or subsidized services like R.O.P. and feed testing.

Utility scores were computed by scoring replies of "very useful", "moderately useful", "slightly useful" and "not useful" as 3, 2, 1 and 0, respectively. Table 11 contain data outlining the distribution of scores for these hypothetical programs.

TABLE 11. COMPARISON OF FARMER GROUPS BY THEIR PERCEPTION OF THE USEFULNESS OF AGRICULTURAL PROGRAMS

	FARMER GROUP					
	Limited Resource ^a					
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Production Advisory</u>						
Very useful	28	72%	11	44%	10	19%
Moderately useful	10	25	7	28	16	30
Slightly useful	1	3	6	24	11	21
Not at all useful	0	0	1	4	16	30
	39	100%	25	100%	53	100%
Average Score	2.7		2.1		1.4	
Average Rank (N=117)	R ₁ = 37.22 R ₁ -R ₂ =18.58 *		R ₂ = 55.80 R ₂ -R ₃ =20.74 **		R ₃ = 76.54 R ₁ -R ₃ =39.32 ***	
<u>Management Advisory</u>						
Very useful	16	41%	7	28%	5	9%
Moderately useful	16	41	6	24	12	23
Slightly useful	5	13	8	32	9	17
Not at all useful	2	5	4	16	27	51
	39	100%	25	100%	53	100%
Average Score	2.2		1.6		0.9	
Average Rank (N=117)	R ₁ = 39.22 R ₁ -R ₂ =15.44		R ₂ = 54.66 R ₂ -R ₃ =20.94 **		R ₃ = 75.60 R ₁ -R ₃ =36.38 ***	
<u>Retirement Advisory</u>						
Very useful	6	15%	5	20%	14	26%
Moderately useful	19	49	8	32	8	15
Slightly useful	12	31	5	20	8	15
Not at all useful	2	5	7	28	23	44
	39	100%	25	100%	53	100%
Average Score	1.7		1.4		1.2	
Average Rank (N=117)	R ₁ = 50.62 R ₁ -R ₂ =8.76		R ₂ = 59.38 R ₂ -R ₃ =5.61		R ₃ = 64.99 R ₁ -R ₃ =14.37	
<u>Direct Subsidies</u>						
Very useful	7	18%	20	80%	34	64%
Moderately useful	9	23	2	8	4	8
Slightly useful	11	28	2	8	6	11
Not at all useful	12	31	1	4	9	17
	39	100%	25	100%	53	100%
Average Score	1.3		2.6		2.2	
Average Rank (N=117)	R ₁ = 78.51 R ₁ -R ₂ =37.05 ***		R ₂ = 41.46 R ₂ -R ₃ =11.45		R ₃ = 52.91 R ₁ -R ₃ =25.60 ***	
<u>Indirect Subsidies</u>						
Very useful	16	41%	9	36%	9	17%
Moderately useful	18	46	8	32	18	34
Slightly useful	5	13	8	32	16	30
Not at all useful	0	0	0	0	10	19
	39	100%	25	100%	53	100%
Average Score	2.3		2.0		1.5	
Average Rank (N=117)	R ₁ = 45.18 R ₁ -R ₂ =8.96		R ₂ = 54.14 R ₂ -R ₃ =17.32 *		R ₃ = 71.46 R ₁ -R ₃ =26.28 ***	
<u>Subsidy Preference</u>						
Direct	4	10%	17	68%	34	69%
Indirect	35	90	8	32	15	31
	39	100%	25	100%	53	100%
Average Score	1.9		1.3		1.2	
Average Rank (N=117)	R ₁ = 78.71 R ₁ -R ₂ =32.63 ***		R ₂ = 46.08 R ₂ -R ₃ =0.78		R ₃ = 45.30 R ₁ -R ₃ =33.41 ***	

*** Significant at .01

** Significant at .05

* Significant at .10

^aSource: Blackburn et al., op. cit., pp. 43-44

Commercial farmers generally tended to value all three types of advisory services more highly than did the limited resource farmers. Also, the receptive group generally valued these services more highly than the unreceptive group. These tendencies were quite pronounced with production advisory services and, to a lesser extent, with management advisory services. There were not great differences between groups in the perceived usefulness of retirement planning services.

Farmers' preferences for direct or indirect subsidies seem quite clear. The commercial farmers perceived a high usefulness for indirect subsidies and preferred them to direct subsidies. The preferences of both groups of limited resource farmers were the reverse, (the receptive group, however, did generally perceive indirect subsidies as quite useful also). These findings are quite similar to those reported by Beal et al.^{1/} who found that farmers with traditional values and beliefs generally had positive attitudes towards income transfer payment programs (i.e. direct subsidies). Farmers with more contemporary values (e.g. higher scientific, risk and economic orientations) had positive attitudes towards programs designed to encourage the process of agricultural adjustment by providing education, information and direct financial aid to farm people (i.e. indirect subsidies). It has been previously noted that the commercial farmers in this study tended to express more contemporary values whereas the limited resource farmers, particularly the unreceptive group, expressed more traditional values and beliefs.

^{1/} G.M. Beal, et al., Rural Value-Orientations and Farm-Policy Positions and Actions. Research Bulletin 561. Ames, Iowa, May, 1968.

Program Suggestions: Respondents were asked to indicate or suggest any specific type of programs that they thought governments should have for farmers like themselves. A wide variety of suggestions were forthcoming. Table 12 shows a comparison of the suggestions made by commercial and the aggregated limited resource group.

The suggestions made by the commercial group were consistent with their high preference for indirect subsidies. For example their suggestions mainly concerned advisory and research services, credits and grants and improved agricultural marketing.

The limited resource farmers mentioned price stabilization schemes most frequently. This is consistent with their high preference for direct

TABLE 12. COMPARISON OF COMMERCIAL WITH LIMITED RESOURCE FARMERS
BY SUGGESTIONS FOR AGRICULTURAL PROGRAMS

	FARMER GROUP			
	<u>Commercial</u>		<u>Limited Resource^a</u>	
	N	%	N	%
<u>Program Suggestions</u>				
1. Less government involvement	6	15%	14	19%
2. More off-farm work	0	0	2	3
3. Improvement in marketing systems	5	13	6	10
4. Improvement in advisory and research services	8	20	3	4
5. Continued or increased use of credits and grants	5	13	5	7
6. Input subsidies or controls on input prices	1	3	4	5
7. Improved participation of farmers in development of legislation	2	5	4	5
8. Price stabilization	0	0	24	29
9. No suggestions	<u>12</u>	<u>31</u>	<u>14</u>	<u>18</u>
	39	100%	78	100%

^aSource: Stringer, op. cit., p. 111.

subsidies. A substantial proportion of both groups said there was too much government involvement already or they had no suggestions of other programs that might be helpful.

Social Participation

Comparisons between the three farmer groups were made with respect to their participation behaviour in four areas: professional contacts per year, participation in clubs and organizations, use of the agricultural mass media and use of government programs.

Professional Contacts: The respondents were asked to indicate the extent that they had contact during the past year with each of the following: bankers, or credit union agents, accountants or lawyers, Farm Credit Corporation advisors, Rural Development officers (or A.R.D.A. staff) and the county extension staff.

For those agencies the respondents had contacted they were asked how often they had various types of contacts in the past year (including office calls or letters, farm visits, meetings, field days and courses). Each respondent was scored by being given a point for each contact he had had over the previous year with any of the agencies. The sum of these points represented a total professional contact score.

The comparisons of the different types of professional contacts seemed to reveal again that the commercial farmers and the unreceptive farmers were located at opposite ends of a continuum. The data support the rejection of the hypothesis of no differences between groups. The commercial farmers reported a high number of contacts while the unreceptive farmers generally located approximately midway along this continuum. The differences were most noticeable in the case of banker, accountant and lawyer, and extension staff contacts.

TABLE 13. COMPARISON OF FARMER GROUPS BY FARM ASSETS
AND PERCENT EQUITY

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Banker and Credit Union Contacts</u>						
0	0	0%	6	24%	35	66%
1 - 2	8	21	9	36	12	22
3 - 5	5	13	6	24	3	6
6 - 11	12	31	1	4	1	2
12 or more	14	35	3	12	2	4
	39	100%	25	100%	53	100%
Average Rank (N=117)	R ₁ = 88.35		R ₂ = 60.42		R ₃ = 36.74	
	R ₁ -R ₂ =27.93***		R ₂ -R ₃ =23.68***		R ₁ -R ₃ =51.61***	
<u>Accountant and Lawyer Contacts</u>						
0	4	10%	7	28%	25	47%
1 - 2	13	33	15	60	27	51
3 - 5	13	33	2	8	0	0
6 - 11	9	24	0	0	1	3
12 or more	0	0	1	4	0	0
	39	100%	25	100%	53	100%
Average Rank (N=117)	R ₁ = 81.96		R ₂ = 56.18		R ₃ = 43.43	
	R ₁ -R ₂ =25.78***		R ₂ -R ₃ =12.75		R ₁ -R ₃ =38.53***	
<u>F.C.C. Advisor Contacts</u>						
0	30	77%	22	88%	50	94%
1 - 2	7	17	2	8	2	4
3 - 5	1	3	1	4	0	0
6 - 11	1	3	0	0	1	2
12 or more	0	0	0	0	0	0
	39	100%	25	100%	53	100%
Average Rank (N=117)	R ₁ = 64.92		R ₂ = 54.54		R ₃ = 54.86	
	R ₁ -R ₂ =6.38		R ₂ -R ₃ =3.68		R ₁ -R ₃ =10.06	

TABLE 13.
(Continued)

	Commercial		Receptive		Unreceptive		
	N	%	N	%	N	%	
<u>A.R.D.A. Counsellor Contacts</u>							
0	28	73%	23	92%	53	100%	
1 - 2	5	12	2	8	0	0	
3 - 5	5	12	0	0	0	0	
6 - 11	1	3	0	0	0	0	
12 or more	0	0	0	0	0	0	
	39	100%	25	100%	53	100%	
Average Rank (N=117)	R ₁ = 69.15		R ₂ = 56.94		R ₃ = 52.50		
	R ₁ -R ₂ =12.21**		R ₂ -R ₃ =4.44		R ₁ -R ₃ =16.65***		
<hr/>							
<u>Extension Staff Contacts</u>							
0	0	0%	9	36%	37	70%	
1 - 2	0	0	7	28	12	22	
3 - 5	5	13	3	12	2	4	
6 - 11	4	10	4	16	1	2	
12 or more	30	77	2	8	1	2	
	39	100%	25	100%	53	100%	
Average Rank (N=117)	R ₁ = 96.94		R ₂ = 53.48		R ₃ = 35.16		
	R ₁ -R ₂ =41.46***		R ₂ -R ₃ =18.32*		R ₁ -R ₃ =59.78***		
<hr/>							
<u>Total Professional Contacts</u>							
Low	0 - 1	0	0%	3	12%	29	55%
Medium	2 - 4	0	0	6	24	14	26
High	5 or more	39	100	16	64	10	19
	30	100%	25	100%	53	100%	
Average Total Contacts	37.7		10.8		2.9		
Average Rank (N=117)	R ₁ = 85.00		R ₂ = 66.58		R ₃ = 36.29		
	R ₁ -R ₂ =18.42*		R ₂ -R ₃ =30.29***		R ₁ -R ₃ =48.71***		

*** Significant at .01

** Significant at .05

* Significant at .10

^aSource: Blackburn et al., op. cit., 49-50; and Stringer, op. cit., p. 155

These findings are similar to those reported in a number of studies. For example, Hobbs et al.^{1/} found positive relationships between management returns and both the use of specialized sources of information and the number of sources used. Fliegel^{2/} and Rust^{3/} both reported significant relationships between farmers' contact with the extension service and managerial performance.

Organizational Participation: Respondents were asked to indicate to which of a wide array of clubs and organizations they belonged as well as the extent of their activity in each of these. A modified Chapin scale^{4/} was used to derive an organizational participation score for each respondent (one point for each: membership; officeship in past; officeship at present; attendance at 1/3 to 2/3 of meetings, plus an extra point for attendance at more than 2/3 of organization meetings).

Table 14 shows data which compare the three farmer groups by their computed organizational participation scores. The commercial farmers generally participated more in clubs and organizations than both limited resource farmer groups. Their average score of 14.6 was much higher than the average scores of 5.5 and 3.5 for the receptive and unreceptive groups, respectively. The commercial farmers' scores were significantly greater than those of both limited resource groups ($p < 0.01$). Although the scores of the receptive

^{1/} D.J. Hobbs, et al. The Relation of Farm Operator Values and Attitudes to Their Economic Performance, Report No. 33, Dept. of Economics and Sociology, Iowa State University, Ames, Iowa. June, 1964.

^{2/} F.C. Fliegel, "Aspirations of Low Income Farmers and Their Performance and Potential for Change", Rural Sociology Vol. 24 (1959) and "Obstacles to Change for the Low Income Farmer" Rural Sociology Vol. 25 (1960).

^{3/} Rust, R.S., "Farm Survey Data Relationship With Managerial Ability", The Economic Analyst, Vol. 33, No. 2, 1963 and Vol. 34, No. 1, 1964.

^{4/} F. Stuart Chapin, Experimental Designers in Sociological Research. New York: Harper, 1955

farmers were generally higher than those of the unreceptive farmers, the difference was not statistically significant.

TABLE 14. COMPARISON OF FARMER GROUPS BY ORGANIZATIONAL PARTICIPATION

		FARMER GROUP					
		Limited Resource ^a					
		Commercial		Receptive		Unreceptive	
Participation Score		N	%	N	%	N	%
Low	0 - 4	3	8%	13	52%	36	68%
	5 - 9	7	18	7	28	11	21
Medium	10 - 14	9	23	3	12	4	7
	15 - 19	12	31	1	4	1	2
High	20 - 40	8	20	1	4	1	2
		39	100%	25	100%	53	100%
Average Score		14.6		5.5		3.5	
Average Rank (N=117)		R ₁ = 87.44		R ₂ = 50.76		R ₃ = 41.96	
		R ₁ -R ₂ =36.68***		R ₂ -R ₃ =8.80		R ₁ -R ₃ =45.48***	

***Significant at .01 probability

^aSource: Blackburn et al., op. cit., p.46

Again, these findings are similar to those reported by other researchers. For example, Jacobson,^{1/} Frawley et al.^{2/} and Rust^{3/} all showed positive relationships between participation rates and management returns.

^{1/}C. Jacobson, "Who Joins Farm Organizations". Journal of Cooperative Extension, Vol. 7, No. 4 (1969).

^{2/}J. Frawley et al., "The Relationship of Scale and Farm Management Performance in Ireland", Irish Journal of Agricultural Economics and Rural Sociology, Vol. 5, No. 1 (1975/75).

^{3/}Rust op. cit.

Use of Agricultural Mass Media: The respondents were asked to indicate the number of farm magazines, newspapers or bulletins which they received and also which farm radio or television programs they happened to follow. The responses are shown in Table 15.

Radio and T.V. Programs

The commercial farmers indicated they followed, on average, 1.9 programs, compared to 1.4 and 0.8 programs for the receptive and unreceptive groups, respectively. The unreceptive farmers followed significantly fewer programs than both the commercial farmers ($p < 0.01$) and the receptive farmers ($p < 0.05$). Although the commercial farmers followed more programs than the receptive farmers the difference was not statistically significant.

There appeared to be a rather limited range of farm programs available to respondents. Only one respondent indicated that he followed more than three programs.

Farm Magazines

The commercial farmers subscribed to an average of 5.9 farm magazines, compared to 3.0 and 2.3 magazines for the receptive and unreceptive groups, respectively. The commercial farmers received a significantly greater number of magazines than both limited resource farmer groups ($p < 0.01$). The receptive group generally subscribed to more magazines than the unreceptive group but the difference was not significant.

Utilization of Government Programs: Table 16 shows a comparison of the use of current government programs by commercial farmers and the total group of limited resource farmers. A three-way comparison of groups was

TABLE 15. COMPARISON OF FARMER GROUPS BY THEIR USE OF AGRICULTURAL MASS MEDIA

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>No. of Farm Radio and T.V. Programs Followed</u>						
0	2	5%	4	16%	23	43%
1	11	28	9	36	19	36
2	15	38	11	44	10	19
3	10	26	1	4	1	2
4	1	3	0	0	0	0
	39	100%	25	100%	53	100%
Average Number of Programs	1.9		1.4		0.8	
Average Rank (N=117)	R ₁ = 79.19		R ₂ = 62.52		R ₃ = 42.48	
	R ₁ -R ₂ =16.67		R ₂ -R ₃ =20.04**		R ₁ -R ₃ =36.71***	
<u>No. of Farm Magazines</u>						
0	0	0%	2	8%	2	4%
1	0	0	2	8	14	26
2	1	3	5	20	18	34
3	3	8	6	24	9	17
4	4	10	7	28	6	11
5	8	20	2	8	2	4
6	8	20	1	4	2	4
7	9	23	0	0	0	0
8	3	8	0	0	0	0
9	3	8	0	0	0	0
	39	100%	25	100%	53	100%
Average Number of Magazines	5.9		3.0		2.3	
Average Rank (N=117)	R ₁ = 91.97		R ₂ = 51.15		R ₃ = 38.44	
	R ₁ -R ₂ =40.83***		R ₂ -R ₃ =12.70		R ₁ -R ₃ =53.33***	

*** Significant at .01

** Significant at .05

^aSource: Blackburn, et al., op. cit., p. 47.

not available.

With the exception of farm vacation host grants which had been utilized by neither group, the commercial farmers had made much greater use of the programs. Of the eleven programs listed, six had been used by more than forty percent of the commercial farmers. Only the feed and soil testing programs had a more than forty percent usage by limited resource farmers.

TABLE 16. COMPARISON OF COMMERCIAL AND LIMITED RESOURCE FARMERS BY GOVERNMENT PROGRAMS APPLIED FOR

Program	FARMER GROUP			
	Commercial		Limited Resource ^a	
	N	%	N	%
	(N = 39)		(N = 78)	
A.R.D.A. Land Transfer	16	41%	5	6%
Crop Insurance	19	49	1	4
Capital Grants:				
Drainage	12	31	15	19
Buildings and Equipment	35	90	31	40
Feed Storage	20	51	5	6
Field Enlargement	13	33	13	17
Wells and Dugouts	6	15	12	15
Farm Vacation Hosts	0	0	1	1
Low Interest Livestock Loans	6	15	8	10
Feed and Soil Testing	28	97	33	42
R.O.P. and D.H.I.	20	51	3	4

^aSource: Stringer, op. cit., p.233

Scores were computed for individual respondents to measure their use of the first nine programs listed in Table 16. The differences in scores between the receptive and unreceptive groups had been previously documented so that it was possible to compare these groups to the commercial farmers. These data are shown in Table 17.

TABLE 17. COMPARISON OF FARMER GROUPS BY USE OF NINE GOVERNMENT PROGRAMS

	FARMER GROUP					
	Limited Resource ^a					
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Number Applied For</u>						
0	0	0%	4	16%	29	55%
1	4	10	5	20	15	28
2 or more	<u>35</u>	<u>90</u>	<u>16</u>	<u>64</u>	<u>9</u>	<u>17</u>
	39	100%	25	100%	53	100%
Average	3.2		2.4		0.7	
Average Rank (N=117)	R ₁ = 83.19		R ₂ = 67.82		R ₃ = 37.04	
	R ₁ -R ₂ =15.37		R ₂ -R ₃ =30.78		R ₁ -R ₃ =46.15***	

*** Significant at .01 probability

^aSource: Stringer, op. cit., p. 165

The commercial farmers had applied for an average of 3.2 programs compared to 2.4 and 0.7 programs for the receptive and unreceptive groups, respectively. Both the commercial and receptive groups had applied for a significantly greater number of programs than the unreceptive group ($p < 0.01$). Although the commercial farmers had applied for more programs than the receptive farmers, the difference was not statistically significant.

Social-Demographic Factors

Table 18 shows data which compare the three farmer groups by a number of selected social-demographic factors.

Age: For comparison purposes, the ages of the farmers in 1976 were used. The average age of the commercial farmers was 40.9 years compared to 44.4 years and 53.3 years for the receptive and unreceptive groups, respectively. The commercial and receptive farmers were significantly younger than the unreceptive farmers ($p < 0.01$). Although the commercial farmers were somewhat younger than the receptive farmers, the difference was not significant.

Formal Education: The scale used to measure the education level of respondents ranged from primary education through four intermediate levels up to college graduate level. It was, therefore, possible to compare the education levels of the farmer groups using the ranking procedure.

The commercial farmers had a significantly higher level of formal education than both the receptive group ($p < 0.05$) and the unreceptive group ($p < 0.01$). Although the general level of education of the receptive group was slightly higher than that of the unreceptive group, the difference was not statistically significant.

Number of Dependents: The average number of dependents per respondent in 1976 were 3.41 for the commercial farmers, 3.28 for the receptive farmers and 2.66 for the unreceptive farmers, respectively. There were not large differences between the groups. However, the commercial farmers did have

TABLE 18. COMPARISON OF FARMER GROUPS BY SELECTED SOCIAL-DEMOGRAPHIC CHARACTERISTICS (1976)

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Age Group</u>						
25 - 34 years	9	23%	5	20%	1	2%
35 - 44 years	20	51	7	28	8	15
45 - 54 years	8	21	9	36	18	34
55 - 65 years	2	5	4	16	26	49
	39	100%	25	100%	53	100%
Average Age	40.9		44.4		53.3	
Average Rank (N=117)	R ₁ = 37.92		R ₂ = 51.56		R ₃ = 78.02	
	R ₁ -R ₂ =13.64		R ₂ -R ₃ =26.46***		R ₁ -R ₃ =40.10***	
<u>Formal Education</u>						
Grade 8 or less	8	20%	14	56%	37	70%
Some High School	19	49	6	24	12	22
Vocational Training	3	8	2	8	2	4
High School Graduate	1	3	0	0	2	4
H.S. + Vocational	0	0	2	8	0	0
College Graduate	8	20	1	4	0	0
	39	100%	25	100%	53	100%
Average Rank (N=117)	R ₁ = 77.72		R ₂ = 56.64		R ₃ = 46.34	
	R ₁ -R ₂ =21.08**		R ₂ -R ₃ =10.30		R ₁ -R ₃ =31.38***	
<u>Number of Dependents</u>						
0	2	5%	0	0%	5	9%
1	3	8	4	16	13	25
2	5	13	5	20	12	23
3	6	15	5	20	5	9
4	15	39	6	24	8	15
5	6	15	2	8	6	11
6	2	5	2	8	1	2
7	0	0	1	4	3	6
	39	100%	25	100%	53	100%
Average Dependents	3.41		3.28		2.66	
Average Rank (N=117)	R ₁ = 67.41		R ₂ = 62.82		R ₃ = 51.01	
	R ₁ -R ₂ =4.59		R ₂ -R ₃ =11.81		R ₁ -R ₃ =16.40*	
<u>Year Started Farming</u>						
Before 1935	2	5%	4	16%	9	17%
1936 - 1940	2	5	1	4	7	13
1941 - 1945	1	3	1	4	18	34
1946 - 1950	6	15	6	24	8	15
1951 - 1960	19	48	5	20	7	13
1961 or later	9	24	8	32	4	8
	39	100%	25	100%	53	100%
Average Rank (N=117)	R ₁ = 75.06		R ₂ = 67.28		R ₃ = 43.27	
	R ₁ -R ₂ =7.78		R ₂ -R ₃ =24.01***		R ₁ -R ₃ =31.79***	

*** Significant at .01

** Significant at .05

* Significant at .10

^aSource: Blackburn et al., *op. cit.*, p. 25

significantly more dependents than the unreceptive farmers ($p < 0.10$).

Farming Experience: Predictably, the rankings and significant differences were almost identical to those shown in the comparison of the age of the farmers. The commercial and receptive groups both had significantly less farming experience than the unreceptive group ($p < 0.01$).

Summary

Surveys which measure the biographical characteristics of farmers in different income groups have usually shown that farmers with the higher gross sales figures are generally younger and better educated than those farmers with lower farm sales. This can be partially explained by the more conservative approach to management often adopted by older age farmers.

The differences in age, education and farming experience between the commercial and unreceptive farmers were all significant at a one percent probability level. The receptive farmers were similar to the commercial farmers in age and farming experience. However, the receptive farmers' overall level of education was more similar to that of the unreceptive farmers. There were not big differences between groups in the number of dependents, although the commercial farmers did have significantly more dependents than the unreceptive farmers ($p < 0.10$).

Management Ability Score

Managerial ability was evaluated as in the Trant^{1/} study through a series of questions based on a numerical index designed to assess the farmers' ability to make decisions and manage his farm. Responses were scored according to the degree to which they reflected good rational management practices.

The score was based on the responses to questions regarding education, fertilization practices, herbicide and insecticide use, livestock selection practices and the use of financial and production records. In addition, each farmer's managerial ability was evaluated subjectively by the interviewer according to the respondent's use of credit, technology and the operation and appearance of his farm.

The sum of the weighted scores for each question became the farmer's numerical management ability index. See Appendix A for the scoring method for each question and the relative weights given to each.

Table 19 contains data comparing the three groups in frequency distributions form by their computed management ability scores. The management ability score was measured on a 0 - 20 scale. The commercial farmers' average score was 17.1 compared to average scores of 12.7 and 9.5 for the receptive and unreceptive groups, respectively.

^{1/} M.J. Trant, "Classification of Limited Resource Farmers in Ontario based on Behavioural and Economic Characteristics", M.Sc. Thesis, University of Guelph, 1976.

The scores of the commercial farmers were significantly higher than those of both limited resource groups ($p < 0.01$). In addition, the scores of the receptive group were significantly higher than those of the unreceptive group ($p < 0.05$).

TABLE 19. COMPARISON OF FARMER GROUPS BY MANAGEMENT ABILITY SCORES

	FARMER GROUP					
	Limited Resource ^a					
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Management Ability Score</u>						
0 - 5	0	0%	0	0%	8	16%
6 - 10	0	0	5	20	22	44
11 - 15	10	26	18	72	20	40
16 - 20	29	74	2	8	0	0
	39	100%	25	100%	50	100%
Average Score	17.1		12.7		9.5	
Average Rank (N=114)	R ₁ = 88.87		R ₂ = 55.16		R ₃ = 34.20	
	R ₁ -R ₂ =33.71***		R ₂ -R ₃ =20.96**		R ₁ -R ₃ =54.67***	

***Significant at .01 probability

** Significant at .05 probability

^aSource: Ellis, op. cit., p. 185; and Trant, op. cit., pp. 135-140.

Technical Practices Score

A technical practices index, similar to the management ability index, was developed by Morton-Gittens^{1/} to measure the use of up-to-date technology by limited resource farmers. Scores were computed for the commercial farmers and compared to the scores of the limited resource farmers.

The score was based on the responses to questions regarding crop yields, livestock facilities, fertilization, herbicide and insecticide use, use

^{1/}K.E. Morton-Gittens, "An Analysis of Economic and Family Viability of Limited Resource Farmers Unreceptive to Farm Improvements", M.Sc. thesis, University of Guelph, 1977.

of quality seeds, livestock selection and feeding procedures. The minimum score for each farmer was associated with low technology or performance and the high scores with higher technology or performance.

The sum of the weighted scores for each factor became the numerical technical practices score. See Appendix B for the scoring method for each factor and the weights given to each.

Table 20 contains data which compare the three groups by their computed scores. The technical practices score was measured on a 7 - 30 scale. The average scores were 26.7 for the commercial farmers, 20.8 for the receptive farmers and 15.8 for the unreceptive farmers.

The three comparisons between groups all showed differences which were statistically significant ($p < 0.01$). The scores of the commercial farmers were higher than those of both limited resource groups. In addition, the receptive farmers generally had higher technical practices scores than the unreceptive farmers.

TABLE 20. COMPARISON OF FARMER GROUPS BY TECHNICAL PRACTICE SCORES

	FARMER GROUP					
	Limited Resource ^a					
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Technical Practices Score</u>						
7 - 10	0	0%	0	0%	6	12%
11 - 15	0	0	1	4	19	38
16 - 20	0	0	8	32	16	32
21 - 25	7	18	14	56	9	18
26 - 30	<u>32</u>	<u>82</u>	<u>2</u>	<u>8</u>	<u>0</u>	<u>0</u>
	39	100%	25	100%	50	100%
Average Score	26.7		20.8		15.8	
Average Rank (N=114)	R ₁ = 91.76		R ₂ = 57.46		R ₃ = 30.80	
	R ₁ -R ₂ =34.30***		R ₂ -R ₃ =26.66***		R ₁ -R ₃ =60.96***	

***Significant at .01

^aSource: Derived from Phase II questionnaire data.

Economic Characteristics

Measures of Income

Table 21 shows data which compare the three farmer groups by their 1976 gross farm sales and net income figures.

Gross Farm Sales:^{1/} The average gross farm sales figures were \$59,137 for the commercial farmers, \$20,439 for the receptive farmers and \$8,978 for the unreceptive farmers. The three comparisons between groups all showed differences significant at a one percent level of probability. Since the value of gross farm sales was the criterion used to initially select respondents, this result was to be expected.

Net Farm Income: The average net farm income of the commercial farmers was \$11,865 compared to average net income of \$5,467 and \$2,537 for the receptive and unreceptive groups, respectively. Although the average income of the commercial farmers was high compared to that of both limited resource farmer groups, there was a high proportion of farmers in this group with relatively low net incomes. However, the net incomes of the commercial farmers were significantly higher than those of the unreceptive farmers ($p < 0.01$). The incomes of the receptive farmers were

^{1/} The CANFARM measure of the value of farm production was used as the figure most comparable to the gross farm sales figures calculated in the limited resource farmer studies.

TABLE 21. COMPARISON OF FARMER GROUPS BY 1976
FARM INCOMES

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Gross Farm Sales</u>						
\$3,000 or less	0	0%	0	0%	7	14%
\$3,001 - \$6,000	0	0	1	4	12	23
\$6,001 - \$9,000	0	0	4	16	13	25
\$9,001 - \$12,000	0	0	3	12	7	14
\$12,001 - \$20,000	1	3	6	24	7	14
\$20,001 or over	38	97	11	44	5	10
	39	100%	25	100%	51	100%
Average	\$59,137		\$20,439		\$8,978	
Average Rank (N=115)	R ₁ = 87.63		R ₂ = 62.32		R ₃ = 33.23	
	R ₁ -R ₂ =25.31***		R ₂ -R ₃ =29.09***		R ₁ -R ₃ =54.40***	
<u>Net Farm Income</u>						
Negative Net Income	6	16%	3	12%	11	22%
\$0 - \$2,000	1	3	4	16	13	25
\$2,001 - \$5,000	4	10	5	20	19	37
\$5,001 - \$9,000	7	18	9	36	6	12
\$9,001 - \$20,000	10	25	4	16	2	4
\$20,001 - \$30,000	9	23	0	0	0	0
\$30,001 and over	2	5	0	0	0	0
	39	100%	25	100%	51	100%
Average	\$11,865		\$5,467		\$2,537	
Average Rank (N=115)	R ₁ = 77.44		R ₂ = 59.82		R ₃ = 42.24	
	R ₁ -R ₂ =17.62		R ₂ -R ₃ =17.57*		R ₁ -R ₃ =35.19***	

*** Significant at .01

* Significant at .10

^aSource: Ellis, op. cit., pp. 188-189; and Morton-Gittens, op. cit., pp. 201-205.

higher than those of the unreceptive farmers ($p < 0.10$). Although the incomes of the commercial farmers were generally higher than those of the receptive farmers, the difference was not statistically significant^{1/}.

Assets and Liabilities

Data comparing the three farmer groups by their value of farm assets and their percentage equity in assets are shown in Table 22.

Total Farm Assets: The average value of farm assets held by the commercial farmers was \$149,509^{2/} compared to average assets of \$144,353 and \$85,332 for the receptive and unreceptive groups, respectively.

The farm assets of both the commercial and receptive groups were significantly higher than those of the unreceptive group at a one percent probability level. Although the commercial farmers' assets were slightly higher in value than those of the receptive farmers, the difference was not significant.

^{1/} The commercial farmers' average income (\$11,865) was double the average income of the receptive limited resource farmers (\$5,467). However, a high proportion of the commercial farmers had low net incomes so that a statistical analysis of the data, using the ranking procedure, did not reveal significant differences.

^{2/} It is likely that the calculated asset values for the commercial farmers were slightly underestimated. The market value of their real estate may have been higher than that shown in their CANFARM balance sheets as a result of capital appreciation. In addition, the value of feeder livestock was not included in their assets. Some feeder livestock may have been included in farm assets in the limited resource farmer studies.

TABLE 22. COMPARISON OF FARMER GROUPS BY FARM ASSETS AND PERCENT EQUITY

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Total Farm Assets</u>						
\$20,000 - \$50,000	0	0%	0	0%	14	27%
\$50,001 - \$100,000	8	21	7	28	22	43
\$100,001 - \$150,000	11	29	11	44	10	20
\$150,001 - \$200,000	14	34	3	12	3	6
\$200,001 - \$300,000	5	13	3	12	2	4
\$300,001 and over	<u>1</u>	<u>3</u>	<u>1</u>	<u>4</u>	<u>0</u>	<u>0</u>
	39	100%	25	100%	51	100%
Average Assets	\$149,509		\$144,353		\$85,332	
Average Rank (N=115)	R ₁ = 76.22		R ₂ = 67.76		R ₃ = 39.28	
	R ₁ -R ₂ =8.46		R ₂ -R ₃ =28.48***		R ₁ -R ₃ =36.94***	
<u>Percent Equity</u>						
Less than 50 percent	6	15%	0	0%	0	0%
50 to 59 percent	6	15	2	8	0	0
60 to 69 percent	5	13	0	0	1	2
70 to 79 percent	9	23	5	20	0	0
80 to 89 percent	7	18	3	12	3	6
90 to 99 percent	5	13	10	40	13	25
100 percent	<u>1</u>	<u>3</u>	<u>5</u>	<u>20</u>	<u>34</u>	<u>67</u>
	39	100%	25	100%	51	100%
Average Equity	70.6%		88.4%		97.7%	
Average Rank (N=115)	R ₁ = 28.44		R ₂ = 54.96		R ₃ = 82.10	
	R ₁ -R ₂ =26.52***		R ₂ -R ₃ =27.14***		R ₁ -R ₃ =53.66***	

*** Significant at .01 probability

^aSource: Ellis, op. cit., p. 191; and Morton-Gittens, op. cit., pp. 201-205.

Percent Equity: The average equity percentages for the groups were 70.6 percent for the commercial farmers, 88.4 percent for the receptive farmers and 97.7 percent for the unreceptive farmers. All three comparisons between the groups showed significant differences ($p < 0.01$). The commercial farmers generally had a high equity, but the level was considerably below that of the unreceptive farmers who generally had a very high equity in assets. The receptive farmers were intermediate between these two extremes.

Economic Efficiency Ratios

Capital Turnover Ratio: This ratio was calculated by dividing the value of farm assets by the volume of farm production^{1/}. The ratio indicates efficiency in use of invested capital in producing saleable produce.

Table 23 contains data which compare the three farmer groups in frequency distribution form by their periods of the capital turnover. The average period of capital turnover for the commercial farmers was 2.9 years compared to 8.1 years and 13.7 years for the receptive and unreceptive groups, respectively. The periods of capital turnover of the commercial farmers were significantly less than those of both limited resource groups at a one percent level of probability. Although the capital turnover ratios of the receptive farmers were considerably lower than those of the unreceptive farmers, the difference was not statistically significant.

The data indicate that the commercial farmers were generally making more intensive use of their invested capital than the limited resource farmers, particularly the unreceptive farmers.

^{1/} - The CANFARM value of farm production figure was taken as being the calculation most comparable to the gross farm sales figures calculated in the limited resource farmer studies.

TABLE 23. COMPARISON OF FARMER GROUPS BY CAPITAL TURNOVER AND COST CONTROL INDICES

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Period of Capital Turnover</u>						
1 - 4 years	33	84%	3	12%	2	4%
4 - 8 years	5	13	9	36	12	23
8 - 12 years	1	3	7	28	16	31
12 - 16 years	0	0	5	20	10	20
16 - 20 years	0	0	1	4	2	4
Over 20 years	0	0	0	0	9	18
	39	100%	25	100%	51	100%
Average Period of Turnover	2.9 years		8.1 years		13.7 years	
Average Rank (N=115)	R ₁ = 25.06		R ₂ = 65.70		R ₃ = 79.41	
	R ₁ -R ₂ =40.64***		R ₂ -R ₃ =13.71		R ₁ -R ₃ =54.35***	
<u>Cost Control Index</u>						
Negative Cost Control	6	15%	3	12%	11	22%
0% - 10%	6	15	6	24	3	6
11% - 20%	6	15	2	8	8	16
21% - 30%	13	34	1	4	6	11
31% - 40%	3	8	2	8	7	13
41% - 50%	4	10	7	28	8	16
51% and over	1	3	4	16	8	16
	30	100%	25	100%	51	100%
Average Cost Control	16%		27%		22% ^b	
Average Rank (N=115)	R ₁ = 51.41		R ₂ = 63.60		R ₃ = 60.29	
	R ₁ -R ₂ =12.19		R ₂ -R ₃ =3.31		R ₁ -R ₃ =8.88	

*** Significant at .01 probability

^aSource: Derived from Phase II questionnaire data.

^bThis is an average for 50 farms. One farm recorded very low gross sales and a large negative income resulting in a meaningless cost control index of -662%.

Cost Control Index: This index was calculated by dividing net farm income by the volume of farm production and expressing the ratio as a percentage. It represents the proportion of farm production retained as net income.

A comparison of the three farmer groups by their calculated cost control indices is also shown in Table 23. The average cost control index of the commercial farmers was 16 percent compared to indices of 27 percent and 22 percent for the receptive and unreceptive groups, respectively. There was a high degree of variability within each group. Statistical analysis of the data in frequency distribution form showed there were no statistically significant differences between groups.

There was a tendency for commercial farmers to have lower cost control indices than both limited resource farmer groups. This could be a reflection of their more intensive use of agricultural inputs.

Viability Target Incomes

The viability target incomes are estimations of the net farm incomes required to achieve various degrees of viability. Table 24 contains data which compare the three farmer groups by their income Targets 2, 3 and 4.^{1/}

^{1/} These targets can be ordered logically as follows:

Target 1: Net Income > 0 (farm expenses covered)

Target 2: Net Income > SMFV (statistical minimum family viability, representing minimum family needs provided according to low income criteria by Statistics Canada.)

Target 3: Net Income > SMFV + CDO (Target 2 plus covering current debt obligations)

Target 4: Net Income > SMFV + CDO + MG (Target 3 plus margining for growth)

TABLE 24. COMPARISON OF FARMER GROUPS BY TARGET INCOMES

FARMER GROUP						
Limited Resource ^a						
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Target 2 Income</u>						
\$3,016	1	3%	0	0%	4	8%
\$4,372	2	5	5	20	18	34
\$5,580	6	16	8	32	9	18
\$6,636	5	13	2	8	6	12
\$7,419	15	36	7	28	4	8
\$8,145	5	13	1	4	4	8
\$8,930	2	5	2	8	6	12
Above \$8,930	3	9	0	0	0	0
	39	100%	25	100%	51	100%
Average	\$7,446		\$6,308		\$5,816	
Average Rank (N=115)	R ₁ = 72.51		R ₂ = 56.60		R ₃ = 47.59	
	R ₁ -R ₂ =16.01		R ₂ -R ₃ =9.01		R ₁ -R ₃ =24.92***	
<u>Target 3 Income</u>						
\$3,016 - \$6,000	3	8%	7	28%	27	53%
\$6,001 - \$9,000	8	21	8	32	15	29
\$9,001 - \$12,000	11	28	3	12	7	14
\$12,001 - \$15,000	5	13	2	8	2	4
\$15,001 or more	12	30	5	20	0	0
	39	100%	25	100%	51	100%
Average	\$12,919		\$9,780		\$6,497	
Average Rank (N=115)	R ₁ = 79.59		R ₂ = 60.08		R ₃ = 40.18	
	R ₁ -R ₂ =18.91*		R ₂ -R ₃ =20.50**		R ₁ -R ₃ =39.41***	
<u>Target 4 Income</u>						
\$6,000 or less	0	0%	0	0%	12	23%
\$6,001 - \$9,000	7	18	8	32	24	47
\$9,001 - \$12,000	4	10	8	32	10	20
\$12,001 - \$15,000	11	28	2	8	4	8
\$15,001 or more	17	44	7	28	1	2
	39	100%	25	100%	51	100%
Average	\$15,909		\$12,496		\$8,064	
Average Rank (N=115)	R ₁ = 80.18		R ₂ = 65.64		R ₃ = 37.29	
	R ₁ -R ₂ =14.54		R ₂ -R ₃ =28.35***		R ₁ -R ₃ =42.89***	

*** Significant at .01 probability

** Significant at .05 probability

* Significant at .10 probability

Target 2: This target represents the net farm income required to maintain the farm family above a certain poverty level. The calculated average Target 2 income of the commercial farmers was \$7,446 compared to averages of \$6,308 and 5,816 for the receptive and unreceptive groups, respectively. The Target 2 incomes of the commercial farmers were significantly higher than those of the unreceptive farmers ($p < 0.01$). This difference is mainly a reflection of the larger family sizes of the commercial farmers.^{1/}

Target 3: This target was calculated by adding the Target 2 income to the annual loan repayments to meet debt obligations. The average Target 3 income of the commercial farmers was \$12,919 compared to averages of \$9,780 and \$6,497 for the receptive and unreceptive groups, respectively. The Target 3 incomes of the commercial farmers were significantly higher than those of both the receptive group ($p < 0.10$) and the unreceptive group ($P < 0.01$). In addition, the Target 2 incomes of the receptive farmers ($p < 0.05$). The relatively high Target 3 incomes of the commercial farmers are indicative of their larger debt repayments as compared to the limited resource groups, particularly the unreceptive group.

^{1/} Three commercial farms supported more than one family unit. The target 2 incomes of these farms also biased the average upwards.

Target 4: This target was calculated by adding a margin of 2 percent of assets to the Target 3 income to allow for farm growth. A farm was defined as being completely viable if the Target 4 income was exceeded by net farm income. The calculated average Target 4 incomes were \$15,909 for the commercial farmers and \$12,496 and \$8,064 for the receptive and unreceptive groups, respectively. The Target 4 incomes of both the commercial and receptive groups were significantly higher than those of the unreceptive group ($p < 0.01$). Although the Target 4 incomes of the commercial farmers were generally higher than those of the receptive farmers, the difference was not statistically significant.

Achievement of Income Targets: Table 25 shows the distribution of farmers in the three groups by their attainment of the various income targets by net farm income.

The ranking procedure showed that the commercial farms were significantly more viable than the farms operated by the unreceptive farmers ($p < 0.01$). A higher proportion of the commercial farms were able to achieve the higher levels by net farm income. In addition, the receptive group was significantly more viable than the unreceptive group ($p < 0.10$). Although the commercial farmers ranked somewhat higher than those of the receptive farmers, the difference was not significant.

The average net farm income of the commercial farmers was \$11,865. This represented 75 percent of their calculated average Target 4 income, and is higher than the comparable figures of 44 percent and 31 percent for the receptive and unreceptive groups, respectively. These figures also

TABLE 25. COMPARISON OF FARMER GROUPS BY HIGHEST INCOME TARGET ACHIEVED

	FARMER GROUP					
	Limited Resource ^a					
	Commercial		Receptive		Unreceptive	
	N	%	N	%	N	%
<u>Target</u>						
Negative Income	6	15%	3	12%	10	19%
Target 1	6	15	10	40	33	65
Target 2	9	23	4	16	1	2
Target 3	3	8	4	16	4	8
Target 4	15	39	4	16	3	6
	39	100%	25	100%	51	100%
Average Rank (N=115)	R ₁ = 72.69		R ₂ = 61.68		R ₃ = 44.96	
	R ₁ -R ₂ =11.01		R ₂ -R ₃ =16.72*		R ₁ -R ₃ =27.73***	

*** Significant at .01

* Significant at .10

^aSource: Blackburn et al., op. cit., p. 65

indicate that the commercial farms were generally more viable units than those of the two limited resource groups, particularly the unreceptive group. The commercial farms generally had a greater ability to meet the requirements of a completely viable farm (i.e. provide a minimum level of living for the farm family, meet annual debt repayments and provide a margin to allow for farm growth).

Summary of Farmer Characteristics

Table 26 shows, in summary form, the average behavioural and economic factor values of the three farmer groups for a number of the characteristics studied. Reference should be made to the preceding discussion for details of significant differences between the groups.

TABLE 26. AVERAGE BEHAVIOURAL AND ECONOMIC FACTOR VALUES
FOR COMMERCIAL, RECEPTIVE AND UNRECEPTIVE GROUPS

	FARMER GROUPS		
	Limited Resource ^a		
	Commercial (N = 39)	Receptive (N = 25)	Unreceptive (N = 53)
<u>Social Factors</u>			
Family Size	4.4	4.1	3.6
Age	40.9	44.4	53.3
Dependants	3.41	3.28	2.66
<u>Value Orientations</u> (Scores based on 5 maximum)			
Economic	1.90	1.64	0.98
Scientific	4.31	3.04	2.70
Risk	2.67	1.44	0.72
Independence	1.74	1.96	2.66
<u>Achievement Motivation</u>			
(Aronson)	6.5	4.8	3.6
<u>Self Concept</u> (Scores normalized based on 20 maximum)			
Social	13.3	14.9	13.6
Assertive	11.0	12.2	10.5
Achievement	16.1	16.5	15.1
Innovative	13.8	14.4	12.0
<u>Aspirations</u> (Scores normalized based on 20 maximum)			
Household	14.3	12.0	11.7
Farm	15.4	14.6	13.2
Family	14.6	14.2	14.0
Social	13.3	11.0	9.1
<u>Farming Satisfaction</u> (3 = very satisfied 2 = slightly satisfied; 1 = slightly dissatisfied; 0 = very dissatisfied)			
	2.7	2.7	2.1

TABLE 26 (Continued)

	Commercial	Receptive	Unreceptive
<u>Perceptions of Limitations</u> (0 = not at all; 1 = slightly; 2 = moderately; 3 = very limiting)			
Land	0.5	1.0	0.6
Credit	0.3	0.4	0.2
Off-farm Work	0.0	0.3	0.5
Buildings and Equipment	0.7	0.9	1.1
Agricultural Information	0.5	0.4	0.3
Formal Education	0.6	0.4	0.5
<u>Usefulness of Programs</u> (0 = not useful; 1 = slightly useful; 2 = moderately useful; 3 = very useful)			
Production Advisory	2.7	2.1	1.4
Management Advisory	2.2	1.6	0.9
Retirement Advisory	1.7	1.4	1.2
Direct Subsidies	1.3	2.6	2.2
Indirect Subsidies	2.3	2.0	1.5
<u>Direct vs. Indirect Subsidies</u> (1 = Direct; 2 = Indirect)			
	1.9	1.3	1.2
<u>Social Participation</u>			
Organization Participation	14.6	5.5	3.5
Total Professional Contacts	37.7	10.8	2.9
Current Program Utilization	3.2	2.4	0.7
Agricultural Magazines	5.9	3.0	2.3
Radio and T.V. Programs	1.9	1.4	0.8
<u>Management</u>			
Management Ability Score	17.1	12.7	9.5
Technical Practices Score	26.7	20.8	15.8

TABLE 26 (continued)

	Commercial	Receptive	Unreceptive
<u>Farm Resources</u>			
Total Assets	\$ 149,509	\$ 144,353	\$ 85,332
Total Liabilities	44,906	15,421	5,347
<u>Income Achievement</u>			
Gross Farm Sales	\$ 59,137	\$ 20,439	\$ 8,978
Net Farm Income	11,865	5,467	2,537
<u>Income Requirements</u>			
Target 2	\$ 7,446	\$ 6,308	\$ 5,816
Target 3	12,919	9,780	6,497
Target 4	15,909	12,496	8,064
<u>Finances</u>			
Percent Equity	70.6	88.4	97.7
Capital Turnover Ratio	2.9	8.1	13.7
Cost Control Ratio	0.16	0.27	0.22

^aSource: Majority of limited resource farmer data from Blackburn et al., op. cit.

SUMMARY OF FINDINGS

This study compared a number of behavioural and economic characteristics of farmers from different income groups. The analysis tended to highlight a number of differences between the three farmer groups. In general, the largest differences were between the commercial farmers and the limited resource farmers categorized as unreceptive to making farm improvements. The characteristics of the receptive limited resource farmers generally placed them somewhere between these two extremes.

In general, the findings are consistent with the results of a number of previous research studies in that it was found that the farmer group with the best economic performance (i.e., the commercial farmer group) tended to possess those behavioural characteristics often associated with a progressive approach to commercial agriculture. On the other hand, the group with the lowest level of economic performance (i.e., the unreceptive limited resource farmer group) tended to possess characteristics associated with a more traditional style of management less well suited to commercial agriculture.

The study compared a large number of farmer characteristics. There were differences between groups in practically all of the comparisons which were made. Some of the characteristics which appear to typify farmers in each group should be noted.

The commercial farmers in the study were generally younger

with an average age of 41 years. They had a higher level of education. Their average net farm income in 1976 was \$11,865. They were generally using up-to-date farming technology and were making intensive use of their capital resources. Their average period of capital turnover was 2.9 years. They were active social participators in a number of areas. For example, they averaged 38 contacts per year with different categories of professional personnel who service agricultural industries. They generally preferred the more indirect forms of support for agriculture (e.g. credit facilities, advisory services). The commercial farmers tended to display modern value orientations, high aspirations, high social needs and a higher level of achievement motivation.

In comparison to the commercial farmers, the characteristics of the unreceptive farmer group were somewhat different. Their average age was higher (i.e., 53 years) and they generally had attained a lower educational level. Their average net farm income in 1976, however, was only \$2,537 and their level of farming technology was typically fairly low. Their average period of capital turnover was 13.7 years indicating that they were not making intensive use of their capital resources. They were generally non-active in social participation (for example, they averaged only three contacts per year with professional personnel). Their policy preferences were towards the direct forms of government assistance to agriculture (such as price subsidies). In comparison to the commercial farmers, the unreceptive group tended to display more traditional value

orientations, lower aspirations, lower social needs and a lower level of achievement motivation.

The receptive limited resource farmers were studied as a third group. Measurement of their characteristics generally placed them somewhere between the extremes represented by the other two groups. The receptive farmers were similar to the commercial group in some characteristics while they were more similar to the unreceptive group in other respects.

The average age of the receptive farmers (44 years) was only slightly higher than the average age of the commercial farmers. However, their overall level of formal education was generally fairly low and similar to the education level of the unreceptive farmers. Their average net farm income in 1976 was \$5,467. They generally were using a moderate level of up-to-date farming technology. Their average period of capital turnover was 8.1 years. They generally displayed moderate levels of social participation (for example, they averaged eleven contacts per year with professional personnel). Their policy preferences were similar to those of the unreceptive farmers in that they preferred direct subsidies. Their value orientations appeared to be intermediate between the modern and traditional extremes and they displayed moderate levels of aspiration, social needs and achievement motivation.

CONCLUSIONS AND IMPLICATIONS

Conclusions

A significant point from the analysis is that a number of farmer characteristics can be thought of as being displayed on continua. The economic characteristics of farmers appear to be reasonable indicators, in general terms, of the behavioural characteristics of farmers within particular income groups. The converse may also be true. The data would indicate that the behavioural characteristics of farmers may be factors which significantly determine their economic success in agriculture.

It is likely that the behavioural characteristics of the unreceptive farmer group have been factors which have inhibited them in making the farm changes necessary to maintain long term farm viability. The same would apply to a lesser extent, with the receptive farmer group. These characteristics are likely to act as a continuing negative factor in determining the success of policies designed to improve their incomes and welfare.

There is great variability among the farming population with respect to such behavioural factors as values, aspirations, needs and perceptions. Because of the influence of these factors on behaviour, it follows that different farmers are likely to react differently to agricultural programs. On the basis of the findings of the study, the following conclusions are drawn:

1. Advisory services and other indirect assistance programs designed to develop profitable farm enterprises will gain the widest acceptance from commercial farmers. However, there are a large number of limited resource farmers, particularly those receptive to farm improvements, who are also likely to make good use of these services. It is, therefore, important that

agricultural extension agencies make some attempt to identify the latter farmers and give them special attention.

The long periods for capital turnover of the limited resource farmers, particularly the unreceptive farmers, indicate that many likely have the physical resources necessary for improvements in production and net income. However, they often lack the necessary management abilities. For the most part, the unreceptive farmers were not interested in programs designed to assist them in expanding production.

2. Direct subsidies (e.g. price subsidies) are likely to gain the widest acceptance from limited resource farmers. However, in the majority of cases, the scale of production is so small that it would take massive price subsidies to give them adequate incomes.

3. The limited resource farmers classed as unreceptive to farm improvements tended to show a high degree of independence. They are, therefore, not likely to quickly accept programs which require a willingness to work and co-operate with others. Ideas such as co-operative ownership of assets (e.g. machinery syndicates) could offer them some cost savings, but such ideas are likely to be more readily accepted by the commercial and receptive groups.

4. Programs aimed at increasing the availability of farm credit are also likely to be most readily accepted by commercial farmers. The limited resource farmers were generally risk averse and did not

perceive credit as being limiting to their ability to increase incomes. However, the receptive group of farmers tended to be only moderately risk averse and could benefit from credit programs where some of the risk was removed. Their moderate-length periods of capital turnover and high equity percentages indicate they could possibly make good use of credit which is made available for farm improvements.

5. A number of limited resource farmers, particularly the unreceptive farmers, indicated the lack of availability of off-farm work was limiting to their ability to increase income. Programs aimed at increasing the availability of work in rural areas could benefit a small proportion of these farmers. However, these farmers were generally older with a relatively low level of formal education and some may have difficulty in being placed in work positions.

6. Most of the commercial and limited resource farmers expressed a strong feeling of attachment to their present communities. Programs encouraging limited resource farmers to leave for employment elsewhere are not likely to be readily accepted.

7. All farmer groups, particularly the commercial and receptive groups, had relatively high family aspirations. These two groups were relatively young and had young families. It is important that maximum opportunities be made available for children in rural areas. Because of the relatively high family aspirations which they expressed,

educational opportunities may very well be used by children from all farm types.

8. The low levels of participation by limited resource farmers in their use of mass media and in farm organizations, and their extremely limited contact with agricultural professionals, accentuate the difficulties in making agricultural programs known to them.

These conclusions have important implications for the designing of specific policy tools. Agricultural programs are likely to be enhanced by a knowledge of the characteristics of different farmer groups. It would seem that agricultural policy should utilize a number of features and approaches. Commercial farmers will generally respond to programs designed to promote economic progress and efficiency. However, there is a high proportion of limited resource farmers who may never participate in such programs. Policy makers may have to compromise between the pursuit of national efficiency and the maintenance of minimum acceptable standards of living for certain sections of the farm population.

Implications

1. In the interests of economic progress and efficiency, there is a need to continue with existing programs such as advisory services and other indirect forms of support to agriculture. However, it should be realized that these services are likely to be perceived as useful mainly by commercial farmers and those limited resource farmers

with behavioural characteristics similar to commercial farmers.

There is a need for advisory staff to make a special attempt to identify and assist those limited resource farmers who could benefit from the aforementioned programs.

2. There is a need for policy makers and local advisory staff to assure their familiarity with the range of values, attitudes and beliefs generally held by different groups of farmers. Programs that are formulated within the behavioural framework of the potential participants are likely to have a greater chance of success. For example, a high proportion of limited resource farmers appear to favour primary group contacts. Learning experiences structured within their own groups, or on a small group or individual basis, are likely to be more readily accepted.

3. A high proportion of limited resource farmers could gain higher incomes by making farm improvements. However, they are also typically risk averse and are less likely to borrow money for this purpose. Some type of risk shared credit program could be of benefit. Such programs should be aimed primarily at the younger category of limited resource farmers who are generally more receptive to making farm improvements.

4. Industrial projects located in rural areas could be of some use to provide greater off-farm work opportunities for farmers with low incomes. There are many, of course, who would be unable to benefit because of age and a lack of skills. However, provincial

and local governments may need to give continued attention to attracting industry to rural areas. Subsidized job training programs to that farmers could upgrade their non-farm work skills would likely be beneficial.

5. In order that the next generation of farmers be better equipped to operate within commercial agriculture, consideration could be given to enhancing existing training programs with farm apprenticeship training programs and with financial assistance to needy farmers wishing to send their children to agricultural schools. It is important that curricula be developed to foster the development of values and attitudes associated with success in modern agriculture. By exposing children to new ideas, such programs could assist in breaking a cycle of intergenerational poverty which can occur when a son takes over a small farm from his father.

6. Limited resource farmers typically favour direct government support for agriculture. Subsidies designed to increase the incomes of low income farmers through the price system would be impractical. However, programs such as direct transfers not tied to output (negative income tax, guaranteed income or some form of welfare support) would likely be well received and could be of considerable benefit. These aspects need further study.

7. Some type of farmer retirement plan would be of benefit to a number of limited resource farmers, particularly if this could be arranged so that it did not involve a physical shift from their

local community.

8. To be realistic, it should be realized that it will be very difficult to solve the problem of low incomes in agriculture, at least in the short term. If a given limited resource farmer wishes to remain in farming and adheres to a system of values and beliefs which are not consistent with commercial agriculture, then the best possible course for him to follow may be subsistence farming. It is possible that subsistence farming should not be discouraged, for at least part of the low income group.

BIBLIOGRAPHY

- Agricultural Statistics for Ontario, 1977. Ontario Ministry of Agriculture and Food, Publication 20.
- Aronson, E. "The Need for Achievement as Measured by Graphic Expression" in Motives in Fantasy Action and Society, ed. J.W. Atkinson. New Jersey: D. Van Nostrand Co., Inc., 1958.
- Beal, G.M., Bohlen, J.M., and Warland, R.H. Rural Value-Orientations and Farm-Policy Positions and Actions. Research Bulletin 561. Ames, Iowa, May 1968.
- Bharadwaj, L.K. and Wilkening, E.A. "Occupational Satisfaction of Farm Husbands and Wives", Human Relations, Vol. 27, No. 8 (1974), pp. 739-753.
- Blackburn, D.J., Brinkman, G.L. and Driver, H.C. Farm Business Behavioural and Participation Characteristics of Limited Resource Farmers. School of Agricultural Economics and Extension Education, University of Guelph. AEEE.78/4, April, 1978 (Revised March, 1979).
- Brinkman, G.L., Driver, H.C., and Blackburn, D.J. A Classification of Limited Resource Farmers Based on Behavioural and Economic Characteristics. School of Agricultural Economics and Extension Education, University of Guelph. AEEE/77/3, May, 1977 (Revised March, 1979).
- Bouma, G.G. "Identification and Evaluation of Factors Facilitating or Impeding Limited Resource Farmers Receptive to Change in Establishing Farm and Family Viability", M.Sc. Thesis, University of Guelph, Guelph, 1977.
- Brayfield, A.H. and Marsh, M.M. "Aptitudes, Interests and Personality Characteristics of Farmers", Journal of Applied Psychology, No. 4 (1957), pp. 98-103.
- Coughenour, C.M. Enterprise Dominance as Related to Communications and Farmers' Technological Competence and Satisfaction. Kentucky Agricultural Experiment Station, Bulletin 712, 1972.
- Dean, A., Aurbach, J.A., and Marsh, C.P. "Some Factors Related to Decision Making Among Farm Operators", Rural Sociology, Vol. 23, (1958), pp. 121-135.
- Ellis, R. "Values, Basic Needs, Aspirations and Perceptions of Limited Resource Farmers in Grey and Renfrew Counties", M.Sc. Thesis, University of Guelph, Guelph, 1977.

Fliege, F.C. "Aspirations of Low Income Farmers and Their Performance and Potential for Change", Rural Sociology, Vol. 24 (1959), pp. 205-214.

_____. "Obstacles to Change for the Low Income Farmer", Rural Sociology, Vol. 25 (1960), pp. 347-351.

Flinn, W.L. and Joynson, D.E. "Agrarianism among Wisconsin Farmers", Rural Sociology, Vol. 39 (1974).

Frawley, J., Bohlen, J.M., and Breathnach, T. "The Relationship of Scale and Farm Management Performance in Ireland", Irish Journal of Agricultural Economics and Rural Sociology, Vol. 5, No. 1 (1974/75), pp. 145-155.

Gasson, R. "Goals and Values of Farmers", Journal of Agricultural Economics, Vol. 24, No. 3 (1973), pp. 521-542.

Gibbons, J.D. Nonparametric Methods for Quantitative Analysis. New York: Holt, Rinehart and Winston, 1976.

Gould, J. A Dictionary of the Social Sciences. New York: The Free Press, 1965.

Haller, A.O. "On the Concept of Aspirations", Rural Sociology, Vol. 33, No. 4 (1968).

Hess, C.V. and Miller, L.F. Some Personal, Economic and Sociological Factors Influencing Dairymen's Actions and Success. Pennsylvania Agricultural Experiment Station, Bulletin 577, 1954.

Hobbs, D.J. Beal, G.M., and Bohlen, J.M. The Relation of Farm Operator Values and Attitudes to Their Economic Performance, Report No. 33, Department of Economics and Sociology, Iowa State University of Science and Technology, Ames, Iowa, June 1964.

Huffman, W.E. "Decision Making: The Role of Education", American Journal of Agricultural Economics, Vol. 56, No. 1 (1974), pp. 85-97.

Jacobson, C. "Who Joins Farm Organizations", Journal of Co-operative Extension, Vol. 7, No. 4 (1969).

Jones, G.E. "The Adoption and Diffusion of Agricultural Practices", World Agricultural Economics and Rural Sociology Abstracts, Review Article No. 6, Vol. 9, No. 3, pp. 1-34.

- Katona, G. "Rational Behaviour and Economic Behaviour", The Making of Decisions, ed. W.J. Gore and J.W. Dyson. New York: The Macmillan Company, 1964.
- Krech, D. and Crutchfield, R.S. Theory and Problems of Social Psychology. New York: McGraw-Hill, 1948.
- Larson, O.F. "Basic Goals and Values of Farm People", Goals and Values in Agricultural Policy. Iowa State University Center for Agricultural and Economic Adjustment: Iowa State University Press, 1961.
- Lee, J.E. and Chastain, E.D. Problem Recognition in Agriculture. Alabama Agricultural Experiment Station, Auburn, Alabama, Bulletin 319, 1959.
- Leonard, O.E. "Rural Social Values and Norms", in Rural Sociology: An Analysis of Contemporary Rural Life, ed. A.L. Bertrand and Associates. New York: McGraw-Hill Co., 1958.
- Maslow, A.H. "A Theory of Human Motivation", Psychological Review, Vol. 50 (1943), pp. 370-396.
- Merton, R.K. Social Theory and Social Structure. Glencoe, Ill.: The Free Press, 1957.
- Morrison, D.E. and Warner, W.K. "Correlates of Farmers' Attitudes Toward Public and Private Aspects of Agricultural Organization", Rural Sociology, Vol. 36, No. 1 (1971), pp. 5-19.
- Morton-Gittens, K.E. "An Analysis of Economic and Family Viability of Limited Resource Farmers Unreceptive to Farm Improvements", M.Sc. Thesis, University of Guelph, Guelph, 1977.
- Muggen, G. "Human Factors and Farm Management: A Review of the Literature", World Agricultural Economics and Rural Sociology Abstracts, Review Article No. 10, Vol. 11, No. w (1969), pp. 1-11.
- Nielson, J. The Michigan Township Extension Experiment: The Farm Families - Their Attitudes, Goals and Goal Achievement. Michigan Agricultural Experiment Station, East Lansing, Michigan, Technical Bulletin 287, 1962.
- Pond, G.A. and Wilcox, W.W. "A Study of the Human Factor in Farm Management", Journal of Farm Economics, Vol. 14 (1932), pp. 470-479.
- Ramsey, G.E., Polson, R.A., and Spencer, G.E. "Values and the Adoption of Practices", Rural Sociology, Vol. 25, No. 1 (1959), pp. 35-47.
- Rushing, W.A. "Class Differences in Goal Orientations and Aspirations: Rural Patterns", Rural Sociology, Vol. 35, No. 3 (1970), pp. 377-395.
- Rushton, W.T. and Shaudys, E.T. "A Systematic Conceptualization of Farm Management", Journal of Farm Economics, Vol. 49 (1967), pp. 53-63.

- Rust, R.S. "Farm Survey Data Relationship with Managerial Ability", The Economic Annalist, Vol. 33, No. 2 (1963), pp. 29-38.
- "Farm Survey Data Relationship with Managerial Ability", The Economic Annalist, Vol. 34, No. 1 (1964), pp. 7-16.
- Simon, H.A. "A Behavioural Model of Economic Choice", The Making of Decisions, ed. W.J. Gore and J.W. Dyson. New York: The Macmillan Company, 1964.
- Smith, A.H. and Martin, W.E. "Socioeconomic Behaviour of Cattle Ranchers with Implications for Rural Community Development in the West", American Journal of Agricultural Economics, Vol. 54, No. 2 (1972), pp. 217-225.
- Steeves, A.D. "Dissatisfaction and the Farm-Non-Farm Work Context", Social Forces, Vol. 48, No. 2 (1970), pp. 224-242.
- Stringer, T.M. "Participation Patterns and Policy Preferences of Limited Resource Farmers", M.Sc. Thesis, University of Guelph, Guelph, 1977.
- Summary of Ontario Farm Management and Accounting Project, 1976.
School of Agricultural Economics and Extension Education,
University of Guelph, Publication No. AEEE/77/4, June 1977.
- Taylor, G.W. "An Analysis of Certain Social and Psychological Factors Differentiating Successful from Unsuccessful Farm Families", Rural Sociology, Vol. 27 (1962), pp. 302-315.
- Trant, M. "Classification of Limited Resource Farmers in Ontario Based on Behavioural and Economic Characteristics", M.Sc. Thesis, University of Guelph, Guelph, 1976.

APPENDIX A
MANAGEMENT ABILITY SCORE

CALCULATION OF MANAGEMENT ABILITY SCORE

Formal Education

- 0 Not completed Elementary School
- 1 Elementary School completed and some or all of Secondary School
- 2 Post Secondary Education

Crop Practices - Fertilization

- 0 No soil test, no manure or other fertilizer applications
- 1 No soil test but manure spread on a sporadic basis
- 2 No soil test, manure spread in conjunction with commercial fertilizers which are applied to some but not all of the crops on a sporadic basis
- 3 No soil test but fertilizers (manure and commercial) are spread on a fairly comprehensive basis in what appears to be in accordance with accepted practices.
- 4 Soil test done and farmer applies fertilizer to all his crops in accordance with accepted practices subject only to other overriding considerations such as fertilizer costs or expected crop prices which may affect his final decision.

Crop Practices - Herbicide Insecticide Use

- 0 Not used although needed and no alternative controls utilized
- 1 Never use herbicide/insecticide but follows some alternative control technique
- 2 Used this year, or not used this year but used when required

Livestock Practices - Stock Selection

- 0 Don't know, don't bother to select, just let them breed, no effort made to be selective

- 1 Try to breed the best stock on hand without having to resort to buying a special stud animal
- 2 Select according to some general knowledge or experience such as the practice of always buying a pure bred animal because it will always produce better stock
- 3 Select according to careful observation in trial and error like procedures of a fairly scientific nature, but with no written production records
- 4 Select according to careful observation in trial and error like procedures of a fairly scientific nature but with particular attention paid to recorded production records

Financial Records - How Are They Kept?

- 0 None kept
- 1 Bills/receipts in box or folders
- 2 Record book, ledgers or CanFarm

Financial Records - Use

- 0 Not used at all, don't know
- 1 Used to determine income tax, payment to Canada Pension Plan
- 2 Used to estimate farm profit or loss, aid in improving farm practices, to analyze specific segments of the farm operation (e.g. profit from a major corp or livestock enterprise on the farm)

Written Production Records - Use

- 0 None kept
- 1 Records kept on some aspects of the enterprise but not used or seldom used in aiding evaluation of farm or particular enterprise production

- 2 Records kept on some aspects of the enterprise and used in aiding evaluation of farm or particular enterprise performance

Subjective Measure of Management by Interviewer

- 2 Poor management, using profit restricting techniques and not particularly willing to change
- 1 Poor to adequate management, less than optimal management but not really poor
- 0 No particular comment by the interviewer concerning the farmer's management ability
- 1 Generally a good manager, seems to be doing well but has some peculiar reservations about for example, using credit, specializing farm. Reasonable manager.
- 2 Excellent manager, knows what to do and what farming is all about, appears progressive and commercially oriented

MANAGEMENT ABILITY SCORING METHOD

Component	Minimum	Maximum
Formal Education	0	2
Fertilizer Use	0	4
Herbicide Insecticide Use	0	2
Stock Selection	0	4
Type of Financial Records	0	2
Use of Financial Records	0	2
Use of Production Records	0	2
Subjective Assessment of Ability	-2	2
Total*	-2	20

*Scores were adjusted for missing observations.

Source: Trant op. cit. pp. 142-144.

APPENDIX B

TECHNICAL PRACTICES SCORE

CALCULATION OF TECHNICAL PRACTICES SCORE

Crop Yields
Score

Guide

- 1 Very low yields on all crops
- 2 Low yield on hay, other crops low or very low
- 3 Moderate hay yield, others very low to moderate, or low hay yield, others moderate to high
- 4 Good hay yield, others moderate to good, or moderate hay yield, others good to high
- 5 High hay yield, others good to high, or good hay yield, others high

Based on the following description of yield categories:

Yield Categories	Hay tons/ac	Corn Silage tons/ac	Grain Corn bu/ac	Other grain bu/ac	Apples bu/ac	Potatoes tons/ac
Very low	<1.0	<6	<60	<30	<100	<1
Low	1.0-1.5	6-9	60-70	30-40	100-150	1-3
Moderate	1.6-2.0	10-13	71-80	41-50	151-200	3.1-5
Good	2.1-2.5	14-17	81-90	51-60	201-250	5.1-9
High	>2.5	>17	>90	>60	>250	>9

Housing and Equipment Facilities

Score

Guide

- 1 All facilities at technological level A
- 2 At least two facilities at level B
- 3 At least three facilities at level B
- 4 At least three facilities at level C
- 5 All facilities above level B

Based on the following description of technological levels:

Technological

Level	Description of Facility
Type of Housing	
A	Open pens in conventional barn
B	Progressive improvements such as box stalls,
C	farrowing crates, etc. and other improvements
Milking System	
A	Hand
B	Machine (bucket)
C	Step-saver
D	Pipe lines
Feeding System	
A	Hand/wheel-barrow
B	Part automatic
C	Mainly automatic
Manure Handling System	
A	Hand/wheel-barrow
B	Part mechanical
C	Loader/Front-end loader
D	Stable cleaner

Fertilizer Use

Score

Guide

- 1 No fertilizer on any crops
- 2 Manure only or very low rates of fertilizer per acre on 2 crops (e.g. less than 100 lbs. 5-10-10- or less than 50 lbs. 15-15-15)
- 3 Low fertilizer rates per acre on 2 crops (e.g. 100-150 lbs. 5-10-10 or 50-100 lbs. 15-15-15)
- 4 Moderate fertilizer rates per acre on 2 crops (e.g. 151-200 lbs. 5-10-10 or 101-150 lbs. 15-15-15)
- 5 High fertilizer rates per acre on 2 crops (e.g. over 200 lbs. 5-10-15 or over 150 lbs. 15-15-15)

Scores were adjusted for the number of crops fertilized, the use of nitrogen on corn and the farmer's attitude towards, and use of, soil testing. Adjustments were usually in an upward direction (e.g. low fertilizer on 3 crops, including nitrogen on corn together with use of soil-testing was scored 4 rather than 3).

Herbicide and Insecticide Use

Score	Guide
1	No herbicides or insecticides used
2	Low rates of herbicides on 1 or 2 crops and used custom spraying <u>or</u> some insecticides
3	Moderate herbicide rates on 1 or 2 crops and used custom spraying <u>or</u> insecticides

Seed

Score	Guide
1	No seed bought, own seed not cleaned
2	Bought small quantities of low priced seed, clean own seed
3	Bought moderate quantities of seed, clean own seed
4	Bought fairly large quantities at higher prices, including alfalfa, clover or corn, clean and treat own seed or send to mill

Selection of Breeding Stock

Score	Guide
1	Physical attributes (size, conformation)
2	Breed
3	Dam's performance or record
4	Breed and physical attributes
5	Record, and physical attributes

Feeding

Score	Guide
1	Hay with <25% legume, little or no grain
2	Hay with 25 to 50% legume plus grain <u>or</u> silage plus protein supplement
3	Hay with >50% legume plus grain <u>or</u> silage plus grain and protein supplement

Averages were used where more than one type of livestock were raised. Swine feeding scores were adjusted to reflect the use of different types of concentrates.

Technical Practices Scoring Method

Component	Minimum	Maximum
Crop yields	1	5
Housing and equipment	1	5
Facilities		
Fertilizer use	1	5
Herbicide and insecticide use	1	3
Seed score	1	4
Breeding practices	1	5
Rations	1	3
Total*	7	30

* Scores were adjusted for missing observations.

Source: Morton Gittens, op.cit., pp.39, 165-167.

