OBJECTIVES, MOTIVES, BUSINESS STYLE, AND PERSONAL HISTORY — HOW THEY RELATE TO MANAGERIAL SUCCESS*

Robert L. Oehrtman

INTRODUCTION

Management of agricultural business firms, such as grain and supply cooperatives, is becoming increasingly complex. Such complexity is a result of growth in size and intricacy of cooperatives over the last decade or more, and of processes of expansion of traditional functions and adoption of new ones. Currently, there is little research information available about the management function, and even less which is specific to agricultural business firms. Several studies have shown that the most important reason a cooperative fails is probably management. Yet, there is seldom any testing of senior management performance [2, pp. 26-34, 3, 6].

This study is concerned with the problem of management in grain and supply cooperatives in Oklahoma [1]. Its objectives are to: (1) determine the underlying factor structure of economic, sociological and psychological variables believed by cooperatives' managers to be relevant to decision-making; (2) determine managerial efficiency and success; and (3) determine the extent of observed variance accounted for by those factors.

ANALYTICAL PROCEDURE

The Sample and Questionnaire

The population consisted of principal managers of 102 cooperatives, 1970 members of the Farmer's Cooperative Grain Dealers Association of Oklahoma. Forty-eight of the returned mail survey questionnaires were used in the study's final analysis. These 48 responses were not classified into groups, although it was recognized that cooperatives varied in size, location and type of business conducted.

An exploratory empirical analysis was conducted through the principal factor method of factor analysis. This method, and the limited number of observations relative to number of variables under study, precluded making statistical tests, but it was not the purpose of this study to test hypotheses. However, a primary objective was to identify some elements controlling managerial success. Results are presented below as hypotheses which will require testing in later studies.

The mail survey questionnaire consisted of three parts. The first contained 80 questions asking managers for opinions on various topics. (These topics have been demonstrated by previous researchers to be relevant to decision-making by managers). The study, exploratory in nature, required that many areas of concern be investigated to provide a broad perspective of the general problem. This necessitated the use of many questions, each of which could be answered quickly and easily. It was therefore decided to present managers with statements about these areas of concern. Managers were asked to score each statement in terms of agreement, using a scale from 1-99, where a 1 would indicate complete disagreement, a 50 no opinion, and 99 complete agreement.[1]

Robert L. Oehrtman is assistant professor of agricultural economics at Oklahoma State University.

*Oklahoma State University Agricultural Experiment Station Journal Article No. 3004. This publication is based on a contributed paper presented at the American Agricultural Economics Association Meetings, Gainesville, Florida. Research reported herein was completed as a contribution to Hatch Project 1254.

[1]Psychologists report that individuals using the psychological response scale of 1-99, under-react to their responses at the extreme end of the response scale, but over-react in their responses elsewhere on the scale. To overcome this possible objection to the responses from the psychological response scale psychologists recommended that all responses be transformed to standard normal deviates as was done in this study.

The second part consisted of 21 personal history questions, seeking information on such subjects as manager age, pay, armed services record and cooperative size.[2] The third part was a request for financial information about the cooperative for the years 1966-1970, from which eleven financial ratios were computed.

Data Analysis

Correlations were computed for each of the 116 variables. Prior to factorization of this correlation matrix, estimating the sufficient number of factors was necessary, to explain a chosen amount of variation in the data. Still, having too many factors would result in reduction of data, and having too few factors might result in some important relationships being missed. To determine the number of factors to extract, a cluster analysis of the correlation matrix was made by computing an Index of Internal Consistency [7, p. 28]. Next, the principal factor method of factor analysis was used and 12 first-order factors were extracted; one being extracted from each cluster of variables.

A principal factor model may be used to describe a variable in terms of a linear combination of hypothetical constructs, or factors, by the equation:

$$(1)\quad Z_j = a_{j1}F_1 + a_{j2}F_2 + \ldots\ldots + a_{jm}F_m + d_jU_{ji}$$

$$(j = 1,2, \ldots\ldots, n)$$

$$(i = 1,2, \ldots\ldots, N)$$

$$(p = 1,2, \ldots\ldots, m)$$

where Z_j is the j-th standarized variable, a_{jp} is the factor loading on the j-th variable on the p-th factor F_p, and d_j is the coefficient of the unique variance U_{ji} for all observations on the j-th variable [4, 5, 7].

The computer program FACTO was used from the Scientific Subroutine Package. Each consecutive entity in a principal factor solution makes a maximum contribution to the explained total variance of n variables. In a principal factor solution, all factors are required to reproduce the matrix of correlations among variables. For explanatory purposes, through, only those factors are retained which account for a large percentage of total variance.

Factor loadings are interpreted in three ways [8, p. 9]. First, they represent the relative importance of each factor in influencing each observed variable. Second, factor loadings represent the net correlation coefficient between each factor and each observed variable. For example, if the first variable has a factor loading of -.54 on Factor 1, this indicates that Factor 1 explains $(-.54)^2$, or 29 percent, of the variance in variable 1, after allowing for the other m-1 factors. The cumulative sum of squared factor loadings for each variable is known as a communality, or that amount of variance explained by all m factors. Third, and in some ways most important, factor loadings serve as a basis for combining variables into common groups. This is done on the basis of each factor which has the highest loading with each particular variable [8, pp. 9-10]. Once all variables are relegated to their respective factors, these can be identified by meaningful interpretation of variables in each factor; this is done by attempting to find a common bond between them.

SECOND-ORDER FACTOR RESULTS, AND AN INTERPRETATION OF THESE FACTORS

A second correlation matrix was computed, using as data factor loadings from the rotated first-order factor matrix containing 12 factors. The resulting 12 × 12 correlation matrix was input to FACTO. Three rotated second-order factors were computed to determine the relationship between first-order factors. The topic of this paper is the resulting second-order factor structure[3] shown in Table 1.

---

[2]Personal history questions were coded by removing the zeros from numbers in the hundreds, thousands and millions to save space.

[3]Factor analysis yields correlations between the variables and the factors. A table or matrix of such correlations is called a factor structure.

Table 1. ROTATED SECOND-ORDER FACTORS A, B, AND C, WITH THEIR FACTOR LOADINGS AND COMMUNALITIES ON EACH OF THE TWELVE FIRST-ORDER FACTORS

First-Order Factor	Second-Order Factor A	B	C	Communalities
1	-.20	-.55	.05	.345
2	-.62	.11	.21	.444
3	-.09	.76	-.20	.625
4	.67	.10	.17	.489
5	.49	.14	.12	.276
6	.15	.08	.64	.443
7	.36	.13	.33	.257
8	.02	.14	.39	.176
9	.14	-.48	-.29	.336
10	-.54	-.11	.58	.646
11	-.12	-.27	-.04	.089
12	-.04	.43	.03	.191
Variance Explained by Each Second-Order Factor	13.8%	12.1%	10.1%	

Table 2. FIRST-ORDER FACTORS AND THEIR LOADINGS IN SECOND-ORDER FACTOR A — PAY AND THE THEORETICALLY GOOD MANAGER

First-Order Factor Number	First-Order Factor Title and Variables Which Compose the First-Order Factors[a]	Factor Loading
4	Fringe Benefits, Pay, Education, and Experience	.67
	Of your 1970 wages, what percent was in the form of fringe benefits? (.78)	
	Of your 1970 wages, what percent was in the form of base pay? (-.72)	
	Hospitalization and Life Insurance? (Zero-one variables.) (.58)	
	How many years were you a foreman and/or assistant manager before becoming a manager? (-.47)	
	What was your formal education? (.44)	
2	Egotistical Autocrat	-.62
	I firmly believe that I should be the only one that formulates the company plans. (.73)	
	I feel extremely uneasy when discussing company business matters with people other than family members and close friends. (.71)	
	In order to be efficient at my job it is necessary that I follow a strict daily schedule. (.70)	
5	Self-Esteem and Confidence	.49
	I appreciate having others look to me as their leader. (.76)	
	I derive great satisfaction from the status I hold in the community as a manager of a grain and feed firm. (.63)	
	The wage I receive from managing my firm gives me a high degree of personal fulfillment. (.63)	
	I encourage suggestions from my employees. (.58)	
7	Management Incentives	.36
	Overhead to gross income. (.86)	
	Of your 1970 wages, what percent was in the form of a management incentive (profit share, etc.)? (.83)	
10[b]	Projection Due to Feelings of Failure	-.54

[a]Factor loadings between variables and first-order factors are given in the parenthesis following each variable.

[b]Factor 10 is included here as it is highly correlated with this second-order factor, and contributes to its interpretation.

Second-Order Factor A — Pay and the Theoretically Good Manager

Those first-order factors that load higher on Second-Order Factor A than on any other are shown in Table 2. First-order factors are organized according to the absolute magnitude of their loadings, except for First-Order Factor 10, included here because it adds to the interpretation of this second-order factor. Principally, though, it belongs in Second-Order Factor C. First-Order Factor 4 (Fringe Benefits, Pay, Education, and Experience) and First-Order Factor 2 (Egotistical Autocrat) have loadings of .67 and -.62, respectively. That is, Second-Order Factor A accounts for 45 and 38 percent of the common variance in First-Order Factors 4 and 2. Of those five first-order factors in Table 2, three are correlated positively with Second Order Factor A and three have loadings which are greater than .50 in absolute magnitude. Those first-order factors that load high on Second-Order Factor A are concerned with pay and with those variables that could be interpreted as indicative of a theoretically good manager. Thus, *Pay and the Theoretically Good Manager* is used as a suggested name for this second-order factor.

An interpretation of Second-Order Factor A would allow one to hypothesize that pay increases with those theoretically determined characteristics of a good manager. This hypothesis is based upon the following interpretation of the following first-order factors: (i) From within Factor 4, as pay increases so do fringe benefits and education, but experience prior to becoming a manager decreases; (ii) Factor 2, negatively correlated with this second-order factor, possibly shows that the theoretically good manager is neither egotistical nor autocratic; he apparently has no dissatisfaction with his Board of Directors and will share company business matters with others; (iii) Factor 5 could indicate that the manager has high self-esteem and is confident of his abilities; that he enjoys his job, is unafraid of asking for advice, and is socially active; (iv) Factor 7 may be inter-

preted as implying that he is likely to receive a management incentive, and that he has a higher than average overhead to gross income ratio. Maybe this is because there are a large number of departments within the cooperative — this ratio could be an indication of size [9, p. 8]. The high factor loading for Factor 10, actually located in Second-Order Factor C, corroborates Factor 2 if Factor 10 is interpreted as indicating that the manager has a low need for power and has no dissatisfaction with his Board of Directors. Thus, it could be hypothesized that the highly-paid manager possesses some characteristics required of a good manager and has a high need for achievement.

Second-Order Factor B — Older Experienced Managers

Table 3 shows Second-Order Factor B with those first-order factors which load higher on it than on any other second-order factor, ordered according to the absolute magnitude of their loadings. Three of the five are correlated positively with this second-order factor and two first-order factors have loadings greater than .50 in the absolute magnitude. First-Order Factor 3, Age and Tenure, has a loading of .76. That is, Second-Order Factor B accounts for 58 percent of the common variance in First-Order Factor 3. Those first-order factors which load high on Second-Order Factor B are concerned with variables which could describe an *Older Experienced Manager,* a suggested name for this factor.

Table 3. FIRST-ORDER FACTORS AND THEIR FACTOR LOADINGS IN SECOND-ORDER FACTOR B — OLDER EXPERIENCED MANAGER

First-Order Factor Number	First-Order Factor Title and Variables Which Compose the First-Order Factors[a]	Factor Loading
3	Age and Tenure	.76
	What was your annual base pay when you began this job? (-.78)	
	In what year did you begin your present job? (-.74)	
	What is your age? (.74)	
	How many years have you been a manager? (.70)	
1	Veridical Perception	-.55
	Discussion of business practices and techniques with other managers is helpful. (.77)	
	I consider it important to participate in trade organizations. (.77)	
	I always consider the effect on the entire firm operation when deciding on new production methods for an enterprise. (.76)	
	I am responsible for searching out and evaluating new ways to operate. (.72)	
	I encourage criticism and suggestions from my customers. (.70)	
9	Responsibility Avoidance	-.48
	I leave many jobs to my employees because they are able to do them as well or better than I can. (.71)	
	In the past, have you set all company objectives? (Zero-one variable.) (-.65)	
	What is the radius, in miles, of your trade area? (-.49)	
12	Operating Profit	.43
	Salaries to gross income. (-.66)	
	Depreciation to gross income. (-.52)	
	Operating profit to gross income. (.48)	
11	Working capital and Profitability	-.27
	Gross income over net working capital. (.81)	
	Inventory to net working capital. (.80)	

[a]Factor loadings between variables and first-order factors are given in the parenthesis following each variable.

It may be hypothesized that experience and profit increase with age, but age is negatively related to some theoretically good characteristics of a manager. This hypothesis is based upon the following interpretation of those first-order factors contained in Second-Order Factor B: (i) Factor 3 may be interpreted as indicating that as age increases so does tenure with the same job, years as a manager, importance of seniority in promotion, and the dislike for risks — possibly indicating rigidity; (ii) Factor 1,, negatively related, may indicate that the older manager is not outgoing, neither investigating new ideas nor using regular accounting methods as aids in decision making. He may therefore have poor veridical perception. In addition, factor 1 may show that the older manager has low self-esteem and is dissatisfied, yet he operates a large grain cooperative; (iii) Factor 9 may indicate that an older manager does not avoid responsibility and has a large trade area; (iv) From variables in Factors 11 and 12, it may be hypothesized that older, more experienced managers have higher profits and more working capital and are less observant of their cooperatives. Further, these incresed profits may be an outcome of having managed the same cooperative for a long period of time, as indicated in Factor 3, and having become familiar with the problems that exist within one particular cooperative.

Second-Order Factor C — Liquidity

There are three first-order factors that load higher on Second-Order Factor C than on any other second-order factor. These are listed in Table 4 according to the magnitude of their loadings. All are positively correlated with Second-Order Factor C and two have a loading of .50 or greater in magnitude. First-Order

Factor 6, Liquidity, has a loading of .65. That is, Second-Order Factor C accounts for 41 percent of the common variance in First-Order Factor 6. The first-order factor that loads high on Second-Order Factor C is concerned with *Liquidity*, a suggested name for this second-order factor.

Table 4. FIRST-ORDER FACTORS AND THEIR FACTOR LOADINGS IN SECOND-ORDER FACTOR C — LIQUIDITY

First-Order Factor Number	First-Order Factor Title and Variables Which Compose the First-Order Factors[a]	Factor Loading
6	Liquidity	.64
	Liquid Ratio. (.89)	
	Current Ratio. (.85)	
10	Projection Due to Feelings of Failure	.58
	One aspect of management which I detest is the heavy competition. (.77)	
	The company's ultimate objectives are highly detailed. (-.64)	
	My Board of Directors is my greatest limiting management factor. (.61)	
	I am the lowest paid manager of any business in the community. (.58)	
	National and world news are important to my business operation. (-.58)	
8	Armed Services Record	.39
	Number of years served in the armed services. (.77)	
	Rank acquired. (.67)	
	My serving in the armed forces gave me experience in the leadership of men which has been beneficial to my business. (If you did not serve, put 50). (.52)	
	When on vacation, I prefer to travel outside the state. (-.48)	

[a]Factor loadings between variables and first-order factors are given in the parenthesis following each variable.

An interpretation of liquidity would allow one to hypothesize that an overly liquid financial position may possibly indicate poor management. This hypothesis is based upon the following interpretations of those variables in First-Order Factors 8 and 10: (i) An interpretation of Factor 10 may indicate a poor manager by his apparent failing to plan ahead, allowing an employee to be irreplaceable in the cooperative, not considering world and national news important, enjoying power but possibly showing a low achievement motivation, and apparently blaming his Board of Directors for his feeling of failure and what he considers low pay; (ii) Liquidity may not be and indicator of profitability, but rather an indicator of safety. This is in keeping with the need for safety as indicated in Factor 8 by dislike for travel outside the state.

SUMMARY

The objectives of this study were to determine the underlying factor structure of some economic, sociological, and psychological variables managers believe are relevant to managerial success; and to determine the extent of observed variance accounted for by the factors. Data were obtained from Oklahoma grain and supply cooperatives. The questionnaire contained opinions regarding management and business practices, personal history and finanacial matters. These data were factor analyzed by the principal factor method; the resulting first-order factors were factor analyzed, producing second-order factors. These second-order factors were interpreted and hypotheses derived as conclusions from the analysis.

Hypotheses from Second-Order Factor A: Pay and the Theoretically Good Manager

1. More educated and higher paid managers are less autocratic and egotistical than less educated and lower paid managers.
2. More educated and higher paid managers have higher self-esteem and confidence than their less educated and lower paid counterparts.
3. More educated and higher paid managers are more likely to receive a management incentive, but have higher overhead costs than less educated and lower paid managers.
4. More educated and higher paid managers have higher achievement motivation, lower power motivation, and are more satisfied at their jobs than the less educated and lower paid.

Hypotheses from Second-Order Factor B: Older Experienced Managers

5. Profitability and experience increase with age of manager.
6. Older managers are more rigid, disliking change or risk.
7. Age is negatively related to veridical perception.
8. Older managers do not avoid responsibility.
9. Older managers control larger cooperatives.

HYPOTHESES FROM SECOND-ORDER FACTOR C: LIQUIDITY

10. An overly liquid financial position is a safety margin used by poor managers.
11. Low achievement motivation, poor business practices, and dissatisfaction with the Board of Directors are positively related to financial liquidity.

REFERENCES

[1] Benitz, Pedro. "Oklahoma Cooperative Managers: Their Managerial Problems and Objectives for Success," Unpublished M.S. Thesis, Oklahoma State University, May 1972.

[2] Cochrane, W.W. and R.H. Elsworth. *Farmer's Cooperative Disturbances 1875-1939,* U.S. Department of Agriculture, Farm Credit Administration Miscellaneous Report No. 65 (1943), Cited by Allen J. Baker, "Management Process in Cooperative Grain Marketing Firms," Unpublished Ph.D. Thesis, Oklahoma State University, 1970, pp. 10-12.

[3] Fox, R.L. "Farm Meat Packaging Enterprises in the U.S.," U.S. Department of Agriculture, Farmers Cooperative Service, General Report 29 (1957), Cited by R.L. Kohls, *Marketing of Agricultural Products,* 3rd. ed. New York: The MacMillan Company, 1967, p. 234.

[4] Harman, Harry H. *Modern Factor Analysis,* Chicago: University of Chicago Press, 1967.

[5] Horst, Paul. *Factor Analysis of Data Matrices,* New York:Holt, Rinehart and Winstron, Inc., 1965.

[6] Miller, R.W. and A.L. Jensen. "Failures of Farmers' Cooperatives," Harvard Business Review, XXV (March-April, 1947), p. 213, Cited by R.L. Kohls, *Marketing of Agricultural Products,* 3rd. ed. New York: The MacMillan Company, 1967, p. 234.

[7] Oehrtman, Robert L. "A Hierarchial Factor Analysis of the Adjustment Problems Facing Bottling Firms," Unpublished Ph.D. Thesis, Iowa State University, 1970.

[8] Oehrtman, Robert L. "Factor Analysis — Some Fundamental Concepts and Examples," Mimeographed material, Department of Agricultural Economics, Iowa State University, Ames, Iowa, November 1967.

[9] Page, R.E., R.W. Schermerhorn, and B.D. Romine. *Financial Analysis of Grain and Supply Cooperatives,* Oklahoma State University Extension Circular E-813, Stillwater, Oklahoma.