ABSTRACT

MBO AS A BEHAVIORAL SYSTEM: A FOCUS ON CHANGE RELATIONSHIPS AND INFERENCES OF CAUSALITY

By

Rodney J. Chesser

Management by objectives (MBO) is a set of policies and procedures concerned with the specification of performance and personal goals, participation in the goal setting process, and the use of the goals as criteria for evaluation. As more organizations have established formal MBO programs, there has been a corresponding increase in the literature on the subject. Much of this literature is descriptive or prescriptive, based on personal experiences and conjecture. One must look for relevant empirical research and theory under such topics as goal setting, motivation, participation, communications, and leadership to gain an understanding of the variables related to MBO. While the research reported under these individual topics is important, it suffers from the weakness that the variables are not integrated. Often the research is only concerned with the relationship between a pair of variables without considering how they relate to a larger set of variables.

The research reported here attempts to integrate a wide range of variables that have been studied independently elsewhere. MBO is viewed as a behavioral system which facilitates a search for interactions between variables and emphasizes model building as a useful research tool.

The research design is differentiated from the mainstream of field research by focusing directly on dynamic relationships and inferences of causality. The usual procedure in field research is to draw associative and causal inferences from an analysis of data collected at a single point in time. Inferences concerning the behavior of the variables over time are often explicitly stated or implied from this type of static analysis. The direct investigation of change relationships and causality was made possible by the availability of longitudinal data. The data were obtained from a questionnaire administered to 73 managers, who were actively involved in an on-going MBO program, at two points in time, eighteen months apart.

A form of multiple-group cluster analysis is used to develop seven scales from the items of the questionnaire. These scales include:

1. Superior-subordinate relationship
2. Goal clarity
3. Orientation toward MBO
4. Association between performance and reward
5. Influence over goals
6. Job satisfaction
7. Perceived success

This research is concerned with the behavior over time of the variables represented by the scales and whether or not the behavior will be different given that the managers differ in certain personality dimensions. Two associative measures of change are obtained. One is a product-moment correlation coefficient between change scores. A second measure is obtained by correlating the scores from the second administration of the questionnaire while holding the scores on the first administration constant. These second order partial correlation coefficients have the effect of eliminating the variance due to different initial scores. Inferences of causality are made by using the cross-lagged panel correlation method.

The seven variables are used to formulate two empirically based models of the change relationships in MBO. Two models are required because it was found that participants who differed on certain personality dimensions responded differently. For "low cool" managers, or managers who rate themselves low on such dimensions as self-assurance, initiative, and perceived occupational level, all the relationships between the variables are positive. For the "high cool" managers, certain of the relationships were found to be negative. This is true of the relationships between changes in perceived success and changes in two variables, job satisfaction and the superior-subordinate relationship.

A five variable change model of the superior-subordinate relationship is also developed. The variables include changes in the superior's supportiveness, superior's concern with failure, subordinate's influence over means, use of goal oriented methods, and satisfaction with superior. One thing the model shows is that increases in the subordinate's affective orientation toward his superior result from increases in the superior's supportiveness, use of goal oriented methods, and the subordinate's influence over means.

One of the most important implications of this research and the resultant models is the complexity of the relationships involved. It is clear that unless MBO is viewed as a system of highly interactive components it cannot be fully understood or most advantageously applied. The interactive nature of the variables and reinforcing causal relationships could produce detrimental consequences if a variable is treated in isolation. When the interactions are not taken into account, the entire system may be adversely affected by a change in a single variable.

The observation of moderating effects infers that a universal response to MBO cannot be expected. While MBO may be effective for some members of an organization it may, in fact, be counter productive for other members.

MBO AS A BEHAVIORAL SYSTEM: A FOCUS ON CHANGE RELATIONSHIPS AND INFERENCES OF CAUSALITY

By

Rodney J. Chesser

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Management

1971

ACKNOWLEDGEMENTS

Many people have contributed to this thesis and I would like to extend my sincere appreciation to each of them.

Dr. Henry Tosi, committee chairman, who in addition to making this study possible, was the guiding force throughout the preparation of this thesis. To Dr. Tosi, I would like to extend a special thank you for your supervision and direction.

Dr. John Hunter, committee member, unselfishly contributed many hours of his time. His knowledge of methodology was an invaluable input into this thesis.

Dr. Frederic Wickert, committee member, made a significant contribution with his constructive comments concerning content and presentation.

Dr. Stephen Carroll, University of Maryland, played an important role. His joint research with Dr. Tosi made this study possible.

I would also like to thank Miss Janice Fuller who, in addition to typing the thesis, was most helpful in matters concerning format.

Above all, a special thank you goes to my wife, Vel. She typed, edited and retyped numerous drafts. But more importantly, I would like to express my sincere gratitude for the many sacrifices to fulfull this personal objective. This thesis is dedicated to her and our new daughter, Nicole, who made this an even more rewarding year.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION, RESEARCH MODEL DEVELOPMENT AND HYPOTHESES

Introduction

Many managerial approaches have been recommended in the past. These include management by exception, management by motivation, management by communications, management by systems, management by results and management by objectives (MBO). While these approaches are not mutually exclusive, MBO has been the most popular, based largely on the early works of Drucker[1] and McGregor.[2] Yet MBO does not represent a well defined process. There are many variations in the application of MBO; however, typical elements in a program would include the following:

1. Establishing and communicating organizational goals.
2. Establishing goals for the members of the organization which are consistent with overall organizational goals.
3. Periodic review of the goals and an interim assessment of goal attainment.
4. Final review (usually annually or biannually) of performance using the established goals as a criterion for evaluation.
5. A procedure for facilitating interaction between superiors and their subordinates in the goal setting and review process.

As more organizations have established formal MBO programs, there has been a corresponding increase in the literature on the subject.

---

[1]Peter F. Drucker, *The Practice of Management* (New York: Harper and Brothers Publishers, 1954).

[2]Douglas McGregor, "An Uneasy Look at Performance Appraisal," *Harvard Business Review*, Vol. 35 (May-June, 1957) pp. 89-94.

Much of this literature is descriptive or prescriptive, based on personal experience and conjecture. One must look for relevant empirical research and theory under such topics as goal setting, motivation, participation, communications, and leadership to gain an understanding of the subject. While the research reported under these individual topics is important, it suffers from the weakness that variables relevant to MBO are not integrated. Often the research is only concerned with the relationship between a pair of variables without considering how they relate to a larger set of variables. Fortunately, there are exceptions. By investigating on-going MBO programs, Raia;[3,4] Meyer, Kay and French;[5] Tosi and Carroll;[6,7,8] and Ivancevich, Donnelly and Lyon[9] have made a considerable contribution to furthering the understanding of MBO.

The research reported here attempts to integrate a wide range of variables that have been studied independently elsewhere. A useful framework for conceptualizing the interrelationships is to view MBO as

---

[3]Anthony Raia, "Goal Setting and Self Control," *Journal of Management Studies*, II-I (February, 1965) pp. 34-53.

[4]Anthony Raia, "A Second Look at Goals and Controls," *California Management Review* (Summer, 1966) pp. 49-58.

[5]Herbert Meyer, Emanuel Kay and John R. French, "Split Roles in Performance Appraisal," *Harvard Business Review*, Vol. 43, No. 1 (January-February, 1965) pp. 123-129.

[6]Henry Tosi and Stephen Carroll, "Managerial Reaction to Management by Objectives," *Academy of Management Journal*, Vol. II (December, 1968) pp. 415-426.

[7]Henry Tosi and Stephen Carroll, "Some Factors Affecting the Success of 'Management by Objectives'," *Journal of Management Studies*, Vol. 7, No. 2 (May, 1970) pp. 209-222.

[8]Stephen Carroll and Henry Tosi, "Goal Characteristics and Personality Factors in a Management-by-Objectives Program," *Administration Science Quarterly*, Vol. 15, No. 3 (September, 1970) pp. 295-305.

[9]John Ivancevich, James H. Donnelly, Jr., and Herbert L. Lyons, "A Study of the Impact of Management by Objectives on Perceived Need Satisfaction," *Personnel Psychology*, Vol. 23 (Summer, 1970) pp. 139-151.

a behavioral process. This encourages the researcher to search for systematic interactions between variables as well as to emphasize model building as a useful research tool.

The research design is differentiated from the mainstream of field research by focusing on the dynamics of the relationships and inferences of causality. The usual procedure in field research is to draw associative and causal inferences from an analysis of data obtained at a single point in time. Inferences concerning the behavior of variables over time are often explicitly stated or implied from this type of static analysis. This research addresses itself to questions of change in a more direct way. Because of the availability of longitudinal data, the relationships between changes in variables over time are analyzed. Vroom calls the technique of establishing the statistical association between the amounts and directions of changes on pairs of variables over time the dynamic correlational method.[10] This is contrasted with the static correlational method where simultaneous measures are taken.

The availability of longitudinal data also facilitates an assessment of cause and effect relationships by permitting the use of the cross-lagged panel correlation method. This approach, earlier discussed by Simon,[11] has been applied by Lawler[12] to infer causality in the

---

[10]Victor H. Vroom, "A Comparison of Static and Dynamic Correlation Methods in the Study of Organizations," *Organizational Behavior and Human Performance*, 1 (1966) pp. 55-70.

[11]Herbert A. Simon, "Spurious Correlations: A Causal Interpretation," *Journal of the American Statistical Association*, 49 (1954) pp. 467-479.

[12]Edward E. Lawler, "A Correlational-Causal Analysis of the Relationship Between Expectancy Attitudes and Job Performance," *Journal of Applied Psychology*, Vol. 52, No. 6 (1968) pp. 462-468.

relationship between attitudes and job performance. Lawler recommends that both the cross-lagged panel and dynamic correlational methods be used to assess causality where the experimenter cannot manipulate variables, which is most often the case in field research.

This study is an outgrowth of the research on MBO being conducted by Tosi and Carroll.[13] Their studies examine relationships between what they define as process variables and end-result variables. Process variables are considered fundamental to MBO and include characteristics of goals, feedback characteristics, and the nature of the superior-subordinate relationship. The end-result variables are viewed as the outcome of MBO and include level of goal achievement, effort expended, level of the goals set, and satisfaction with the MBO program. The effects of personality characteristics of the participants and situational variables on the relationships between process variables and end-result variables were also investigated.

The research reported here utilizes data that were obtained from a questionnaire administered to 73 managers at two points in time, 18 months apart. This made it possible to analyze how changes in variables are related as well as to make an assessment of causality. This study is also concerned with the effects of personality characteristics on the change relationships. Of interest is whether or not participants react differently to MBO, given that they differ on a particular personality dimension. An assessment of personality characteristics was obtained from a forced-choice self-inventory developed by Ghiselli.[14] A more

---

[13]Tosi and Carroll, "Some Factors Affecting the Success of 'Management by Objectives.'"

[14]Edwin E. Ghiselli, "Self-Description Inventory," (Berkeley, Calif.: University of California).

detailed discussion of the instruments and the sample will be presented in Chapter 2.

Research Model Development

The purpose of this section is to present the research model and to briefly discuss how it was developed (a more detailed development is presented in Chapter 2). As part of the development, the item structure of the scales will be presented and the variables defined.

A Priori Model

A model developed by Tosi and Carroll was used as an *a priori* model for scale development (see Figure 1-1).[15] The strategy used by Tosi and Carroll was to formulate multiple item sub-scales to assess characteristics of process, end-result, and moderating variables. The variables and corresponding sub-scales are presented in Table 1-1. The items constituting the sub-scales are keyed to the sample questionnaire in Appendix A. Feedback characteristics, goal characteristics, and the superior-subordinate relationship are considered to be process variables in that they are fundamental elements of the hypothesized processes involved in the application of MBO. In this sense, the process variables are the independent variables. The end-result variables represent the expected outcome of the program and can be considered dependent variables.

An Intermediate Model

As part of the research methodology, the items of the questionnaire were analyzed and the *a priori* scales were modified (see Chapter 2). The first revision of the *a priori* scales resulted in the formation of fourteen multiple item scales and five single item scales. The item

---

[15] Tosi and Carroll, "Some Factors..."

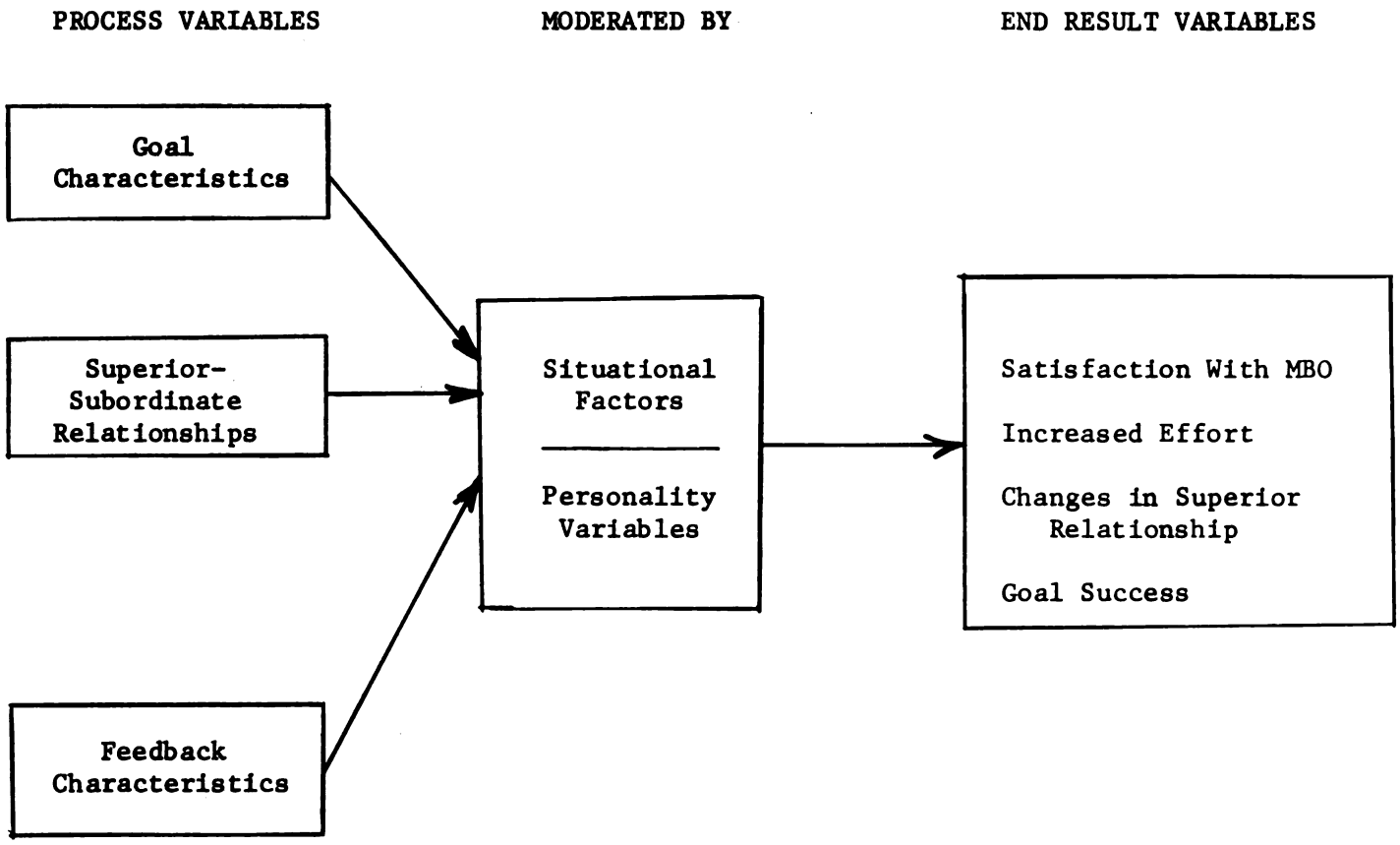


Figure 1-1. Tosi and Carroll's research model.

Table 1-1. *A priori* sub-scales

Sub-scales	Questionnaire Item Numbers
Goal Characteristics	
Goal characteristics	1,2
Goal clarity and relevance	3,4,6,7,11
Boss priority for self-improvement goals	38
Excessive number of performance goals	10
Influence over goals	18,37
Feedback Characteristics	
Feedback frequency	5,9
Amount of positive feedback	43
Boss concern with failure	44,45
Boss-Subordinate Relationship	
Boss involvement	23,24,25,26
Psychological participation[a]	27,28
Satisfaction with boss	29,30,31
Organizational support for WPR	21,22
Boss time on WPR	36
Situational Characteristics	
Satisfaction with job	32,33
Performance related to advancement	34,35
Interest in job	42
Control over means of goal achievement	8
Number of outside contacts	20
Amount of change in job	19

Table 1-1 (cont'd.)

Sub-scales	Questionnaire Item Numbers
End-Results	
Effort	12
Change in boss relations	13
Success in goal achievement	14,15
Change in goal levels	16
Satisfaction with program	39,40,41
Managerial Traits	
Ghiselli dimensions[b]	
Intelligence	
Supervisory ability	
Initiative	
Self-assurance	
Perceived occupational level	
Decision making approach	
Sociometric popularity	
Maturity	
Need for policy	46,47

[a]These are versions of subscales developed by Victor Vroom in *Some Personality Determinants of the Effects of Participation*, Englewood Cliffs, N.J.: Prentice-Hall, 1960.

[b]Measured by a self-inventory developed by Edwin Ghiselli.

structure of the scales is presented in Table 1-2. For reasons discussed in more detail in the next section, these were not the scales used to develop the research model; however, relationships derived by using these scales were particularly useful in developing a change model of the superior-subordinate relationship which is presented in Chapter 4.

Final Revision of Scales

Correlation coefficients were computed on change scores derived from the fourteen scales. From an analysis of the resultant correlational pattern and an assessment of the reliability of the change scores, it was concluded that further scale development was necessary to increase the internal reliability of the scales. Since internal reliability is a function of the number of items in a scale as well as the average inter-item correlation, sub-scales were combined to form more macro measures wherever it would be reasonable from both a correlational and a content standpoint. The fourteen multiple-item scales and five single items were collapsed into seven multiple-item scales. The scales and item structure are presented in Table 1-3, page 11. It should be noted that a price is paid for the increased internal reliability in that some degree of specificity is lost. For example, the final superior-subordinate relationship scale consists of six of the multiple-item scales and one of the single items.

Description of the Variables and Item Structure

It is a well established practice to attach labels to variables that are being assessed by multiple-item scales, if for no other reason than to facilitate reporting by providing a shorthand description. The reader is well advised to consider the item structure of the scale before accepting an experimenter's imposed label.

Table 1-2. Intermediate scale development

Scale	Questionnaire Item Numbers
1. Use of goal oriented methods	5,9,11,21,22,26
2. Satisfaction with boss	29,30,31
3. Self-improvement goal clarity	2,4,38
4. Performance goal clarity	3,6,7,24
5. Orientation toward MBO	39,40,41
6. Boss concern with failure	44,45
7. Boss supportiveness	23,25,26,43
8. Influence over boss	8,27,28
9. Need for policy	46,47
10. Association between performance and rewards	24,25
11. Influence over goals	37,18
12. Performance goal difficulty	1,10
13. Satisfaction with job	32,33
14. Success in attaining goals	14,15

Table 1-3. Final scales developed

Scales	Questionnaire Item Numbers
1. Superior-subordinate relationship	5,8,9,11,21,22, 23,25,26,27,28, 29,30,31,36,43, 44,45
2. Goal clarity and relevance	1,2,3,4,6,7,24, 38
3. Orientation toward MBO	39,40,41
4. Performance-reward association	24,25
5. Subordinate influence over goals	18,37
6. Satisfaction with job	32,33
7. Success in attaining goals	14,15

Superior-Subordinate Relationship. This variable represents a complex description of the overall relationship between the superior and the subordinate. It incorporates three aspects of the relationship: (1) the frequency of interaction in goal-directed activity; (2) the subordinate's perception of the usefulness of the interaction to job performance; and (3) the subordinate's evaluation of his superior as a supervisor. Admittedly, this is a complex variable; however, the item analysis gave sufficient justification to collapse the various sub-scales into one macro measure, properly reflecting the common element present in the items.

The scale is composed of the following items, keyed numerically to the sample questionnaire in Appendix A:

5. How often were you given feedback in your progress on your performance goals?

8. To what extent do you feel you control the means of reaching your performance goals?

9. How often were you given feedback on your progress on your self-improvement goals?

11. How much emphasis did your boss put on attaining your self-improvement goals?

21. How much of an interest do you think the company has in the OPA program?

22. How much of an interest do you think your boss has in the work planning and review program?

23. Which statement best describes the manner in which your boss helps you in performing your job?

25. Which statement best describes the concern of your boss for your career?

26. Which statement best describes the kind of feedback you generally get from your boss about your performance?

27. How often does your boss ask your opinion when a problem comes up that involves your work?

28. To what extent do you feel that you can influence the decisions of your boss regarding things about which you are concerned?

29. In your opinion, how capable a manager is your boss?

30. How good is your boss in dealing with people?

31. All in all, how satisfied are you with your boss?

36. In general, how much time did your boss devote to the OPA program?

43. Which of the statements best describes the amount of praise you received from your boss about your performance last year?

44. How concerned do you feel your boss would be if you failed to achieve the goals established for your job to a significant degree?

45. What kind of criticism would you receive from your boss if you failed to achieve the goals established for your job to a significant degree?

Goal Clarity and Relevance. This variable is a measure of the degree to which the goals set reflect organizational and personal needs. It also reflects whether or not the goals were clearly stated and priorities established. The scale is composed of the following eight items:

1. What, in your opinion, was the level of difficulty of the performance goals set for you?

2. What, in your opinion, was the level of difficulty of the self-improvement goals set for you?

3. To what extent did the performance goals set for you under the program reflect the most serious and pressing needs of your department and the company?

4. To what extent did the self-improvement goals set for you reflect your personal development needs?

6. To what extent were your performance goals clearly stated with respect to results expected?

7. To what extent was the relative importance of your various performance goals pointed out to you?

24. Which statement best describes the present difficulty your boss has in measuring your performance?

38. Did you boss indicate any priorities for your self-improvement goals?

Orientation Toward MBO. Orientation toward MBO is a measure of the perceived utility of the MBO program as experienced by the participants. It assesses the degree to which MBO is viewed as being helpful in meeting job requirements. It consists of the following three items:

39. How well do you like the OPA program?

40. In general, how applicable do you think the OPA program is to your job?

41. How helpful has the OPA program been to you in performing the duties of your job?

Performance-Reward Association. This variable assesses the degree to which rewards in the form of salary increases and promotion are viewed as being based on an evaluation of actual job performance. The four items in the scale are:

34. In your opinion, to what extent will your actual job performance affect your future salary increases?

35. In your opinion, to what extent will your actual job performance affect your future promotions?

Subordinate's Influence Over Goals. The subordinate's influence over goals attempts to measure the relative influence shared by the subordinate and his superior in the goal setting process. As the value of the variable increases, the subordinate's perceived relative influence increases. The scale is composed of two items:

18. Who had the most influence in setting the performance goals for you?

37. Who had the most influence in setting self-improvement goals for you?

Satisfaction With Job. This is a measure of the subordinate's satisfaction with the job situation. As the items show, satisfaction is measured by an assessment of the propensity to leave the organization.

32. Considering your skills and the effort you put into the job, how satisfied are you with your pay?

33. If you had a chance to get a much better paying job working for another company in this area, how would you feel about changing?

Perceived Success. This measure of success is concerned with the perceived relationship between performance and established goals. An increase in perceived success means the subordinate feels that his performance has increased relative to the requirements established by the goals.

14. How successful were you in attaining the performance goals set for you under the overall Performance Appraisal Program?

15. How successful were you in attaining the self-improvement goals set for you last year?

Managerial Traits

In addition to the variables discussed above, another set of variables was obtained by administering a self-description inventory developed by Ghiselli. This instrument is used to assess eight personality dimensions. The dimensions, as defined by Ghiselli, are presented below.

> "Intelligence. This refers to a rather broad domain of cognitive abilities. It is considered to involve such abilities as judgment and reasoning, and to reflect the capacity to deal with abstract ideas and concepts.
>
> "Supervisory Ability. This refers to the capacity to direct others, to integrate their activities, and to organize the operations of subordinates toward the group goal.

"Initiative. This has two aspects. One is motivational and involves the beginning of actions, and the other is cognitive and involves the capacity to note and discover new means of goal achievement. The first aspect involves the ability to act independently and to initiate actions without stimulation and support from others. The second aspect involves the capacity to see courses of action and implementations that are not readily apparent to others. Both aspects have the property of being self-generative. Initiative does not imply the capacity to maintain motivation or to sustain goal-oriented activity in the face of frustration. Rather a person who possesses initiative is an inaugurator or originator who opens new fields and conceives of novel ways of doing things.

"Self-Assurance. This refers to the extent to which the individual perceives himself to be effective in dealing with the problems that confront him. There are those persons who see themselves being sound in judgment and able to cope with almost any situation, whereas others think of themselves as being slow to grasp things, making many mistakes, and being generally inept.

"Perceived Occupational Level. People at different occupational levels differ in the way in which they perceive themselves. Therefore it is possible to think of a scale of perceived occupational level. Occupational level scales are generally considered to measure something akin to levels of aspiration. The individual who is placed high on the scale of perceived occupational level is regarded as one who wants the responsibility and prestige associated with higher level jobs, and an individual who is placed low on the scale is one who is content with less in the way of rewards and status.

"Decision Making Approach. This scale came into being as the result of a study wherein the responses on the Self-Description Inventory of top management personnel were compared with those of middle management personnel. A comparison of the adjectives suggested that there exists a dimension of the way in which people approach the matter of making decisions. At the one extreme are those who consider proposed actions from all angles and aspects before they are willing to take action, and who wish to think out things in a careful and cautious manner beforehand.

"Sociometric Popularity. The purpose of this scale is to measure sociometric popularity at the level of manual workers. The intent is to distinguish those individuals who are liked and are highly regarded by their fellows from those who are not.

> "Maturity of Self Perception. This scale is intended to measure the extent to which the individual perceives himself in the ways that older more mature people do rather than in the ways that younger more immature people do. The concern is with maturity at the adult levels. As a consequence the scale is only applicable to individuals eighteen years of age and above. Although the scale was developed on men who had at least one year of college, apparently it can be used fairly well with men who have never attended college and also with women."[16]

Hypotheses

The seven variables developed by the item analysis were used to formulate a research model. The model, presented in Figure 1-2, focuses on the interaction between the various variables. It should be noted that the variables in the model represent changes across time as opposed to variables measured at a single point in time.

Each arrow in the model represents a hypothesized significant relationship and direction of causality. These hypotheses are stated below. Each hypothesis is composed of two parts, a statement of association and a statement of causality. In each case, the alternate form of the hypothesis is stated.

Hypothesis 1A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's influence in the goal setting process.

Hypothesis 1B. Changes in the superior-subordinate relationship will cause changes in the subordinate's influence in the goal setting process.

---

[16] Ghiselli, p. 4a-19.

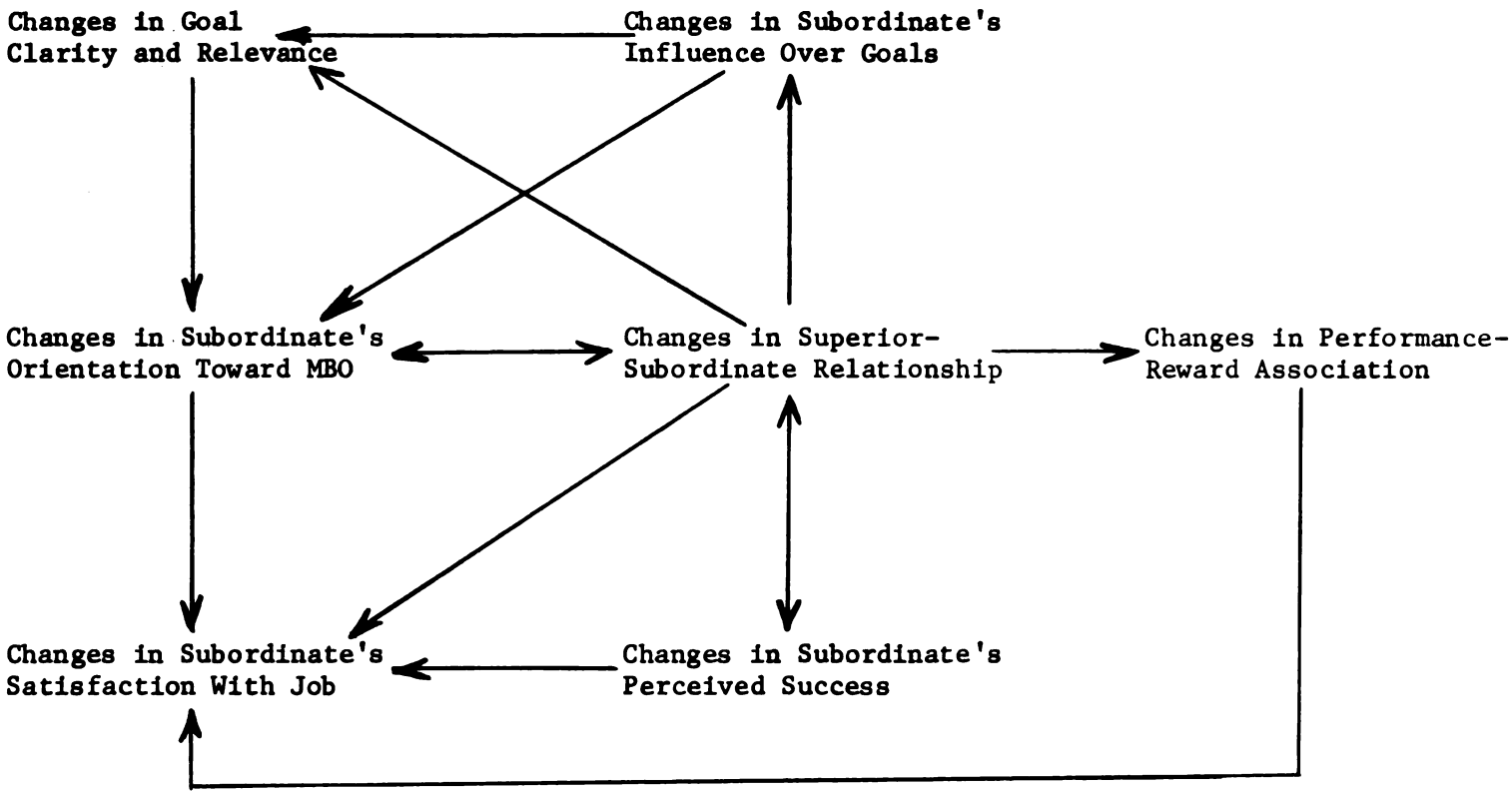


Figure 1-2. Hypotheses to be tested in model form.

Hypothesis 2A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the clarity and relevance of the goals set for the subordinate.

Hypothesis 2B. Changes in the superior-subordinate relationship will cause changes to occur in the clarity and relevance of the goals set for the subordinate.

Hypothesis 3A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's orientation toward MBO.

Hypothesis 3B. The causality is mutually reinforcing in that changes in each variable will produce changes in the other variable.

Hypothesis 4A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's satisfaction with his job.

Hypothesis 4B. Changes in the superior-subordinate relationship will cause changes in the subordinate's satisfaction with his job.

Hypothesis 5A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's success in attaining the goals set for him.

Hypothesis 5B. The causality is mutually reinforcing in that changes in each variable will cause changes in the other variable.

Hypothesis 6A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's perception of the relationship between rewards and actual job performance.

Hypothesis 6B. Changes in the superior-subordinate relationship will cause changes in the subordinate's perception of the relationship between rewards and actual job performance.

Hypothesis 7A. Increases (decreases) in the subordinate's influence in the goal setting process are associated with increases (decreases) in the clarity and relevance of the goals set for the subordinate.

Hypothesis 7B. Changes in the subordinate's influence in the goal setting process will cause changes in the clarity and relevance of the goals set.

Hypothesis 8A. Increases (decreases) in the clarity and relevance of the goals set for the subordinate are associated with increases (decreases) in the subordinate's orientation toward MBO.

Hypothesis 8B. Changes in the clarity and relevance of the goals set for the subordinate will cause changes in the subordinate's orientation toward MBO.

Hypothesis 9A. Increases (decreases) in the subordinate's orientation toward MBO are associated with increases (decreases) in the subordinate's satisfaction with his job.

Hypothesis 9B. Changes in the subordinate's orientation toward MBO will cause changes in the subordinate's satisfaction with his job.

Hypothesis 10A. Increases (decreases) in the subordinate's perception of the association between rewards and actual job performance are associated with increases (decreases) in the subordinate's satisfaction with his job.

Hypothesis 10B. Changes in the subordinate's perception of the association between rewards and actual job performance will cause changes in the subordinate's satisfaction with his job.

Hypothesis 11A. Increases (decreases) in the subordinate's perceived success are associated with increases (decreases) in the subordinate's satisfaction with his job.

Hypothesis 11B. Changes in the subordinate's perceived success will cause changes in the subordinate's satisfaction with his job.

Hypothesis 12A. Increases (decreases) in the subordinate's influence in the goal setting process are associated with increases (decreases) in the subordinate's orientation toward MBO.

Hypothesis 12B. Changes in the subordinate's influence in the goal setting process will cause changes in the subordinate's orientation toward MBO.

Hypotheses Concerning Moderated Relationships

In their research on MBO, Tosi and Carroll found that certain static relationships were moderated by personality dimensions.[17] One of the objectives of this research was to determine the extent to which the personality dimensions moderated the dynamic relationships. By intent and design, the investigation of moderator variables was exploratory in nature.

The imposition of eight potential moderator variables on the interactive nature of the research model makes hypotheses formulation a complex problem. Rather than take this approach for moderating

---

[17]Tosi and Carroll, "Some Factors..."

relationships, a search strategy was chosen. This approach seems reasonable and is justified by the exploratory nature of this phase of the research. Once moderating variables are detected, they can provide a basis for formulating hypotheses in later research.

Description of the Model

The purpose of this section is to describe the research model and to provide a rationale for the relationships hypothesized. One of the traditional means of providing rationale for hypotheses is to draw upon past research. While the relationships between variables in the model have been studied, most of this research has been of a static nature. Static relationships may be helpful in understanding dynamic relationships, but it does not necessarily follow that two variables related at a single point in time will be related in terms of changes in these variables over time. This means that while static research can provide some guidance in formulating hypotheses, the hypotheses stated here, out of necessity, will be of a more theoretical nature.

In order to facilitate the discussion, the research model will be divided into two loops. The first loop to be discussed is presented in Figure 1-3. Since it is hypothesized that all the relationships shown in Loop A are positive, the loop represents a circular reinforcing flow.

It is hypothesized that improvement in the superior-subordinate relationship will result in the subordinate's perceiving that he has more relative influence in the goal setting process. One of the components of the superior-subordinate relationship variable is the degree to which the two interact in regard to goal-related activities. As this type of interaction increases, the subordinate perceives that he is being consulted more as to the nature of the goals and means of attaining the

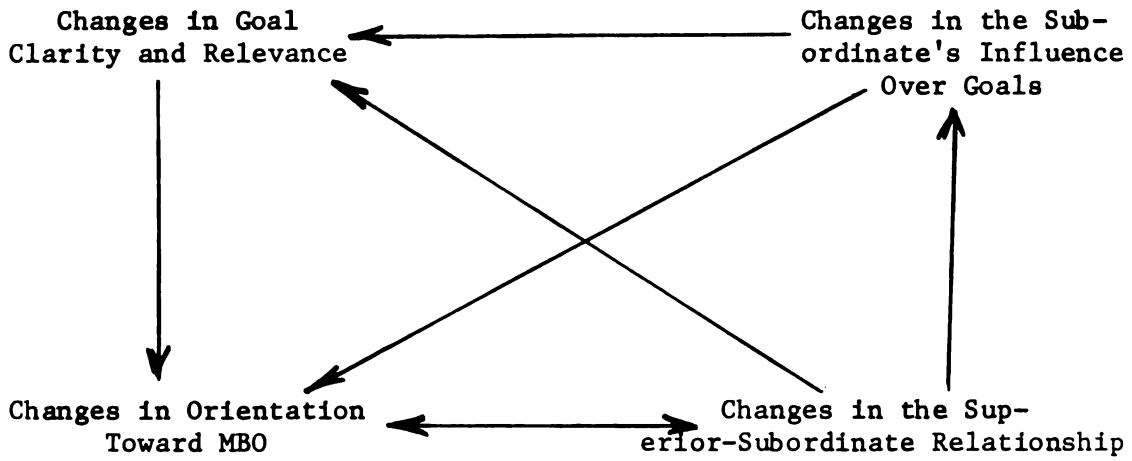


Figure 1-3. Loop A of research model.

goals. When the subordinate has an opportunity to present his views, he perceives that his influence is increased. Tosi and Carroll found that interaction, in the form of feedback, is related to the subordinate's perceptions of changes in the relationship with his superior.[18] It is further hypothesized that as the subordinate's influence in the goal setting process increases, his goals will be more relevant and clear. Research has shown that when given a choice between a specific goal or a more general goal such as "do your best," the specific goal is preferred and results in higher performance.[19,20,21] Given that specific goals are preferred, a subordinate would seek to clarify the goals when he feels that his influence has increased. It could also be true that the

---

[18] *Ibid.*

[19] Edwin A. Locke and Judith Bryan, "Cognitive Aspects of Psychomotor Performance," *Journal of Applied Psychology*, Vol. 50 (1966) pp. 286-291.

[20] Edwin A. Locke and Judith Bryan, "Performance Goals as Determinants of Level of Performance and Boredom," *Journal of Applied Psychology*, Vol. 51 (1967) pp. 120-130.

[21] Edwin A. Locke, "Motivational Effects of Knowledge of Results: Knowledge or Goal Setting?" *Journal of Applied Psychology*, Vol. 51 (1967) pp. 324-320.

subordinate would perceive that the goals were clearer, simply because he was involved in their formulation.

Increases in goal clarity and relevance can be produced in another way. As the superior-subordinate relationship improves, reflecting an increased level of interaction related to goals, it is hypothesized that the subordinate will perceive his goals as being clearer and more relevant. Tosi and Carroll found a strong static relationship between goal clarity and the subordinate's relationship with his superior.[22]

The preference for clear and relevant goals should produce a positive relationship between goal clarity and relevance and the orientation toward MBO, the subject's perception of how useful MBO is to him and how well he likes the program. Given that the certainty associated with clearly stated goals is a desirable state, one's satisfaction with MBO should increase as the mechanisms of MBO are viewed as encouraging the clarification of goals. Research has shown that there is a strong relationship between various types of role discrepancies which could be produced by unclear goals and attitudes. Smith found role clarity related to satisfaction.[23] In a more recent study, Lyons found the relationship between role clarity and satisfaction to be much stronger for persons with a "high need for clarity."[24] Rizzo found that role ambiguity was negatively correlated with a number of satisfaction measures.[25] Tosi

---

[22]Tosi and Carroll, "Some Factors..."

[23]E. E. Smith, "The Effects of Clear and Unclear Role Expectations on Group Productivity and Defensiveness," *Journal of Abnormal and Social Psychology*, Vol. 55 (1957) pp. 213-217.

[24]Thomas Lyons, "Role Clarity, Need for Clarity, Satisfaction, Tension, and Withdrawal," *Organizational Behavior and Human Performance*, Vol. 6 (1971) pp. 99-110.

[25]John R. Rizzo, Robert House and Sidney L. Lirtzman, "Role Conflict and Ambiguity in Complex Organizations," *Administrative Science Quarterly*, Vol. 15, No. 2 (June, 1970) pp. 150-163.

and Tosi found that role conflict was negatively correlated with job satisfaction.[26]

Increases in the subordinate's orientation toward MBO should also result from the perception that the subordinate has more relative influence in the goal setting process. This is based on the premise that individuals prefer to have influence in the discussions that affect their work situation and would be favorably disposed toward a program that was perceived as encouraging and facilitating their involvement. Vroom[27,28] and Tosi[29] both show influence related to satisfaction.

The relationship between changes in orientation toward MBO and the superior-subordinate relationship is hypothesized to be complex in that a two-way flow of influence is inferred. In an assessment of one's attitude toward MBO, the relationship with the superior would be a critical element. As the superior-subordinate relationship improved, the positive attitude would be relfected by a more favorable orientation toward MBO. As the subordinate and superior interact, the subordinate should gain a better understanding of the requirements of his job and the part MBO might play. At the same time, as the subordinate's orientation toward MBO increases and he gains a greater appreciation for its potential, he might well be more likely to initiate interaction with his

---

[26]Henry Tosi and Donald Tosi, "Some Correlates of Role Conflict and Role Ambiguity Among Public School Teachers," *Journal of Human Relations*, Vol. 18, No. 3 (1970) pp. 1068-1075.

[27]Victor H. Vroom, *Some Personality Determinants of the Effects of Participation* (Englewood Cliffs, N.J.: Prentice-Hall, 1960).

[28]Victor H. Vroom, *Work and Motivation* (New York: Wiley, 1965).

[29]Henry Tosi, "Organizational Stress as a Moderator of the Relationship Between Participation and Job Satisfaction, Job Anxiety, and Productivity." Paper delivered at XV International Meetings, The Institute of Management Science, September, 1968.

superior. As interaction increases due to the favorable attitude, the subordinate perceives that his relationship with the superior is improving.

The second set of hypothesized relationships to be discussed is shown in Figure 1-4.

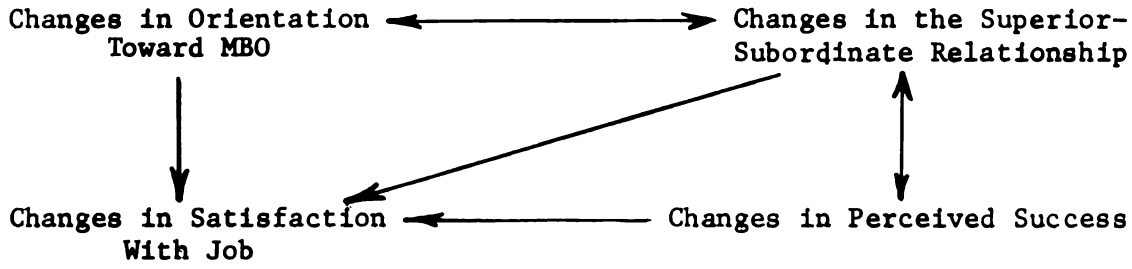


Figure 1-4. Loop B of research model.

The hypothesized relationships in Loop B do not represent the circular reinforcing flow that was present in Loop A but instead emphasize the "outcome" nature of satisfaction with job.

It is hypothesized that increases in orientation toward MBO will result in more favorable attitudes toward the job. In those situations where MBO is an established part of the work environment, an assessment of MBO would enter into one's attitudes concerning his job. As orientation toward MBO increases reflecting increases in goal clarity, increases in the subordinate's influence over goals, and improvements in the superior-subordinate relationship, satisfaction with the total job situation should increase.

As hypothesized in Loop B, improvements in the superior-subordinate relationship will result in increases in job satisfaction. One of the elements in the superior-subordinate relationship is the subordinate's perceived participation. There has been considerable research which has shown a significant relationship between participation and job satisfaction.[30]

[30]See Tosi and Tosi, "Some Correlates of Role Conflict...;" Vroom, *Some Personality Determinants of the Effects of Participation*; and Vroom, *Work and Motivation*.

The remaining variable that is hypothesized to enter into one's assessment of satisfaction with his job is the changes in his perceived success. This is based on the proposition that a feeling of improvement in attaining goals is a satisfying experience and the realization of such an experience will be projected into an evaluation of the job situation. An increase in the success of attaining goals will be reflected in increased satisfaction with the job. On the other hand, a decrease in goal success will be a frustrating experience and will lead to a devaluation of job satisfaction. The attempt to establish a relationship between performance and job satisfaction has been the source of much research. In an extensive review of the literature Brayfield and Crockett concluded that there was little evidence in the literature that employee attitudes, such as job satisfaction, were appreciably related to performance on the job.[31] In a later review of the literature, Vroom concluded that there was a low but consistent positive relationship between satisfaction and performance.[32] Using data collected from middle and lower level managers in five organizations, Lawler and Porter have shown that job satisfaction correlates significantly with both the superior's and peer's ranking of performance.[33]

The causality relationship between success and the superior-subordinate relationship is hypothesized to be reinforcing. As the superior-subordinate relationship improves reflecting goal-oriented activities, the subordinate's success in attaining goals should increase.

---

[31]Arthur H. Brayfield and Walter H. Crockett, "Employee Attitudes and Employee Performance," *Psychological Bulletin*, Vol. 52 (September, 1955) pp. 396-424.

[32]Vroom, *Work and Motivation*...

[33]Edward E. Lawler and Lyman Porter, "The Effects of Performance on Job Satisfaction," *Industrial Relations - A Journal of Economy and Society*, Vol. 7, No. 1 (October, 1967) pp. 22-28.

A healthy superior-subordinate relationship would mean that the superior is providing meaningful feedback to the subordinate as well as requesting opinions from him. This hypothesis is consistent with considerable research that has shown feedback significantly and positively related to job performance.[34,35]

It is also hypothesized that increases in success will result in an improved superior-subordinate relationship. There are many reasons why one would expect this to be true. The superior-subordinate relationship is influenced by the actions and attitudes of both the superior and the subordinate. As a subordinate's success increases, one would expect the superior's attitude toward the subordinate to become more favorable. He may then be more likely to initiate actions which have the effect of improving the relationship, such as more praise, more frequent feedback, and more support. From the subordinate's viewpoint, increases in success should provide adequate motivation to initiate further interaction with his superior, with an increasing confidence that his opinions will be respected. The net effect is that "success breeds success" through the development of a kind of superior-subordinate relationship that emphasizes goal-directed actions.

In addition to the two loops discussed above, two additional relationships are hypothesized. As the superior-subordinate relationship improves, the subordinate increases his perception that performance (goal attainment) is related to reward. As the interaction between the

---

[34] J. A. Weitz, J. Antoinetti and S. R. Wallace, "The Effects of Home Office Contact on Sales Performance," *Personnel Psychology*, Vol. 7 (1954) pp. 381-384.

[35] L. Miller, *The Use of Knowledge of Results in Improving the Performance of Hourly Operators*, General Electric Co., Behavioral Research Service, 1965.

superior and the subordinate increases, the superior acquires information related to performance that can be used to evaluate his subordinates. Knowing that his superior has this information, the subordinate may well feel that the probability that his performance will be a major criterion for allocating rewards has increased. In the absence of interaction, the subordinate may feel that his superior really doesn't know how he is doing and must rely on more subjective criteria for evaluation reducing the association between performance and reward.

Lastly, it is hypothesized that increases in the association between performance and reward will result in increases in the subordinate's job satisfaction. One of the major purposes of MBO is to make the appraisal system "objective oriented" rather than "trait oriented." In an "objective oriented" appraisal system, performance as reflected in goal attainment, is emphasized as a criterion for allocating rewards. While there has only been a limited amount of research on "goal-oriented" appraisal systems, the results consistently show that people like the idea of being evaluated on performance as opposed to more subjective criteria.[36] Given that an "objective-oriented" appraisal system is desirable, then increases in the perceived probability that rewards will be based on actual job performance should result in more favorable attitudes toward the job.

---

[36]See Raia, "Goal Setting and Self Control;" Raia, "A Second Look at Goals and Controls;" Meyer, Kay and French, "Split Roles in Performance Appraisal;" and Tosi and Carroll, "Some Factors Affecting the Success..."

CHAPTER 2

METHODS USED TO TEST HYPOTHESES

The purpose of this chapter is to describe the methods used to test the hypotheses stated in Chapter 1. To facilitate reporting, the chapter is divided into six sections. The first section describes the characteristics of the managers who constitute the sample for this research. The second section discusses the administration and structure of the questionnaire. The techniques used to develop new scales are presented in the third section along with cross-validation studies. Section four is concerned with the methodology of assessing dynamic relationships. Causality analysis based on the use of cross-lagged panel correlations is discussed in section five. The final section presents special methodology developed to search for variables that moderate the relationships between the variables of interest in this research.

Description of Subjects

Data were collected from managers actively involved in an on-going MBO program in a large national industrial firm. This particular program was called the Overall Performance Appraisal Program (OPA), a variant of MBO. The more general term, MBO, will be used to designate OPA and other variants of management by objectives programs. The questionnaire was administered to 150 managers in March, 1968, and again in November, 1969. The purpose of the second administration of the

questionnaire was to assess the effects of changes instituted in the MBO program as a result of an evaluation of data from the initial study.

There were 128 useful responses to the initial administration of the questionnaire and 119 useful responses to the second administration. Since this research examines relationships between change scores on particular variables, only managers who had useful responses in both administrations of the questionnaire were utilized. There were 73 such managers representing various functional areas and organizational levels in the organization as shown in Tables 2-1 and 2-2.

Measurement of Variables

To assess manager's perceptions of an on-going MBO program, a questionnaire was administered in March, 1968, and November, 1969 (a sample questionnaire is included in Appendix A). Each item in the questionnaire presented the manager with a question and a response pattern of four to six alternatives. Each manager was asked to make the response which best reflected his attitudes.

In developing the questionnaire, Tosi and Carroll were interested in investigating the relationships between process and end-result variables and the potential moderating effects of situational and psychological variables.[1] The scales developed by Tosi and Carroll were considered *a priori* scales to be further analyzed (see Table 1-1, page 7).

---

[1]Henry Tosi and Stephen Carroll, "Some Factors Affecting the Success of 'Management by Objectives'," *Journal of Management Studies*, Vol. 7, No. 2 (May, 1970) pp. 209-222.

Table 2-1. Classification of managers according to functional areas

Functional Area	Number
Marketing	30
Research and Development	20
Production	13
Administration (Other)	10
Total	73

Table 2-2.[a] Classification of managers according to organizational level

Organizational Level	Number
Vice-President	3
Directors	7
Middle Management	38
Lower Management	25
Total	73

[a]The categorization of managers into organizational levels is complicated by different job titles, particularly across functional areas. Table 2-2 shows broad categories as opposed to specific job titles.

Development of New Scales

The importance of internally reliable scales increases when change scores are being analyzed. Because of this, the *a priori* scales were not considered to be appropriate for the development of change measures and further scale analysis was undertaken. A form of cluster analysis was used to develop new scales.

Cluster Analysis

Items in the questionnaire were analyzed to develop more meaningful scales. A form of multiple-group cluster analysis called PACKAGE was used to perform the item analysis. PACKAGE is a family of Fortran programs to analyze correlational data, developed at Michigan State University by John Hunter and Stan Cohen.[2] While a complete description of PACKAGE is beyond the scope of this report, it should be pointed out that the analytical strategy used by PACKAGE is to de-emphasize blind rules for forming large clusters and to facilitate reordering and presenting correlational matrices for efficient visual inspection.

When using PACKAGE, one employs a hierarchical approach to synthesizing data. The operational procedure is to first inspect an inter-item correlation matrix and form small clusters of similar items, possibly two or three item groups. The procedure of combining items and groups into larger groups is continued until it is felt that additional combinations would only blur important distinctions.

PACKAGE has two features which are very useful in item analysis. In addition to analyzing an item correlation matrix, PACKAGE also utilizes a matrix of similarity coefficients. The coefficients are

---

[2] J. E. Hunter and S. H. Cohen, "PACKAGE: A System of Computer Routines for the Analysis of Correlational Data," *Educational Psychological Measurement*, Vol. 29 (1969) pp. 697-700.

standardized raw dot products in the correlation matrix. Given parameters, equivalent items could be located by computing an index of similarity between columns of correlation coefficients by the following formula:[3]

$$s_{ij} = \frac{\Sigma_k \; r_{ik} \; r_{jk}}{\sqrt{\Sigma_k r^2_{ik}} \sqrt{\Sigma_k r^2_{jk}}}$$

If the diagnonal entries, r_{ii}, are communalities, this coefficient would be 1 for weakly equivalent items.[4] Similarity coefficients have the operational advantage of being more stable in the face of sampling error. This is because they are based on more data than correlation coefficients in that the relationships between a variable and all other variables are taken into account. A matrix of similarities will be simpler in structure than a correlation matrix. This can be very beneficial in analyzing matrices where the variables do not break into clearly defined clusters.

In item analysis, it is useful to work with a correlation matrix that has been corrected for attenuation. This results in correlation coefficients that are a measure of the relationship between the true components of variables. The formula for correcting for attenuation is given by:[5]

---

[3]J. E. Hunter, "ARRANGE: A Method of Reordering the Correlations Matrix." Unpublished paper written at Michigan State University, East Lansing, Mich., 1970.

[4]*Ibid.*

[5]J. P. Guilford, *Psychometric Methods* (New York: McGraw-Hill Book Company, Inc., 1967) p. 400.

$$r_{TU} = \frac{r_{xy}}{\sqrt{r_{xx}\ r_{yy}}}$$

where r_{TU} = correlation between true components of x and y

r_{xy} = observed correlation between x and y (contains both true and error components

r_{xx}, r_{yy} = reliability coefficients of x and y.

In PACKAGE, the correlations between items and clusters and the correlations between clusters are corrected for attenuation by using communalities as diagonal entries (in an uncorrected matrix, the diagonal entries are 1's). In simplified terms, communalities are numbers other than 1's on the diagonal of a correlation matrix. The matrix is corrected for attenuation by using estimates of reliabilities as communalities. A major analytical problem is that the value of the communality must be known in advance. PACKAGE uses an iterative process to estimate communalities. Initial estimates of the communalities are given by the square of the largest correlation coefficient between an item and the group to which it belongs. With the estimated communality as diagonal elements, the correlation matrix is recomputed and the procedure iterated until the values of the communalities stabilize. For small groups consisting of two or three items, the communalities tend to stabilize after three or four iterations.

Means of Evaluating Scales

It is not meaningful to separate scale development from scale evaluation. In practice, scale development is an iterative process of grouping items and evaluating the combinations. While PACKAGE is capable of generating and arranging the special matrices discussed in the last subsection, the final determination of how the items will be grouped is left

to the discretion of the experimenter. Three techniques can be used to evaluate item clusters. These techniques are internal analysis, external analysis, and content analysis.

Internal Analysis. This analysis is concerned with internal consistency or how well the items in the scale are related to one another. If scales consist of parallel items, one would expect a high degree of internal consistency. Nunnally argues that the most meaningful measure of internal reliability is given by:[6]

$$r_{xx} = \frac{N\bar{r}}{1 + (N-1)\bar{r}}$$

where r_{xx} = the estimated internal reliability

$\bar{r}$ = the average off-diagonal correlation between items

N = the number of items in the scale.

In effect, this formulation is the Spearman-Brown formula applied to off-diagonal correlations. While this method was used to estimate internal reliabilities, it should be noted that when the items in the scale have the same variance, as is true with the data here, this method will yield the same numerical estimates as other methods of computing reliability, such as coefficient alpha and Kuder-Richardson.

The critical question of what constitutes an acceptable level of reliability cannot be ignored. Nunnally suggests that it depends on how a measure is being used. He argues that,

---

[6]Jum C. Nunnally, *Psychometric Theory* (New York: McGraw-Hill Book Company, Inc., 1967) p. 193.

> "in early stages of research on prediction tests or hypothesized measures of a construct, one saves time and energy by working with instruments that have only modest reliability, for which purpose reliabilities of .60 or .50 will suffice."[7]

The nature of this research presents a special problem in regard to reliability. Nunnally's comments apply to static research; however, as pointed out in the next subsection, "Reliability and Change Scores," reliability takes on added importance when working with change scores. This heightens the need for careful scale development.

External Analysis. Another means of evaluating the similarity of items in a group is to analyze the patterns of correlations with items external to the group. If the items in the group "belong together" in the sense that they are parallel items, they should exhibit a similar pattern of correlations with other items. This does not mean that items in a group should have equal correlations with items outside their group. There may well be strong or weak items in the group which would show up as correlations having similar patterns but consistent high or low values.

There is no single quantitative measure to facilitate an easy assessment of the external consistency. The experimenter must visually inspect the correlation pattern of each item in the scale with external items, noting areas of inconsistency. One key to the analysis is the sign of the correlation coefficient. If the assumption is made that two items are roughly parallel then correlation coefficients computed between each item and a third item should not have opposite signs. The repeated observation of sign differences should alert the experimenter to the possibility that the items in the scale are too heterogeneous to be

---

[7] *Ibid.*, p. 226.

legitimately combined. Problems associated with item construction are such that the items will be less than perfectly parallel so inconsistencies may well appear. *What constitutes an unacceptable degree of inconsistency is a judgment that must be made by the experimenter.*

Content Analysis. A third means used to evaluate a particular item combination is to examine the content of the items. If the items are roughly parallel, then one would expect the content of the items to be similar. The experimenter must be cautious in interpreting the content of an item. The important factor is the subject's perceived content of the item which may or may not be what the experimenter had in mind when writing the item. Given this limitation, the experimenter can only judge the "reasonable" similarity of content of the various items.

Cross Validations

Two cross-validation studies were performed as a means of further evaluating scales. Data obtained from the first administration of the questionnaire were used to develop the new scales. Data obtained from the second administration of the questionnaire were then used to cross validate the results of the item analysis. The combinations obtained from the cluster analysis of the first administration were formed using data from the second administration of the questionnaire and external and internal analyses were performed. A second cross-validation study was conducted using data from 600 managers from another firm which had responded to the same questionnaire. As in the first cross-validation, combinations resulting from the item analysis of the first administration of the questionnaire were formed using data from the third sample and the internal and external analyses repeated. If the correlations between the various groups of items are consistent across the samples, then the

experimenter has added confidence in concluding that they represent meaningful scales.

Intermediate Result of Item Analysis

At one point in the research, fourteen multiple item groups were formed (see Table 1-2, page 10). The items in each of the groups have very similar internal and external patterns of correlation and appear to have somewhat different content. The inter-scale correlations were also consistent across the samples used in the cross-validations. The results of the cross-validations are shown in Table 2-3. For reasons pointed out in the next subsection, the fourteen scales were not the ones used to assess the variables in the hypothesized relationships; however, some of the variables are used in Chapter 4 to develop a model of the superior-subordinate relationships.

Reliability and Change Scores

When one works with change scores, the reliability of the scales takes on added importance. The reason for this can be shown quite easily. The relationship between the internal reliability of the scale at time 1 and time 2 ($r_{xx'}$, $r_{x'x'}$) and the resultant reliability of change scores ($r_{x'-x}$) is given by:

$$r_{x'-x} = \frac{\left(\frac{r_{xx} + r_{x'x'}}{2}\right) - r_{xx'}}{1 - r_{xx'}}$$

$$= \frac{\bar{r}_{xx} - r_{xx'}}{1 - r_{xx'}}$$

The relationship shows that as the correlation of the scale between time 1 and time 2, $r_{xx'}$, is positive, the reliability of the change

Table 2-3. Correlation coefficients between fourteen scales for first administration (A), second administration (B) and independent sample (C)

Variables	Variable Names and Correlation Coefficients																				
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
	1			2			3			4			5			6			7		
1	*Use of Goal Oriented Methods																				
2	.61	.51	.55	*Satisfaction With Superior																	
3	.44	.21	.38	.33	.19	.17	*Self-Improvement Goal Clarity														
4	.61	.61	.63	.43	.26	.40	.38	.42	.36	*Performance Goal Clarity											
5	.53	.40	.40	.22	.26	.19	.29	.21	.25	.51	.41	.50	*Orientation Toward MBO								
6	.39	.24	.50	.35	.07	.36	.18	.03	.21	.29	.05	.46	.18	.13	.33	*Superior Concern with Future					
7	.63	.66	.61	.67	.74	.66	.26	.14	.23	.44	.41	.48	.21	.36	.25	.38	.14	.38	*Superior Supportiveness		
8	.40	.49	.45	.47	.58	.51	.21	.24	.17	.37	.42	.40	.18	.38	.25	.15	.24	.26	.47	.65	.52
9	.29	.25	.24	.26	.12	.19	.13	.20	.16	.08	.07	.26	.16	.08	.28	.27	.10	.20	.17	.01	.17
10	.22	.36	.43	.26	.39	.37	.28	.05	.29	.12	.30	.41	.20	.17	.41	.21	.10	.30	.28	.39	.39
11	.21	.16	.24	.04	.10	.12	.14	.05	.16	.02	.06	.17	.09	-.09	-.13	-.06	.01	.19	.02	.08	.14
12	.01	.02	.15	-.02	-.12	.03	.08	.04	.23	.00	.02	.12	.10	.22	.06	.09	.01	.10	-.16	-.19	.04
13	.15	.38	.37	.19	.30	.31	.15	.01	.19	.14	.28	.29	.12	.30	.30	.17	.13	.18	.16	.40	.33
14	.15	.15	.19	.18	.18	.10	.21	.10	.04	.03	.06	.15	.10	.27	.16	-.01	.26	.18	.21	.22	.16

Significant values of r

	.05	.01
Samples A and B	.23	.30
Samples C	.08	.11

Table 2-3 (cont'd.)

Variables	Variable Names and Correlation Coefficients																				
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
	8			9			10			11			12			13			14		
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8	*Influence Over Means																				
9	-.03	.00	.09	*Need for Policy																	
10	.24	.36	.34	.14	.11	.23	*Performance-Reward Association														
11	-.20	-.01	-.12	.04	.16	.11	-.09	-.12	.07	*Influence Over Goals											
12	-.03	-.30	.00	.02	.09	.08	.04	.00	.03	-.10	.05	.10	*Goal Difficulty								
13	.09	.31	.27	.24	.10	.13	.44	.34	.37	.12	.11	.06	.11	-.10	.06	*Job Satisfaction					
14	.13	.19	.12	-.01	.02	.03	.09	.02	.15	-.04	-.13	-.05	-.12	-.26	-.17	-.15	.07	.04	*Perceived Success		

scores will be less than the average reliability of the scales, $\bar{r}_{xx}$. Three examples will show why reliability is important. In all examples, it will be assumed that the scales are correlated .40 from time 1 to time 2. If a scale has an average reliability of .70, then the reliability of the change score is:

$$r_{x'-x} = \frac{.70 - .40}{1 - .40}$$

$$= \frac{.30}{.60} = .50$$

On the other hand, if the average reliability is .90, the reliability of the change scores is:

$$r_{x'-x} = \frac{.90 - .40}{1 - .40}$$

$$= \frac{.50}{.60} = .83$$

As the two examples show, the reliability of change scores is very sensitive to the reliability of the scale. A third example shows how scales that have low reliability will result in a disproportionate reduction in change score reliability. Assuming that the average reliability of a scale is .5, the reliability of the change score is:

$$r_{x-x'} = \frac{.50 - .40}{1 - .40}$$

$$= \frac{.10}{.60} = .17$$

The examples show that when the average reliability of the scales is reduced from .90 to .50, the reliability of the change scores falls from .83 to .17. While an experimenter may choose to assess static relationships with a scale that has a reliability of .50, the resultant change score reliability of .17 is extremely low.

Revision of Scales

Change scores were calculated for the variables represented by the fourteen scales and correlation coefficients were computed between change scores (this methodology will be discussed in the next section, "Development of Change Measures"). From an analysis of the reliabilities of the change scores, it was concluded that additional scale development was needed. The internal reliabilities and reliabilities of the change scores are presented in Table 2-4. The data in Table 2-4 illustrate the concern over the unreliability of change scores. While all but three of the static reliabilities meet Nunnally's "satisficing" criterion of .60 to .50, half of the change score reliabilities are less than .50.

There are two areas of special concern. Variables concerning the relationship between superiors and subordinates, and variables related to goal characteristics, are considered to be of special importance in this research because of their key role in MBO. The two variables concerned with goal clarity have change score reliabilities of .54 and .53, respectively. Some of the variables concerning the relationship between superiors and subordinates also have low change score reliabilities. Scale 7, the superior's concern for the subordinate's failure, has a change score reliability of .35 and scale 8, the subordinate's influence over the superior, has a change score reliability of .29. Also of concern is the low observed change score reliabilities for the two variables, satisfaction with job and success in attaining goals.

Because of the considerations stated above, it was decided to attempt to increase the reliability of the scales. It has been pointed out that reliability is a function of the average inter-item correlation and the number of items in the scale, which means that reliability can often be improved by increasing the number of items in a scale.

Table 2-4. Reliabilities of fourteen scales

Scale	Internal Reliability[a,b] r_{xx}	Change Score Reliability[c] r_{x-x}
1. Use of goal-oriented methods	.95	.90
2. Satisfaction with boss	.90	.88
3. Self-improvement goal clarity	.60	.54
4. Performance goal clarity	.68	.53
5. Orientation toward MBO	.80	.50
6. Boss concern with failure	.57	.35
7. Boss supportiveness	.78	.70
8. Influence over boss	.60	.29
9. Need for policy	.48	.31
10. Association between performance and reward	.84	.68
11. Influence over goals	.75	.50
12. Performance goal difficulty	.44	.44
13. Satisfaction with job	.58	.35
14. Success in attaining goals	.65	.30

[a]Calculated by Equation 6-18, Nunnally, p. 193.

[b]Reported reliabilities were calculated from data obtained on independent sample of 600 managers. They represent estimated internal reliabilities based on cross-validation results.

[c]See formula on page 39.

Since the total number of items is given by the questionnaire, it was necessary to combine scales into more macro measures. This does not mean that scales can be, or were, haphazardly combined. It would not be advantageous to add items to a scale that would substantially reduce the average inter-item correlation as would tend to be the case if nonparallel items were combined.

The potential for combining scales existed in that the fourteen scales were not orthogonal. In fact, some scales were highly inter-correlated and could only be justified as separate entities by their correlational patterns and apparent content. When performing the item analysis that led to the formation of the fourteen scales, the objective was to form meaningful scales, but not to blur what was considered important distinctions. However, when the objective is to increase reliability, the criteria for item combination must change. The experimenter must evaluate the cost of less distinction in the scales against the benefits obtained by more reliable scales.

Scales were combined into a single measure wherever an analysis of correlational patterns indicated that it was proper to do so. The same techniques of internal, external and content analyses were used to develop and evaluate the more macro measures. By collapsing some scales and rearranging items of other scales, the fourteen scales were reduced to seven (see Table 1-3, page 11).

The major revision was the formation of an eighteen-item scale concerning the superior-subordinate relationship. The items constituting this scale made up five of the fourteen scales. The common element in each of the items is the subordinate's perception of his superior's behavior. The scales concerning performance goal clarity and self-improvement goal clarity were collapsed into one scale.

The scale revision left five of the fourteen scales unchanged. These were: (1) orientation toward MBO, (2) subordinate's influence over goals, (3) satisfaction with job, (4) success in attaining goals, and (5) performance-reward association.

The reliabilities of the scales are presented in Table 2-5. As a comparison of Tables 2-4 and 2-5 shows, the objectives of the scale revision were partially attained. The reliabilities of the scales concerning the superior-subordinate relationship and goal clarity were increased. Since the other scales were not altered, their reliabilities were unaffected. The scales, satisfaction with superior and success in attaining goals, cause the most concern because of their low reliability, particularly in the change scores. Since the reliability of these scales cannot be increased by adding existing items, additional scale development is suggested if the variables are used in future research.

These seven scales were subjected to the same evaluation procedures that were discussed previously. Internal, external and content analyses were performed as well as two cross-validation studies. The results of the analyses were sufficiently positive to warrant their use in developing the change relationships. An inter-item correlation matrix arranged by item clusters is presented in Appendix B. The results of the cross-validation studies are presented in Table 2-6, page 48).

Development of Change Measures

Carl Bereiter has pointed out that,

> "although it is commonplace for research to be stymied by some difficulty in experimental methodology, there are really not many instances in the behavioral sciences of promising questions going unresearched

Table 2-5. Reliabilities of seven scales

Scale	Internal Reliability[a,b] r_{xx}	Change Score Reliability[c] r_{x-x}
1. Superior-subordinate relationship	.96	.94
2. Goal clarity and relevance	.90	.87
3. Orientation toward MBO	.80	.50
4. Performance-Reward association	.84	.68
5. Subordinate influence over goals	.75	.50
6. Satisfaction with job	.58	.35
7. Success in attaining goals	.65	.30

[a]Calculated by Equation 6-18, Nunnally, p. 193.

[b]Reported reliabilities were calculated from data obtained on independent sample of 600 managers. They represented estimated internal reliabilities based on cross-validation results.

[c]See formula on page 39.

Table 2-6. Correlation coefficients between seven scales for first administration (A), second administration (B) and independent sample (C)

Scale Number and Name / Sample	1			2			3			4		
	A	B	C	A	B	C	A	B	C	A	B	C
1. Superior-Subordinate Relationship	1.00	1.00	1.00									
2. Goal Clarity and Relevance	.39	.22	.30	1.00	1.00	1.00						
3. Orientation Toward MBO	.45	.44	.43	.33	.21	.25	1.00	1.00	1.00			
4. Performance-Reward Association	.27	.39	.33	.13	.23	.19	.11	.17	.15	1.00	1.00	1.00
5. Subordinate Influence Over Goals	.02	.08	.07	-.05	.07	.03	.15	-.09	.03	.00	-.15	-.06
6. Satisfaction With Job	.31	.39	.36	.21	.10	.17	.09	.31	.30	.46	.37	.41
7. Perceived Success	.27	.27	.29	.06	-.05	.02	.24	.29	.16	.08	.03	.09

Significant values of r	.05	.01
Samples A and B	.23	.30
Sample C	.08	.11

Table 2-6 (cont'd.)

Scale Number and Name \ Sample	5			6			7		
	A	B	C	A	B	C	A	B	C
1. Superior-Subordinate Relationship									
2. Goal Clarity and Relevance									
3. Orientation Toward MBO									
4. Performance-Reward Association									
5. Subordinate Influence Over Goals	1.00	1.00	1.00						
6. Satisfaction With Job	.08	-.08	.06	1.00	1.00	1.00			
7. Perceived Success	-.10	-.02	-.05	-.10	.04	.01	1.00	1.00	1.00

> because of deficiencies in statistical methodology. Questions dealing with psychological change may well constitute the most important exceptions."[8]

The fact that there are problems in working with change studies should not discourage research, if for no other reason that we exist in a dynamic, not a static, world. At the same time, the experimenter must be aware of special problems of working with change measures. While it is beyond the scope of this report to go into detail concerning deficiencies in statistical methodology when working with change measures, a brief discussion of the major problems will be presented.

Much of the concern over change scores has come from those conducting research in the field of education. The concern is whether or not an instrument used over time is measuring the same thing. In studies of scholastic achievement, this concern can be quite real.

Carl Bereiter describes "persisting dilemmas" in the measurement of change.[9] The first of these is labeled the "over-correction-under-correction dilemma." The central point in this dilemma is the spurious element in the correlation between the initial scores and change scores in the same variable because of correlated error. The statistical basis for this observation is well documented. In 1924, both Thorndike[10] and Thomson[11] pointed out the spurious nature of the correlation between

---

[8]Carl Bereiter, "Some Persisting Dilemmas in the Measurement of Change," as in *Problems in Measuring Change*, ed. Chester W. Harris (Madison, Wisconsin: The University of Wisconsin Press, 1967) p. 3.

[9]*Ibid.*, p. 3-20.

[10]E. L. Thorndike, "The Influence of Chance Imperfections of Measures Upon the Relation of Initial Score to Gain or Loss," *Journal of Experimental Psychology*, Vol. 7 (1924) pp. 225-232.

[11]G. H. Thomson, "A Formula to Correct for the Effects of Errors of Measurement on the Correlation of Initial Values With Gains," *Journal of Experimental Psychology*, Vol. 7 (1924) pp. 321-324.

pre-test and observed gains. The observed change in a variable may be viewed as consisting of changes in a true score component and an error component. The error component of the variable and changes in the variable will be correlated injecting a spurious element into the correlation between the initial and change scores. It is also the nature of the correlated error to produce a negative correlation between initial scores and change scores on the same variable. Lord points out that,

> "if the research worker correlates pretest score with observed gain, he is correlating t_1 with the quantity t_2-t_1. Now it is known that t_1 contains an error of measurement, say e_1. If e_1 appears in t_1 with a negative sign, then it appears in the quantity t_2-t_1 with a positive sign. Thus there tends to be a spurious negative correlation between pretest and observed gain.[12]

The name given to this dilemma is based on the observation that methods of solving for the regression of gains in initial scores tend to lead to inconsistent results.[13] While Bereiter's point is well taken for those cases where initial scores are correlated with gain scores, it does not apply in those situations where gain scores on two different variables are being correlated. In this case, the error terms are uncorrelated and there will be no spurious negative correlations produced.

Lord has noted that another important consideration when working with change is whether or not the pretest and post-test are measuring the same thing.[14] As was pointed out, this is a real concern in research in education. For example, in developing a test for

---

[12]F. M. Lord, "Further Problems in the Measurement of Growth," *Educational and Psychological Measurement*, Vol. 18 (1958) p. 439.

[13]R. F. Garside, "The Regression of Gains Upon Initial Scores," *Psychometrika*, Vol. 21 (1956) pp. 67-77.

[14]Lord, pp. 437-451.

mathematical aptitude one must be alert to the possibility of changes in content over time. The items that discriminate in the eighth grade might be concerned with arithmetic while in the ninth grade algebraic questions might be the discriminating items. If this is true, then the test is not measuring the same thing over time.

In this study, there were no significant differences in pretest and post-test response distribution so the concern expressed by Lord does not apply.

Measures of Change

In order to investigate the dynamic relationship between the variables represented by the scales developed, two measures of change were calculated. The first was a product-moment correlation coefficient between change scores. The correlation coefficients were then corrected to eliminate the variance due to initial scores.

Dynamic Correlations. Change scores were obtained by subtracting the pretest score from the post-test score for each scale. Product moment correlation coefficients were computed between the raw change scores. Vroom calls this measure of the association between change scores a dynamic correlation coefficient.[15] His terminology will be followed here.

Corrected Correlation Coefficients. When the dynamic correlations were analyzed, there was evidence to indicate a regression toward the mean. Managers who rated high on a variable in the first measurement tended to decrease in score on the same variable between the two

---

[15]Victor H. Vroom, "A Comparison of Static and Dynamic Correlation Methods in the Study of Organizations," *Organizational Behavior and Human Performance*, Vol. 1 (1966) pp. 55-70.

measurements and managers with a low initial score tended to increase. Regression toward the mean is indicated by a negative correlation between initial scores and change scores when there is no significant change in the variance across all managers. The correlations between initial scores and change scores are shown in Table 2-7, and the means and variances are presented in Table 2-8. It should be noted that 70 percent of the correlations are negative while the variance remains unchanged.

In discussing the possible explanations for the phenomenon observed in Tables 2-7 and 2-8, Lord points out the complexity of the situation by showing that evidence indicating a regression toward the mean may, in fact, be real or may result from measurement error.[16] It has been previously pointed out in this chapter that the diagonal entries in Table 2-7 are spurious because of correlated error components. The off-diagonal correlations are not spurious since they involve different measurement errors.

There have been many methods proposed to correct for regression to the mean. The subject has been extensively discussed by Garside[17] and Lord.[18] Vroom suggests that change scores should be corrected by calculating second order partial correlations between change scores with initial scores in both variables held constant.[19] Second order partial correlations, $r_{x'y'\cdot xy}$, were computed for each pair of variables. Vroom calls these dynamic (corrected) correlation coefficients.[20]

---

[16] Lord, p. 446.

[17] Garside, pp. 67-77.

[18] F. M. Lord, "The Measurement of Growth," *Educational and Psychological Measurement*, Vol. 16 (1956) pp. 421-436.

[19] Vroom, p. 64.

[20] *Ibid.*, p. 65.

Table 2-7. Product-moment correlation coefficients between initial scores and change scores

Initial Scores	Change Scores						
	1	2	3	4	5	6	7
1. Superior-Subordinate Relationship	-.46[a]	-.32	-.15	.02	-.03	.02	-.03
2. Goal Clarity and Relevance	-.13	-.62	.08	.11	-.04	.04	-.23
3. Orientation Toward MBO	-.03	-.19	-.39	.13	-.19	.21	-.16
4. Performance-Reward Association	-.04	-.12	-.07	-.53	-.15	-.27	.01
5. Subordinate's Influence Over Goals	-.12	0	-.08	.08	-.76	.04	.10
6. Satisfaction With Job	-.23	-.21	-.10	-.11	-.05	-.61	-.06
7. Perceived Success	.05	.01	.03	0	-.02	.26	-.57

[a]The diagonal entries are correlations between a variable measured at time 1 and changes in the same variable from time 1 to time 2. Off-diagonal entries are correlations between a variable measured at time 1 and changes in a second variable.

Significant values of r

.05 level = .23
.01 level = .30

Table 2-8. Means and variables for first and second administration of questionnaire

Variables	Means		Variances	
	Time 1	Time 2	Time 1	Time 2
1. Superior-Subordinate Relationship	3.1	3.2	.11	.14
2. Goal Clarity and Relevance	2.8	3.0	.23	.23
3. Orientation Toward MBO	3.0	3.4	.74	.96
4. Performance-Reward Association	3.8	3.7	.49	.50
5. Subordinate's Influence Over Goals	2.8	3.0	1.2	.90
6. Satisfaction With Job	3.1	3.2	.83	.64
7. Perceived Success	3.0	3.1	.81	.73

Inference of Causality

The difficulties of performing laboratory experiments and controlled field experimentation have been limiting factors in the investigation of complex organizational phenomena. Field studies have the advantage of dealing with the real world but have the operational disadvantage of limiting the experimenter's control over the variables. Most organizational research is carried out by obtaining simultaneous measures on variables and statistically analyzing the relationships, most often using correlation techniques.

The problems of inferring causality from static correlational methods is well known. If a statistically significant relationship is found between variables x and y, one cannot determine whether variable x causes variable y, variable y causes variable x, or whether some third variable, z, causes both variables x and y to move in a correlated fashion.

When longitudinal data are available, there are methods to infer causality from correlational data. One method used to infer causality from correlational data is called the cross-lagged panel correlation method. This approach, initially discussed by Simon,[21,22] has been more recently considered by Pelz and Andrews,[23] Blalock,[24,25]

---

[21]Herbert A. Simon, "Spurious Correlations: A Causal Interpretation," *Journal of the American Statistical Association*, Vol. 49 (1954) pp. 467-479.

[22]Herbert A. Simon, *Models of Man* (New York: Wiley, 1957).

[23]D. C. Pelz and F. M. Andrews, "Detecting Causal Priorities in Panel Study Data," *American Sociological Review*, Vol. 29 (1964) pp. 836-848.

[24]H. M. Blalock, "Correlation and Causality: The Multivariate Case," *Social Forces* (March, 1961) pp. 246-251.

[25]H. M. Blalock, "Spuriousness Versus Intervening Variables: The Problem of Temporal Sequences," *Social Forces* (May, 1962) pp. 330-336.

Campbell,[26] Campbell and Stanley,[27] and Lawler.[28]

To use this method, measures are taken at two different points in time and six correlation coefficients are obtained. Figure 2-1 shows the relevant correlational coefficient for two hypothetical variables, A and B.

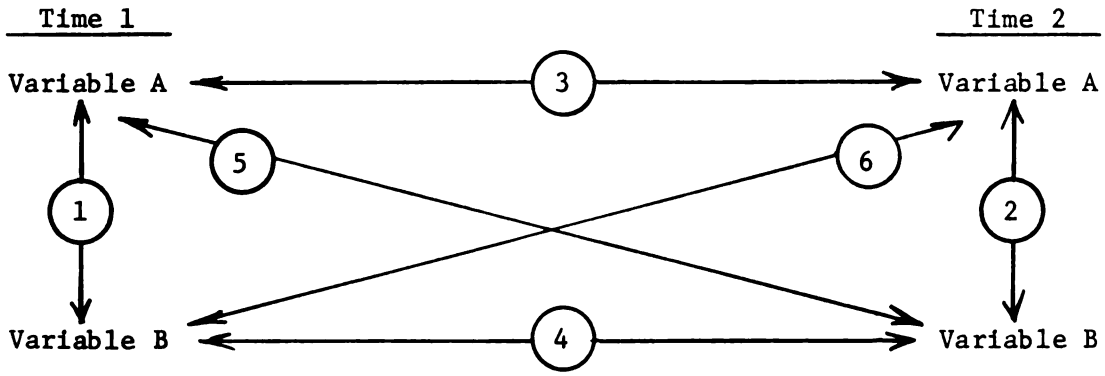


Figure 2-1. Pattern of cross-lagged correlations.

The logical basis of the method is given by Lawler.

> "The logic underlying this kind of analysis rests upon the time lag that typically exists when one variable causes another. The argument is that if A causes B, then the present state of A should be more strongly related to B's future state than to B's past or present state. Thus, where A→B, then r_{ab} where B is measured after A should be greater than r_{ab} where B is measured either before or at the same time as A. Thus, by comparing the relative sizes of r_{ab1}, r_{ab2} and r_{ab3} where B is measured before, after, and at the same time as A, it is possible to determine whether the hypotheses A→B or B→A is more tenable.[29]

---

[26]Donald T. Campbell, "From Description to Experimentation: Interpreting Trends as Quasi-Experiments," as in *Problems in Measuring Change*, ed. Chester W. Harris (Madison, Wisc.: University of Wisconsin Press, 1967) p. 10.

[27]Donald T. Campbell and J. C. Stanley, "Experimental and Quasi-Experimental Designs for Research on Teaching, as in *Handbook of Research on Teaching*, ed. N. C. Gage (New York: Rand McNally, 1963).

[28]Edward E. Lawler, "A Correlational-Causal Analysis of the Relationship Between Expectancy Attitudes and Job Performance," *Journal of Applied Psychology*, Vol. 52, No. 6 (1968) pp. 462-468.

[29]*Ibid.*, p. 463.

Pelz and Andrews point out that to strongly support the hypotheses that variable A causes variable B, then correlations 1, 2, 5, and 6 must have the relationship 5 > (1=2) > 6.[30] They further note that an observation of 5 > 6, *but not* an observation of 5 > (1=2), is still evidence that variable A causes variable B, although the interval of measurement may not have matched the true causal interval.[31]

There are some methodological issues in the use of this method, such as the test-retest effect, instability of measures, and uneven reliabilities, which are beyond the scope of this report. In a reflection of his earlier criticism of the method, Campbell dispels some of the issues and concludes that,

> "the design represents a welcome addition to our armanentarium of quasi-experimental analyses. Using it on the bodies of data and exposing the results to the criticisms of colleagues wise in the specific content areas will in the long run enable us better to fill out the check-list of plausible rival hypotheses.[32]

Testing for Moderators

One of the stated objectives of this research is to determine if any of the hypothesized dynamic relationships are moderated by personality characteristics of the managers. Anastasi notes that it is not uncommon to find that a validity coefficient, when computed for a total group, may be too low to be of much practical value; however, when recomputed for subsets of individuals differing in some identifiable characteristics, validity may be high in one subset and negligible in another.[33]

---

[30] Pelz and Andrews, p. 838.

[31] *Ibid.*, p. 839.

[32] Campbell, p. 242.

[33] Anne Anastasi, *Psychological Testing* (New York: Macmillan, 1964) p. 286.

One way to test for this effect would be to divide the subjects into high and low groups on some third variable and to compute the correlations in both groups. The significance level of the difference between the correlations obtained for the high and low groups could then be tested. While this procedure is effective, it becomes very laborious as the number of potential moderating variables increase by requiring excessive data manipulation.

To assist in searching for moderator variables in this research, a family of computer programs, MODERATOR, was designed to show simultaneously the moderating effects and nonlinear relations among a set of variables.[34] Given that the X's represent deviation scores from their means, it can be shown that X_k moderates X_j on X_i if the product of X_k and X_i contributes to the correlation, $^{r}X_j (X_iX_k)$. The computer program considers each variable as a potential moderator of any of the possible dynamic relationships between the variables. Since the program analyzes all possible relationships, information is generated other than that needed to assess moderating effects. The possible combinations are shown in Figure 2-2 and their interpretation follows.

---

[34] J. E. Hunter and R. J. Chesser, "MODERATOR: A Family of Computer Programs Designed to Show Simultaneously the Moderating Effects and Nonlinear Relationships Among a Set of Variables." Unpublished paper written at Michigan State University, East Lansing, Mich., 1971.

	X's	$X_j \cdot X_i$
X's	IV	I
$X_j \cdot X_i$	III	II

Figure 2-2. Output generated by program MODERATOR.

Quadrant IV contains the inter-item correlations between the input variables. Quadrants I and III contain the information to assess moderating effects. The correlations in these quadrants represent the relationship between combinations of the variables X_i, X_j and X_k. If one variable is represented, the correlation, $^{r}X_j$ $(X_j \cdot X_j)$, reflects the skewness in the variable X_j. A non-zero value of the correlation means that the variable, X_j, is skewed. A negative value means that X_j is skewed to the left or values tend to be concentrated at the high end of the scale. Where two variables are represented, the correlation, $^{r}X_j$ $(X_j \cdot X_i)$ indicates predictor orthogonality. A zero correlation is interpreted as supporting a hypothesis of orthogonality between X_j and X_i. Moderating effects are obtained from the correlation where all three variables are represented, $^{r}X_j$ $(X_i \cdot X_k)$. If this correlation is non-zero and the variables are relatively unskewed and uncorrelated, then it is known that X_k moderates the relationship between X_k and X_i. If this is true, then it is also true that X_i moderates the relationship between X_j and X_k.

The above procedure only shows whether a particular variable acts as a moderator in a given relationship. While it is an efficient search procedure, the experimenter is more often interested in knowing the correlation between X_i and X_j for those subjects who rate high and low on X_k. One way to do this would be to divide the subjects into high and low groups on the isolated moderator variable and calculate the two

correlation coefficients for the moderated relationship. Assuming that the moderator variable is normally distributed, estimates of the correlation between X_i and X_j for high and low values of X_k can be made from the output of MODERATOR. If the subjects are divided into two groups, half high (+) and half low (-), then equation (1) applies.

$$(1) \quad {}^{r}X_iX_j = .5\ ({}^{r}X_iX_j[+] + {}^{r}X_iX_j[-])$$

Since only ${}^{r}X_iX_j$ is known, there are two unknowns and only one equation, which cannot be solved. If X_k is normally distributed, equation (2) holds.

$$(2) \quad E(X_iX_jX_k) = .5\ (.8{}^{r}X_iX_j[+] - .8{}^{r}X_iX_j[-])$$

It then follows that:

$$(3) \quad {}^{r}X_iX_jX_k = .50\ ({}^{r}X_iX_j[+] - {}^{r}X_iX_j[-])$$

Since ${}^{r}X_iX_jX_k$ is generated by MODERATOR, the combinations of equations (1) and (3) give two equations and two unknowns. Solving equations (1) and (3) simultaneously for ${}^{r}X_iX_j(+)$ and ${}^{r}X_iX_j(-)$ gives equations (4) and (5), which are the correlations of interest.

$$(4) \quad {}^{r}X_iX_j[+] = {}^{r}X_iX_j + 1.25\ {}^{r}X_iX_jX_k$$

$$(5) \quad {}^{r}X_iX_j[-] = {}^{r}X_iX_j - 1.25\ {}^{r}X_iX_jX_k$$

A test of significant difference between the two correlation coefficients, such as conversion to Fisher's Z's, should be consistent with the observation of a non-zero value of ${}^{r}X_j(X_iX_k)$ in the search program.

The data generated by program MODERATOR was also used to graphically represent the moderating effects of a variable Z on the relationship

between variables X and Y. The procedure used was to select convenient values of X and Z and to compute corresponding values for the mean of Y. To facilitate computation and interpretation of results the standardized scores of +1, 0, and -1 were used as values of X and Z. The expected value of Y conditioned upon X and Z was then computed. The standard scores of X and standard mean scores of Y were plotted with Z parameterized. The resulting plot shows the relationship between changes in X and mean changes in Y for managers rating high and low on Z.

The computational method utilizes the regression equation of Y on X and Z.

$$Y = \alpha X + \beta Z + \gamma XZ$$

where

$$\alpha = r_{XY}$$

$$\beta = r_{YZ}$$

$$\gamma = r_{XYZ}$$

A 3X3 table of means was computed in the following manner:

$$[\bar{Y}] = \begin{pmatrix} \beta & \beta & \beta \\ 0 & 0 & 0 \\ -\beta & -\beta & -\beta \end{pmatrix} + \begin{pmatrix} -\alpha & 0 & -\alpha \\ -\alpha & 0 & \alpha \\ -\alpha & 0 & -\alpha \end{pmatrix} + \begin{pmatrix} -\alpha & 0 & \alpha \\ 0 & 0 & 0 \\ \alpha & 0 & -\alpha \end{pmatrix}$$

The table of means takes the form shown below:

	X		
	-1	0	+1
+1	$\bar{Y}_{11}$	$\bar{Y}_{12}$	$\bar{Y}_{13}$
0	$\bar{Y}_{21}$	$\bar{Y}_{22}$	$\bar{Y}_{23}$
-1	$\bar{Y}_{31}$	$\bar{Y}_{32}$	$\bar{Y}_{33}$

The relationship between X and Y for those managers rating high on Z is represented by plotting the points $(-1, \overline{Y}_{11})$, $(0, \overline{Y}_{12})$, and $(+1, \overline{Y}_{13})$. For low rating managers, the relationship is obtained by plotting $(-1, \overline{Y}_{31})$, $(0, \overline{Y}_{32})$, and $(+1, \overline{Y}_{33})$. The middle row in the table represents the values of $\overline{Y}$ for a mean (0) rating on Z.

CHAPTER 3

RESULTS AND TEST OF HYPOTHESES

Presentation of Results

The purpose of this chapter is to present the results of the analyses of the data. Both the A and B form of each hypothesis are tested. While it is not meaningful to test causality in a relationship where no statistical significant association is found, the reporting of the cross-lagged panel correlations is a convenient way to display the data.

It was pointed out in Chapter 2 that two measures of the association between change scores were obtained. One measure was a product-moment correlation coefficient between raw change scores. A second measure was obtained by correcting the correlation coefficient between change scores to eliminate the variance due to initial responses. Both sets of correlations are presented in Table 3-1, page 65. It can be observed that the two measures are very similar. In fact, while the corrected correlation coefficients are reported, the conclusions would be the same if the correlation between raw change scores were used.

Figure 3-1 shows the format that will be used to present the data needed to test the hypotheses. Table 3-2, page 67, presents the inter-scale correlation coefficients between the first and second administrations of the questionnaire. Correlations 3, 4, 5, and 6 in the cross-lagged pattern can be obtained from the table. For example, the correlation between the superior-subordinate relationship, as measured at time 1, and goal clarity and relevance, as measured at time 2, is found in

Table 3-1. Matrix of raw and corrected correlation coefficients between change scores

Variable	Raw and Corrected Change Score Correlation Coefficients[a]													
	1		2		3		4		5		6		7	
1. Superior-Subordinate Relationship	1.0	1.0												
2. Goal Clarity and Relevance	.30	.25	1.0	1.0										
3. Orientation Toward MBO	.24	.31	.05	.15	1.0	1.0								
4. Performance-Reward Association	.23	.30	.12	.15	.08	.11	1.0	1.0						
5. Subordinate's Influence Over Goals	.14	.19	.08	.11	.07	-.04	-.01	-.06	1.0	1.0				
6. Satisfaction With Job	.34	.36	.11	.13	.23	.27	.37	.26	-.06	-.06	1.0	1.0		
7. Perceived Success	-.16	.07	.06	-.06	.21	.20	-.10	-.05	-.07	.06	-.13	.07	1.0	1.0

[a]The correlation between raw change scores is reported first, followed by the corrected coefficient.

Significant values of r

.05 level = .23
.01 level = .30

Key:

1. The static correlation between variables A and B obtained from the first administration of the questionnaire.

2. The static correlation between variables A and B obtained from the second administration of the questionnaire.

3. The correlation between variable A as measured in the first and second administration of the questionnaire.

4. The correlation between variable B as measured in the first and second administration of the questionnaire.

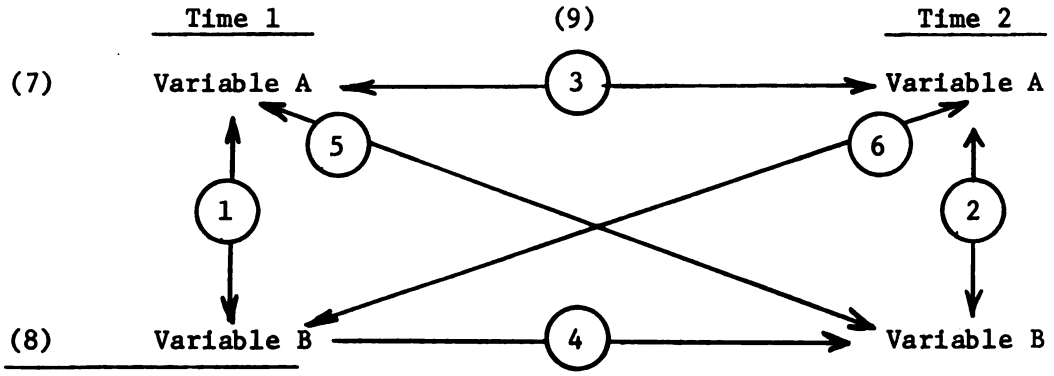
5. The correlation between variable A as measured in the first administration of the questionnaire and variable B as measured in the second administration.

6. The correlation between variable B as measured in the first administration of the questionnaire and variable A as measured in the first administration.

7. The internal reliability of the scale used to measure variable A.

8. The internal reliability of the scale used to measure variable B.

9. The corrected dynamic correlation between changes in variable A and changes in variable B.



*Statistically significant at .05 confidence level.

**Statistically significant at .01 confidence level.

⇒Hypothesized direction of causality.

Figure 3-1. Format for displaying data.

Table 3-2. Inter-scale correlation coefficients between first and second administrations of the questionnaire

First Administration	Second Administration 1	2	3	4	5	6	7
1. Superior-Subordinate Relationship	.46[a]	.01	.26	.26	-.14	.35	.32
2. Goal Clarity and Relevance	.23	.23	.36	.13	-.04	.17	-.06
3. Orientation Toward MBO	.39	.09	.51	.19	-.10	.29	.08
4. Performance-Reward Association	.20	.00	.03	.42	-.23	.23	.12
5. Subordinate's Influence	-.10	-.11	.05	.02	.17	.08	-.07
6. Satisfaction With Job	.05	-.05	.02	.33	-.07	.48	-.01
7. Perceived Success	.31	.07	.20	.08	-.19	.19	.37

[a]The diagonal entries are correlations between a variable measured at time 1 and time 2. Off-diagonal entries are correlations between a variable measured at time 1 and a second variable measured at time 2.

Significant value of r

.05 level = .23
.01 level = .30

the table at the intersection of the superior-subordinate relationship under the heading, "First Administration," with goal clarity and relevance (variable 2) under the heading, "Second Administration." The value obtained is .01.

Test of Hypothesis

Superior-Subordinate Relationship - Subordinate's Influence Over Goals

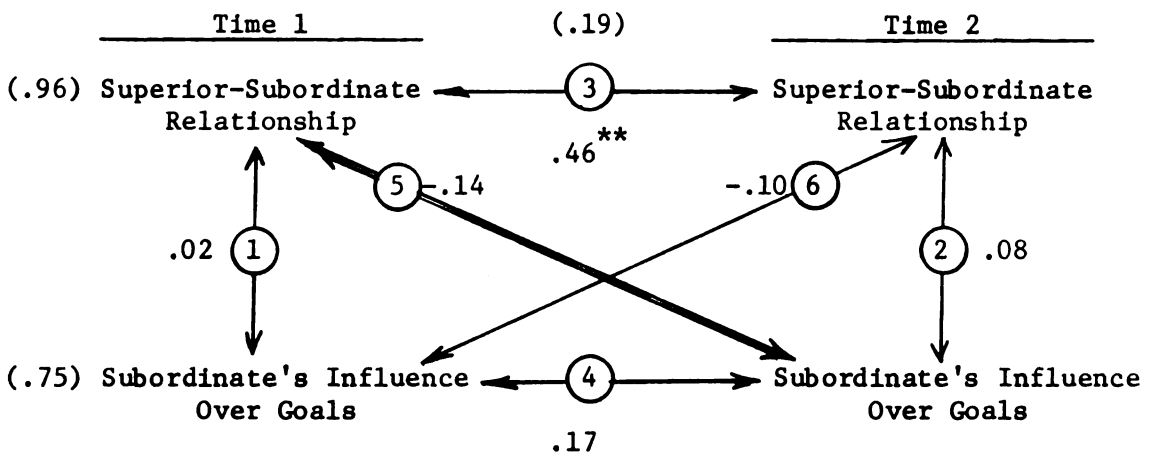


Figure 3-2. Cross-lagged panel correlation coefficients for the relationship between the superior-subordinate relationship and the subordinate's influence over goals.

Hypothesis 1A. Increases (decreases in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's influence in the goal setting process.

The data do not support this hypothesis. Changes in the superior-subordinate relationship and changes in the subordinate's influence over goals are not statistically significantly related ($r = .19, .10 > p > .05$).

Hypothesis 1B. Changes in the superior-subordinate relationship will cause changes in the subordinate's influence in the goal setting process.

As was pointed out in Chapter 2 in the section, "Inference of Causality," one would expect a correlational pattern of $5 > (1=2) > 6$

in Figure 4-2 if the data were to support hypothesis 1B. This is clearly not the case. In fact, none of the correlations, 1, 2, 5, and 6, are statistically different from zero.

Superior-Subordinate Relationship - Goal Clarity and Relevance

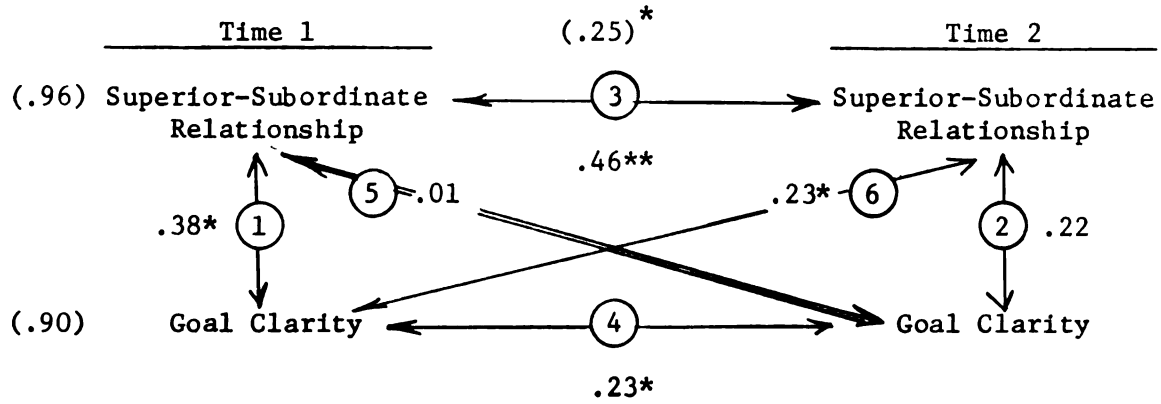


Figure 3-3. Cross-lagged panel correlations between superior-subordinate relationship and goal clarity.

Hypothesis 2A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the clarity and relevance of the goals set.

The data support this hypothesis. Changes in the superior-subordinate relationship are positively associated with changes in goal clarity and relevance ($r = .25$, $p < .05$).

Hypothesis 2B. Changes in the superior-subordinate relationship will cause changes to occur in goal clarity and relevance.

It can be seen in Figure 3-3 that the cross-lagged correlations do not fit the pattern required to support the causal hypothesis. While the required relationships are not observed to infer that either variable is the causal variable ($5 > (1=2) > 6$ or $6 > (1=2) > 5$), the relatively greater magnitude of correlation 6 as compared to correlation 5 suggests that goal clarity and relevance may well be the causal variable.

Superior-Subordinate Relationship -
Subordinate's Orientation Toward MBO

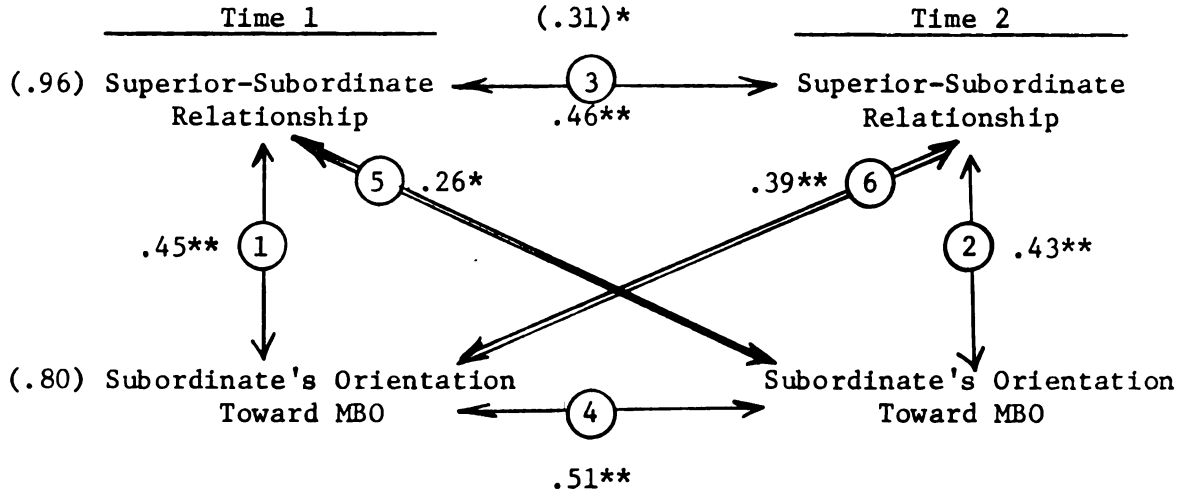


Figure 3-4. Cross-lagged panel correlations between the superior-subordinate relationship and the subordinate's orientation toward MBO.

Hypothesis 3A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's orientation toward MBO.

The data support this hypothesis. Changes in the superior-subordinate relationship are statistically significantly related to changes in the subordinate's orientation toward MBO ($r = .31$, $p < .05$).

Hypothesis 3B. The causality in the relationship between changes in the superior-subordinate relationship and changes in the subordinate's orientation is mutually reinforcing in that changes in each variable will produce changes in the other variable.

The cross-lagged panel correlations support the hypothesis that the causality is reinforcing. Correlations 5 and 6 are both statistically significant ($r_5 = .26$, $p < .05$; $r_6 = .39$, $p < .01$). While the observed value of correlation 6 is greater than correlation 5, the two are not statistically significantly different ($Z = .8$, $p > .10$). In effect, the current state of each variable is an equally good predictor of the future state of the other variable.

Superior-Subordinate Relationship - Subordinate's Satisfaction With Job

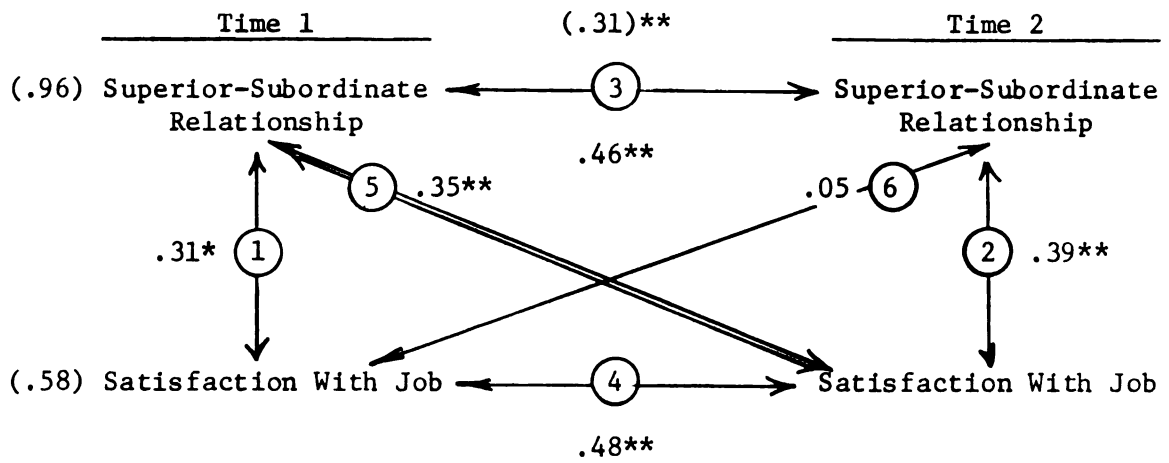


Figure 3-5. Cross-lagged panel correlation between the superior-subordinate relationship and the subordinate's satisfaction with his job.

Hypothesis 4A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's satisfaction with his job.

The results support the hypothesis that changes in the superior-subordinate relationship are positively associated with changes in the subordinate's satisfaction with his job ($r = .36$, $p < .01$).

Hypothesis 4B. Changes in the superior-subordinate relationship will cause changes in the subordinate's satisfaction with his job.

The pattern of correlations shown in Figure 3-5 supports the inference that the superior-subordinate relationship causes job satisfaction. The observed pattern of correlations closely approximates the model, $5 > (1=2) > 6$, necessary if the superior-subordinate relationship is, in fact, the causal variable. Correlation 5 ($r = .35$) is greater than correlation 6 ($r = .05$), indicating that the current state of the superior-subordinate relationship is a better indicator of the future state of the subordinate's satisfaction with his job than is the reverse situation.

Superior-Subordinate Relationship -
Subordinate's Perceived Success

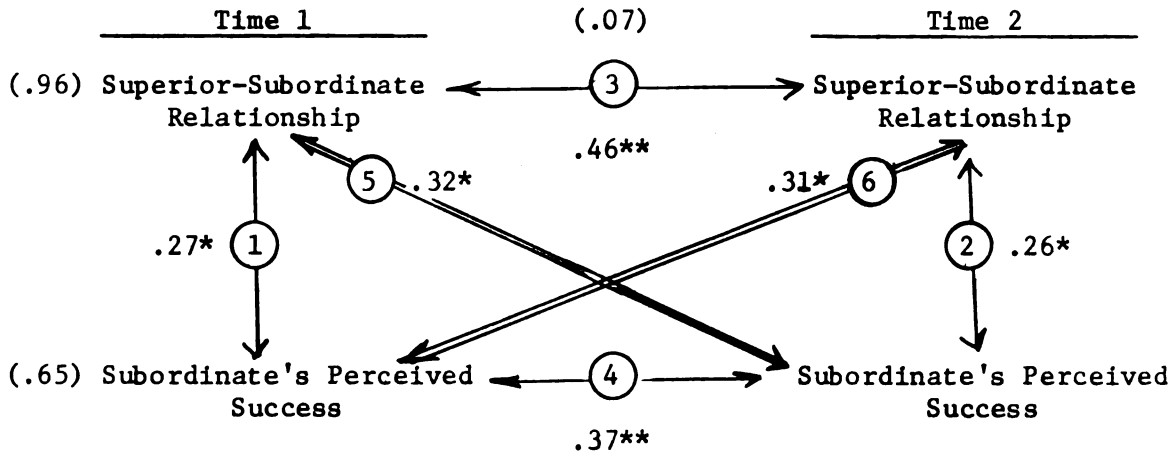


Figure 3-6. Cross-lagged panel correlations between the superior-subordinate relationship and the subordinate's perceived success.

Hypothesis 5A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's perceived success in goal attainment.

The hypothesized relationship was not observed. Changes in the superior-subordinate relationship were found to be unrelated to changes in the subordinate's perceived success ($r = .07$, $p > .10$).

Hypothesis 5B. The causality is mutually reinforcing in that changes in each variable will cause changes in the other variable.

While the data do not support the A form of the hypothesis, the B form is supported. In Figure 3-6 correlations 5 and 6 are both satistically significant ($r_5 = .32$, $p < .05$; $r_6 = .31$, $p < .05$) reflecting their mutual predictive capability.

Superior-Subordinate Relationship -
Performance-Reward Association

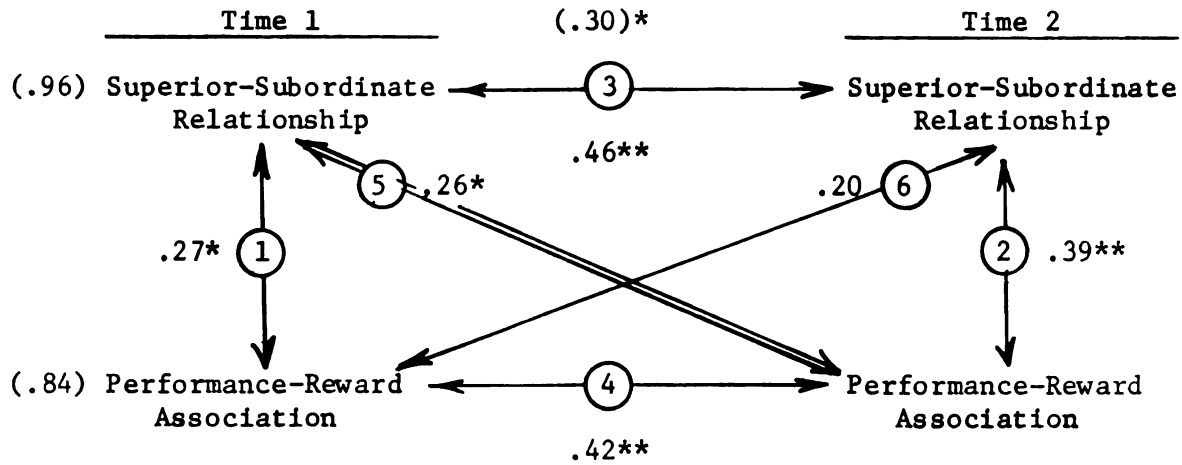


Figure 3-7. Cross-lagged panel correlations between the superior-subordinate relationship and the subordinate's perception of the relationship between rewards and actual job performance.

Hypothesis 6A. Increases (decreases) in the superior-subordinate relationship are associated with increases (decreases) in the subordinate's perception of the relationship between rewards and actual job performance.

The magnitude and the sign of the correlation coefficient support the hypothesis that changes in the superior-subordinate relationship are directly related to changes in the subordinate's association between rewards and actual job performance ($r = .30$, $p < .05$).

Hypothesis 6B. Changes in the superior-subordinate relationship will cause changes in the subordinate's perception of the relationship between rewards and actual job performance.

The correlation pattern required to infer that the superior-subordinate relationship is the causal variable ($5 > (1=2) > 6$) was not observed; however, the data lend some support to the hypothesis. The observed value of correlation 5 ($r_5 = .26$) is greater than correlation 6 ($r_6 = .20$) which is necessary if the superior-subordinate relationship is the causal variable but the two correlations are not significantly different ($Z = .3$, $p > .10$).

Subordinate's Influence - Goal Clarity and Relevance

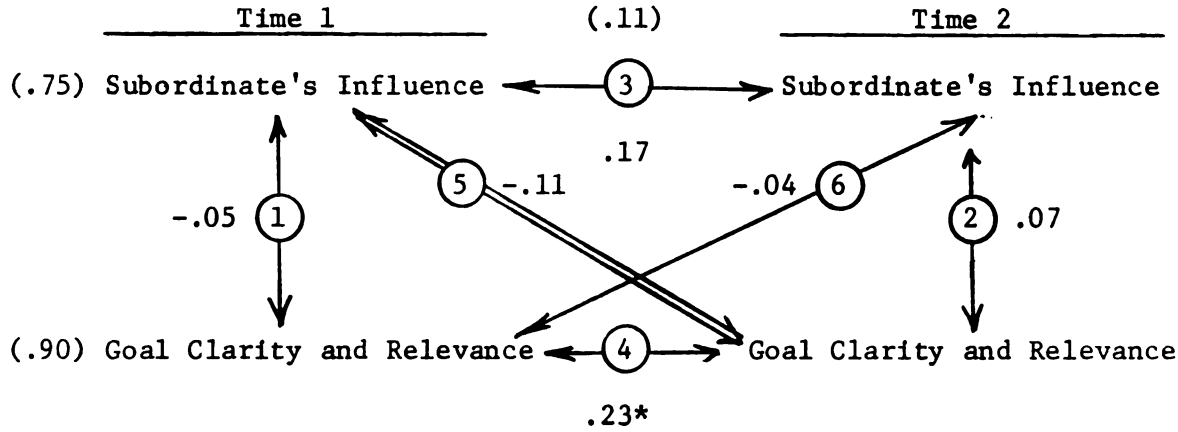


Figure 3-8. Cross-lagged correlations between subordinate's influence and goal clarity and relevance.

Hypothesis 7A. Increases (decreases) in the subordinate's influence in the goal setting process are associated with increases (decreases) in the clarity and relevance of goals.

It was found that changes in the subordinate's influence were not statistically significantly related to changes in goal clarity and relevance ($r = .11$, $p > .10$).

Hypothesis 7B. Changes in the subordinate's influence in the goal setting process will cause changes in the clarity and relevance of the goals set.

The cross-lagged correlations presented in Figure 3-8 do not support the inference of causality. All of the cross-lagged correlations but correlation 4 ($r_4 = .23$, $p \leq .05$) are not significantly different from zero.

Goal Clarity and Relevance - Subordinate's Orientation Toward MBO

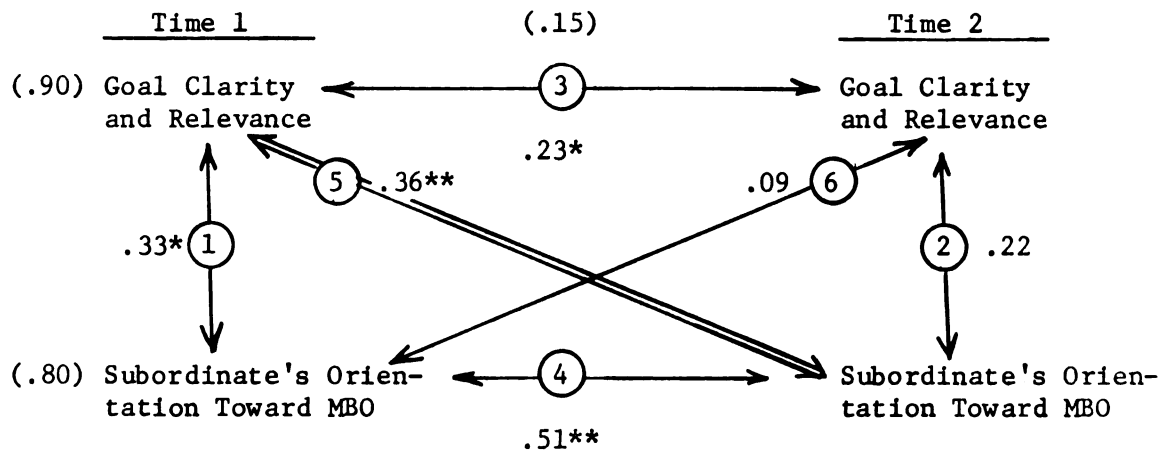


Figure 3-9. Cross-lagged panel correlations for the relationship between goal clarity and relevance and the subordinate's orientation toward MBO.

Hypothesis 8A. Increases (decreases) in the clarity and relevance of the goals set for the subordinate are associated with increases (decreases) in the subordinate's orientation toward MBO.

This hypothesis is not supported. Changes in goal clarity and relevance are not significantly related to changes in the subordinate's orientation toward MBO ($r = .15$, $p > .10$).

Hypothesis 8B. Changes in the clarity and relevance of the goals set for the subordinate will cause changes in the subordinate's orientation toward MBO.

The data support the B form of the hypothesis. The pattern of correlations presented in Figure 3-9 closely approximates the necessary pattern, $5 > (1=2) > 6$, if goal clarity and relevance is the true causal variable.

Orientation Toward MBO -
Satisfaction With Job

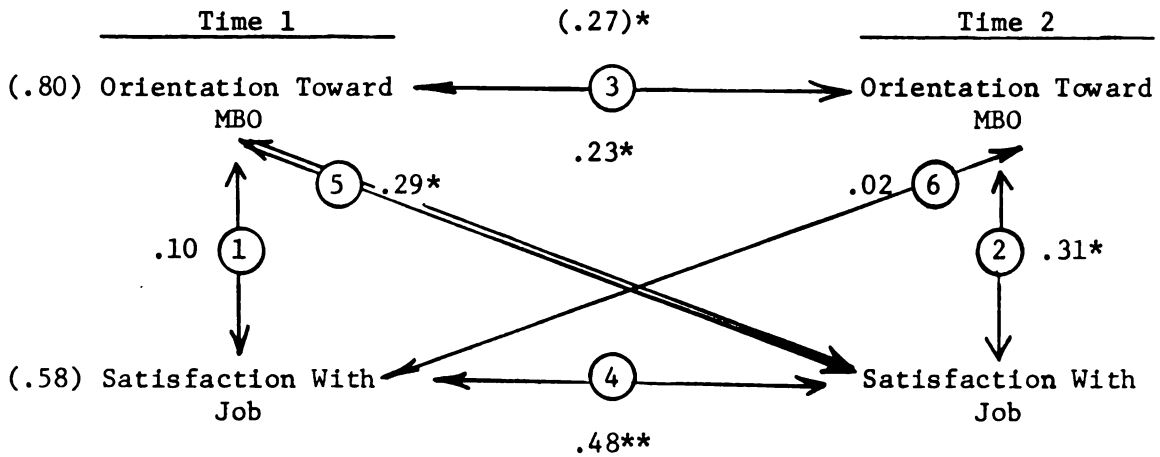


Figure 3-10. Cross-lagged panel correlations between the subordinate's orientation toward MBO and his satisfaction with his job.

Hypothesis 9A. Increases (decreases) in the subordinate's orientation toward MBO are associated with increases (decreases) in the subordinate's satisfaction with his job.

This hypothesis is supported. Changes in the subordinate's orientation toward MBO were statistically significantly and positively related to changes in the subordinate's satisfaction with his job ($r = .27$, $p < .05$).

Hypothesis 9B. Changes in the subordinate's orientation toward MBO will cause changes in the subordinate's satisfaction with his job.

The correlational pattern presented in Figure 3-10 is supportive of the hypothesis that the current state of orientation toward MBO is a better predictor of the future state of job satisfaction than is the reverse situation. The support is somewhat weakened by the difference observed in correlations 1 and 2 ($r_1 = .10$, $r_2 = .31$). In the strict interpretation of the cross-lagged model, these two correlations should not be statistically different.

Performance-Reward Association - Satisfaction With Job

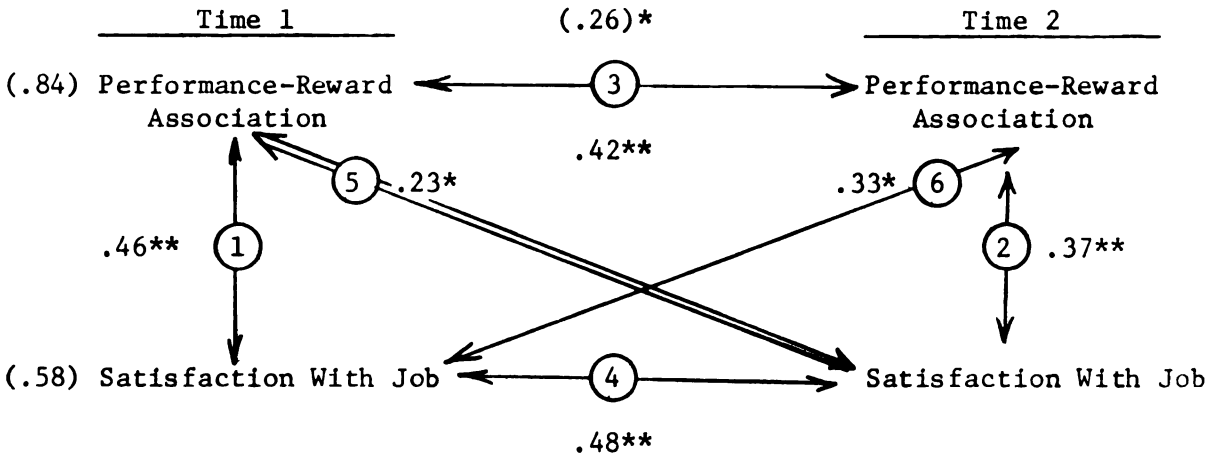


Figure 3-11. Cross-lagged panel correlations between the subordinate's perception of the association between rewards and actual job performance and his satisfaction with his job.

Hypothesis 10A. Increases (decreases) in the subordinate's perception of the association between rewards and actual job performance are associated with increases (decreases) in the subordinate's satisfaction with his job.

The data support the view that changes in the association of rewards with actual job performance are significantly and directly related to changes in satisfaction with job ($r = .26$, $p < .05$).

Hypothesis 10B. Changes in the subordinate's perception of the association between rewards and actual job performance will cause changes in the subordinate's satisfaction with his job.

The pattern of correlations does not support the hypothesized causality. If the association between rewards and performance is the causal variable then the pattern, $5 > (1=2) > 6$, should be observed. Correlation 5 ($r_5 = .23$) and 6 ($r_6 = .33$) are not significantly different and the expected relationship between them and correlations 1 and 2 are not observed. Since both correlations 5 and 6 are significantly different from zero ($p < .05$) and at the same time are not significantly different, a more plausible hypothesis is that the relationship between the two variables is mutually reinforcing.

Perceived Success - Job Satisfaction

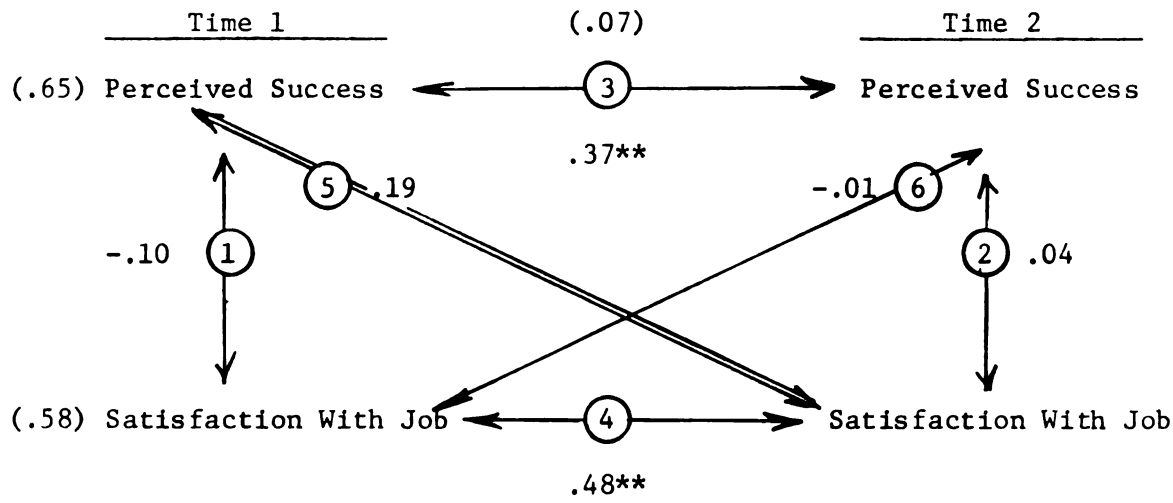


Figure 3-12. Cross-lagged panel correlations between changes in subordinate's perceived success and changes in his satisfaction with job.

Hypothesis 11A. Increases (decreases) in the subordinate's perceived success are associated with increases (decreases) in the subordinate's satisfaction with his job.

This hypothesis is not supported by the data. Changes in perceived success are not significantly related to job satisfaction ($r = .07$, $p > .10$).

Hypothesis 11B. Changes in the subordinate's perceived success will cause changes in the subordinate's satisfaction with his job.

The correlation pattern, $5 > (1=2) > 6$, is not observed. However, there is some support for the hypothesis in that correlation 5 is greater than correlation 6 ($p < .10$), as would be expected if perceived success were, in fact, the causal variable.

Subordinate's Influence - Orientation Toward MBO

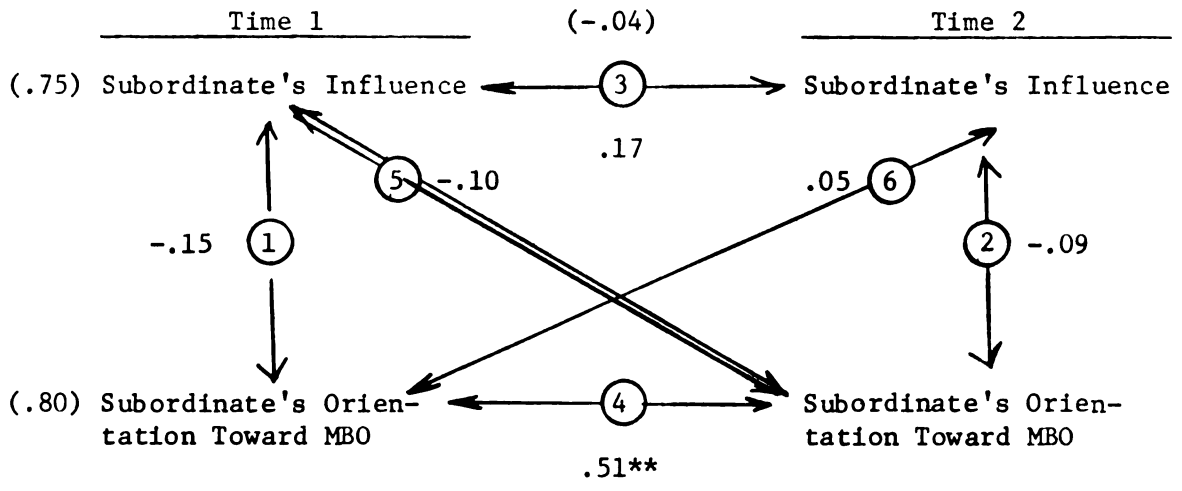


Figure 3-13. Cross-lagged correlation between changes in subordinate's influence in the goal setting process and changes in subordinate's orientation toward MBO.

Hypothesis 12A. Increases (decreases) in the subordinate's influence in the goal setting process are related to increases (decreases) in the subordinate's orientation toward MBO.

The data do not support the hypothesis ($r = -.04$, $p > .10$).

Hypothesis 12B. Changes in the subordinate's perceived influence in the goal setting process will cause changes in the subordinate's orientation toward MBO.

The pattern of cross-lagged correlations presented in Figure 3-13 does not permit an inference of causality. Therefore, the hypothesis is not supported.

Implied Hypotheses

When working with seven variables, there are twenty-one possible relationships between pairs of variables that could be analyzed. By selecting only a subset of the total relationships from which to formulate hypotheses, the experimenter is, in effect, implying that the remaining relationships are not significant. Twelve hypotheses concerning paired relationships were formulated in this research. This leaves nine

relationships for which no hypotheses were explicitly stated. These nine relationships are listed in Table 3-3 along with a measure of association.

In addition to each pair of variables not being significantly related ($p < .05$), inferences of causality also could not be made. This can be confirmed by noting that cross-lagged correlations 5 and 6, which may be obtained for each pair of variables from Table 3-2, do not significantly differ from zero ($p < .05$).

Moderated Relationships

One of the stated objectives of this research was to determine if any of the Ghiselli dimensions moderated dynamic relationships between variables. Instead of formulating specific hypotheses of moderated relationships, a search strategy was used. The purpose of this section is to report the results of the search for moderator variables.

The experimenter must be cautious in interpreting the results of a blind search procedure. One should expect a portion of the relationships to satisfy a test for moderation simply by chance. For example, at the 5 percent confidence level, 5 percent of the total relationships analyzed could be moderated by chance alone.

Tables 3-4 and 3-5 show the dynamic relationships that were found to be moderated by one or more of the Ghiselli dimensions. The tables present the correlation coefficients between variables for the high and low rating managers on a particular Ghiselli dimension. To confirm the proposition that the relationships in Tables 3-4 and 3-5 are moderated, the correlation coefficients can be converted to Fisher's Z's and a test of significance performed. In each case, the moderated correlation coefficients for the managers rating themselves high or low are significantly different ($p < .05$).

Table 3-3. Implied hypotheses

Change Relationships	Corrected Correlation Coefficient
Goal Clarity - Performance-Reward Association	.15
Goal Clarity - Satisfaction With Job	.13
Goal Clarity - Perceived Success	-.06
Orientation Toward MBO - Performance-Reward Association	.11
Orientation Toward MBO - Perceived Success	.20[a]
Performance-Reward Association - Subordinate's Influence	.06
Performance-Reward Association - Perceived Success	.05
Subordinate's Influence - Satisfaction With Job	-.06
Subordinate's Influence - Perceived Success	.06

[a]For a discussion of this relationship see "Discussion of Non-significant Results" in Chapter 4.

Talble 3-4. Moderated relationships between changes in perceived success, satisfaction with job, and superior-subordinate relationship.[a]

	Changes in Subordinate's Perceived Success							
	Perceived Occupational Level		Initiative		Self-Assurance		Intelligence	
	Low	High	Low	High	Low	High	Low	High
Changes in Satisfaction With Job	+.15	-.41**	.30	-.57**	+.11	-.37*	+.16	-.42**
Changes in the Superior-Subordinate Relationship	+.14	-.46**	+.17	-.49**	+.10	-.42**	.00	-.32*

[a]In each case, the correlation coefficients for the high and low groups are significantly different ($p < .05$).

*$p < .05$.

**$p < .01$.

Table 3-5. Moderated relationships between changes in performance-reward association, satisfaction with job, superior-subordinate relationship and orientation toward MBO.[a]

	Changes in Performance-Reward Association							
	Perceived Occupational Level		Initiative		Self-Assurance		Intelligence	
	Low	High	Low	High	Low	High	Low	High
Changes in Satisfaction With Job	+.74**	.00	+.69**	+.05				
Changes in Superior-Subordinate Relationship			+.53**	-.07	.40*	.00		
Orientation Toward MBO			+.34*	-.16	+.32*	-.14	+.33*	-.12

[a]In each case the correlation coefficients for the high and low group are significantly different ($p < .05$).

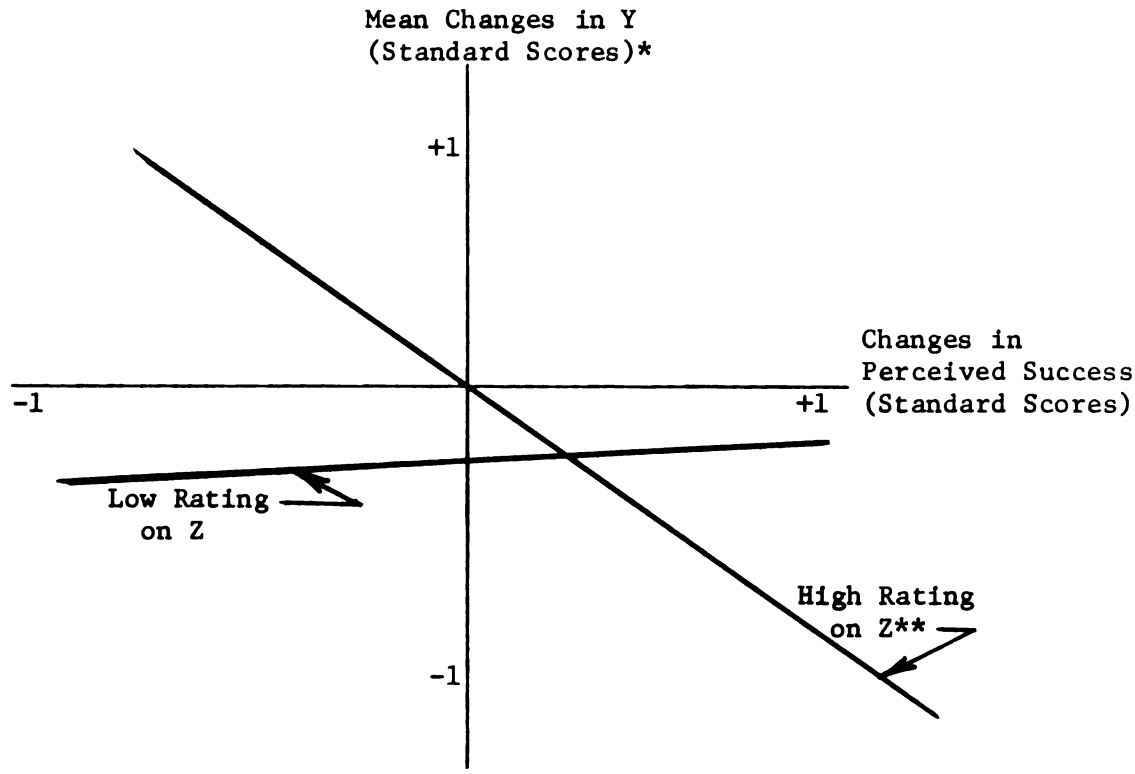
*$p < .05$.

**$p < .01$.

Graphical representation of the moderated relationships in Tables 3-4 and 3-5 are shown in Figures 3-14 and 3-15. The graphing procedure used was described in the section, "Testing for Moderators," in Chapter 2. In each case changes in variable X are plotted against mean changes in Y for those managers rating high and low on a moderating variable. Standard scores are used to compensate for differences in scaling.

Figure 3-14 reflects the consistent pattern of moderated relationships shown in Table 3-4. Satisfaction with job or the superior-subordinate relationship may be substituted for Y and any one of four Ghiselli dimensions; perceived occupational level, initiative, self-assurance or intelligence used as Z without misrepresenting the results obtained. The negative slope of the plot for managers rating high on Z corresponds to the consistent significant negative correlations for the high groups in Table 3-4 while the plot for the low rating managers is only slightly positive, as are the correlations for the low groups in Table 3-4.

The pattern of moderated relationships presented in Table 3-5 is not as consistent as that presented in Table 3-4 in that there are blank entries representing no moderating effects. As a result, Figure 3-15 is not as "clean" as Figure 3-14. It is most applicable to the relationship between changes in the association between performance and rewards and mean changes in satisfaction with job, superior-subordinate relationship, or orientation toward MBO as moderated by initiative. The positive slope of the plot for managers rating low on initiative reflects the positive correlations presented in Table 3-5 for the low initiative group. The slope, like the correlations for the high initiative group, is slightly negative. The graphical representation also applies to two other relationships. A similar plot is obtained for the relationship



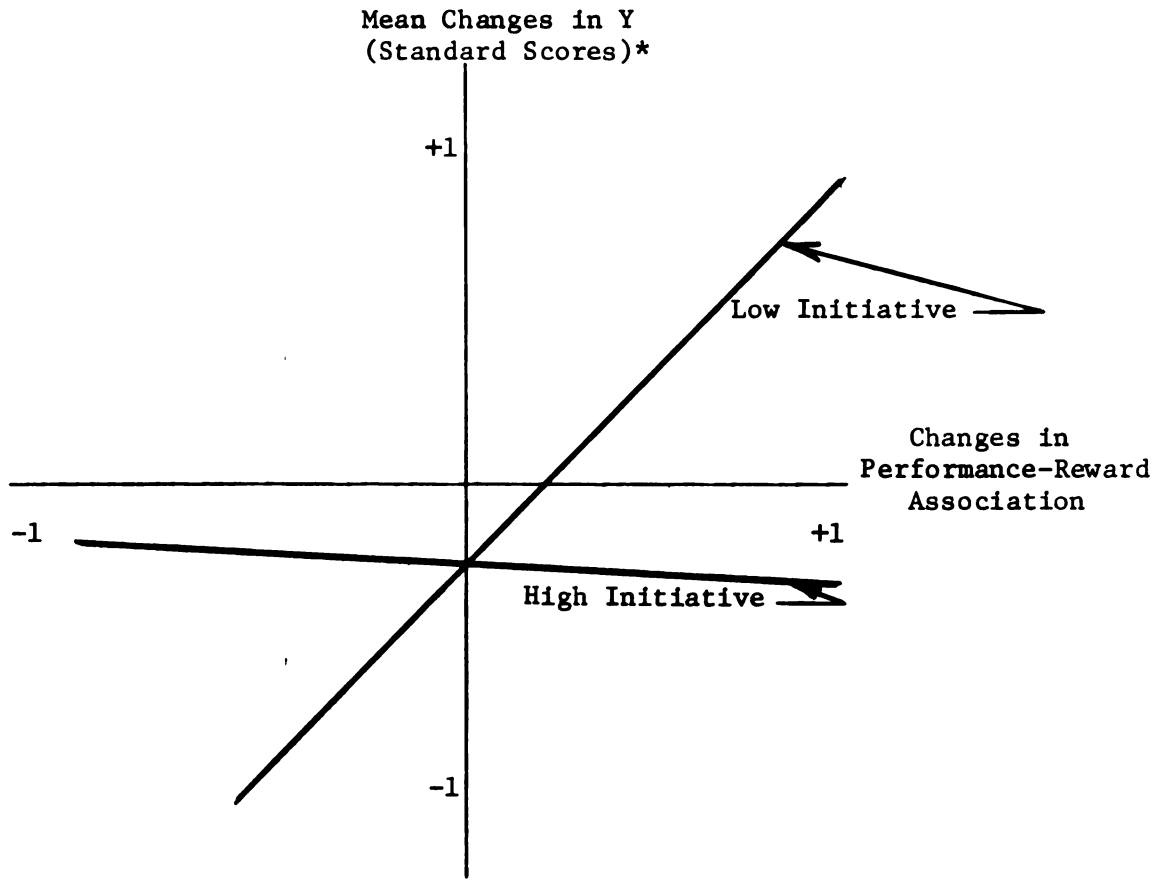
*Variable Y

Satisfaction With Job
Superior-Subordinate Relationship

**Variable Z

Perceived Occupational Level
Initiative
Self-Assurance
Intelligence

Figure 3-14. Graphical representation of moderated relationships in Table 3-4.



*Variable Y

Satisfaction With Job
Superior-Subordinate Relationship
Orientation Toward MBO

NOTE: The same graphical representation applies to the relationships:

1. Changes in performance-reward and changes in satisfaction with job as moderated by perceived occupational level.

2. Changes in performance-reward and changes in orientation toward MBO as moderated by intelligence.

Figure 3-15. Graphical representation of moderated relationships in Table 3-5.

between changes in the association between performance and reward and mean changes in satisfaction with job as moderated by perceived occupational level. For those managers who have a low perceived occupational level there is a strong positive relationship between the two variables while the variables are unrelated for managers with a high perceived occupational level. The same effects are observed in the relationship between changes in the association between performance and reward as moderated by intelligence.

Summary of Moderated Relationships

Four Ghiselli dimensions were found to moderate the relationship between changes in perceived success and changes in satisfaction with job. For those managers who rated themselves high on perceived occupational level, initiative, self-assurance or intelligence, the relationship was found to be negative while the variables were unrelated for those managers rating themselves low on any of the four Ghiselli dimensions. These same moderating effects were found in the relationship between changes in perceived success and changes in the superior-subordinate relationship. The relationship between changes in perceived success and changes in the superior-subordinate relationship was negative for those managers rating themselves high on perceived occupational level, initiative, self-assurance, or intelligence. The variables were unrelated for the managers rating low on the Ghiselli dimensions.

Initiative was found to moderate the relationship between changes in the association between performance and reward and three other change variables; satisfaction with job, superior-subordinate relationship and orientation toward MBO. For those managers rating themselves low on initiative the relationships between performance-reward association and

the three variables were positive while the variables were unrelated for high rating managers.

There were two additional relationships that were moderated by a single Ghiselli dimension. There was a strong positive association between changes in the performance-reward association and changes in satisfaction with job for those managers rating high on perceived occupational level while the two variables were unrelated for managers rating low on the dimension. For low perceived intelligence, there was a positive relationship between changes in the association between performance and reward and changes in orientation toward MBO. The two variables were unrelated for managers with high perceived intelligence.

As a general observation, it should be noted that 10 percent of the relationships analyzed were found to be moderated by one or more of the Ghiselli dimensions. This exceeds the number one would expect to be moderated by chance alone ($p < .05$).

CHAPTER 4

DISCUSSION OF FINDINGS

This chapter contains six major sections. In the first section the nonsignificant results obtained in Chapter 3 are discussed. An in-depth analysis of the superior-subordinate relationship is performed in the second section. In the third section, the relationships that were found to be significant are used to models of MBO. A fourth section treats the implication of this research to managers and firms involved in or contemplating an application of MBO while the fifth section is concerned with the implications to future research objectives and designs. A final section contains closing comments.

Discussion of Nonsignificant Results

There were twelve hypotheses tested in this research. Six hypotheses were found to be statistically significant with respect to direction and amount of relationship. Of these six hypotheses, inferences of causality could be made in four cases.

The purpose of this section is to discuss in more detail the six hypotheses of association that were not supported by the data.

Superior-Subordinate Relationship - Subordinate's Influence Over Goals

A high score on the superior-subordinate relationship variable infers that there is frequent interaction between the subordinate and his superior regarding work objectives and the means to achieve the

objectives. From the subordinate's perspective, a high rating on the variable means that he is being consulted regarding means of achieving goals. It would appear to follow that as the subordinate perceives the relationship with his superior improving, he would also perceive that his influence is increased. Since the correlation coefficient between the two variables approaches significance ($r = .19, p < .10$), one might be tempted to conclude that the hypothesized relationship is defensible; however, when additional data are brought into the analysis, the conclusion that the two variables are related seems less tenable.

The cross-lagged correlational data presented in Figure 3-2, page 68, are useful in analyzing the relationship in more detail. Numerous observations can be made from these data. The most obvious observation is that the two variables are not significantly related in either administration of the questionnaire. The correlation between the two variables was .02 in the first administration and .08 in the second. An independent measure of the relationship between the variables was obtained from a sample of 600 managers from another firm who had responded to the same questionnaire. In this sample, the correlation was .07 ($p > .05$). It can also be observed that the cross-lagged correlations (correlations 5 and 6) are not significantly different from zero. The conclusion that seems most appropriate from these data is that the two variables are not statistically significantly related in the samples tested.

Goal Clarity and Relevance - Orientation Toward MBO

Another hypothesis that is not supported is that changes in goal clarity and relevance are positively associated with the subordinate's orientation toward MBO. Research has consistently shown that people prefer specific, clearly stated goals which they feel are

important.[1,2,3] It was hypothesized that the managers would be more favorably disposed toward a program that emphasizes the specification of goals. It was found that the dynamic correlation between changes in the variables is not significant ($r = .15$, $p > .10$). The cross-lagged correlations presented in Figure 3-9, page 75, show that the two variables are related in the first administration of the questionnaire ($r = .33$, $p < .05$) while in the second administration the correlation coefficient approaches significance ($r = .22$, $p < .10$). The two variables are also related in the independent sample of 600 managers ($r = .25$, $p < .05$). The pattern of cross-lagged correlations also supports the hypothesis that goal clarity and relevance is the causal variable. While a test of the change hypothesis does not meet the five percent confidence level criterion, the data indicate that the two variables are related statically and causally.

Superior-Subordinate Relationship - Subordinate's Perceived Success

The data do not support the hypothesis that changes in the superior-subordinate relationship are related to the subordinate's perceived success for the total sample ($r = .07$, $p > .10$). However, moderating effects were observed. The correlation between the two variables for those managers who rated themselves high on perceived occupational level

---

[1]Edwin A. Locke and Judith Bryan, "Cognitive Aspects of Psychomotor Performance," *Journal of Applied Psychology*, Vol. 50 (1966) pp. 286-291.

[2]Edwin A. Locke and Judith Bryan, "Performance Goals as Determinants of Level of Performance and Boredom," *Journal of Applied Psychology*, Vol. 51 (1967) pp. 120-130.

[3]Edwin A. Locke, "Motivational Effects of Knowledge of Results: Knowledge or Goal Setting?" *Journal of Applied Psychology*, Vol. 51 (1967) pp. 324-320.

was -.46; high initiative, -.49; high self-assurance, -.42; and high perceived intelligence, -.32. Each of these correlations is significantly different from zero at the five percent confidence level. For those managers rating themselves low on each of the above Ghiselli dimensions, the two variables are unrelated.

The nature of the moderating effects of selected personality characteristics brings up some interesting possibilities. To facilitate discussion, the managers were classified as "high cool" or "low cool" depending on whether they rated themselves high or low on the Ghiselli dimensions. The "high cool" manager, one who rates himself high on occupational level, initiative, self-assurance and intelligence, might prefer to work at his own pace in a manner which he personally thinks is most appropriate. He may view increased interaction with his superior (an increase in the superior-subordinate relationship) as signifying that his performance is not as it should be. On the other hand, the "high cool" manager would view limited interaction as indicating that his performance is satisfactory or improving. This phenomenon, if true, would result in a negative correlation between the two variables as observed. For the "low cool" managers, the relationship between the two variables is positive but not significantly different from zero.

The data indicate that the superior-subordinate relationship may be more important for managers with selected personality characteristics. The "high cool" managers react to more frequent interaction with their superior which may be interpreted as closer supervision by perceiving that they are less successful. For the "low cool" manager, the assessment of changes in the relationship with his superior does not appear to be an important input into his perceived success.

Subordinate's Influence Over Goals - Goal Clarity and Relevance

The data do not support the hypothesis that increases in the subordinate's influence in the goal setting process would be associated with increased goal clarity and relevance ($r = .11$, $p > .10$). The basis for the hypothesis is prior research which has demonstrated that people prefer clearly stated goals and goals that they feel are relevant to the organizational needs.[4,5,6] As the subordinate's influence in the goal setting process increases, one would expect that a concerted effort would be made to clarify his goals. While there is this logical basis for the association hypothesized, the two variables simply do not appear to be related in this sample of managers. It can be observed from the cross-lagged correlations in Figure 3-8, page 74, that the two variables were not related in either administration of the questionnaire. The cross-lagged correlations 5 and 6 are not significantly different from zero which negates an inference of causality ($r_5 = -.11$, $r_6 = -.04$, $p > .10$). The two variables were also not significantly related in the independent sample of 600 managers who responded to the questionnaire ($r = .03$, $p > .10$).

Perceived Success - Satisfaction With Job

The data for the entire sample of managers do not support the hypothesis that changes in perceived success are related to changes in the subordinate's satisfaction with his job ($r = .07$, $p > .10$).

---

[4]Locke and Bryan, "Cognitive Aspects of Psychomotor Performance..."

[5]Locke and Bryan, "Performance Goals as Determinants of Level of Performance and Boredom."

[6]Locke, "Motivational Effects of Knowledge of Results..."

Additional insight into the relationship is gained by the observed moderating effects. The relationship for the "low cool" managers is positive but not significantly different from zero while there is a strong negative relationship for the "high cool" managers. This moderating effect is of special interest and is discussed in detail in the next section. The important point to be made here is that the two variables do appear to be significantly related for a subset of the managers.

Subordinate's Influence - Orientation Toward MBO

It was found that changes in the subordinate's perceived influence in the goal setting process are not significantly related to changes in the subordinate's orientation toward MBO. This finding is consistent with the observation that the variables are not statistically related. The correlation coefficient is .15 and -.09 in the first and second administration of the questionnaire. In the independent sample of 600 managers from another firm who responded to the same questionnaire the correlation is .03. Also the cross-lagged correlations presented in Figure 3-13 do not permit an inference of causality. The two variables simply do not appear to be related in this sample of managers.

Summary Comments on Nonsignificant Results

When the above discussion is taken into account, the results of the statistical tests of the hypotheses in Chapter 3 need to be qualified in two cases. It has been shown that while the relationship between changes in superior-subordinate relationship and the subordinate's perceived success is not significant for the total sample of managers, the relationship is significant for a subset of managers who have certain psychological characteristics. The same is true for the relationship between changes in the subordinate's perceived success and changes in

his job satisfaction. It has also been pointed out that complete rejection of the hypothesis that changes in goal clarity and relevance are associated with the subordinate's orientation toward MBO may be too extreme. While a test of the hypothesis does not satisfy the five percent confidence level criterion, the additional data analyzed indicate that there is some support for the position that the two variables are related.

Review of the nonsignificant results supports the position that changes in the subordinate's influence in the goal setting process are not related to changes in goal clarity, changes in orientation toward MBO and changes in the superior-subordinate relationship.

A Change Model of the Superior-Subordinate Relationship

In the following section, the hypotheses that were supported by the data are used to formulate change models of MBO. The superior-subordinate relationship is an important variable in the models in that it is related to most of the other variables and is the causal variable in many of the relationships.

In the development of the final scales to measure change, five subscales were collapsed to form the larger scale, superior-subordinate relationship (see Chapter 2 for a more complete development). While these five subscales were highly correlated, they had slightly different correlational patterns and content. The decision was made to collapse the scales into a more macro measure in order to increase the reliability of the resultant change scores. Additional insight into the nature of the superior-subordinate relationship can be gained by analyzing the relationships between the variables represented by the five subscales. Conceptually, the model presented in this section represents the

infra-structure of the superior-subordinate relationship in the models presented in Figures 4-2 and 4-3.

Description of Variables

The five variables that will form the model of the superior-subordinate relationship are defined below.

Satisfaction With Superior. This variable measures the orientation of the respondent to his superior as supervisor. It is an attempt to determine the extent to which the subordinate feels that his superior is generally adequate in his management capabilities and general capacities in dealing with people. The scale has an internal reliability of .95 and is composed of the following items:

29. In your opinion, how capable a manager is your boss?

30. How good is your boss in dealing with people?

31. All in all, how satisfied are you with your boss?

The Use of Goal-Oriented Methods. The items in this scale center around the superior's interest in management by objectives as reflected in the amount of time he spends in such activity and the amount of feedback he gives the subordinate concerning his perceived progress. The scale has an internal reliability of .95 and is composed of the following items:

5. How often were you given feedback in your progress on your performance goals?

9. How often were you given feedback on your progress in your self-improvement goals?

11. How much emphasis did your boss put in attaining your self-improvement goals?

21. How much of an interest do you think the company has in the MBO program?

22. How much of an interest do you think your boss has in the MBO program?

36. In general, how much time did your boss devote to the MBO program?

Superior Concern With Failure. This variable appears to be a measure of the "criticism" behavior of the supervisor. It is, in a sense, a measure of the degree of subordinate anxiety about his superior's behavior if the specified goals are not attained. The scale has an internal reliability of .65 and is composed of the following items:

44. How concerned do you feel your boss would be if you failed to achieve the goals established for your job to a significant degree?

45. What kind of criticism would you receive from your boss if you failed to achieve the goals established for your job to a significant degree?

Superior Supportiveness. The items which comprise this variable focus on the degree to which the superior is positively supportive of the subordinate in the working situation. The scale has an internal reliability of .78 and is composed of the following items:

23. Which statement best describes the manner in which your boss helps you in performing your job?

25. Which statement best describes the concern of your boss for your career?

26. Which statement best describes the kind of feedback you generally get from your boss about your performance?

43. Which of the statements best describes the amount of praise you received from your boss about your performance last year?

Subordinate's Influence Over Means. As opposed to the previously discussed variable, influence over goals, this variable measures the degree to which the subordinate feels he controls the allocation of resources required to achieve his goals. The scale consists of the

following three items and has an internal reliability of .60:

8. To what extent do you feel you control the means of reaching your performance goals?

27. How often does your boss ask your opinion when a problem comes up that involves your work?

28. To what extent do you feel you can influence the decisions of your boss regarding things about which you are concerned?

Model Formulation

A change model of the superior-subordinate relationship is shown in Figure 4-1. This model shows the relationships between changes in the variables which make up the superior-subordinate relationship and is formulated from the results obtained by calculating dynamic correlation coefficients between pairs of variables.[7] When a signficicant correlation was found, cross-lagged correlations were used to assess causality.

The corrected dynamic correlations are presented in Table 4-1. The inter-scale correlation coefficients between the first and second administration which constitute cross-lagged correlations 5 and 6 are presented in Table 4-2. The complete pattern of cross-lagged correlations appears in Appendix C.

The Dynamics of the Model

Changes in satisfaction with the superior vary significantly and in the same direction as changes in superior supportiveness, the superior's use of goal-oriented methods, and the amount of the subordinate's influence over means. While the relative impact of each variable is

---

[7]Henry Tosi, Rod Chesser and Stephen Carroll, "A Dynamic Model of Certain Aspects of the Superior/Subordinate Relationship." Unpublished paper, Michigan State University, East Lansing, Mich., 1971.

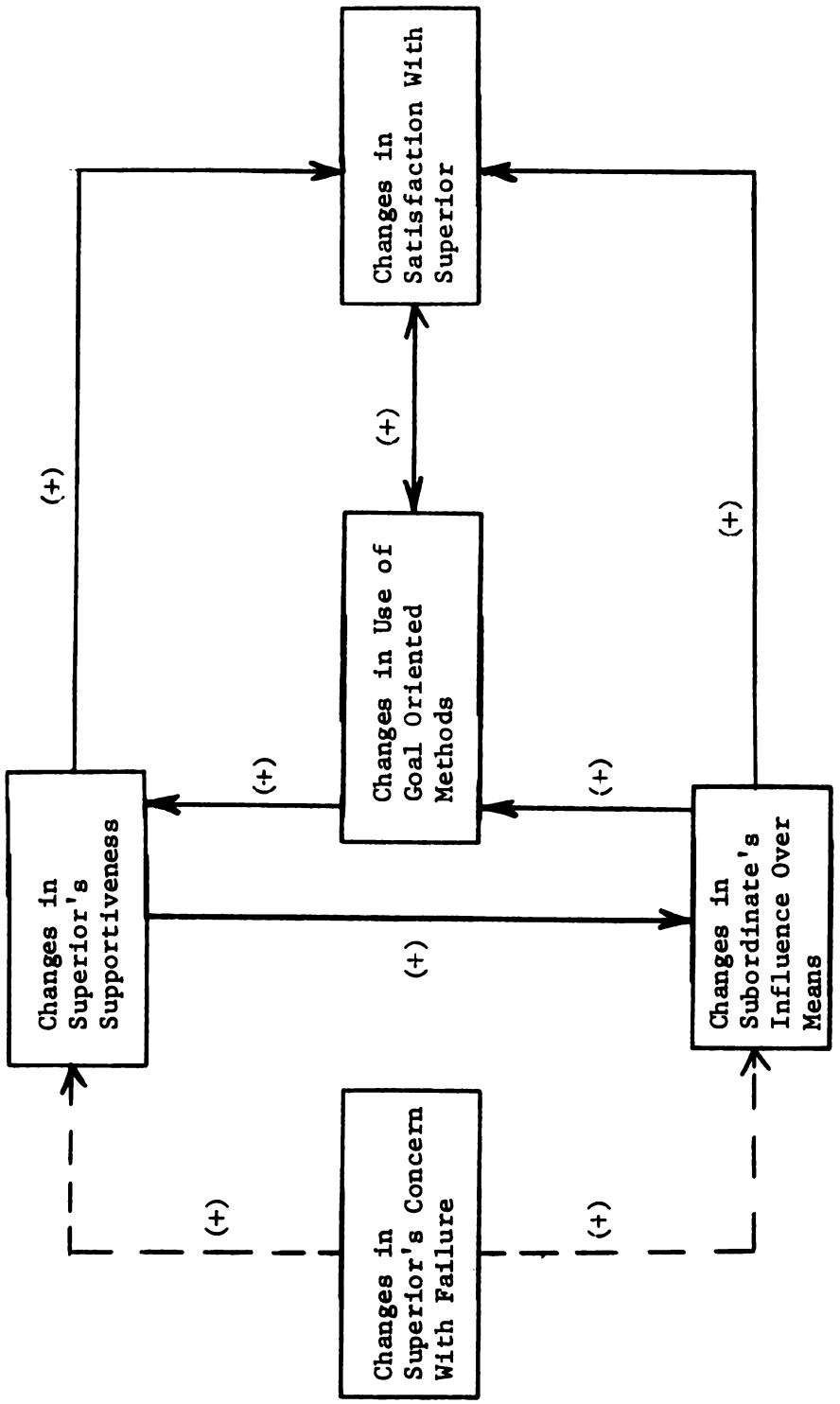


Figure 4-1. Model of change relationships in the superior-subordinate relationship.

Table 4-1. Corrected dynamic correlations between variables in the model of the superior-subordinate relationship

Variable	1	2	3	4	5
1. Superior's Supportiveness	1.00				
2. Use of Goal Oriented Methods	.61**	1.00			
3. Subordinate's Influence Over Means	.40**	.44**	1.00		
4. Superior's Concern With Failure	.30*	.17	.26*	1.00	
5. Satisfaction With Superior	.57**	.46**	.56**	.12	1.00

*$p < .05$.

**$p < .01$.

Table 4-2. Inter-scale correlations between first and second administrations of the questionnaire for variables in the model of superior-subordinate relationship

First Administration	Second Administration 1	2	3	4	5
1. Superior's Supportiveness	.25[a]	.29	.26	.06	.30
2. Use of Goal Oriented Methods	.40	.47	.18	.06	.32
3. Subordinate's Influence Over Means	.18	.27	.44	.11	.30
4. Superior's Concern With Failure	.04	.10	.16	.46	.02
5. Satisfaction With Superior	.20	.29	.11	.09	.25

[a]The diagonal entries are correlations between a variable measured at time 1 and time 2. Off-diagonal correlations are between a variable measured at time 1 and a second variable measured at time 2.

Significant value of r

.05 level = .23
.01 level = .30

not known, it can be stated that when the subordinate perceives that his superior increases his support, feedback, goal orientation, and is influenced by the subordinate's inputs, satisfaction with the superior increases.

Subordinates perceive their supervisors as becoming more goal oriented as they feel they exert more influence over the allocation of resources and other job related activities necessary to attain their established goals. In return, the subordinate perceives that he has more influence over the means necessary to attain the goals when the superior is perceived as being more supportive. When the subordinate feels that his superior is really concerned with what he, the subordinate, thinks, and the superior initiates frequent interactions concerning the progress on goals, the subordinate feels that he has greater input into the process and perceives that his relative influence has increased.

The correlation between changes in the superior's concern with failure and the subordinate's influence is significant; however, the observed cross-lagged correlations do not support a causal inference. The direction of causality shown in the model is as hypothesized. It is possible that as the subordinate becomes aware that his superior is concerned with the level of goal achievement and as this concern is communicated to the subordinate, he may feel that he has greater control over the work situation than previously might have been the case. Perhaps increasing the subordinate's awareness of the superior's concern with failure increases the subordinate's perception of his own responsibility in the work situation. The superior may make it very clear that the subordinate is responsible for certain activities and also specify what resources are at his disposal to achieve goals. As the superior and subordinate increase their interaction because of the mutual concern

over goal attainment, the subordinate may perceive that his influence over means has increased.

The perceived supportiveness of the superior changes as the subordinate is aware of changes in the use of goal-oriented methods and the superior's concern for the failure to attain goals. When the superior is more explicit with feedback, he may appear to be using a more goal-oriented approach and when he communicates that he is more concerned about the level of goal attainment, he is perceived as having more concern and providing more support to the subordinate.

It is interesting to note the circular nature of the model. As the subordinate's perceived influence increases, he feels that his superior's use of a goal-oriented approach has increased. Increases in the use of a goal-oriented approach increase the perceptions of the supportiveness of the superior which in turn increase the perceived influence of the subordinate.

Changes in superior supportiveness, changes in satisfaction with the superior, and changes in the superior's use of a goal-oriented approach constitute another circular flow. As the subordinate perceives that his superior is using a more goal-oriented approach, the superior is viewed as being more supportive which increases the satisfaction with the superior. As the satisfaction increases, the superior is viewed as being more goal-oriented. The link between satisfaction and the use of goal-oriented approach appears to be reinforcing. This may result simply because the subordinate feels, under conditions of increased satisfaction, that the superior is providing more goal-oriented direction and feedback, or is attempting to do so. This, of course, should be highly satisfying to a subordinate if it occurs, or dissatisfying if it does not. As an individual is more satisfied, he

has more positive feelings toward the job situation of which his superior plays a major role. An alternative explanation would be that as satisfaction with the superior increases, the subordinate interacts more frequently with him. He talks with him more and is more likely to ask directions, and this may increase his understanding of the work requirements. When this happens, the subordinate's awareness of the goals and responsibilities of his position may be more clear. This may well result in a belief that the superior is being more definite in spelling out job requirements and providing more feedback on performance, thereby using a more goal-oriented approach.

Some Implications of the Model

The model shows that affective orientation toward the superior is a function of the use of a goal-oriented approach, the perceived supportiveness of the superior and the subordinate's perceived influence over means of goal attainment. Since each of the relationships is positive, increases in the subordinate's satisfaction with his superior will result if the subordinate perceives that the superior is more aware of what he, the subordinate, is doing; if the superior shows more concern for the subordinate's work; and if the superior is willing to permit the subordinate more influence in the work situation. It follows from the model that if any one of these variables is increased, positive changes will be induced in the other variables. The positive effects may generalize to other aspects of the superior's behavior and increase the level of subordinate satisfaction. But the converse is also true. A deterioration in any of the relationships will be accompanied by a deterioration in the other relationships. Thus, in effect, a good situation gets better and a bad situation gets worse. Because of the circular

flow and the reinforcing nature of some of the relationships, the situation may deteriorate rapidly before it is realized there is a problem.

The circular, reinforcing nature of the model also provides an additional justification for combining the subscales into a single measure.

Development of Change Models of MBO

A revised model of the relationships between change scores is presented in Figure 4-2. The model represents a revision of the *a priori* model presented in Chapter 1 in light of additional information generated by this analysis. With the exception of the relationship between changes in goal clarity and relevance and changes in the subordinate's orientation toward MBO, each of the relationships in the model is supported by the data. As was pointed out earlier, there is sufficient support for the hypothesis that changes in goal clarity and relevance cause changes in the subordinate's orientation toward MBO to warrant its inclusion in the model.

The model presented in Figure 4-2 is based on the total sample of managers. In the following subsection, the model is altered to take into account differences in perception by managers who vary on Ghiselli dimensions. Before this is done, some general comments concerning the model will be made.

The model is more representative of an interactive system than the conventional input-output models. As such, the model tends to be very complex. The variables in the model are interrelated and the causality in two of the relationships is not representative of simple cause and effect but is mutually reinforcing.

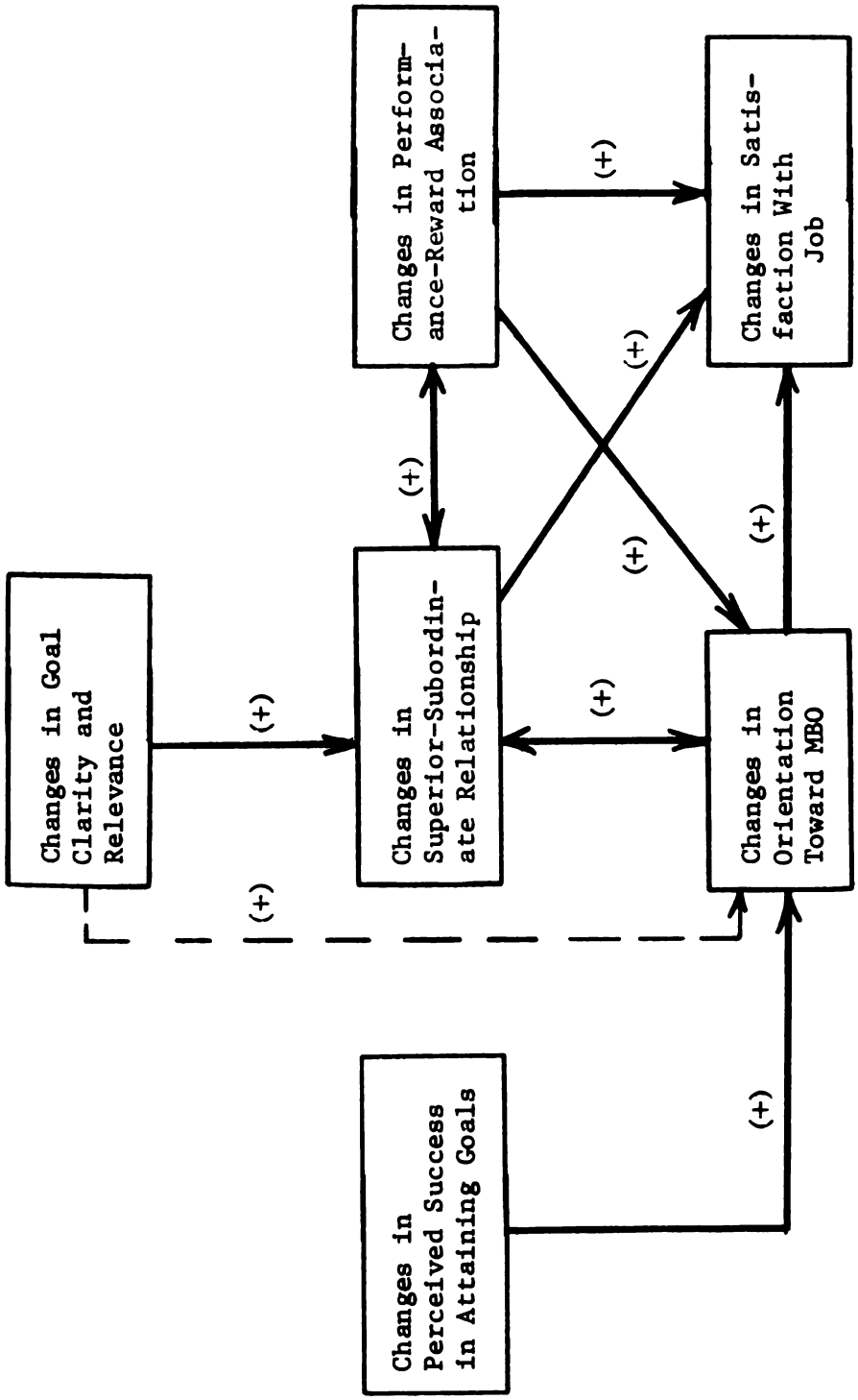


Figure 4-2. Model of change relationships for the total sample and "low cool" managers.

The superior-subordinate relationship is an important variable in the model. Changes in the superior-subordinate relationship are related to changes in goal clarity, subordinate's orientation toward MBO, association between rewards and job performance, and satisfaction with job. The causal relationship between changes in the superior-subordinate relationship and three of the variables is two-way, or reinforcing. This is indicated by the two-directional arrows in the model. One of the reinforcing relationships is between changes in the subordinate's orientation toward MBO and changes in the superior-subordinate relationship. As a subordinate becomes more oriented toward MBO and committed to the program, he would be expected to increase interaction with his superior regarding goals and goal related activities. As the subordinate interacts with his superior, the advantages of a goal centered approach would become more evident, thereby increasing his orientation toward MBO which has as one of its basic objectives the incorporation of goal awareness. If these relationships are linear, the opposite situation must be true. If a subordinate is not favorably disposed toward MBO and goal related activities, he may well attempt to avoid his superior who, faced with pressures to implement MBO, desires goal directed activities. As the relationship between the subordinate and his superior deteriorates, the subordinate may become disenchanted with his work situation of which MBO is a major component. This view is consistent with the positive relationship found between changes in the superior-subordinate relationship and changes in the subordinate's satisfaction with his job and the positive relationship between changes in the subordinate's orientation toward MBO and changes in his satisfaction with the job.

The same type of reinforcing relationship occurs between changes in the association of rewards with actual job performance and changes in the superior-subordinate relationship. As the superior-subordinate relationship improves reflecting increased interaction regarding goals and means of attaining the goals, the subordinate's association between rewards and goal attainment should increase as his understanding of the goal orientation of the MBO program increases. As the association between rewards and job performance increases, the subordinate may well initiate interaction with his superior in order to clarify his goals and to let the superior know how he is doing, or to seek feedback about his performance. When the superior-subordinate relationship deteriorates, the subordinate would most likely feel that his superior does not really know what he is doing and will have to base rewards primarily on subjective criteria. This would have the effect of weakening the association between rewards and job performance.

A decrease in the association between rewards and performance will, in turn, lead to a worsening of the superior-subordinate relationship. The organization, through its implementation of the MBO program, has created an expectation that rewards will be based on actual job performance. When a subordinate feels that the association between rewards are now less likely based on actual job performance, the superior will be viewed as behaving consistent with the intent of the program. Since the superior has the major evaluation responsibility, the subordinate might blame the superior for the decrease in the association between performance and reward. As a result, the subordinate perceives that the relationship with his superior has diminished.

In addition to changes in the superior-subordinate relationship, there are two other variables which produce changes in the subordinate's

orientation toward MBO. When the subordinate perceives that he is more successful, he becomes more positively oriented toward MBO. The reverse situation is also true. If the subordinate perceives that he is less successful, he might question the utility of MBO and look for other means of increasing success.

There is also some support for the position that increases in goal clarity and relevance also cause the subordinate to become more oriented toward MBO. One of the objectives of implementing MBO is to provide a procedure whereby goals can be made more specific and relevant to the subordinate and to the organization. When a subordinate perceives that his goals are more clearly stated and relevant, the MBO program will appear to be more useful. If the goals become less clear and relevant, the MBO program will be viewed as being less useful.

Changes in goal clarity and relevance are also associated with the subordinate's perception of the relationship between performance and reward. As goals become more clear, the strength of the association between performance and reward is increased. When goals are clearly stated, they provide a less subjective yardstick to measure performance. If goals are not clearly stated, the subordinate may feel that rewards must be based on criteria other than goal attainment such as the whims of his superior.

The model shows that there are three variables which are associated with the subordinate's satisfaction with his job. Increases in job satisfaction result from an improvement in the superior-subordinate relationship, the association between performance and reward, and the subordinate's orientation toward MBO. When a subordinate becomes more positively oriented toward MBO, he also becomes more satisfied with his job. When there is a formal MBO program, it is an important part of the

job situation. It seems reasonable to assume that when a subordinate feels more favorable toward MBO, he also feels more satisfied with his total job situation.

The subordinate is also more satisfied with his job when he feels that he is more likely to be rewarded according to his actual job performance and when he feels that the relationship with his superior has improved. The superior is a key element in the total job situation. Improvements in the relationship with the superior would most likely be projected to an assessment of job satisfaction. Since there is a direct relationship between the three variables and satisfaction with the job, a decrease in any of the variables would result in a decrease in the subordinate's satisfaction with his job.

The model also shows that changes in goal clarity and relevance will produce changes in the superior-subordinate relationship. In the *a priori* research model, it was hypothesized that the direction of causality was opposite that shown in the model. However, the data support the relationship as shown in Figure 4-2. It could well be that as the subordinate perceives that goals are more clear and relevant, he would be more likely to initiate interaction with his superior concerning goal related activities. As the subordinate and superior interact more frequently over goals and how they could be attained, the subordinate may feel that the relationship between himself and the superior has improved. If the goals were to become less clear and less relevant, the subordinate could become frustrated. This negative feeling could be transferred to his superior. The subordinate could "blame" his superior for holding him responsible for goals that were not clearly stated and unimportant.

High Cool and Low Cool Managers

The model presented in Figure 4-2 is based on the results of the analyses of the total sample of managers. Some of the relationships were moderated by one or more of the Ghiselli dimensions. A different pattern of responses was observed for managers who rated themselves high or low on certain dimensions. These differences can be shown by altering Figure 4-2.

Low Cool. Managers who consistently describe themselves low on such Ghiselli dimensions as occupational level, self-assurance, initiative and intelligence are designated as "low cool" managers. The relationships between the variables that were observed for "low cool" managers were identical to those discussed above (see Figure 4-2, page 106).

High Cool. The "high cool" managers are those who rate themselves high on such dimensions as occupational level, self-assurance, initiative, and intelligence. This group of managers had a different pattern of responses than did the "low cool" managers. The model for the "high cool" managers is presented in Figure 4-3. One of the major differences is the inverse relationships between changes in perceived success and changes in either of two variables, satisfaction with job and the superior-subordinate relationship. This means that increases in perceived success are associated with decreases in satisfaction with job and the superior-subordinate relationship. One explanation for this is that as perceived success increases so do expectations concerning both financial and non-financial inducements from the organization. If these expectations are not met, the "high cool" manager may hold his superior responsible, become less satisfied with his job and feel that the relationship with his superior has deteriorated.

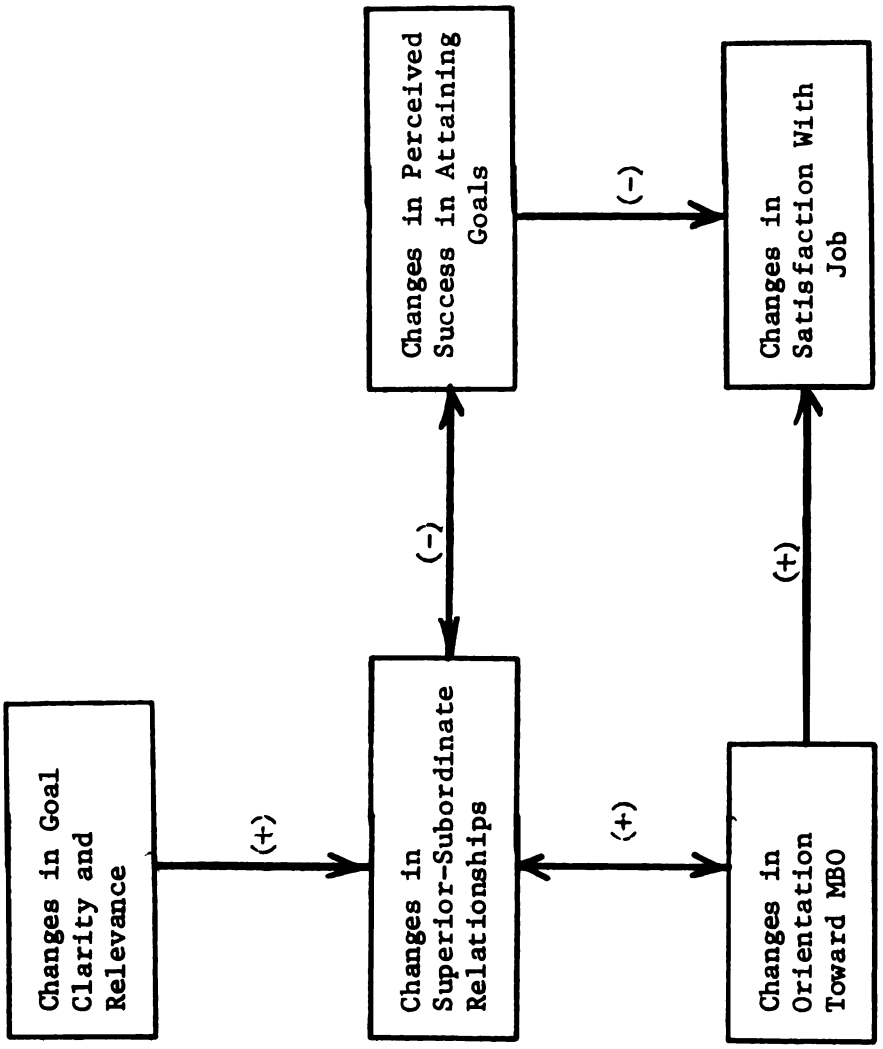


Figure 4-3. Model of change relationships for "high cool" managers.

For the "low cool" managers, changes in perceived success are unrelated to changes in orientation toward MBO while there is a positive relationship between changes in success and changes in satisfaction with job. It could be that the expected returns, generated by an increase in perceived success, are not so great for the "low cool" managers as to cause excessive frustration which might lead to discontent with the job and the superior.

There is some danger in misinterpreting the differences in the relationship between success and job satisfaction. It should not be concluded that "high cool" managers are more satisfied by a decrease in perceived success. Both "high cool" and "low cool" managers probably prefer increases in success while the differences in expected returns produced by the increases in perceived success account for the relationships observed.

The association between performance and reward is not significantly related to any other variable for the "high cool" managers. For the "low cool" managers, changes in goal clarity and relevance, superior-subordinate relationship and satisfaction with job are all significantly related to changes in the association between performance and reward. These findings support a more general proposition that the "low cool" managers have a greater need for certainty. They view a strong association between actual job performance and reward as desirable in that it removes uncertainty regarding how they will be evaluated. This is reflected in the observation that for the "low cool" managers changes in the association between performance and reward is the causal variable in the relationships with changes in job satisfaction and changes in the superior-subordinate relationship. On the other hand, the association between performance and reward does not appear to be an important

consideration for the "high cool" managers. This group of managers could be motivated by challenges beyond the accomplishment of day-to-day work requirements, could be better able to cope with uncertainties and would feel challenged more by unstructured and ill-defined situations.

Implications of This Research to MBO

The purpose of this section is to discuss the implications of this research to operating managers who are involved in or planning the implementation of an MBO program. One of the most important is the apparent complexity of the relationships involved. It is clear that unless MBO is viewed as a highly interactive system with several components it cannot be fully understood or most effectively applied. The interactive nature of variables and reinforcing causal relationships could produce detrimental consequences if a variable is treated in isolation. When the interactions are not taken into account, it may not appear too serious for a manager to focus on one or two factors; however, when the variable is, in fact, highly related to other variables, the entire system may be adversely affected. This is especially true if all the relationships between the variables are positive, which is the case for the model of MBO for "low cool" managers. This also means that an increase in one variable will tend to produce positive changes throughout the system.

The situation is more complicated when there is a mixture of positive and negative relationships as in the model for the "high cool" managers. In this case, opposing forces may be at work on certain variables. The resultant states of the variables depend on the relative strength of the forces. It would be possible for the opposing forces to offset each other, in which case there would not be any changes.

It has already been pointed out that the superior-subordinate relationship is a key variable in the models of MBO (see Figures 4-2 and 4-3) because it is significantly related to most of the other variables. Changes in goal clarity and relevance is another key variable because of its strategic position. Changes in goal clarity and relevance will generate changes in all the variables in the model of MBO for the "high cool" managers (see Figure 4-3). There is no other variable for which this is true. In the model of MBO for the "low cool" managers, changes in goal clarity and relevance will generate changes in all the variables except changes in perceived success (see Figure 4-2).

The finding that has the greatest potential implication to MBO is the moderating effects of certain Ghiselli dimensions. If the moderating effects are substantiated in further research, these implications seem clear. It means that a general response to MBO cannot be expected. Given that the participants differ on psychological dimensions, variability in the perceptions of their superiors, usefulness of the program, satisfaction with their job, and other variables will be observed. In a practical sense, this may mean that while MBO may be effective for some members of the organization it may, in fact, be counterproductive for other members. Unfortunately this phase of the research is not sufficiently developed to justify recommendations to the practicing manager; however, it can be stated that the notion that an MBO program will elicit equally favorable responses from all members of the organization is not justified and will probably lead to sub-optimal results.

The important role of the superior-subordinate relationship has already been pointed out, but it is again mentioned here because of its implication to management. While an organization may devote considerable time and resources to the development of a systematic method of setting

goals and appraising performance, the success of such an effort may depend on the interpersonal relationship between the subordinate and his superior. It simply points out the tremendous impact that a superior plays in a subordinate's perception of his work environment. As the model of the superior-subordinate relationship shows, the perception that a subordinate has of his superior is, by itself, a complex phenomenon. For the total sample of managers in this research, the model shows that subordinates tend to be more satisfied with their superiors when the superiors are viewed as being supportive, using goal-oriented methods, and permitting subordinate input into resource allocation decisions. The fact that MBO permits an organization to implement recommendations that have been made by the various behavioral sciences does not relieve superiors of the responsibility of developing an effective interpersonal relationship with their subordinates in day-to-day interactions.

A Note on Future Research

The models presented in Figures 4-1, 4-2 and 4-3 may be viewed as the end result of this research. The models represent relationships derived from the analysis of longitudinal data gathered on a single sample of managers. A logical extension of this research would be to investigate the extent to which the models hold for other managers in other firms. There is evidence that indicates that the model would hold across samples. It was pointed out in Chapter 2 that correlations between change scores provide a check of static correlations, or correlations obtained from simultaneous measures. Correlations between change scores that are consistent with static correlations infer that the relationship is, in fact, between the variables and not between people. The correlations between change scores were highly consistent

with the static correlations in this research which would indicate that the relationships depicted in the models are between the variables shown. Another piece of evidence that indicates that the models might well hold across samples is that a very similar pattern of inter-item and inter-scale correlations was observed for an independent sample of 600 managers from another firm who had responded to the same questionnaire. A second administration of the questionnaire to these managers would provide an opportunity to see if the models hold for a second firm.

The models of change were based on responses to a questionnaire administered at two points in time. Data obtained from a third administration of the questionnaire to the same managers would be most useful. The data would facilitate an assessment of the stability of the change. There was a change agent at work between the two administrations of the questionnaire. The third set of data would permit an assessment of change during a more stable period of time.

Another objective would be to further investigate the effects of moderator variables on the change relationships. This study utilized a search procedure for identifying moderator variables. As has been pointed out, the results of the search appear to have important implications to firms using MBO and to provide a basis for formulating hypotheses about moderating effects in future research.

There are two additional concerns which must be taken into account if the models are to be the basis of future research. If the variables in the models are to be used, additional scale development is needed. The reliabilities of the change measures were presented in Table 2-5, page 47. Two of the variables, satisfaction with job and perceived success, have change score reliabilities of .35 and .30, respectively. Additional items need to be formulated in order to increase the internal reliability of the scales.

A second concern is that this research has only been concerned with managerial perceptions of MBO. In order to make the model more operational, it needs to be related to more objective measures of performance. This link would make it possible to investigate the effects of attitudes on job performance, and how job performance, in turn, affects attitudes.

Final Comments

As was stated in Chapter 1, the objective of this research was to attempt to integrate a wide range of variables that have been studied independently elsewhere. The models presented in Figures 4-1, 4-2, and 4-3 are the results of that objective. Because of the interactive nature of the variables, the models are very complex and difficult to discuss. The complexity did not result from an attempt to create an "illusion of sophistication" but exists simply because the models reflect reality. Complexity is a condition the experimenter must accept when investigating systems of interacting variables, rather than the traditional two variable models.

This research is not based on a well defined, unifying theory. This is true simply because *a* theory does not exist. The results of this research may be viewed as an initial step in developing a more integrative theory of MBO.

The results reported here were obtained from data collected from managers in a single firm. As in all field research of this nature, one must be extremely cautious in generalizing the results to other managers, particularly in other firms. A better strategy, and one that should be followed, is to use the results of this research as a basis for formulating hypotheses in future research. In this manner, subsequent research would be directed toward determining the degree to which the

results reported here could be generalized and toward making necessary modifications.

This research has also attempted to tackle some very difficult methodological issues, namely, change relationships and inferences of causality. It is hoped that a significant contribution has been made by using the dynamic correlational method to measure associative relationships of change and the cross-lagged panel correlational method to infer causality. The two methods appear to be extremely useful tools when questions of change are being investigated.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

Anastasi, Ann. *Psychological Testing.* New York: Macmillan, 1964.

Drucker, Peter F. *The Practice of Management.* New York: Harper and Brothers Publishers, 1954.

Guilford, J. P. *Psychometric Methods.* New York: McGraw-Hill Book Company, Inc., 1967.

Miller, L. *The Use of Knowledge of Results in Improving the Performance of Hourly Operators*, General Electric Company, Behavioral Research Service, 1965.

Nunnally, Jum C. *Psychometric Theory.* New York: McGraw-Hill Book Company, Inc., 1967.

Simon, Herbert A. *Models of Man.* New York: Wiley, 1957.

Vroom, Victor H. *Some Personality Determinants of the Effects of Participation.* Englewood Cliffs, N.J.: Prentice-Hall, 1960.

Vroom, Victor H. *Work and Motivation.* New York: Wiley, 1965.

Articles

Bereiter, Carl. "Some Persisting Dilemmas in the Measurement of Change," as in *Problems in Measuring Change*, ed. Chester W. Harris. Madison, Wisc.: University of Wisconsin Press, 1967) 3.

Blalock, H. M. "Correlation and Causality: The Multivariate Case," *Social Forces* (March, 1961) 246-251.

Blalock, H. M. "Spuriousness Versus Intervening Variables: The Problem of Temporal Sequences," *Social Forces* (May, 1962) 330-336.

Brayfield, Arthur H. and Walter H. Crockett, "Employee Attitudes and Employee Performance," *Psychological Bulletin*, Vol. 52 (September, 1955) 396-424.

Campbell, Donald T. "From Description to Experimentation: Interpreting Trends as Quasi-Experiments," as in *Problems in Measuring Change*, ed. Chester W. Harris. (Madison, Wisc.: University of Wisconsin Press, 1967) 10.

Carroll, Stephen and Henry Tosi. "Goal Characteristics and Personality Factors in a Management-by-Objectives Program," *Administration Science Quarterly*, Vol. 15, No. 3 (September, 1970) 295-305.

Garside, R. F. "The Regression of Gains Upon Initial Scores," *Psychometrika*, 21 (1956) 67-77.

Ghiselli, Edwin E. "Self-Description Inventory." Berkeley, Calif.: University of California (Typewritten Xeroxed copy).

Hunter, J. E. "ARRANGE: A Method of Reordering the Correlations Matrix." Unpublished paper written at Michigan State University, East Lansing, Mich., 1970.

Hunter, J. E. and R. J. Chesser. "MODERATOR: A Family of Computer Programs Designed to Show Simultaneously the Moderating Effects and Nonlinear Relationships Among a Set of Variables." Unpublished paper written at Michigan State University, East Lansing, Mich., 1971.

Hunter, J. E. and S. H. Cohen. "PACKAGE: A System of Computer Routines for the Analysis of Correlational Data," *Educational Psychological Measurement*, 29 (1969) 697-700.

Ivancevich, John, James H. Donnelly, Jr., and Herbert L. Lyons. "A Study of the Impact of Management by Objectives on Perceived Need Satisfaction," *Personnel Psychology*, Vol. 23 (Summer, 1970) 139-151.

Lawler, Edward E. "A Correlational-Causal Analysis of the Relationship Between Expectancy Attitudes and Job Performance," *Journal of Applied Psychology*, Vol. 52, No. 6 (1968) 462-468.

Lawler, Edward E. and Lyman Porter. "The Effects of Performance on Job Satisfaction," *Industrial Relations - A Journal of Economy and Society*, Vol. 7, No. 1 (October, 1967) 22-28.

Locke, Edwin A. "Motivational Effects of Knowledge of Results: Knowledge or Goal Setting?" *Journal of Applied Psychology*, Vol. 51 (1967) 324-320.

Locke, Edwin A. and Judith Bryan. "Cognitive Aspects of Psychomotor Performance," *Journal of Applied Psychology*, Vol. 50 (1966) 286-291.

Locke, Edwin A. and Judith Bryan. "Performance Goals as Determinants of Level of Performance and Boredom," *Journal of Applied Psychology*, Vol. 51 (1967) 120-130.

Lord, F. M. "Further Problems in the Measurement of Growth," *Educational and Psychological Measurement*, 18 (1958) 439.

Lord, F. M. "The Measurement of Growth," *Educational and Psychological Measurement*, 16 (1956) 421-436.

Lyons, Thomas. "Role Clarity, Need for Clarity, Satisfaction, Tension, and Withdrawal," *Organizational Behavior and Human Performance*, 6 (1971) 99-110.

McGregor, Douglas. "An Uneasy Look at Performance Appraisal," *Harvard Business Review*, Vol. 35 (May-June, 1957) 89-94.

Meyer, Herbert, Emanuel Kay and John R. French. "Split Roles in Performance Appraisal," *Harvard Business Review*, Vol. 43, No. 1 (January-February, 1965) 123-129.

Pelz, D. C. and F. M. Andrews. "Detecting Causal Priorities in Panel Study Data," *American Sociological Review*, 29 (1964) 836-848.

Raia, Anthony. "Goal Setting and Self Control," *Journal of Management Studies*, II-I (February, 1965) 34-53.

Raia, Anthony. "A Second Look at Goals and Controls," *California Management Review* (Summer, 1966) 49-58.

Rizzo, John R., Robert House and Sidney L. Lirtzman, "Role Conflict and Ambiguity in Complex Organizations," *Administrative Science Quarterly*, Vol. 15, No. 2 (June, 1970) 150-163.

Simon, Herbert A. "Spurious Correlations: A Causal Interpretation," *Journal of the American Statistical Association*, 49 (1954) 467-479.

Smith, E. E. "The Effects of Clear and Unclear Role Expectations on Group Productivity and Defensiveness," *Journal of Abnormal and Social Psychology*, 55 (1957) 213-217.

Thomson, G. H. "A Formula to Correct for the Effects of Errors of Measurement of the Correlation of Initial Values With Gains," *Journal of Experimental Psychology*, 7 (1924) 321-324.

Thorndike, E. L. "The Influence of Chance Imperfections of Measures Upon the Relation of Initial Score to Gain or Loss," *Journal of Experimental Psychology*, 7 (1924) 225-232.

Tosi, Henry. "Organizational Stress as a Moderator of the Relationship Between Participation and Job Satisfaction, Job Anxiety, and Productivity." Paper delivered at XV International Meetings, The Institute of Management Science, September, 1968.

Tosi, Henry and Stephen Carroll, "Managerial Reaction to Management by Objectives," *Academy of Management Journal*, Vol. II (December, 1968) 415-426.

Tosi, Henry and Stephen Carroll. "Some Factors Affecting the Success of 'Management by Objectives'," *Journal of Management Studies*, Vol. 7, No. 2 (May, 1970) 209-222.

Tosi, Henry, Rod Chesser and Stephen Carroll. "A Dynamic Model of Certain Aspects of the Superior/Subordinate Relationship." Unpublished paper, Michigan State University, East Lansing, Mich., 1971.

Tosi, Henry and Donald Tosi. "Some Correlates of Role Conflict and Role Ambiguity Among Public School Teachers," *Journal of Human Relations*, Vol. 18, No. 3 (1970) 1068-1075.

Vroom, Victor H. "A Comparison of Static and Dynamic Correlation Methods in the Study of Organizations," *Organizational Behavior and Human Performance*, Vol. 1 (1966) 55-70.

Weitz, J. A., J. Antoinetti and S. R. Wallace. "The Effects of Home Office Contact on Sales Performance," *Personnel Psychology*, Vol. 7 (1954) 381-384.

APPENDICES

APPENDIX A

SAMPLE QUESTIONNAIRE

SAMPLE QUESTIONNAIRE

Please answer the following questions as truthfully as you can. The success of this study depends on your willingness to answer the questions in a truthful and careful manner. Your responses will be held in the strictest confidence by the two academic researchers conducting this study. The company will receive only summary data concerning the study.

In answering questions having to do with the WPR program, assume the question is referring to last year's program unless the question specifically states this is not the case.

1. What, in your opinion, was the level of difficulty of the performance goals set for your position?

   _____Extremely difficult
   _____Quite difficult
   _____Moderately difficult
   _____Not too difficult
   _____Easy

2. What, in your opinion, was the level of difficulty of the self-improvement goals set for you?

   _____Quite difficult
   _____Moderately difficult
   _____Not too difficult
   _____Easy
   _____No self-improvement goals were set

3. To what extent did the performance goals set for you under the WPR program reflect the most serious and pressing needs of your department and the company?

   _____To a very great degree
   _____To a great degree
   _____To a moderate degree
   _____To a minor degree
   _____Did not focus on any real needs of department or company

4. To what degree did the self-improvement goals set for you reflect your personal development needs?

   _____To a very great degree
   _____To a great degree
   _____To a moderate degree
   _____To a minor degree
   _____Did not focus on real deficiencies

5. How often were you given feedback on your progress on your performance goals?

_____Very frequently
_____Frequently
_____Occasionally
_____Rarely
_____Never

6. To what extent were your performance goals clearly stated with respect to results expected?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____Not at all clearly stated

7. To what extent was the relative importance of your various performance goals pointed out to you?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____No clues given as to the relative importance of performance goals

8. To what extent do you feel you control the means of reaching your performance goals?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____Do not control means of reaching goals

9. How often were you given feedback on your progress on your self-improvement goals?

_____Very frequently
_____Frequently
_____Occasionally
_____Rarely
_____Never

10. To what extent do you feel you were given too many performance goals?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____Not given too many performance goals

11. How much emphasis did your boss put on attaining your self-improvement goals?

_____A very strong emphasis
_____A strong emphasis
_____A moderate emphasis
_____A minor emphasis
_____No emphasis at all

12. How did the amount of effort you put into your job last year compare to that of previous years?

_____Very much greater
_____Much greater
_____Somewhat greater
_____A little less

13. How do relations with your boss at the present time compare to your relations with him during previous years?

_____Our relationship is much improved
_____Our relationship is moderately improved
_____No change
_____Our relationship is somewhat worse
_____Our relationship is much worse

14. How successful were you in attaining the performance goals set for you under the WPR program?

_____Performance was much higher
_____Performance was a little higher than the goals set
_____Performance was about equal to the goals set
_____Performance was a little less than the goals set
_____Performance was much less than the goals set

15. How successful were you in attaining the self-improvement goals set for you last year?

_____Improvement was much higher than goals set
_____Improvement was a little higher than the goals set
_____Improvement was about equal to the goals set
_____Improvement was a little less than the goals set
_____Improvement was much less than the goals set

16. This year new performance goals have been set for you under the WPR program. How does the level of performance goals compare with the level of these goals last year?

_____Very much higher
_____Much higher
_____A little higher
_____About the same
_____A little lower
_____Much lower

17. This year new self-improvement goals have been set for you under the WPR program. How does the difficulty of these goals compare to those of last year?

_____Much more difficult
_____A little more difficult
_____About the same
_____A little less difficult
_____Much less difficult

18. Who had the most influence on setting the performance goals for you?

_____My boss had much more influence than I
_____My boss had somewhat more influence than I
_____My boss and I had about equal influence
_____I had somewhat more influence than my boss
_____I had much more influence than my boss

19. The amount of change associated with my job is:

_____Much more than most other jobs at my level
_____More than most other jobs at my level
_____Equal to most other jobs at my level
_____Less than most other jobs at my level
_____Much less than most other jobs at my level

20. The number of contacts with persons outside my department are:

_____Much more frequent than contacts with persons inside my department
_____More frequent than contacts with persons inside my department
_____Equal in frequency to the contacts with persons inside my department
_____Less frequent than contacts with persons inside my department
_____Much less frequent than contacts with persons inside my department

21. How much of an interest do you think the company has in the WPR program?

_____A great deal of interest
_____A moderate amount of interest
_____Some interest
_____Very little interest
_____No interest

22. How much of an interest do you think your boss has in the work planning and review program?

_____A great deal of interest
_____A moderate amount of interest
_____Some interest
_____Very little interest
_____No interest

23. Which statement best describes the manner in which your boss helps you in performing your job?

_____He rarely makes suggestions to me
_____He gives me some ideas but I could use much more help
_____Sometimes my boss helps me how to plan to reach a goal and sometimes he doesn't
_____Generally when I encouter a serious obstacle my boss will suggest ways of overcoming it
_____Generally when a serious obstacle arises, I discuss it with my boss and we revise the strategy *and* the goal

24. Which statement best describes the present difficulty your boss has in measuring your performance?

_____My work is too complex to express in terms of standards of performance
_____My boss is barely able to determine if I have done a good job
_____Sometimes my boss knows enough about the work I do to make judgments about my performance, sometimes he doesn't
_____I have some measures of performance in practically every area of responsibility
_____I have verifiable work goals: I mean, at the date agreed upon, my boss can tell readily how close I've come to accomplishing my goals

25. Which statement best describes the concern of your boss for your career?

_____My boss feels this is my responsibility, not his
_____He might discuss career plans with me but views this outside his responsibility
_____He will discuss my long term career goals with me if I push him to do so
_____We have agreed on specific things I need to do for my self-improvement
_____My boss is interested in my development and views setting work goals as part of this process

26. Which statement best describes the kind of feedback you generally get from your boss about your performance?

_____I'm lucky if I get any hint from higher management on how well I'm doing my job
_____There are too many times when I really don't know what my boss expects of me
_____The only real feedback I get about my performance comes through official channels
_____I get some specific feedback about my performance but I need more
_____Much of the information I get about my performance is objective, not just subjective, and this helps

27. How often does your boss ask your opinion when a problem comes up that involves your work?

_____Almost always
_____Most of the time
_____Sometimes
_____Rarely

28. To what extent do you feel you can influence the decisions of your boss regarding things about which you are concerned?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____Not at all

29. In your opinion, how capable a manager is your boss?

_____Extremely capable
_____Quite capable
_____Capable
_____Not too capable
_____Not capable

30. How good is your boss in dealing with people?

_____Very effective
_____Quite effective
_____Moderately effective
_____Not too effective
_____Ineffective

31. All in all, how satisfied are you with your boss?

_____Very satisfied
_____Quite satisfied
_____Fairly well satisfied
_____A little dissatisfied
_____Very dissatisfied

32. Considering your skills and the effort you put into the job, how satisfied are you with your pay?

_____Very satisfied
_____Quite satisfied
_____Fairly well satisfied
_____A little dissatisfied
_____Very dissatisfied

33. If you had a chance to get a much better paying job working for another company in this area, how would you feel about changing?

_____I would strongly prefer to stay here
_____I would somewhat prefer to stay here
_____I would have a hard time deciding
_____I would somewhat prefer to change
_____I would strongly prefer to change to the other company

34. In your opinion, to what extent will your actual job performance affect your future salary increases?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____It will not affect it at all

35. In your opinion, to what extent will your actual job performance affect your future promotions?

_____To a very great degree
_____To a great degree
_____To a moderate degree
_____To a minor degree
_____They will not be related at all

36. In general, how much time did your boss devote to the Work Planning and Review Program?

_____A great deal of time
_____Quite a bit of time
_____A moderate amount of time
_____A small amount of time
_____Very little time

37. Who had the most influence on setting self-improvement goals for you?

_____My boss had much more influence than I
_____My boss had somewhat more influence than I
_____My boss and I had equal influence
_____I had somewhat more influence than my boss
_____I had much more influence than my boss

38. Did your boss indicate any priorities for your self-improvement goals?

_____Yes
_____No

39. How well do you like the WPR program?

_____I like it very much
_____I like it pretty well
_____I like it in some ways but not in others
_____I don't like it very much
_____I don't like it at all

40. In general, how applicable do you think the WPR program is to your job?

_____Very applicable
_____Quite applicable
_____Fairly applicable
_____Not too applicable
_____Not at all applicable

41. How helpful has the WPR program been to you in performing the duties of your job?

_____Very helpful
_____Quite helpful
_____Fairly helpful
_____Not too helpful
_____Not at all helpful

42. How interesting is the work in your present job?

_____Extremely interesting
_____Quite interesting
_____Fairly interesting
_____Neither interesting nor uninteresting
_____Not at all interesting

43. Which of the statements best describes the amount of praise you received from your boss about your performance last year?

_____Received only praise with no criticism
_____Received mostly praise with just a little criticism
_____Received about an equal amount of praise and criticism
_____Received mostly criticism with just a little praise
_____Received only criticism with no praise

44. How concerned do you feel your boss would be if you failed to achieve the goals established for your job to a significant degree?

_____Very concerned
_____Quite concerned
_____Somewhat concerned
_____Just slightly concerned
_____Not at all concerned

45. What kind of criticism would you receive from your boss if you failed to achieve the goals established for your job to a significant degree?

_____Extremely severe criticism
_____Quite severe criticism
_____Somewhat severe criticism
_____Mild criticism
_____No criticism at all

46. How important is it for you to know what your boss wants you to do?

_____Extremely important
_____Quite important
_____Somewhat important
_____Slightly important
_____Not at all important

47. How important is it for you to have definite policies and procedures to help you in performing your job?

_____Extremely important
_____Quite important
_____Somewhat important
_____Slightly important
_____Not at all important

APPENDIX B

INTER-ITEM AND INTER-SCALE CORRELATIONAL PATTERN RESULTING FROM CLUSTER ANALYSIS

Table A-1. Inter-item and inter-scale correlations resulting from cluster analysis

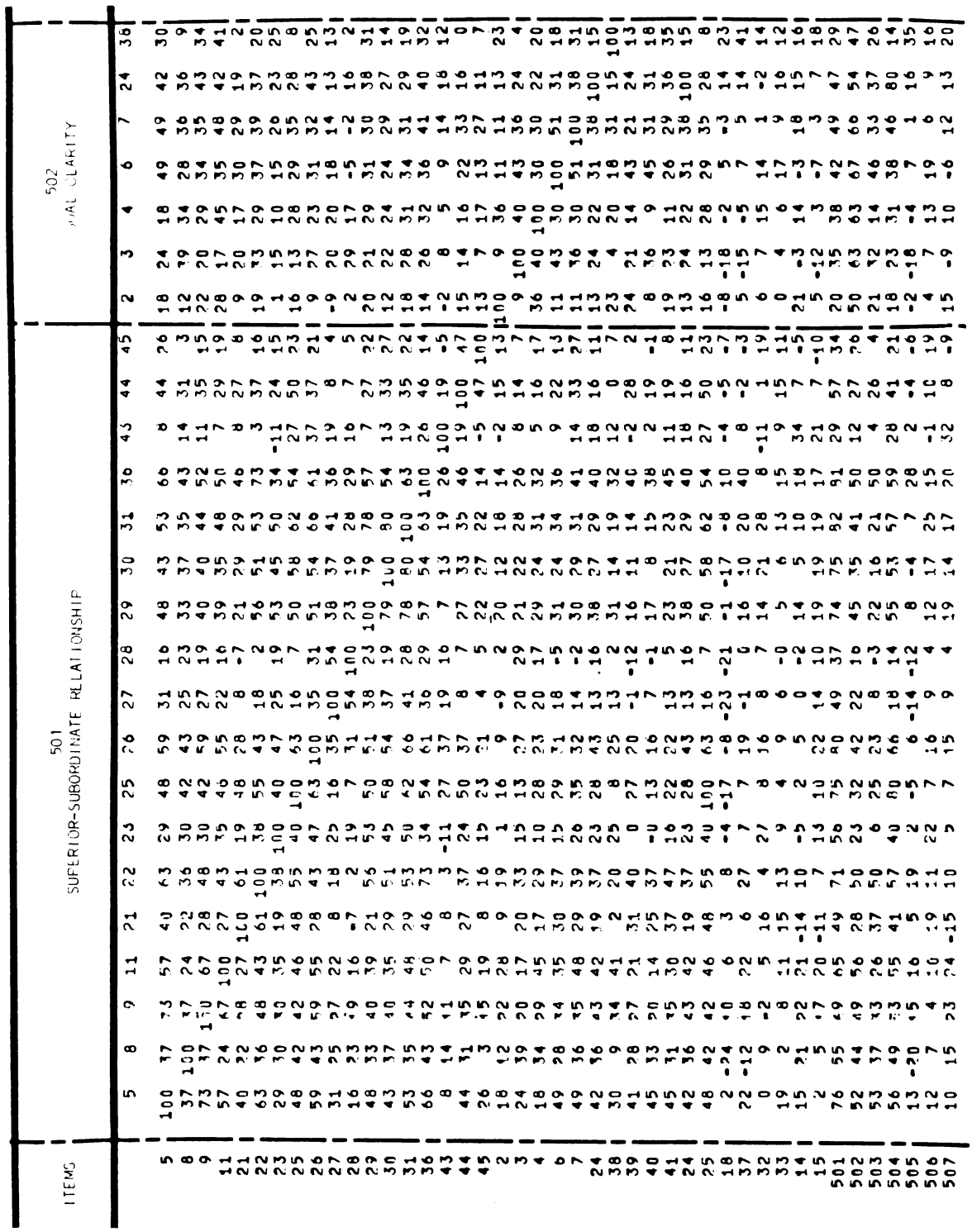
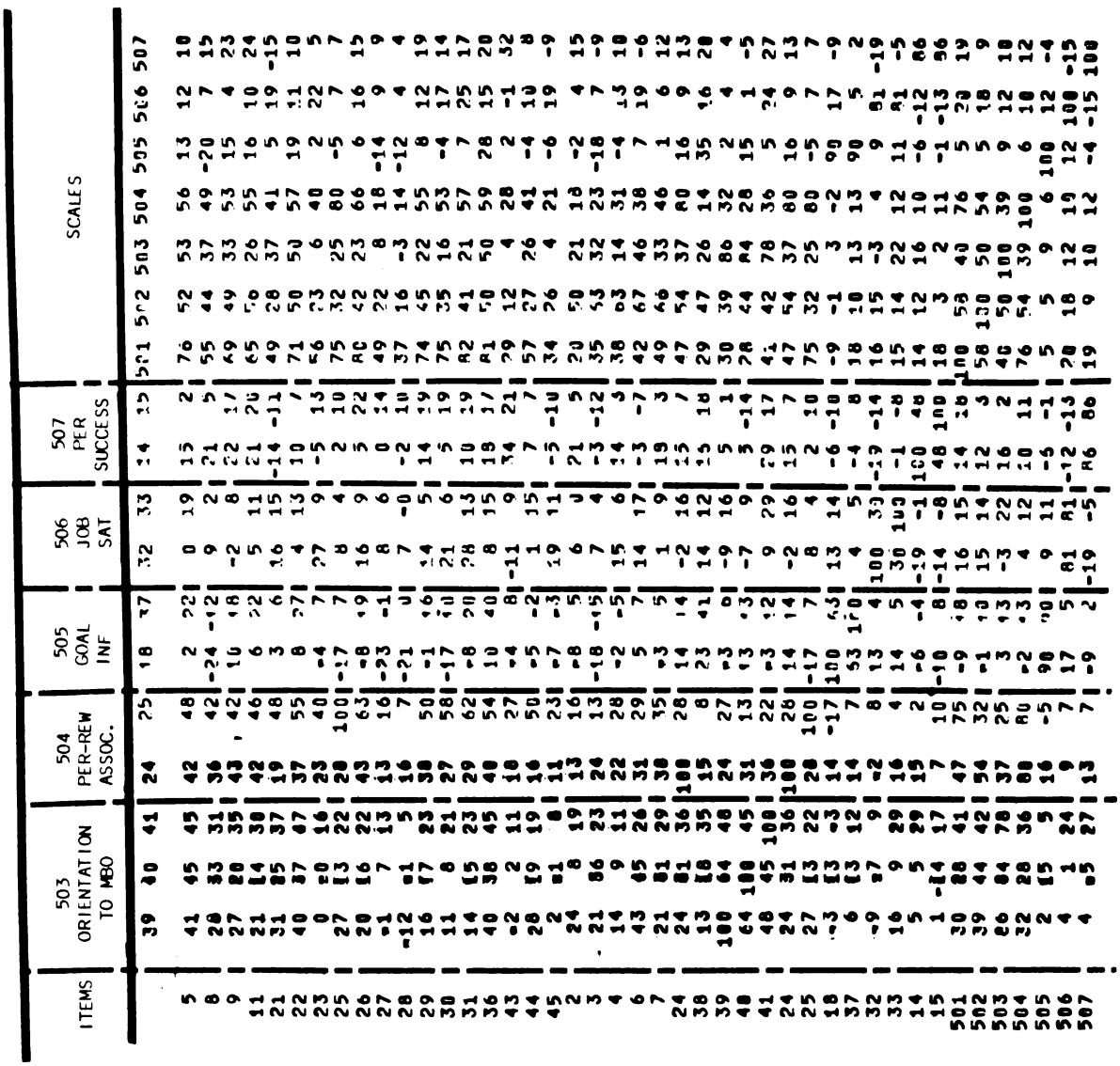


Table A-1 (cont'd.)



APPENDIX C

CROSS-LAGGED PANEL CORRELATIONS FOR VARIABLES IN MODEL OF THE SUPERIOR-SUBORDINATE RELATIONSHIP

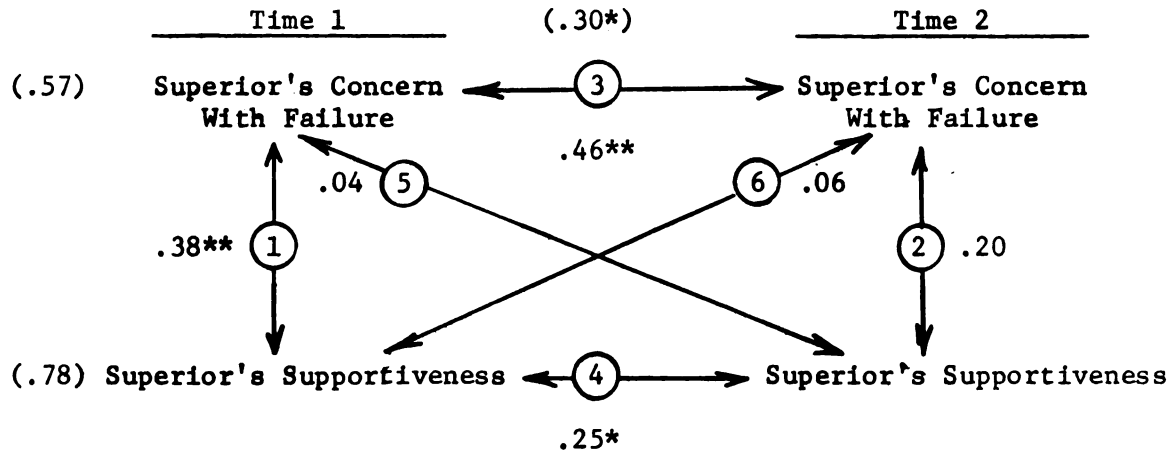


Figure A-1. Cross-lagged correlations between superior's concern with failure and superior's supportiveness.

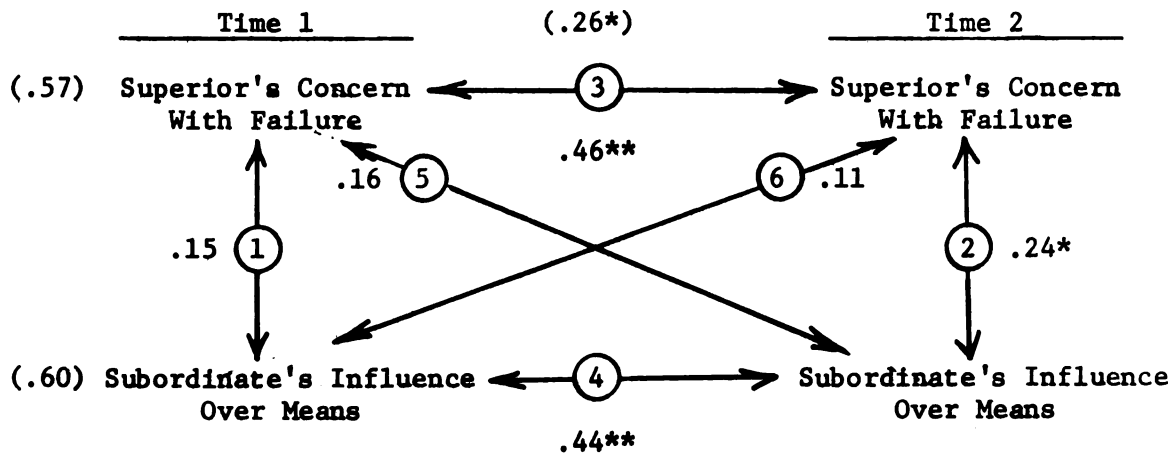


Figure A-2. Cross-lagged correlations between superior's concern with failure and subordinate's influence over means.

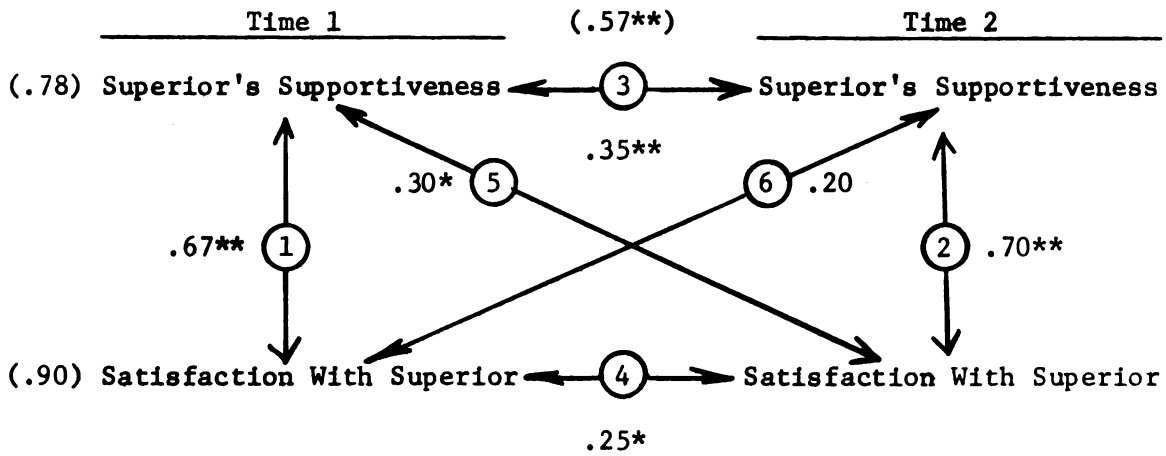


Figure A-3. Cross-lagged correlations between superior's supportiveness and satisfaction with superior.

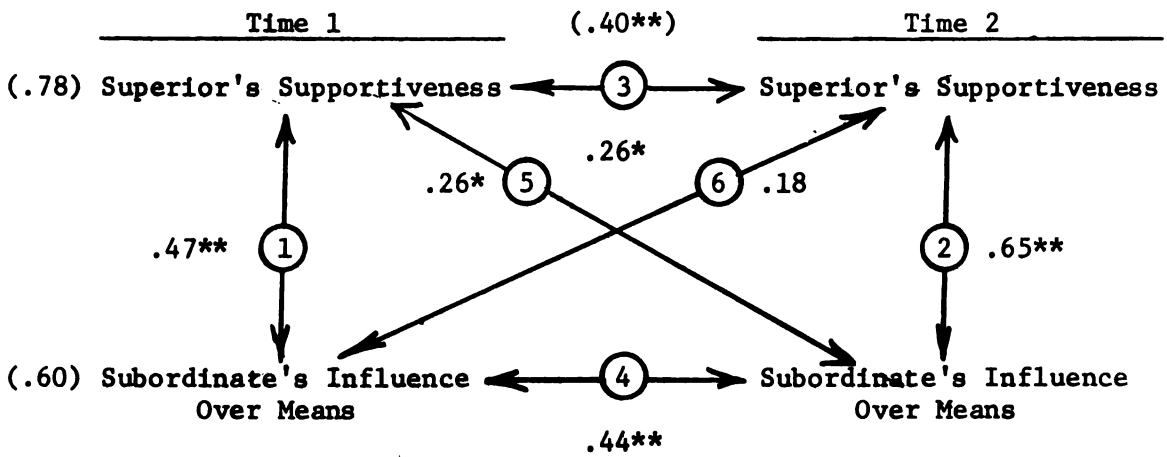


Figure A-4. Cross-lagged correlations between superior's supportiveness and subordinate's influence over means.

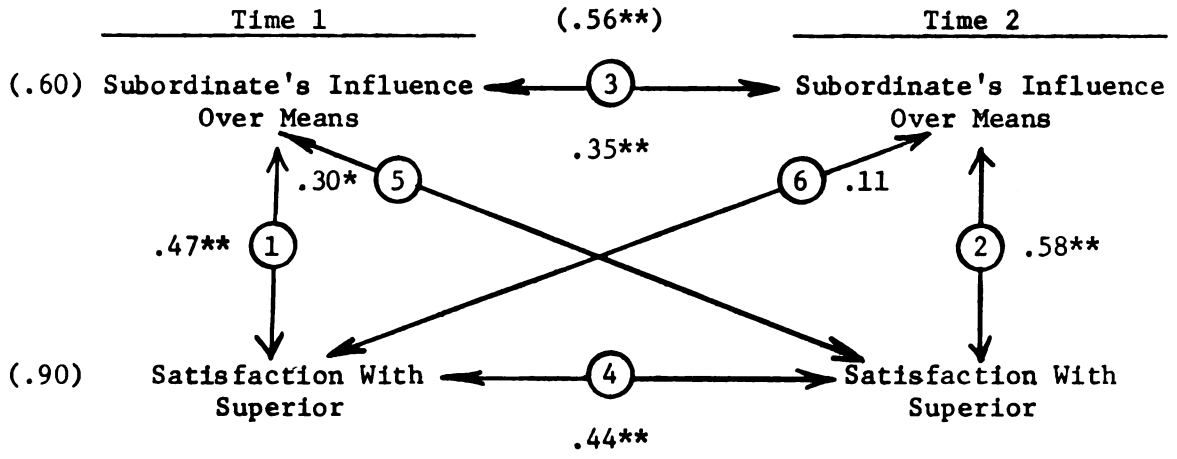


Figure A-5. Cross-lagged correlations between subordinate's influence over means and satisfaction with superior.

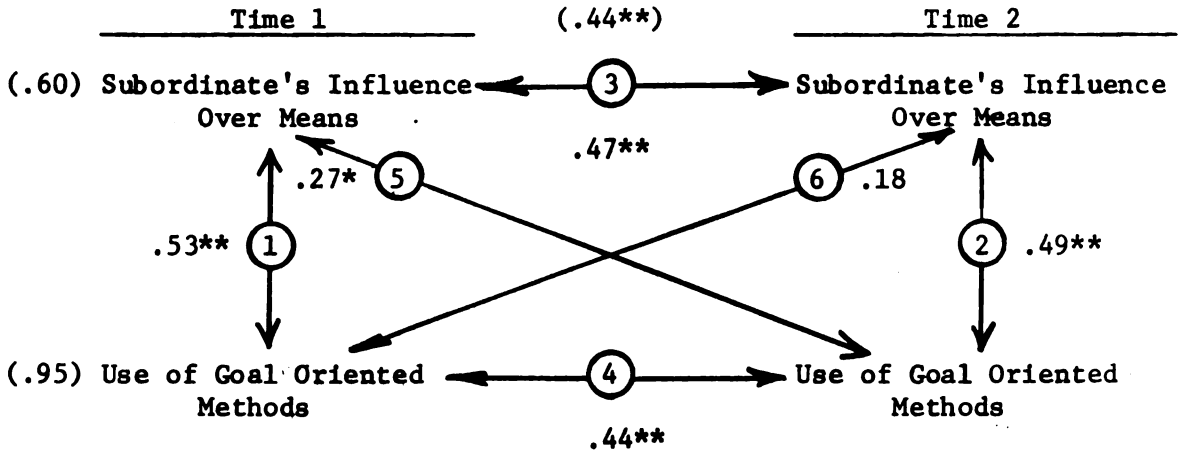


Figure A-6. Cross-lagged correlations between subordinate's influence over means and use of goal oriented methods.

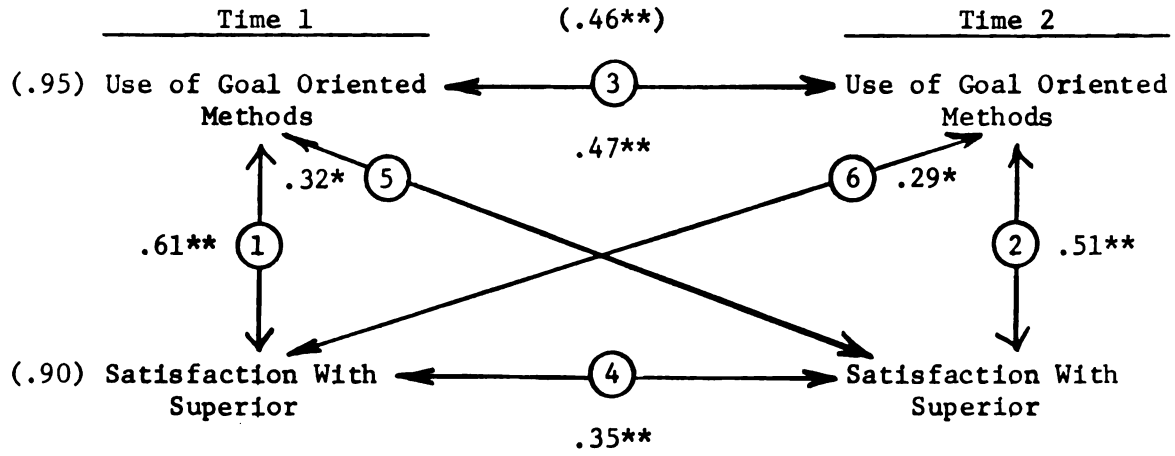


Figure A-7. Cross-lagged correlations between use of goal oriented methods and satisfaction with superior.

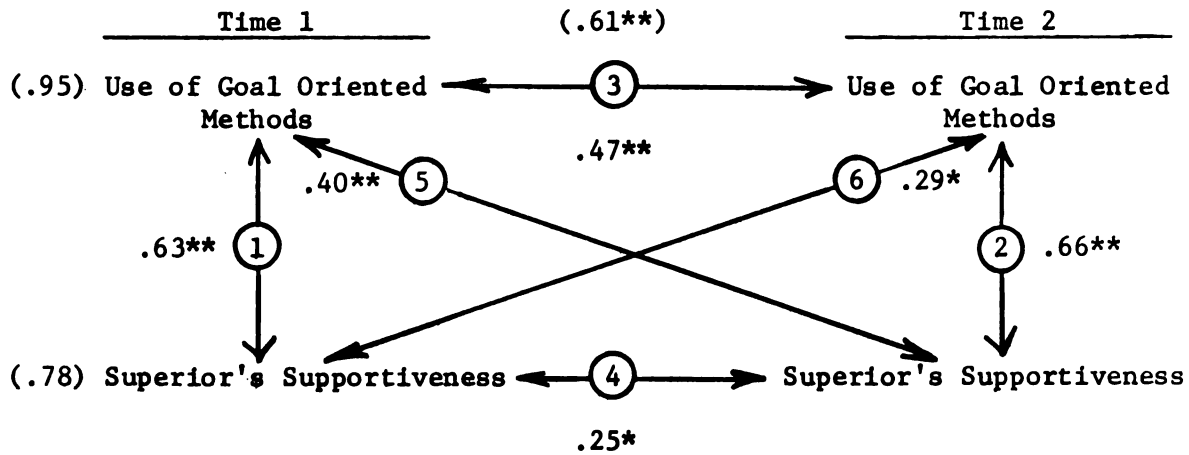


Figure A-8. Cross-lagged correlations between use of goal oriented methods and superior's supportiveness.