DISCONTINUANCE OF INNOVATIONS BY FARMERS IN MINAS GERAIS, BRAZIL

> Thesis for the Degree of M. A. MICHIGAN STATE UNIVERSITY MICHAEL W. JORISSEN 1969



HESIS





#### ABSTRACT

## DISCONTINUANCE OF INNOVATIONS BY FARMERS IN MINAS GERAIS, BRAZIL

by Michael W. Jorissen

The present thesis is a study of discontinuance innovationdecisions among farmers in the State of Minas Gerais, Brazil. The present study concerns itself with the rate of discontinuance of farmers rather than with the farmers' absolute scores on the number of innovations discontinued in order to obtain more insight into the discontinuers. The main questions investigated are: (1) the adopter category, as defined by past diffusion of innovations research, to which the discontinuer belongs; (2) the communication behavior of the discontinuer; and (3) the degree of opinion leadership that the discontinuer exercises over his peers.

Twenty communities were selected for the site of the study with the assistance of personnel from <u>The Association for Credit</u> <u>and Rural Development</u> (ACAR), a change agency providing rural extension services and loan orientations. Four criteria were used in the selection of the communities. The communities had (1) nuclear centers, (2) accessible by road, (3) within broadcast range of radio and television stations, and (4) the services of a local ACAR agent for a minimum of three years.

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The data for the present study were obtained by trained Brazilian interviewers who administered interview-schedules to farmers (1) who were the major decision-makers for their farm operations; (2) who were an integral part of the community; (3) who owned at least part of the land they operated; and (4) who were not absentee landowners. There were 1,307 usable interviews.

Zero-order and multiple correlations were computed among the independent variables and the dependent variable, discontinuance.

The results indicate that the individual with a high rate of discontinuance (1) tends to be a laggard, (2) with localite communication patterns, (3) exercising little opinion leadership over his peers.

The multiple correlation indicates that the number of variables employed to explain the variance of discontinuance and among the independent variables evidenced in the present study could be considerably reduced with a negligible loss in the amount of variance explained.

The unexpected results are discussed and conclusions are presented with some suggestions for future research.

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Accepted by the faculty of the Department of Communication, College of Communication Arts, Michigan State University, in partial fulfillment of the requirements for the Master of Arts degree.

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#### DISCONTINUANCE OF INNOVATIONS BY

# FARMERS IN MINAS GERAIS, BRAZIL

By

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# A THESIS

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## CHAPTER I

#### INTRODUCTION

## Justification of the Study

#### The Problem of Discontinuance

Staggering problems confront our generation, problems that become more uncontrollable each day. To mention just two, (1) burdgeoning world population growth, and (2) the world food supply, whose inadequacy already plagues three-fourths of the world. These problems demand the effective diffusion (1) of agricultural innovations on an international basis in order to increase crop yields, and (2) of methods of effective family planning.

Problems of world population growth and world food supply are central to the concern of the field of the diffusion of innovations. Considerable research has been compiled with the objective of constructing models that can contribute to the effective diffusion of innovations.

Central to diffusion models is the potential adopter of a new idea. The agency or individual promoting the innovation may be well aware of the advantages of the new idea. But what about the client, the potential adopter? The model attempting to clarify the stages through which a potential adopter passes in relation to an innovation was called the adoption process.

However, in recent years there has been a growing, although still small, body of research which indicates that adoption of an innovation is not necessarily the terminal point for the client, nor should it be the final concern for the change agent in relation to his client. Adopters tend to discontinue the use of innovations after they have adopted them. This new insight contributed to the demise of the "adoption process" model in favor of the "innovation-decision process" model. "The <u>innovationdecision process</u> is the mental process through which an individual passes from first knowledge of an innovation to a decision to adopt or reject and to confirmation of the decision" (Rogers, 1969, Chapter 3). The innovation-decision process has four steps (Rogers, 1969, Chapter 3).

- 1. <u>Knowledge</u> -- where the individual is exposed to the innovation's existence, and gains some understanding of how it functions.
- 2. <u>Persuasion</u> -- where the individual forms a favorable or unfavorable attitude toward the innovation.
- 3. Decision -- where the individual engages in activities which lead to a choice to adopt or reject the innovation.
- 4. <u>Confirmation</u> -- where the individual seeks reinforcement for the innovation-decision he has made, but where he may reverse his previous decision if exposed to conflicting messages about the innovation.

An innovation-decision occurs either because an individual has been presented with a new way, an alternative to a previous approach to a problem, or because he has been re-presented with an alternative which provokes reconsideration and a new decision to adopt or reject the innovation. The adopter does not terminate his activity with the decision to adopt the new idea. Rather, he can confirm the adoption or resolve to abandon the use of the innovation. It is the decision to cease use of the innovation which is the central variable of the present study. "The decision to cease use of an innovation after previously adopting it" (Rogers, 1969, Chapter 3) is referred to as <u>discontinuance</u>. It is a possible alternative to continued use of an innovation in the confirmation stage of the innovation-decision process.

Why does an individual resolve to discontinue use of an innovation after previously using it? This is a crucial question for which two plausible responses have been presented.

1. <u>Replacement</u> -- the adopter uses the innovation until a better alternative is presented by someone other than the adopter, or else a better alternative is discovered by the adopter himself. At this point, he ceases use of the innovation in favor of the new and apparently better alternative.

2. <u>Disenchantment</u> -- after adoption of an innovation, the adopter becomes disappointed with the innovation and resolves to revert to his behavior prior to the use of the innovation.

Most change agencies do not consider replacement discontinuance as a source of concern because the adopter replaces a less effective alternative with a better one. This is consistent with most change agencies' objectives. However, disenchantment discontinuance is sometimes a problem to the change agency because it

is a reversal of the decision to innovate, possibly a retrogression. If the innovation is important for the individual and his society, the decision to discontinue becomes more or less critical relative to the innovation's significance. From the perspective of the change agent, disenchantment discontinuance can cause concern because it makes the innovation's result unavailable and can create a negative attitude toward the innovation among members of the discontinuer's social system (Leuthold, 1967). Not only has the use of the innovation not been continued by the discontinuer, but its possibilities of full and continued use among his peers are weakened.

An example may help. If a less developed country is suffering a food shortage and a farmer resolves to discontinue an innovation which can provide a greater corn yield per acre for an older, less productive method, the decision has social as well as personal consequences. How will food be provided for an already underfed population? What about the economic gain for the farmer? For an innovation to be effective, its use must be continued and implemented to its full extent. What kind of influence will the discontinuer's decision have upon his fellow farmers with whom he interacts?

Although the study of discontinuance behavior has been rare in diffusion research, it is not an infrequent phenomenon in daily life. The Johnson and van den Ban study (1959) in Wisconsin found that over a five year period, there were 216 adoptions of

seven agricultural innovations by 200 farmers, while there were 255 discontinuances of these same innovations. The Silverman and Bailey study (1961) cited 232 adoptions and 100 discontinuances of 12 agricultural innovations by 107 Mississippi farmers over a three year period. These studies indicate the frequence of discontinuance behavior. The proportion of discontinuances of innovations to their adoption makes this decision an important focal point for diffusion research. But of the 1,700 studies in the diffusion of innovations, there have only been about eight that focused their attention on discontinuance behavior. Due to the limited amount of research, the knowledge of discontinuance is small.

Discontinuance, especially because of disenchantment, is a reversal of the change agency's efforts for the modernization of some segment of society. Considerable time, money, and energy have been expended for the adoption of an innovation and frustrated by the adopter's decision to discontinue its use. Planning and promoting change is an expensive activity, but justified from the change agency's perspective by the continued use of the innovation. Discontinuance is an apparent negation of the investments made by those promoting the innovation. Change agencies need to be better informed about discontinuance behavior in order to economize on their time, energy, and finances through the planning of strategies for more effective and continued use of innovations.

A knowledge of the communication sources/channels used, of the psychological and socio-economic characteristics of discontinuers could assist change agencies in planning strategies to avoid discontinuance by their clients. More knowledge of the discontinuer could assist the change agent in the adaptation of his program for those individuals who are more likely to discontinue use of the adopted innovation. But because of the inadequate research of this variable, the information is not yet available to the change agent. More research is needed.

#### The Focus of the Present Study

Because of the need to know more about the discontinuer, the present study will focus its attention on discontinuance of innovations, especially disenchantment discontinuance, because disenchantment implies a lack of innovativeness, while replacement is an affirmation of innovativeness through adoption of a better alternative, at least as perceived by the adopter.

Naturally, those who adopt more innovations have a greater potential for discontinuing innovations in an absolute sense. The sheer number of innovations adopted provides this possibility. Because of the more innovative person's greater potential to discontinue, we expect that he will have a greater absolute number of discontinuances.\* But a rate of discontinuance\*\* provides us

<sup>\*</sup>The number of discontinuances of some particular innovation could be helpful in the study of the innovation's characteristics. Our interest, however, is in the discontinuer.

with more insights into the discontinuer. By a knowledge of the individual adopter's proportion of discontinuances to innovations adopted, we obtain more insight into who the discontinuer is and what his characteristics are. For example, if one man adopts five innovations and discontinues one, and a second man adopts one innovation and discontinues one, the significance is not the same. Yet the absolute number of discontinuances is the same. The sheer number of discontinues would place them in the same category. But by rate of discontinuance, the first discontinues 20 percent of the innovations adopted, while the second discontinues 100 percent. There is a very significant difference.

From the perspective provided by the rate of discontinuance, we obtain better indications of whether the innovation is a replacement or a disenchantment discontinuance. The higher the proportion of discontinuances, the more we presume that they were disenchantment discontinuances. On the other hand, if the rate of discontinuance is low, we suspect that the innovation was probably discontinued because of replacement.

We shall center our attention on the rate of discontinuance rather than on the number of discontinuances, in order to gain more insight into the discontinuer.

#### The Present Study's Objectives

In order to answer some of the perplexing questions that surround the discontinuer, the following objectives were chosen

for the present study to provide insight into the personal characteristics of the discontinuer and his influence upon his social system.

1. To determine the discontinuer's age and education, relative to members of his social system, as well as those social participation and psychological variables, such as innovativeness, empathy, and cosmopoliteness, degrees of which assist in classifying individuals into adopter categories.

2. To determine the communication behavior of the discontinuer. From which communication sources/channels does the discontinuer tend to receive information about innovations? Is he inclined to receive news from interpersonal or mass media sources' channels? Does the discontinuer tend to interact with change agents?

3. To determine the degree of opinion leadership that the discontinuer exercises over his peers. Does the discontinuer exercise influence upon the innovation-decision behavior of other members of his social system?

A Review of the Relevant Literature

There are only a few studies that deal with discontinuance, and not all these studies are relevant to our concerns in this research project. We have selected those studies which we consider pertinent.

#### Wilkening Study (1952) in North Carolina

The Wilkening study focused its attention on three North Carolina communities. Although its central interest was not discontinuance, there was a measure taken in relation to one innovation, hybrid seed. The sample study did provide some data on the source/channel from which information was obtained for the adoption of hybrid seed.

These data provided the basis for two conclusions, with more emphasis on the first.

1. Contact with high credible sources, such as agricultural agencies, increases the likelihood of the adoption of agricultural innovations.

2. Contact with high credible sources, such as agricultural agencies, increases the likelihood of the continued use of an innovation.

It may be noted that innovators are more likely to have agricultural agency contact than are discontinuers.

#### Johnson and van den Ban Study (1959) in Wisconsin

The Johnson and van den Ban study analyzed both the adoption and discontinuance behavior of 176 farmers in Rock County, Wisconsin. They studied the changes in innovation-decisions over a five year period (1951-1956).

The same farmers were interviewed at the beginning and end of the period concerning seven agricultural innovations for which there had been 216 adoptions and 255 discontinuances.

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Table 1
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Communication Sources/Channels Used by Farmers in Three North Carolina Communities For Most Information Regarding Hybrid Seed Corn.\*

Type of Contact	Continued Users (N=179)	Discontinuers (N=74)
Other Farmers	45	58
Agricultural Agency	31	19
Farm Magazines, Newspapers, Rac	lio 17	17
Other Sources or "Don't Know"	7	7
Total Percentage	100	. 101

\*Source: Wilkening (1952, p. 32).



Some o These more in continuing O the same tim while discor In r innovative using and adopt less Silverman Si county am over a th D disconti for even not a c practic But the showin <sup>the</sup> av great tinuar Some of the farmers were already using the innovations. These more innovative farmers adopted 0.72 innovations while discontinuing 0.77 innovations during the five year period. During the same time span, the less innovative farmers adopted 0.57, while discontinuing 1.22 innovations.

In respect to the rate of adoption of innovations, more innovative farmers adopt more of the innovations they are not yet using and continue to use them. Less innovative farmers tend to adopt less and discontinue proportionately more.

#### Silverman and Bailey Study (1961) in Mississippi

Silverman and Bailey performed their study in one Mississippi county among 107 farmers in relation to 12 agricultural innovations over a three year period (1954-1957).

During this time period, there were 232 adoptions and 100 discontinuances, or the farmers discontinued about one innovation for every two that they adopted.

Table 2 illustrates that on an absolute basis there is not a considerable difference between the average number of practices discontinued by innovators and those in other categories. But the rate of discontinuance provides another perspective, showing a constant progression from innovators to laggards. Since the average number of practices discontinued does not vary to a great extent, the difference is found in the number of discontinuances in relation to the number of adoptions.

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# Table 2

Discontinuance Behavior of 107 Mississippi Farmers in Relation To 12 Agricultural Innovations Over A Three Year Period.\*

(Adopter Category)**	Number of Respondents in Category	Number of Innovations Used in 1954	Average Number of Innovations Discontinued 1954-1957	Percent Discon- tinued by Users
(Innovators)**	14	9-11	0.4	4.0
(Early Adopters)*	* 25	7-8	1.1	14.7
(Early Majority)*	* 34	5-6	0.9	16.4
(Late Majority)**	21	3-4	0.8	22.9
(Laggards)**	13	1-2	0.8	53.3
Totals	107	5.68	. 85	15.0

\*Source: Silverman and Bailey (1961, p. 7).

\*\*The parentheses and their contents were provided by the author of the present study.

# The Bishop Seve decision be period (193 status, wi younger th least one laggards m Tab The Deutso Th Saucio, an behavior of the st (Table 4) Υc patterns, ι tinuers a TI to radio scored 2 <sup>indicati</sup> disconti Ţ <sup>major</sup>ity

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#### The Bishop and Coughenour Study (1964) in Ohio

Seventy-nine Ohio farmers were studied in their innovationdecision behavior in relation to 10 innovations over a six year period (1957-1963). Thirty-nine farmers slightly higher in social status, with more education, more gross income, and a few years younger than farmers who had not discontinued, discontinued at least one practice. However, as regards the rate of discontinuance, laggards more than doubled the rate of discontinuance.

Table 3 illustrates the findings.

## The Deutschmann and Havens Study (1964) in Saucio

The Deutschmann and Havens study included 71 farmers in Saucio, an Andean Village in Colombia. Their innovation-decision behavior in relation to six agricultural innovations was the focus of the study. Their study provided us with the following data (Table 4).

Younger men, locally oriented in their communication patterns, were positively related with discontinuance. Discontinuers appear to be a weak "mirror image" of innovators.

The interview schedule also contained a question of exposure to radio, movies, newspapers and books. Potato variety discontinuers scored 2.0, while other discontinuers scored an average of 2.3, indicating slightly less mass media exposure among potato variety discontinuers.

Table 5 gives the results by adopter categories. Late majority and laggards discontinued at much lower rates than did the

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The Rate of Discontinuance of 10 Agricultural Innovations By 79 Ohio Farmers Over a Six Year Period.\*

Adopter Categories	Percent Discontinued by Users
Innovators and Early Adopters	14
Early Majority	27
Late Majority	34
Laggards	49

\*<u>Source</u>: Bishop and Coughenour (1964, p. 3).

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# Characteristics of Discontinuers Among 71 Farmers in Saucio, Colombia.\*

Characteristics	Potato Variety Discontinuers	Other Innovations	Total
Age	36.8	39.8	38.7
Years of Formal Education	n 1.0	1.4	1.63
Literacy	50%	61%	58%
Size of Farm in Acres	2.1	4.9	8.48

\*Source: Deutschmann and Havens (1964, p. 12).

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# Distribution of Discontinuers Among 71 Farmers in Saució, Colombia, by Adopter Category.\*

Adopter Category	Potato Variety Discontinuers	Other Innovations
Innovators		
Early Adopters	37.5%	5.6%
Early Majority	37.5%	44.4%
Late Majority	12.5%	44.4%
Laggards	12.5%	5.6%

\*Source: Deutschmann and Havens (1964, p. 10).

early adopters and early majority among the potato variety discontinuers. For other innovations, the early and late majorities discontinued at higher rates than did the other categories.

#### The Leuthold Study (1966) in Saskatchewan

Leuthold studied two communities in Saskatchewan. Community A was less prosperous and had 136 participants in the study, while community B had 112. Eight innovations served as the basis for the study with interviews in 1961 and 1963.

Table 6 presents the results. In community A, the economic variables, total farm acreage and number of cattle, influenced decisions to discontinue. They show a significant negative relationship with discontinuance. Farm advice score (opinion leadership) also shows a significant negative relationship with discontinuance. In community B, number of organizational memberships shows a significant negative relationship with discontinuance.

#### The Leuthold Study (1967) in Wisconsin

Four hundred farmers were interviewed in 1962, about 14 farm management innovations that had been available for several years.

Table 7 presents the results relevant to the findings of the present study.

Younger age, formal education, membership in formal organizations, county agent contact, reading extension articles, agricultural specialist contact and gross farm income are all significantly and negatively correlated with discontinuance.

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## Table 6

# Characteristics of Two Saskatchewan Communities Related to Discontinuance Behavior on Eight Innovations.\*

	Cori	relations With
Independent Variables	Discor	itinuance Scores
	Community A	Community B
Age	.16	.18
Formal Education	11	11
Number of Organizational Memberships	.00	24**
Ideas Obtained From Radio and Television	01	23**
Personal Agricultural Penrecentative Con	_	
tact	12	18
Sought for Farm Advice	20**	12
Total Farm Acreage	29**	.00
Number of Cattle	23**	01

\*Source: Table 6 is a selective summary table of five different tables in Leuthold (1966). Age, formal education, and number of organizational memberships, p. 122; ideas obtained from radio and television, p. 125; personal agricultural representative contact, p. 128; sought for farm advice, p. 131; total farm acreage and number of cattle, p. 123.

\*\*Statistically significant at the .05 level of probability.
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Extension Arti

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## Table 7

Characteristics of 400 Wisconsin Farmers Related To Discontinuance on 14 Agricultural Innovations.\*

Independent Variables	Correlation with Discontinuance Scores		
Younger Age	17**		
Formal Education	18**		
Formal Organizations	17**		
Opinion Leadership	06		
County Agent Contact	14**		
Extension Articles	18**		
Agricultural Specialist	14**		
Farm Magazines	01		
Gross Farm Income	14**		

\*Source: Leuthold (1967, p. 91).

\*\*Statistically significant at the .05 level of probability.

Sumary By means studies cited th classes of vari and rate of dis studies. Older ag discontinuance lationship. Li uance while the literature show found to have b <sup>studies</sup>. Opini cant relationsh Regative relati

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Summary

By means of the formulation of a common table (8) with the studies cited that lend themselves to grouping on the basis of common classes of variables, we find relationships between certain variables and rate of discontinuance and certain conflicting results across studies.

Older age shows a tendency to a positive relationship with discontinuance while formal education shows a slight negative relationship. Literacy shows a positive relationship with discontinuance while the implementation of literacy through the use of farm literature shows a negative relationship. County agent contact was found to have both positive and negative relationships in different studies. Opinion leadership and economic variables show no significant relationship. Number of organizational memberships shows a negative relationship to discontinuance.

The results of this summary table of three studies is that there are no clear emerging relationships of these variables with discontinuance across studies.

However, three studies that categorized their respondents in adopter categories by their rate of adoption, show a definite rise in the rate of discontinuance from innovators to laggards. Innovators tend to have a rate of discontinuance significantly lower than laggards.

## Table 8

# Summary Table of Variables Related To Discontinuance

		Three a D:	Three Studies Reporting a Relativity With Discontinuance	
Var Dis	riables Related to continuance Scores	Positive	None	Negative
1.	Age	2	2	
2.	Formal Education		3	
3.	Literacy	1		
4.	Farm Literature*		1	1
5.	Number of Organizational Memberships		1	2
6.	County Agent Contact**	1	2	1
7.	Opinion Leadership		1	
8.	Economic Variables***		1	
Tot	al	4 11 5		5

\*Farm literature includes farm magazines and extension articles.

\*\*County agent contact includes the presence of agricultural agency in community.

\*\*\*Economic variables includes total farm acreage, number of cattle, and gross farm income.

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These last three studies assist us to speculate on those variables ordinarily related to each adopter category and what their relationships with the rate of discontinuance might be.

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### CHAPTER II

#### HYPOTHESES

This chapter is organized on the basis of predicted relationships of 18 independent variables with discontinuance. The predicted relationship of each variable with discontinuance is stated in hypothesis form. The rationale includes a definition of the independent variable, where it is considered necessary, followed by the logic that led to the prediction. Past research supporting the hypothesis is cited. Lastly, an indication of how the variable was operationalized in the present study is given.

First, however, I state a general logic that pervades all of the 18 hypotheses.

<u>Discontinuance</u>\* is the degree to which an individual ceases use of an innovation after previously using it. In contrast, <u>innovativeness</u> "is the degree to which an individual adopts new ideas relatively earlier than others in his social system" (Rogers, 1969). Both the variables are measured by overt behavioral, rather than attitudinal or cognitive, change. Discontinuance refers to the actual use of an innovation and then its rejection, whereas

<sup>\*</sup>Discontinuance was defined in Chapter I in terms of the operation involved in discontinuing. In Chapter II, it is defined in terms of degree to establish discontinuance as a variable.

innovative adoption of tiveness s tors. But adopters d innovation innovative tions, to expect tha their farm mass media <sup>1962</sup>) char tinuer (as an apparen of innovat <sup>defense</sup> of innovative funcation: <sup>gardin</sup>g 1 \*<u>S</u> even impo are chann anothe another p cated frc

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agent a s example i from the innovativeness is expressed in the relatively earlier (than others) adoption of the innovation. In itself, the definition of innovativeness states nothing about the discontinuance behavior of innovators. But Bishop and Coughenour (1964) found that more innovative adopters discontinued a substantially lower proportion of farm innovations than less innovative farmers. Because the more innovative farmers tend to be more successful in their farm operations, to have higher social status and to be wealthier, we would expect that more innovative farmers would integrate innovations into their farm operations more successfully. Their tendencies to use mass media and scientific sources/channels\* of information (Rogers, 1962) characterize the innovator as the antithesis of the discontinuer (as defined in the present study). Because innovators provide an apparent "mirror image" of discontinuers we shall employ degrees of innovativeness, or its lack, as part of our rationale in the defense of our hypotheses. An example of a variable related to innovativeness is functional literacy. Past research indicates that funcational literacy is a facilitator of innovativeness. By regarding literacy-illiteracy as a continuum, we would expect more

<sup>\*</sup>Sources and channels of information are often difficult or even impossible to differentiate. Radio, television, and telephone are channels through which an individual can communicate a message to another person. It is the vehicle through which a message is communicated from some source, some individual. But the change agent represents the change agency. The message he communicates to the client system is the message of the change agency. Does this make the change agent a source of communication or a channel of communication? This example illustrates the difficulty of differentiating the channel from the source.

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<sup>order</sup> to de

<sup>interviewee</sup>



<sup>t</sup>Dis dissonant, by changing Chapter 3). literate people to be more innovative, and we would expect people at the opposite end of the continuum (at the illiterate end) to be higher in discontinuance. Innovativeness and discontinuance are mirrors of each other.

#### Hypotheses

Hypothesis 1: Age is positively related with discontinuance.

As individuals grow older, they tend to develop a certain rhythm of life. The more settled one becomes in this pattern, the more difficult it becomes to adapt to change. Change may create a state of dissonance.\* Consequently, it becomes more difficult for older people to adapt to the new style of life that an innovation demands.

Leuthold (1967) found age to be significantly related to discontinuance. This is consistent with the findings in diffusion researches that more innovative individuals tend to be younger.

Bishop and Coughenour (1964) stated that the laggards in their Ohio study tended to be older than early adopters. The rate of discontinuance for laggards was twice as great as for early adopters.

The present interviewees were asked how old they were in order to determine their age. Scores ranged according to the interviewee's actual age.

<sup>\*</sup>Dissonance is "an uncomfortable state of mind that the individual seeks to reduce or eliminate. So when the individual feels dissonant, he will ordinarily be motivated to reduce this condition by changing his knowledge, attitudes, or actions" (Rogers, 1969, Chapter 3).

Hypothesis 2: Years of formal education are negatively related with discontinuance.

Education develops mental abilities that support change. Schooling enables the farmer to abstract from his situation and to project himself, his family, and his farm into new conditions.

In less developed countries, education is often a privilege instead of a right. Because of school expenses such as uniforms, books, possibly tuition, and the loss of the students' working hours due to his studies, education is often beyond the reach of the poor. It becomes the prerogative of those who are wealthier. The more formal education one has, the more likely the individual was raised in relatively\* affluent surroundings From this perspective, the number of years of formal education becomes an economic variable. The more innovative individuals have been found to be wealthier (Rogers, 1962). So more formal education not only develops the mental abilities that support change, but probably also implies the financial resources that support change and innovation.

In order to obtain an education, the individual must have accessibility to a school. Schools that exist in the country are generally on an elementary level. The higher the level of education, the more likely it is that the school exists in a village, a city, or a metropolitan area. Accessibility implies that the individual either lives near a metropolitan area, or that he had

<sup>\*</sup>The affluence of the individual is relative to others' financial condition within his social system.

the financial means to travel to the city or village. If the individual lived near the city or village, then it would facilitate more interaction with his social system. He would be potentially more cosmopolite than those who lived more distant from the city. If his formal education included college, it is more likely that he studied in a large urban area where he would encounter different ideas and innovations. Education, especially higher education, involves some degree of cosmopoliteness. Rogers (1962) stated that more innovative persons tend to be more cosmopolite.

Leuthold (1965) found years of formal education to be significantly related to the continued use of an innovation.

Deutschmann and Havens (1965) reported that potato variety discontinuers had the lowest level of education in a Colombian peasant village.

The farmer respondents were asked how many years they had attended school.

Hypothesis 3: <u>Functional literacy is negatively related</u> with discontinuance.

<u>Functional literacy</u> refers to the "ability to read and write written symbols at a level of competence adequate for carrying out the functions of the individual's role in his customary social system" (Rogers, 1969, p. 73-74).

Funcational literacy facilitates the development of the abilities to abstract. It enables the individual to manipulate symbols. Literacy is a door from a traditional way of life, giving access to print media, a new world populated with thousands of ideas. The accessible ideas cut across time and distance and enable the individual to be more creative. A world outside the local community is opened, in which he may feel more comfortable with innovations.

One of the major assets of functional literacy is the ability to store and retrieve print information at will, demanding less dependence on memory. If the innovation is one that is used only in certain seasons of the year he can reread directions and materials related to its use. The illiterate peasant must depend on his recall ability, or on the advice of others. Recall is selective and would make available only part of the instructions related to the innovation's use. To be able to retrieve written materials related to the innovation's use, provides the farmer with more complete instructions on its use and integration in his farm operation.

Deutschmann and Havens (1965) found potato variety discontinuers to be less literate than those who continued use of the innovation.

To measure functional literacy in Brazil the interviewer presented the interviewee with a printed card for him to read.\*

<sup>\*</sup>Functional literacy test: "He who cannot read is like a blind man who has to be guided according to other people's wishes; or then he will stumble along his way. The illiterate man is not altogether free; he is a slave of his ignorance. Never stop reading something every day and keep learning" (Herzog, et al., 1968).

The farmer's ability was measured by the number of words he could read. The number of words missed was subtracted from 50. The individual who read 45-50 words correctly was considered functionally literate.

Hypothesis 4: <u>Political knowledge is negatively related</u> with discontinuance.

"<u>Political knowledge</u> is the degree to which an individual comprehends those facts which are essential to his functioning as an active and effective citizen" (Rogers, 1969, p. 56).

Political knowledge probably indicates a certain sense of identity with the national process and infers some degree of political modernization. It necessitates active information seeking. Political knowledge is also a measure of certain education variables such as literacy, indicating certain capacities to obtain knowledge through newspapers and magazines, and perhaps, radio and television.

In all nations, from the more developed to the less developed, politics is involved in economics. All nations have budgets with the allocation of funds to certain governmental services. Agricultural services are a facet of a national budget. A farmer who is politically knowledgeable knows about those governmental services which are more directly related to his profession, namely extension services, governmental loans, and farm bulletins. Through these services, the government seeks to modernize the farmer's operation, to make him more innovative. Thus, within political knowledge there are aspects of economic knowledge and innovativeness. Political knowledge was scored on a five-item scale by asking the respondent the name of the governor of the state, and certain questions relating to foreign affairs of Brazil during the last year. Each correct response of the farmer held the value of one point. A score of political knowledge could range from zero to five.

Hypothesis 5: Economic knowledge is negatively related with discontinuance.

<u>Economic knowledge</u> refers to an individual farmer's understanding of economic principles. Those who are economically knowledgeable have internalized certain criteria with which they can evaluate innovations. They can better perceive the significance and possible success of an innovation for their farm operation before they adopt it. Their economic knowledge probably diminishes the anxiety caused by the risk of innovating.

More than likely, those with economic knowledge are financially more capable of supporting the risk of innovation. A subsistence or semi-subsistence farmer cannot tolerate the risk because a failure would destroy his operation. This, in itself, would create a great deal of dissonance in the mind of the poorer farmer, perhaps precipitate a discontinuance.

The negative correlation predicted by this hypothesis is consistent with Leuthold and Wilkening's (1965) findings of a positive correlation between farm size and the continued use of an innovation. A six-item scale was constructed to measure the respondent's economic knowledge. Farmers were asked such questions as: "Do you think if <u>all</u> farmers managed to increase their crops quickly, <u>all</u> of them would get more profits?" Each correct answer was worth one point, providing a possible range of scores from zero to six.

Hypothesis 6: <u>The availability of the mass media is</u> negatively related with discontinuance.

Availability of the mass media refers to the presence of a radio or newspapers and magazines in the home. The availability of the mass media indicates that either the respondent or a member of his family has a positive disposition toward the mass media. Even though the farmer might not be directly exposed to the mass media, someone close to him is. The mass media messages would thus have some effect upon him. Availability of the mass media is essentially family exposure to the mass media.

In less developed countries it is very likely that mass media and their availability are related to economic variables. Newspapers and magazines are expensive luxuries for the poor. Radio introduces the questions of the availability and cost of electric energy.

The availability of the mass media was operationalized through the use of two questions. "Are you used to receiving newspapers or magazines?" If the respondent receives a newspaper "never", he receives a score of zero, if "sometimes", he receives a score of one, if "more or less regularly", a score of two. The second question was: "Do you have a radio at home?" For a respondent's answer "no",

he receives a score of zero; for "doesn't know", he receives a score of one; for "yes", he receives a score of two. The total score for the two questions was added to obtain the score for the availability of mass media.

Hypothesis 7: <u>Electronic mass media use is negatively re</u>lated with discontinuance.

<u>Electronic mass media use</u> refers to the actual exposure of a respondent to radio, television, and/or cinema. The actual use of the mass media indicates more than a certain attitudinal tolerance, or openness to the mass media, as the availability of the mass media may. But electronic mass media use is an overt behavior, an actual exposure to the message.

One of the characteristics of innovators, as substantiated in diffusion research, is that they tend to receive their information from technical, mass media sources/channels.

In most developing nations, the development of the mass media accompanies mational development. However, the Communist nations, most notably Russia and China, have developed their mass media beyond their actual stage of national development, in order to induce modernization. This is consistent with Lerner's (1958) position that mass media participation is part of the modernization model. The electronic mass media multiply the message of modernization and create the environment for development.

Deutschmann and Havens (1965) found that none of the potato variety discontinuers received their original information about the innovation from the mass media. Farmers were scored on their electronic mass media use from their responses to questions about how often they used radio, television, and cinema. "How often do you listen to a radio?" The response "never" equals zero, "almost never" equals one, "sometimes" equals three, and "more or less an hour per day" equals five. "Do you watch television?" A response of "never" equals zero, "sometimes" equals two, and "more or less regularly" equals four. "Do you go to the cinema?" A response of "doesn't go" equals zero. For each attendance, the respondent received a score of one for a maximum of six. The sum of the three media exposure scores represents an electronic mass media exposure score.

Hypothesis 8: <u>The total number of communication sources</u>/ channels used is negatively related with discontinuance.

Total number of communication sources/channels used refers to the diversity of media from which the farmer receives messages.

The greater the number of communication sources/channels used, the more likely the farmer possesses new knowledge, the more innovative he tends to be. The greater the number of technical information sources/channels used, the more likely the individual will receive reinforcement in the continued use of an innovation. To discontinue use of an innovation in the presence of a quantity of messages to the contrary, creates dissonance in the adopter or discontinuer. If a farmer is exposed, or uses many communication sources/channels, he will receive many innovative messages. If he tends to discontinue many innovations, the messages will contradict his behavior. In order to resolve the dissonance he would have

to discontinue the use of the information sources. To discontinue many information sources/channels would profoundly alter the style of his life. It is unlikely that he would discontinue use of many information sources/channels. He will continue to use the information sources/channels and also the innovations.

Leuthold and Wilkening (1965) determined that the continued use of an innovation was affected by the use of more technical sources/channels of information.

The farmer received a score from zero to seven depending on his use of seven communication sources/channels, radio, television, newspaper, magazine, ACAR bulletin, agronomist or veterinary, and neighbor. One point was assigned for each communication source used. The sum is the score for the total number of communication sources used.

Hypothesis 9: <u>Change agent contact is negatively related with</u> discontinuance.

<u>Change agent contact</u> refers to the interaction between the representative of an agricultural change agency and a farmermember of the client system.

The change agent is more likely to seek individuals that are more receptive to him and his services. This ordinarily means innovative farmers and farmer-opinion leaders who will communicate the ideas to their followers. These farmers tend to be more stable in their adoption behavior. One contact with an opinion leader should be of value in countering considerable innovation negativism among the opinion leader's followers. The change agent's contact, especially when it is consistent with his role of promoting agricultural innovations, should be conducive to the continued use of an innovation by adopters.

The fact that a farmer will interact with a change agent is a sign that the farmer finds this contact rewarding, that he has a positive orientation toward innovation in general or toward a particular innovation.

Interaction with the change agent implies some knowledge of his role, some empathy and probably some economic and political knowledge. Since the change agent does not belong to the social system, this contact also indicates some orientation of the farmer outside of his social system, a cosmopolite orientation. All of the factors implied in the interaction with the change agent, empathy, political and economic knowledge, cosmopoliteness, even though they exist in small degrees in the farmer, are positively related with innovativeness (Rogers, 1969).

Deutschmann and Havens (1965) found that potato variety discontinuers were less likely to accept the advice of agricultural technicians. Leuthold (1967) showed that agricultural specialist contact was related to the continued use of an innovation.

The farmer received a possible score of zero to six on the basis of his responses to three questions. "Does anyone come here to explain a better way of planting or dealing with the cattle?" A response of "no" equals zero, "doesn't know" equals one, and "yes"

equals two. Next the respondent was asked "Who?". A response of "no one" equals zero, "doesn't know" equals one, "a private individual comes" equals two, "a technical specialist" equals three, and "ACAR agent" equals four. "How many times did you talk to the ACAR agent last year?" A response of "no times" equals two. An additional point was given for each conversation with the ACAR agent last year for a maximum score of six. The sum of the three scores represents the change agent contact score.

Hypothesis 10: <u>Membership in a cooperative is negatively</u> related with discontinuance.

<u>Membership in a cooperative</u> is an individual's participation in an agricultural organization in which the participants share responsibility and rewards for its effective functioning. A cooperative is a very complex organization involving a need for competent technical advice and administration based both on economic and political knowledge. An effective cooperative demands the active involvement of the cooperative membership in the venture. The norms of the cooperative must be internalized and common effort must be expended for the attainment of the cooperative's objectives. This causes close interaction among the membership. Needless to say, membership in a cooperative is an overt behavioral variable.

Research has demonstrated that a group like a cooperative will assume positions that involve more risk than will individuals. They will tend to be more innovative. The cooperative will adopt innovations but, with efficiency and profit as criteria, it will adopt only with long range planning, integrating the innovation into

its services. If a cooperative did not have definite criteria for evaluating innovations, they would adopt and discontinue innovations, a cause of financial loss for the cooperative. A cooperative cannot sustain very many losses and remain functioning.

If the cooperative tends to be innovative, it makes its members innovative. The norms of the cooperative become the norms of the membership. The farmers-cooperative members' interaction will be affected by the innovative norms of the cooperative. The members of the cooperative will reinforce each other in their innovativeness, in their continued use of innovations. If the farmers did not assume the value of innovativeness, they would find it necessary to withdraw from the cooperative because of dissonance between their own noninnovative orientation and the cooperative's innovative orientation.

Leuthold (1967) found membership in a formal organization to be significantly related to the continued use of an innovation.

Membership in a cooperative was operationalized by asking the interviewee: "Are you a member of the cooperative?" A response of "no" equals zero, "doesn't know" equals one, and "yes" equals two. The result was the respondent's score for membership in a cooperative.

Hypothesis 11: Trust is negatively related with discontinuance.

"<u>Trust</u> is fundamentally an expectation on the part of some individual that another person or group will usually be helpful to him" (Stanfield, 1968, p. 4).

If a man trusts in the basic honesty of people, he will have greater trust in those who have the credentials of authoritativeness and character. Trust would incline an individual to willingly accept interaction with technical information sources/channels, especially the change agent. The trusting man's contact with the change agent or with his opinion leader would incline him to accept the advice to continue use of an innovation.

When a high credible source interacts with a trusting individual, there should be a considerable reduction of dissonance in the adopter. The high credible source can also serve to evaluate the innovation after trial results. The trusting individual should be more disposed to accept his advice.

It might be feared that a trusting individual would discontinue use of an innovation because of the negative reaction of "other farmers" with whom he interacts. Johnson and van den Ban (1959) studied "other farmers" as a cause of discontinuance. But they did not find any significant relationship between discontinuance and interaction with "other farmers."

A measure of trust was obtained by asking the farmer: "Do you think that the majority of men are naturally dishonest or honest?" A response of "dishonest" equals zero; "doesn't know" equals one; and "honest" equals two.

Hypothesis 12: <u>Cosmopoliteness is negatively related with</u> discontinuance.

<u>Cosmopoliteness</u> is the degree to which an individual has contact outside of his social system. The cosmopolite's orientation

accustoms him to new ideas. Either by his travel to the city with its direct contact with a different way of life, or by those from outside his social system who visit the individual, he reduces the potential dissonance that innovations can cause.

In order for a farmer to be away from his farm, he must have someone whom he can leave in charge, a member of the family or hired help. Beyond this, travel costs money. To be able to leave the farm for visits to the city, and the money to cover the costs of travel, indicates some financial stability on the part of the farmer. The more visits the farmer makes to the city, the more stability he must have. There seems to be interaction of economics in cosmopoliteness.

His varied contacts in the city or in his social system with those from outside his social system provides an opportunity for growth in empathy. If the cosmopolite visits the city frequently, he must have some understanding of the professional roles of city people. He must have some empathy. Empathy, as economics, is related to innovativeness.

Rogers (1969, p. 150) stated: "We believe that cosmopoliteness plays a central role in the modernization process."

Deutschmann and Havens (1965) found a positive relationship between localite orientation and the discontinuance of innovations.

A farmer was measured on cosmopoliteness by his responses to three questions. "Have you ever lived outside of this community?" A response of "never" equals zero, "lived outside but not in a large city", or "no response" equals two; "lived in a large city" equals

four. "Did you visit a large city last year? (one with more than 40,000 inhabitants)." "No" represents a value of zero. Each visit has a value of one for a maximum score of three. "Do you have a relative who lives in a large city? (more than 40,000 inhabitants). "No" has a value of zero. The value of one point was attributed for each visit, for a maximum value of three. The total for the responses to the three questions was added for a cosmopolite score for each farmer.

Hypothesis 13: <u>Empathy is negatively related with discon</u>tinuance.

<u>Empathy</u> is defined "as the ability of an individual to project himself into the role of another" (Rogers, 1969, p. 197). It is this very psychic mobility, the ability of the farmer to project himself into the role of another, which enables him to receive new ideas more effectively and to adapt to them.

The empathic individual should have greater understanding of the role and services provided by the change agent. Evidently empathy helps the individual to feel more comfortable with innovations, to reduce dissonance caused by innovations.

The experiences that facilitate development of empathy, travel outside the local community, contact with individuals from outside the community, literacy and mass media exposure, suggest that empathic farmers have high social status within their social systems. The means by which empathy is cultivated suggests the interaction of economic variables as facilitators.

To obtain a measure of empathy, four questions were presented to the farmers. "If you were (1) county director, (2) the ACAR supervisor, (3) President of Brazil, (4) the person in charge of a factory, what would you do?" For counter-factual behavior as county director, "doesn't know" or foolish responses were given a value of zero. General responses were scored as one. More specific responses were valued at two while specific responses were given the value of three. For counter-factual behavior as ACAR supervisor, "doesn't know" equals two, very general responses, three, more specific responses, four, and very specific responses, five. The sum of the scores for the four questions represents the empathy score for the respondent. For counter-factual behavior as President of Brazil, "doesn't know" equals three. Very general responses equal four, while more specific responses equal five. Very specific responses represent a value of six. For responses to counterfactual behavior as factory manager, "doesn't know" equals four. General responses were valued at five, more specific responses, at six, and very specific responses, at seven.

Hypothesis 14: <u>Satisfaction is positively related with</u> discontinuance.

<u>Satisfaction</u> refers to the contentment of an individual with his situation. If an individual is content with his present situation, it is unlikely that he perceives any need to change, to innovate. If he does innovate, he will place himself in a dissonant condition necessitating resolution. The farmer resolves his dissonant

condition by full psychological participation in the adoption of the innovation, or by discontinuance, which seems more probable for the satisfied individual.

Satisfaction also indicates less need on the part of the farmer to interact with change agents, subscribe to technical bulletins, and generally expose himself to technical information sources. We might expect that without the use of more technical sources of information, the implementation of an innovation would be only partial and lead to more disenchantment discontinuance.

To operationalize satisfaction, farmers were asked, "Are you content with your present situation?" A response of "no" equals zero, while "doesn't know" equals one, and "yes" equals two. The total for this question represents the farmer's score for satisfaction.

Hypothesis 15: <u>Patriarchalism is positively related with</u> discontinuance.

<u>Patriarchalism</u> is the degree to which an individual perceives the world as ordered on hierarchies of authority.

A patriarchal society is tradition-oriented, oriented toward past and proven ways of resolving problems. It does not tend to seek out new ideas.

Because of the authority bias of a patriarchal society, it is logical that the higher an individual measures in patriarchalism, the more he will tend to adopt an innovation on an authoritysubmissive basis, rather than by internalizing the reasons for the

adoption of an innovation. We expect the change agent to be perceived as an authority figure in a patriarchal society. Adoption would be effected while the change agent is present, but once the change agent withdraws, we would expect the patriarchal farmer to feel dissonance with the innovation and eventually discontinue its use.

Patriarchalism was measured with two questions. "If possible, would you like your daughters to marry: whom they had chosen, or some boy you had chosen?" And, "If possible, would you like you sons to take up the occupation they would wish, or would you like them to take up the occupation you yourself had chosen?" For both questions, a response indicating the "obligation" of the daughter and son to follow the will of the father equals zero. "Doesn't know" equals one, and a response indicating the daughter or son's freedom of choice equals two. Responses to the two questions were summed to represent the interviewee's patriarchalism score.

Hypothesis 16: <u>Achievement motivation is negatively related</u> with discontinuance.

Achievement motivation is the degree to which an individual desires excellence in his profession. The variable implies some active information seeking on the part of the farmer. He seeks to sharpen his professional competence, which disposes him to contact with those sources/channels, interpersonal and mass media, that can provide him with the needed information.

Achievement motivation implies some dissatisfaction with the present situation, and orientation to change, unless the farmer feels that he has already attained professional excellence.

Five questions were posed to farmers. They were similar to the following: "Do you agree or disagree with the following? It is better to be content with the little one has than to always be struggling for more? ....The way things are nowadays makes it discouraging to work hard?" For each of the five questions a response indicating the lack of a disposition to effect change equals zero. A "doesn't know" response equals one, and a disposition to effect change equals two. The sum of the responses for the five questions represents the achievement motivation score for the respondent.

Hypothesis 17: <u>Innovativeness is negatively related with</u> discontinuance.

<u>Innovativeness</u> "is the degree to which an individual adopts new ideas relatively earlier than others in his social system" (Rogers, 1969, p. 294). Innovativeness is an overt behavioral variable, not merely attitudinal. It is measured by the actual adoption of innovations. The basic rationale underlying all the hypotheses is each variable's relationship with innovativeness. Further development of the rationale for innovativeness' negative relationship with discontinuance is presented in the introduction of Chapter II.

Innovativeness indicates a willingness to risk, which is probably facilitated by economic security. Every innovation involves <u>some</u> risk, but if the adopter has criteria by which to evaluate an innovation, he can reduce the risk. We expect that an innovator probably feels less risk because of positive experiences with innovations in the past.

Innovators adopt more innovations than others. This gives them the possibility of discontinuing more than other adopters by sheer numbers. But it is the hypothesis of this paper that the innovator's rate of discontinuance is smaller than other adopter categories.

Bishop and Coughenour (1964) found that those who innovated more discontinued a substantially lower proportion of the innovations they had adopted than farmers who adopted less. They also found that early adopters discontinue at lower rates than late adopters.

A score on innovativeness was obtained by questioning the farmers on 10 to 12 agricultural innovations appropriate to that social system, and introduced a number of years before the interview. He was then asked how many years since he had adopted each practice. The sum of the number of years since the farmer had adopted each practice, divided by the number of practices appropriate to that community, 10 to 12, provide an innovativeness score.

Hypothesis 18: <u>Opinion leadership is negatively related to</u> discontinuance.

"<u>Opinion leadership</u> is the ability to influence informally other individuals' attitudes in a desired way and with relatively high frequency" (Rogers, 1969, p. 88).

A person does not seek advice from a failure. If a farmer is looking for assistance on farm innovations, he does not tend to go to those who have demonstrated bad judgment in the past. An opinion leader must be more competent than those who seek advice from him.

A farmer with more agricultural information would be more likely to be sought out for advice. But, in turn, the opinion leader would also seek competent people from whom to receive information, mass media, change agents. These factors would contribute to more critical adoption decisions, making discontinuance less likely.

Deutschmann and Havens (1965) found that potato variety discontinuers were less likely to be opinion leaders than were nondiscontinuers.

To obtain an opinion leadership score, farmers were asked four questions. They were asked to whom they would go for each of three innovations. The opinion leadership score was the number of times a particular individual was mentioned in response to the questions.

Table 9 shows the predicted relationships of each of the 18 independent variables with discontinuance.

# Table 9

# Predicted Relationships of 18 Independent Variables and Discontinuance

Ind	ependent Variables	Predicted Relationship	Dependent Var	riable
1.	Age of Respondent	+		
2.	Years of Formal Education	-		
3.	Functional Literacy	-,\\\		
4.	Political Knowledge	-, \\\\		
5.	Economic Knowledge	-,////		
6.	Availability of Mass Media	-////		
7.	Electronic Mass Media Use	- //		
8.	Total Number of Communication Sources Used			
9.	Membership in a Cooperative		Disconti	inuance
10.	Change Agent Contact	- /		
<b>1</b> 1.	Trust	-//	////	
12.	Cosmopoliteness	-///		
13.	Empathy	-////	//	
14.	Satisfaction	+////		
15.	Patriarchalism	+////		
16.	Achievement Motivation	_/ //		
17.	Innovativeness	_//		
18,	Opinion Leadership	_/		
#### CHAPTER III

### METHODOLOGY

The purpose of this chapter is to discuss the present study's design and present the statistical techniques employed in the dataanalysis.\*

### Design of the Present Study

In southern Brazil, situated between the poverty belt of the northeast and the more prosperous regions of the deep South and East, is the State of Minas Gerais. The state, larger than Texas, has about 10 million inhabitants whose main profession is agriculture. Economically, the state is neither the poorest nor the most prosperous region in Brazil. Because of its agricultural orientation and its economic middle ground, Minas Gerais was chosen as the site for the present study with the expectation that from its data, conclusions could be reached that would be applicable to other regions of Brazil. However, if a more extreme area had been selected as the research site, it is doubtful that the data-analysis would provide conclusions generalizable to locations in Brazil outside of the area researched.

<sup>\*</sup>The present study is part of a larger study, Herzog, et al., 1968.

## Organization of Field Work

## ACAR: A Change Agency

An additional characteristic important to the selection of Minas Gerais as the research site is the presence of ACAR, <u>The</u> <u>Association for Credit and Rural Development</u>. ACAR is a change agency that provides both rural\* extension services and loan orientations. ACAR does not finance the loans.

ACAR's central office is in the city of Belo Horizonte, with regional offices throughout the state. Each local office is staffed by a male agricultural agent, a female home demonstration agent, and a secretary. The services provided by the agricultural agent are to advise farmers about solutions to their problems, to serve as a liason person between the farmer-clients and resource people in the central office for problems beyond the agent's scope, and to introduce agricultural innovations appropriate to the community he serves.

### Interview Schedule and Interviewers

Since the research project was a study of the innovationdecision behavior of farmers, it was necessary to have innovations appropriate to the area. Both ACAR's central office and the local agents assisted in the selection of the appropriate innovations. The

<sup>\*</sup>Rural rather than agricultural because it also provides home services.

number of innovations\* varied from community to community in which the research was executed. But there were 10 to 12 innovations for every community.

The interview-schedule contained questions on the awareness of innovations, adoption, and the discontinuance of innovations. The interview-schedule was prepared in Portuguese and pretested with a small group of farmers.

In February, 1966, four ACAR personnel were loaned to the project, trained as interviewers, and formed into a single interview team. In addition, 18 university students were hired, trained, and formed into interview teams directed by a senior research associate. Including the ACAR personnel, there were six interview teams.

#### The Client System

From the 176 areas in which ACAR has local offices, 20 communities were chosen to participate in the present study. The project personnel, with the assistance of ACAR personnel from the central office, selected areas in which there were communities that fulfilled four criteria.

1. The community had to have a nuclear center, a village where people can have face-to-face interaction among farmers provided for a study of farmers' influence upon each other's innovationdecision behavior.

<sup>\*</sup>For a list of the innovations used in the different communities, see Herzog, et al., 1968.

2. The community had to have relatively easy accessibility in order that the interviewers could interview the farmers. Transportation accessibility also provided the possibility of travel outside the local community, and access of the village to outsiders.

3. The community had to be within broadcasting range of radio and television stations. The potential exposure to electronic mass media provided the opportunity to study the influence of the mass media upon the innovation-decision behavior of the farmers.

4. ACAR had to be active within the community for at least three years. The minimum three year period was stipulated to allow the ACAR agent a reasonable period of time for knowledge of, and contact with his client system. The ACAR agent's minimum presence of three years in the community provided the possibility of studying the influence of the agent's contact upon the innovation-decision behavior of the farmers.

The specific communities within the area served by the local ACAR offices were chosen at random from a list of communities in which the local agent stated that he was more successful in introducing innovations, and in which he was less successful. One "more successful" and one "less successful" community was chosen in each area.

# Compilation and Coding of the Data

The interviewing of the farmers lasted six weeks. The interview teams obtained 1,307 usable interviews from the 20 communities.

Only those interviews were acceptable in which the farmers fulfilled certain criteria.

1. The respondent had to be the major decision-maker for a particular farm. Unless the farmer who was the major decisionmaker responded to the interview-schedule, the data on the innovationdecision behavior of the farmer could only be the estimate of a second person, a wife, a son, or a neighbor. An interview from a second-hand source raises the question of reliability. Interviews that did not contain the direct responses of the farm's major decisionmaker were discarded.

2. The respondent was an integral part of the community. Unless the farmer formed an integral part of the community, it would be impossible to study the influence of farmers upon other farmers' innovation-decision behavior.

3. The respondent was owner of at least part of the land he operated. The present study's interest is in him who has the authority and responsibility of innovation-decisions, and not merely in the individual who implements the innovation-decisions of others. If the respondent did not own at least part of the land he operated, his interview was discarded.

4. The respondent could not be an absentee landowner. An absentee landowner would not be an integral part of the community. The question of who makes innovation-decisions, the absentee landowner or the farm manager, raises the question of the validity of the responses.

<sup>\*</sup>Fortunately, absentee landowners were a rarity in Minas Gerais.

After completion of the interviews, 10 percent of the respondents were reinterviewed for a reliability check.

Data were gathered in Brazil and forwarded to Michigan State University for transfer to IBM cards. A check of errors included frequency counts on the variables and the use of special computer programs to identify illogical, implausible, or inadmissible codes, or code combinations.

For some variables, a simple sum of raw scores or normalized items served this purpose. For other variables, items which were designed to measure a single factor were submitted to factor analysis to verify their uni-dimensionality.

Because of the focal point of the present study, more detail on the construction of the discontinuance variable may be of assistance.

Ten to twelve innovations appropriate to the particular community, where the interview-schedule was administered, were selected. But prior to the administration of the interview, each of the innovations was submitted to factor analysis to determine that all the innovations included in the interview schedule were (1) applicable for any given community, and (2) representative of an underlying adoption dimension.

In the administration of the interview-schedule, farmers were asked which of the 10 to 12 innovations appropriate to his community he had adopted, and which he had discontinued. The number of innovations the farmer had ceased to use provided an absolute

score of discontinuance behavior. In order to obtain a rate of discontinuance for each respondent, the number of innovations a farmer had adopted was divided into the number he had discontinued. This provided a measure of the rate of discontinuance for each farmer.

#### Data-Analysis

Eighteen independent variables were selected for the present study to determine their relationship with the rate of discontinuance. The rationale for the selection of the 18 independent variables is presented in Chapter II as well as the coding procedure for each of the independent variables. Zero-order correlations were computed between the 18 independent variables and the dependent variable, rate of discontinuance. These correlations were computed in order to determine the degree of relationship between each of the 18 independent variables with the rate of discontinuance. The 18 independent variables were selected in order to provide insight into (1) which adopter category is most characteristic of discontinuers; (2) the communication behavior of discontinuers; and (3) the opinion leadership of the discontinuer.

Multiple correlations were also computed among the 18 independent variables and the rate of discontinuance to determine the degree of variance in discontinuance scores that each independent variable explains. A multiple correlation determined which predictor variables explain the greatest variances in the dependent variable by all of the dependent variables considered together.

## CHAPTER IV

# EIGHTEEN INDEPENDENT VARIABLES AND DISCONTINUANCE

#### Introduction

The present chapter presents the zero-order and multiple correlations of 18 independent variables with the dependent variable, discontinuance.

# Zero-Order and Partial Correlations

This section of the present chapter presents (1) the hypotheses as stated in Chapter II, (2) the zero-order and partial correlations for each independent variable with discontinuance, (3) one conclusion resulting from the relationship as shown by the partial correlation, and (4) explanations where there is a contradiction between the predicted relationship or where there is a contradiction between the zero-order and partial correlations.

Hypothesis 1: Age is positively related with discontinuance.

Both zero-order and partial correlations show a positive correlation of age with discontinuance, .007, and .018, respectively. But neither is significant at the .05 level of probability. There is no significant correlation between age and the rate of discontinuance of innovations.

Hypothesis 2: Years of formal education is negatively related with discontinuance.

Both correlations show a negative correlation between years of formal education and discontinuance of -.190, and -.012, respectively. However, only the zero-order correlation is significant and significant at the .01 level of probability. There is no significant relationship between years of formal education and the rate of discontinuance of innovations.

Hypothesis 3: <u>Functional literacy is negatively related</u> with discontinuance.

Zero-order correlations show functional literacy to have a non-significant correlation with discontinuance of -.010. However, partial correlations show a relationship of -.069, statistically significant at the .05 level or probability. As functional literacy increases, the rate of discontinuance of innovations decreases.

All the educational variables, years of formal education, political knowledge, and economic knowledge, with the exception of functional literacy, are statistically significant at the .01 level of probability, as evidenced by zero-order correlations. However, when all the independent variables are held constant, the only educational variable that is shown to have a significant relationship with discontinuance is functional literacy, significant at the .05 level of probability. This seems to indicate the mutual influence of the educational variables upon each other. Years of formal education seems to be less important in explaining the variance in discontinuance than the result which does or does not occur from formal education, functional literacy. Political and economic

# Table 10

# Zero-Order and Partial Correlations of 18 Independent Variables and Discontinuance

Ind	ependent Variables	Zero-Order Correlation with Discontinuance	Partial Correlation Coefficients with Discontinuance
1.	Age of Respondent	+.007	+.018
2.	Years of Formal Education	190*	012
3.	Functional Literacy	010	069*
4.	Political Knowledge	313**	007
5.	Economic Knowledge	230**	023
6.	Availability of Mass Media	401**	021
7.	Electronic Mass Media Expos	ure399**	201**
8.	Total Number of Communicati Sources Used	on 415**	084**
9.	Membership in a Cooperative	355**	148**
10.	Change Agent Contact	193**	076**
11.	Trust	+.090**	005
12.	Cosmopoliteness	155**	+.004
13.	Empathy	234**	058*
14.	Satisfaction	078*	058*
15.	Patriarchalism	+.068*	+.015
16.	Achievement Motivation	141**	+.002
17.	Innovativeness	418**	215**
18.	Opinion Leadership	010	+.041

\*Statistically significant at the .05 level of probability. \*\*Statistically significant at the .01 level of probability. knowledge seem to be dependent on, and expressions of functional literacy. Thus, functional literacy seems to be the key educational variable.

Hypothesis 4: <u>Political knowledge is negatively related</u> with discontinuance.

Political knowledge has a significant relationship with discontinuance of -.313, at the .01 level of probability by the zeroorder correlations. But partial correlations show a non-significant correlation of -.007. Political knowledge is not significantly correlated with the rate of discontinuance of innovations.

Hypothesis 5: <u>Economic knowledge is negatively related</u> with discontinuance.

Economic knowledge has a significant relationship of -.230, at the .01 level of probability, as shown by the zero-order correlations. But the partial correlations show it to be -.023, not significant. Economic knowledge is not significantly correlated with the rate of discontinuance of innovations.

Hypothesis 6: <u>Availability of the mass media is negatively</u> related with discontinuance.

Zero-order correlations show availability of mass media to have a significant relationship with discontinuance of -.401, at the .01 level of probability. But the partial correlations evidence a nonsignificant correlation of -.021. There is no significant correlation between availability of mass media and the rate of discontinuance of innovations. Availability of mass media is not independent of two other variables which include the use of the mass media, namely, electronic mass media exposure, and total number of communication sources used. Electronic mass media exposure and total number of communication sources used have significant relationships with the rate of discontinuance of innovations in the zero-order and partial correlations. It seems that these latter two variables contribute to the significant relationship of availability of mass media in the zero-order correlations, but the significance disappears in the partial correlations. It appears that the use of the media is more important in explaining variance in discontinuance than the availability of the mass media.

Hypothesis 7: <u>Electronic mass media exposure is negatively</u> related with discontinuance.

Consistent with the prediction, electronic mass media exposure has a significant relationship with discontinuance as shown in both correlations, of -.399, and -.201, respectively, at a .01 level of probability. As electronic mass media exposure increases, the rate of discontinuance of innovations decreases.

Hypothesis 8: <u>Total number of communication sources used</u> is negatively related with discontinuance.

Total number of communication sources used has a significant relationship with discontinuance at the .01 level of probability, as shown by both correlations, of -.415, and -.084. The greater the number of communication sources used, the lower the rate of discontinuance tends to be.

Hypothesis 9: <u>Membership in a cooperative is negatively</u> related with discontinuance.

Membership in a cooperative is negatively related with discontinuance as both zero-order (-.355) and partial correlations (-.148) show. Both show a relationship significant at the .01 level of probability. If a farmer has membership in a cooperative, he will probably have a lower rate of discontinuance of innovations.

Hypothesis 10: <u>Change agent contact is negatively related</u> with discontinuance.

Both zero-order and partial correlations show change agent contact to have a significant relationship with discontinuance, of -.193, and -.076, respectively, at the .01 level of probability. The greater the change agent contact, the lower the rate of discontinuance tends to be.

Hypothesis 11: Trust is negatively related with discontinuance.

Although zero-order correlations show trust to have a positive relationship (+.090) with discontinuance, significant at the .01 level of probability, partial correlations show a negative, non-significant correlation (-.005). Trust does not have a significant correlation with discontinuance.

The change of trust from a positive and significant relationship with discontinuance in the zero-order correlation to a negative, non-significant correlation with discontinuance in the partial correlations is difficult to attempt to explain. The only explanation seems to be that the influence of the other 17 independent variables in the zero-order correlations makes trust's relationship with discontinuance positive and significant. When the 17 independent variables are held constant, trust has a negative, non-significant correlation with discontinuance.

Hypothesis 12: <u>Cosmopoliteness is negatively related with</u> discontinuance.

Zero-order correlations show cosmopoliteness to have a negative relationship with discontinuance of -.155, significant at the .01 level of probability. But partial correlations show the correlation to be positive and non-significant (+.004). There is no significant correlation between cosmopoliteness and the rate of discontinuance of innovations.

Electronic mass media exposure, total number of communication sources used, and change agent contact represent some of the sources/channels from which a cosmopolite would receive his information. Electronic mass media, the change agent, and some of the communication sources used are cosmopolite, from outside the local social system. A cosmopolite would tend to interact with these sources of information. The fact that change agent contact, electronic mass media exposure, and total number of communication sources used are significant in the partial correlations, while cosmopoliteness is not, seems to indicate that the three have contributed to the significance of cosmopoliteness in the zero-order correlations. When the four variables (electronic mass media exposure, change agent contact, total number of communication sources used, and cosmopoliteness) are held constant, only cosmopoliteness is not significant.

Hypothesis 13: <u>Empathy is negatively related with discon</u>tinuance.

Both zero-order and partial correlations show a negative relationship (-.234, and -.058) between empathy and discontinuance, significant at the .01 level of probability. As empathy increases, the rate of discontinuance tends to decrease.

Hypothesis 14: <u>Satisfaction is positively related with</u> discontinuance.

Contrary to the predicted relationship, satisfaction has a negative relationship with discontinuance of -.234, and -.058, as evidenced by both correlations, significant at the .05 level of probability. As the level of satisfaction grows, the rate of discontinuance of innovations tends to diminish.

The rationale for the predicted relationship between satisfaction and discontinuance stated that an individual who is satisfied with his life situation would sense dissonance if he changed his style of life, if he innovated. But it must be remembered that the interview-schedule was administered after 10 to 12 innovations were adopted, and that the questions centered around the innovations. It is logical that if the farmer-respondent was satisfied after adopting the innovations, that he would not discontinue the innovations.

Hypothesis 15: <u>Patriarchalism is positively related with</u> discontinuance.

Consistent with the predicted relationship, patriarchalism is positively correlated with discontinuance. Zero-order correlations show a relationship of +.068, significant at the .05 level of probability. Partial correlations show a non-significant relationship of +.015. Patriarchalism is not significantly correlated with the rate of discontinuance of innovations.

The only explanation that seems plausible for the change in the significance of the correlation between patriarchalism and discontinuance from the zero-order to partial correlations is the influence of the other 17 independent variables on the correlation of patriarchalism with discontinuance in the zero-order correlations.

Hypothesis 16: <u>Achievement motivation is negatively related</u> with discontinuance.

The zero-order correlation is -.141, significant at the .01 level of probability. However, the partial correlation is positive, +.002, but not significant. Achievement motivation is not significantly correlated with the rate of discontinuance of innovations.

It is probable that change agent contact, electronic mass media exposure, and innovativeness contribute to the significant relationship of achievement motivation with discontinuance in the zeroorder correlation by serving as stimuli for greater achievement. But when the influence of these variables is held constant, the individual tends to assume localite norms which tend to be non-innovative, changing the correlation from a significant, negative relationship with discontinuance to a negative correlation.

Hypothesis 17: <u>Innovativeness is negatively related with</u> discontinuance.

Both zero-order and partial correlations show innovativeness to have a negative relationship with discontinuance of -.418, and -.215, respectively. Both are significant at the .01 level of probability. As innovativeness increases, the rate of discontinuance of innovations decreases.

Hypothesis 18: <u>Opinion leadership is negatively related with</u> discontinuance.

Opinion leadership has a negative, non-significant, zero-order correlation (-.010) with discontinuance. But partial correlations, although still not significant, show a positive correlation (+.041). There is no significant correlation of opinion leadership with the rate of discontinuance of innovations.

Change agents tend to seek out opinion leaders in order to obtain adoption of innovations by members of a social system. The influence of the change agent tends to be innovative. It is possible that change agent contact contributes to the positive correlation between opinion leadership and discontinuance in the zero-order correlations. Once the influence of the change agent contact is held constant, opinion leadership tends to be based on the opinion leader's own past experience. This experience is apparently traditional and non-innovative.

# Predictors of Variance in Discontinuance

From the multiple correlations of the least squares deleted program\*, those independent variables which are the most significant predictors of variance in the dependent variable, discontinuance, emerge. Ten independent variables (achievement motivation, cosmopoliteness, trust, political knowledge, years of formal education, patriarchalism, age, availability of mass media, economic knowledge, and opinion leadership)\*\* were shown to explain only .0025 in the variance of the dependent variable discontinuance. These 10 were deleted.

The eight remaining independent variables (satisfaction, empathy, change agent contact, functional literacy, total number of communication sources used, membership in a cooperative, electronic mass media exposure, and innovativeness)\*\*\* explain .332 of the variance in discontinuance. Of the eight remaining independent variables, one is an educational variable, functional literacy, explaining .021 of the variance. Three are communication sources/channels variables, change agent contact (.016), total number of communication sources used (.044), and electronic mass media exposure (.086), explaining .152 of the variance of discontinuance. There is one social participation variable, membership in a cooperative, explaining .053 of the variance. Finally, there are three psychological variables, satisfaction (.007), empathy (.014), and innovativeness (.091), explaining .112 of the variance in the dependent variable, discontinuance.

<sup>\*</sup>The program employed in the present analysis is called Multiple Correlation R2 LSDEL. \*\*See Table 13.

<sup>\*\*\*</sup>See Table 12.



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In Va	dependen <sup>1</sup> riables*	t (1)	(2)	(3)	(4)	(5)	(9)	(2)	(8)	(6)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(12)
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	owledge	100	.241	.258	.333													
6.	Availab	ility																
	of MM	087	.240	.333	.500	.282												
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	Exposure	e014	.213	.294	.377	.224	.489											
∞.	Total Co	omm																
	Sources	030	.219	.342	.412	.310	.561	.405										
9.	Coop Mer	F																
	bership	066	.206	.238	.261	.439	.376	.266	.450									
10.	Change /	Agent																
	Contact	030	.134	.168	.201	.170	.246	.184	.292	.243								
11.	Trust	- ,089	084	097	136	062	147	140	116	088	.060							
12.	Cosmopo																	
	iteness	037	.175	.158	.240	.166	.194	.172	.182	.079	.124	033						
13.	Empathy	-,032	.159	.223	.281	.284	.246	.245	.292	.202	.152	044	.124					
14.	Satisfa	υ																
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	ism	119	047	066	161	042	-,112	100	040	062 -	.050	010 .	.088	044	.070			
16.	Achiever	nent Mo	ti															
	vation	154	.156	.159	.194	.175	.160	.130	.214	.149	.147	003	.123	.147	087	.021		
17.	Innovat	ive																
	ness	097	.155	.238	.369	.262	.043	.252	.408	.246	.238	123	.227	.202	.076	.056	186	
18.	Opinion	Lead	1															
	ership	067	.055	.037	.113	.018	.079	.013	.073	.057	.278	064	.069	.039	051	069	031	.154
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Zero-Crder Intercorrelation Matrix of 18 Independent Variables

# Table 12

# Eight Predictors of Variance in Discontinuance As Shown by Multiple Order Correlations\*

Independent Variables		Variance of Discontinuance Explained	Percent of Variance Explained	
1.	Satisfaction	.007	.021	
2,	Empathy	.014	.042	
3.	Change Agent Contact	.016	.048	
4.	Functional Literacy	.021	.063	
5.	Total Number of Communication Sources Used	.044	.136	
6.	Membership in Cooperative	.053	.159	
7.	Electronic Mass Media Exposure	.086	.258	
8,	Innovativeness	.091	.273	
Total		.332	1.000	

\*All the variables are significant at the .05 level of probability. The variables are presented according to their power to explain the variance of discontinuance.

\*\*The multiple correlation program presenting these results was the Multiple Correlation R2 LSDEL. The independent variables with the least power to explain the variance of discontinuance were deleted in the order of the variable of least explaining power first. Table 13 presents the 10 variables deleted in their order of deletion.

# Table 13

# Ten Independent Variables Deleted in Order of Least Power to Explain Variance in Discontinuance.\*

Ind	ependent Variable	R2 Deletes
1.	Achievement Motivation	.334
2.	Cosmopoliteness	.334
3.	Trust	.334
4.	Political Knowledge	.334
5.	Years of Formal Education	.334
6.	Patriarchalism	.334
7.	Age	. 334
8.	Availability of Mass Media	.334
9.	Economic Knowledge	.334
10.	Opinion Leadership	.333

\*The ten independent variables explain .0025 of the variance in discontinuance.

#### CHAPTER V

## SUMMARY AND CONCLUSIONS

### Summary

The Focus of the Present Study

The study had three objectives.

1. To determine the age, education, and psychological characteristics of the discontinuer.

2. To determine the communication behavior of the discontinuer.

3. To determine the degree of opinion leadership that the discontinuer exercises over his peers.

By resolving these perplexing questions, change agencies can plan more effective programs of change, programs that will not only obtain adoption, but also continued use of innovations.

Much research in the field of the diffusion of innovations has concentrated on the various stages of the innovation-decision process. The one relatively-neglected stage, and yet of central importance, is discontinuance.

<u>Discontinuance</u> is defined (Rogers, 1969, Chapter 3) as "a decision to cease use of an innovation after previously using it." Two plausible reasons have been posited as the causes of discontinuance: (1) replacement, in which the innovation is discontinued in favor of a

better idea; and (2) <u>disenchantment</u>, dissatisfaction either because the innovation is perceived by the adopter to be inappropriate, or because of misuse of the innovation by the adopter. The concern of the present study is disenchantment.

The focus of the present study was on the rate of discontinuance, the proportion of discontinuances of innovations to adoptions. Rate of discontinuance provides more insight into the discontinuer than the absolute number of discontinuances, because it is assumed that the more innovative person has greater potential for discontinuances by weight of the greater number of innovations he adopts. The innovative individual's discontinuance behavior is probably more indicative of replacement, while the person high in rate of discontinuance, is probably motivated by disenchantment.

## Methodology

Twenty farming communities in Minas Gerais, Brazil, were chosen for the site of the present study. These communities were selected because of matching on community size, transportation access, and availability of the mass media. The interviewers, mainly university students, were organized in supervised teams to administer the interview schedules. The interviewers sought farmers (1) who owned at least part of their land, (2) who made the major decisions for the farm, (3) who were not absentee landowners, and (4) who were an integral part of the community. 1,307 farmers qualified.

Part of the interview schedule dealt with 10 to 12 innovations introduced within the last fifteen years. In order that the innovations

would be those most suited for the locale, different innovations were selected for different communities.

Each farmer was scored on innovativeness and discontinuance. Innovativeness was scored by summing the number of years since adoption of each innovation and divided by the number of innovations adopted. A measure of discontinuance was calculated by forming a ratio of the number of innovations which a farmer had discontinued using, to the total number he had adopted.

The schedule contained questions pertaining to characteristics of the farmer, his farm operation, and his communication behavior, which have generally been associated with innovation-decision behavior. From the interview schedule, 18 independent variables\* were constructed in order to determine their relationship with discontinuance. The variables selected were age, education and knowledge variables, communication source/channel variables, psychological variables, membership in a cooperative, and opinion leadership.

The first class of variables included age of respondent, years of formal education, functional literacy, political and economic knowledge. Variables of the second class were availability of mass media, electronic mass media exposure, total number of communication sources used, and change agent contact.

<sup>\*</sup>Table 13 presents the predicted relationships and the zeroorder correlations computed.

The third class of variables included trust, cosmopoliteness, empathy, satisfaction, patriarchalism, achievement motivation, and innovativeness.

All the variables were predicted to have a negative relationship with discontinuance except, age of respondent, satisfaction, and patriarchalism, for which positive relationships with discontinuance were predicted.

Zero-order and partial correlations were computed to determine the correlations between the 18 independent variables and the dependent variable, discontinuance.

### Results

Zero-order correlations determined 16 of the 18 independent variables to be correlated with discontinuance in the direction predicted. Zero-order correlations determined age of respondent and patriarchalism to have positive correlations with discontinuance, patriarchalism at the .05 level of probability. Years of formal education, political knowledge, economic knowledge, availability of mass media, total number of communication sources used, membership in a cooperative, change agent contact, cosmopoliteness, empathy, achievement motivation, and electronic mass media exposure have significant, negative relationships with discontinuance at the .05 level of probability, as shown by zero-order correlations. Funcational literacy and opinion leadership have negative correlations with discontinuance, but not at significant levels. Contrary to the

# Predicted Relationships and Zero-Order and Partial Correlations Between 18 Independent Variables and Discontinuance

Ind	enendent Variables	Predicted Relationships	Zero-Order	Partial Corr.
<u></u>	ependent variables	Keracionships		coefficients
1.	Age of Respondent	+	+.007	+.018
2.	Years of Formal Education	-	190**	012
3.	Functional Literacy	-	010	069*
4.	Political Knowledge	-	313**	007
5.	Economic Knowledge	-	230**	023
6.	Availability of Mass Media	-	401**	021
7.	Electronic Mass Media Expo	sure -	399*	201**
8.	Total Number of Communicat Sources Used	ion -	415**	084**
9.	Membership in a Cooperativ	e*** -	355**	148**
10.	Change Agent Contact	-	193**	076**
11.	Trust***	-	+.090**	005
12.	Cosmopoliteness	-	155**	+.004
13.	Empathy	-	234**	058*
14.	Satisfaction***	+	078*	058*
15.	Patriarchalism	+	+.068*	+.015
16.	Achievement Motivation	-	141**	+.002
17.	Innovativeness	-	418**	215**
18.	Opinion Leadership	-	010	+.041

\*Statistically significant at the .05 level of probability.

\*\*Statistically significant at the .01 level of probability.

\*\*\*Membership in a Cooperative, satisfaction, and trust are dichotomized variables, constructed on single questions in the interview schedule. The author apologizes to the reader. predictions, trust has a positive relationship, and satisfaction, a negative relationship, both at the .05 level of probability.

Careson II

The partial correlations showed eight independent variables to have significant relationships with discontinuance at the .05 level of probability. Negatively related with discontinuance are functional literacy, electronic mass media exposure, total number of communication sources used, membership in a cooperative, change agent contact, empathy, satisfaction, and innovativeness. Satisfaction's negative relationship with discontinuance is contrary to the predicted relationship.

Satisfaction was predicted to have a positive relationship with discontinuance. Satisfaction apparently indicates satisfaction with the innovations already incorporated into the farm operation. Satisfaction probably indicates a mental disposition that is relaxed and capable of assimilating innovations.

The 10 independent variables, age, years of formal education, political and economic knowledge, availability of mass media, trust, cosmopoliteness, patriarchalism achievement motivation, and opinion leadership were shown to explain only .0025 of the variance in the dependent variable, discontinuance. As a result, they were deleted.

Eight independent variables, functional literacy, electronic mass media exposure, total number of communication sources used, membership in a cooperative, change agent contact, empathy, satisfaction, and innovativeness explain .332 of the variance of discontinuance, as determined by multiple correlations.

#### Conclusions

## The Objectives of the Present Study

There were three objectives cited for the present study.

1. To determine the personal and psychological characteristics of the discontinuer.

The discontinuer's ability to empathize is low. He finds it difficult to project himself into the role of others. He is not complacent but rather unhappy about the circumstances of his life. The strongest characteristic of the discontinuer is his uninnovative orientation. He does not like to innovate. Thus, he probably feels dissonance when he does innovate, which causes him to discontinue use of the innovation in order to resolve the dissonance.

The discontinuer does not tend to belong to a cooperative, a group that has innovative norms. He is also less literate than other members of his social system limiting his access to information which can increase his political and economic knowledge. It probably also indicates little formal education.

2. To determine the communication behavior of the discontinuer.

The discontinuer does not tend to expose himself to the mass media, radio, television, or cinema. He probably does not receive a newspaper in his home. The discontinuer does not tend to interact with change agents or other sources of technical information. Thus, he tends to receive his information second hand, from a friend, a neighbor, or a relative, which probably indicates some distortion

in the information that he receives about innovations. The innovator tends to be localite in his communication patterns.

3. To determine the degree of opinion leadership of the discontinuer.

The discontinuer exercises little opinion leadership. But the opinion leadership that he does exercise, because he does not tend to use technical information sources/channels, mass media and interpersonal, is inclined to maintain the norms and traditions of the social system to which he belongs. In other words, his opinion leadership, although it is small, encourages the discontinuance of innovations.

The discontinuer shares those characteristics which are commonly ascribed to the laggard. The discontinuer is the "mirror image" of the innovator.

9

### Implications for Change Agent Activity

Since the discontinuer tends to be a late adopter, a laggard, and does not use technical information sources/channels for first information about an innovation, he does not thoroughly integrate the innovation into his farm operation. Thus, the innovation appears to be inappropriate to his farm operation, causing dissonance that must be resolved. Because he is not inclined toward technical information sources, he resolves the dissonance for himself by discontinuing use of the innovation. The change agent must maintain more contact with later adopters so that they can better integrate innovations into their farm operations. The change agent should be aware, that by the time information reaches the laggards, it is somewhat distorted. One means of avoiding distortion of the information is personal contact with later adopters.

The discontinuer relates to a social system that is traditional in its orientation. The change agent must do more group work with the traditional people of the social system in order to encourage more innovative norms. This work is tedious and slow in rendering results, but necessary, if continued use of innovations is to be realized.

### Future Research

1. Considerable research must be done on discontinuers as a distinct social system. To whom do they communicate within their own social system, that is, the social system of discontinuers. A content analysis study should be performed on messages that discontinuers receive about innovations and then they should be compared with the original communications about innovations. By a study of the chain of communication from the laggard to the original information source/channel, it could be determined after how many levels of communication the message becomes distorted.

2. Most of the variables in the present study give indications, and not well defined characteristics of the discontinuer and his system. All of the variables in the present study need

considerable research. The variables in this study were dictated by their relationships with innovativeness, which is a negative orientation toward discontinuers. Positive constructs must be created that tell more about what the characteristics of the discontinuer are, rather than what they are not. For example, the discontinuer is not innovative. He does not tend toward technical information sources/channels. What characteristics are proper to discontinuers?

3. Why does the discontinuer cease use of the innovation? Did the person from whom he heard about the innovation also discontinue use of the innovation? Did he adopt because of social pressure or because of the perceived advantages of the innovation?

4. Is the discontinuer a victim of economic circumstances? Does he have the financial resources that support the risk that innovating demands? If the discontinuer is low on satisfaction, why does he not do something to change his situation? Does he have low tolerance for ambiguity?

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