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TOWARD MEASUREMENT OF MANAGEMENT BY OBJECTIVES (MBO) SYSTEMS: AN INTEGRATIVE APPROACH

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and
Anthony P. Raia

Management by Objectives (MBO) has held the attention of management practitioners and researchers for nearly three decades. A wide variety of both profit and nonprofit organizations have adopted it. Schuster (1974), for example, found that almost half of the companies in the FORTUNE 500 have an MBO program of some type. These types of widespread applications have met with varying degrees of success and failure, and have produced contradictory claims and numerous prescriptions in the management literature (Wickens, 1968; Humble, 1970b; Koontz, 1972; McConkey, 1972b; Jamieson, 1973; McCaskey, 1974; Hersey and Blanchard, 1974; Wehrich, 1976; Defee, 1977; Kondrasuk, 1981). At the present, there is no valid or reliable instrument to measure the many elements of MBO and their adequacy in practice.

A review of the literature reveals different emphases and a general lack of agreement as to what constitutes an effective MBO program. For example, some authors tend to focus on goals and the goal-setting process, while others emphasize the relationship between MBO, and performance appraisal and management development. Many also stress the importance of organization climate and the problems of implementation and support. Table 1 summarizes the essential elements of MBO and identifies some of the authors who have stressed the importance of each element.

TABLE 1
SUMMARY OF ESSENTIAL MBO INGREDIENTS
AND SELECTED LITERATURE REFERENCES

1. Goals should be clear, tangible, and/or verifiable — e.g., Drucker (1954), Schleh (1960), Corey (1967), Mendelson (1968), Malli (1972), McConkey (1972a), and Greenwood (1981).
2. Goals should be challenging, realistic, and/or attainable — e.g., McGregor (1960), Hughes (1965), Miller (1966), Tosi and Carroll (1969), Levinson (1970), Mendelson (1970), Morrisey (1970), and Miglione (1976).
3. Action plans designed to achieve desired results should be developed — e.g., Huse and Kay (1964), Schaffer (1964), Dove (1970), Tosi, Rizzo,

and Carroll (1970), Varney (1971), Morrisey (1975), Higgins (1976), Albrecht (1978).

4. Support and feedback from superiors, peers, and subordinates are essential — e.g., Locke, Cartledge, and Koppel (1968), Ivancevich, Donnelly, and Lyon (1970), Locke, Cartledge, and Knerr (1970), Cummings, Schwab, and Rosen (1971), Froissart (1971), Lasagna (1971), Reddin (1971), Beck and Hillmar (1972), McConkey (1972c), French (1975), Steers (1975), Ivancevich (1977), and Likert and Fisher (1977).
5. Performance appraisal should be based upon the attainment of objectives and plans — e.g., McGregor (1957), Patton (1960), Kindall and Gatz (1963), Meyer, Kay, and French (1965), French, Kay, and Meyer (1966), Wikstrom (1966), McConkey (1967), Burke and Wilcox (1969), and Koontz (1971).
6. MBO should also provide the basis for management training and self-development — e.g., Tosi (1965), Huse (1966), Humble (1968, 1970a), Eastman (1970), and Latham and Kinne (1974).
7. Successful implementation requires an appropriate organization climate, top management participation and support, and adequate resources — e.g., Raia (1965, 1966), Tosi and Carroll (1968, 1970), Ivancevich (1972, 1974), Motamedi (1974), and Hollman (1976).

As indicated in Table 1, the primary focus of much of the descriptive and some of the empirical MBO literature tends to be on the goal-setting process and on the relationship between goal-setting and planning. Goals need to be not only verifiable and challenging, but realistic and attainable as well. They should also include action plans for their accomplishment. A second major emphasis is on the relationship between MBO and performance appraisal. This includes appropriate feedback relative to progress and results. Attention is also paid to providing opportunities for management training and development.

A sizable portion of the empirical literature deals with the problems of implementation of MBO programs. The focus tends to be on the development of an appropriate organization climate and on the need for top management support, involvement, and providing adequate resources for implementation. A common theme is that successful implementation cannot be left to chance.

It is evident from our survey that most of the literature and research to date has emphasized different aspects of MBO and the relationships between a limited number of variables. This paper has three objectives: first, to present a conceptual model and description of the characteristics of an integrative MBO system; second, to develop and validate an instrument designed to measure dimensions and characteristics of the model; and third, to use the instrument to evaluate the MBO systems of two different organizations.

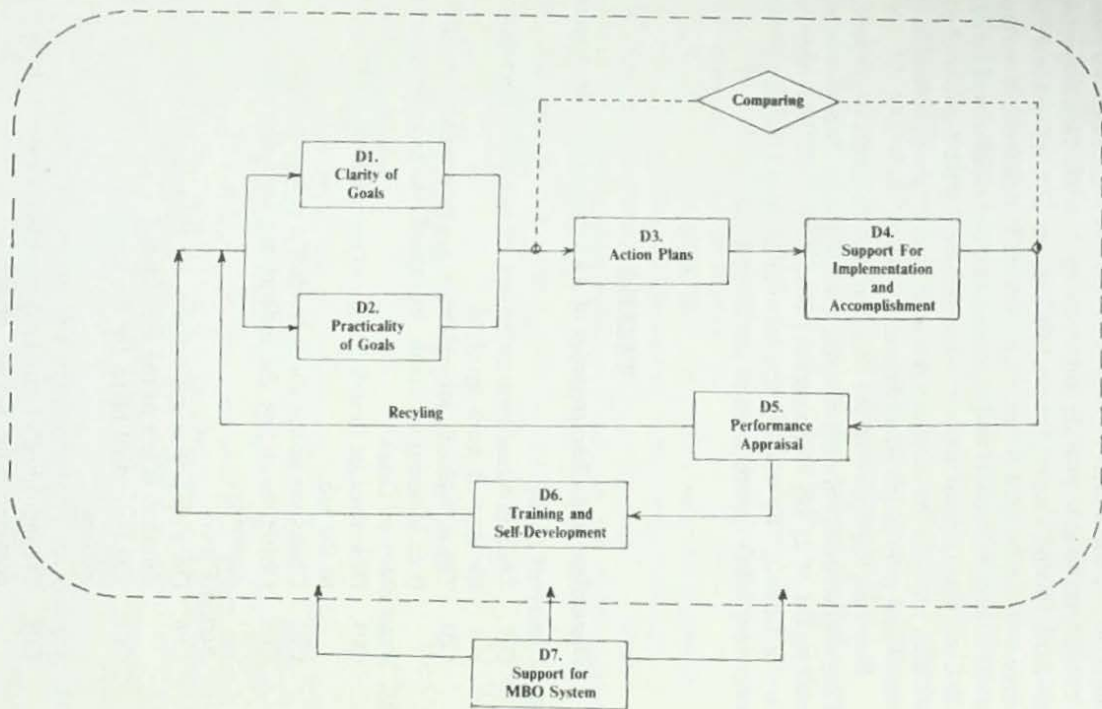
Despite these apparent distinctions and differences in emphasis, both in theory and in practice, the need to integrate MBO internally and with other management activities has not gone unrecognized (Shetty and Carlisle, 1974; 1975; Willcoxon and Bracato, 1976a; 1976b). Odiorne (1965) describes MBO as a system of participative goal-setting and links the process to performance review and salary administration. Batten (1966) emphasizes the need to properly integrate human resources with other organization resources. According to Howell (1970), MBO involves a "normal evolution" through three stages of development — from performance appraisal, to the integration of objectives, to long range planning. Patton (1972) stresses the need to integrate MBO with organizational development and the reward and penalty system. And, finally Carroll and Tosi (1973) conclude that MBO programs will fail if they are not given adequate support by management and are not well integrated with other key organization processes and activities.

Other authors have been even more explicit and systematic in the descriptions of their models. Raia (1974, p. 15) defines MBO as an "integrative management system . . . designed to integrate key management processes and activities in a logical and consistent manner." Included among these are the formulation of overall organization goals and strategic plans, the development of individual job objectives and action plans for their accomplishment, the use of periodic progress reviews for feedback and problem solving, and the appraisal of performance as a basis for manager training and self-development. Other characteristics include direction and support from top management and increased emphasis on self-control and individual growth. In a somewhat similar vein, Weihrich (1977) describes a systems approach to MBO which stresses its integration with the managerial functions of planning, organizing, staffing, directing, and controlling and utilizes systems concepts to emphasize the interdependence of MBO with its environment.

The components of an integrative MBO system (IMBOS), as suggested by our survey of the existing literature, have been identified and the relationship between them graphically illustrated in Figure 1. The IMBOS model consists of seven basic dimensions (D1, D2 . . . D7). Goal-setting, an essential first step in the process, consists of two aspects. One involves the formulation and development of clear goals and objectives for the organization and for the individual (D1). The other involves the degree to which the goals and objectives are practical in terms of the challenge they offer, the extent to which they define the individual's authority and responsibility, and the degree to which they are flexible and responsive to environmental dynamics (D2). Action planning (D3) involves the freedom and autonomy to plan for the achievement of one's own job objectives. Support for implementation and accomplishment of objectives (D4) includes support from superiors and subordinates, in terms of implementing and accomplishing job objectives, and the availability of timely and valuable feedback concerning progress toward job objectives and events which impact on their attainment. Per-

FIGURE 1

Components of the Integrative MBO Systems (IMBOS)



formance appraisal (D5) includes an assessment of accomplishments and results in terms of the established goals and objectives. It also takes into account the circumstances of the job (including performance in other areas) and links with the training and development. Training and self-development (D6) reflect opportunities on and/or off the job and are included among the job objectives so as to provide and encourage continued learning opportunities. And, finally, support for the MBO system (D7) is dependent upon the degree to which the total system's (i.e., individual, departmental and organizational) objectives support and accommodate one another, and the extent to which top management actively supports the program and is involved in its activities, provides the necessary resources, and creates opportunities for self control and growth for subordinates.

Based on the review of the literature and the seven dimensions, a list of key characteristics of each dimension was developed and summarized. The resulting list of 21 key characteristics (C1, C2 . . . C21) has been summarized in Table 2. The relationships between them and the dimensions of an integrative MBO system are also shown in Figure 1.

TABLE 2

Dimensions and Characteristics of An Integrative MBO System

- D1. *Clarity of Goals:*
 - C01. The individual's job objectives are quantified appropriately for the type of work involved.
 - C02. The individual's job objectives are expressed in verifiable terms (i.e., in nonquantifiable, but specific terms) when appropriate.
- D2. *Practicality of Goals:*
 - C03. Objectives are flexible in view of environmental dynamics related to the job.
 - C04. Objectives utilize the individual's potential on the job.
 - C05. Objectives define the individual's area of responsibility and authority.
- D3. *Action Plans:*
 - C06. Once objectives are defined, the planning of actions to be undertaken is left to the individual.
 - C07. The individual plans for the achievement of his own job objectives.
- D4. *Support for Implementation and Accomplishment:*
 - C08. The individual's manager(s) provide(s) support to implement and accomplish his/her job objectives.
 - C09. The individual supports his/her peers, subordinates and manager(s) in the pursuit of job objectives.
 - C10. The individual gets feedback about events and his own progress toward attainment of objectives periodically or when needed.

- C11. The feedback that the individual gets is valuable to the achievement of his job objectives.
- D5. *Performance Appraisal:*
 - C12. The individual accomplishes his job objectives fully within the established time frame(s).
 - C13. Individual performance appraisal is based upon job objectives.
 - C14. Circumstances (e.g., performance in other areas) are taken into consideration in the individual's performance appraisal.
 - C15. The individual's performance appraisal is coupled to a training and development program.
- D6. *Training and Self-Development Opportunities:*
 - C16. The individual has opportunities for self development either on the job or via in-house and/or external programs.
 - C17. Training and self-development objectives are included in the individual's job objectives.
- D7. *Support for The MBO System:*
 - C18. Top management actively participates in and supports the implementation of the MBO system.
 - C19. The total system's (i.e., individual, departmental and organizational) objectives support and accommodate one another.
 - C20. Self control is an integral part of MBO practices (i.e., individual, not the boss, determines the behavior or activities required to achieve objectives).
 - C21. Resources needed to support the achievement of job objectives are provided.

THE MEASUREMENT OF IMBO SYSTEMS

The Research Instrument

The questionnaire (IMBOSQ) was constructed to test the dimensions and characteristics of the model described above. Two types of questions relating to each of the 21 characteristics were developed and were included in the instrument. The A-type questions provided data about *current* managerial practices (the "how it is now" features), while the B-type questions provided data about *desired* managerial practices (the "how it should be" features). The use of A and B type questions provides the respondent with an opportunity to rate the characteristics in terms of how he or she experiences them in relation to a desired or ideal state. The measured discrepancies or differences in responses to A-type and B-type questions, as related to each item, provide data about the direction and magnitude of desired improvement. The ratings are scored on a seven-point Likert-type scale, with one being the minimum and seven the maximum, as illustrated below:

	not at all	very little extent	little extent	some extent	great extent	very great extent	full extent
4. A. Do your job objectives utilize your potentials?	1	2	3	4	5	6	7
B. Should your job objectives utilize your potentials?	1	2	3	4	5	6	7
15. A. Is performance appraisal coupled to a training and development program?	1	2	3	4	5	6	7
B. Should performance appraisal be coupled to a training and development program?	1	2	3	4	5	6	7

Respondents Characteristics

A survey of practicing managers from two different organizations was conducted. The surveyed organizations have adopted MBO programs that were installed by different consulting firms. Both organizations utilize similar technologies and are involved in forest-related products. The IMBOSQ was sent to all of the 138 managers in Organization I and all of the 119 managers in Organization II. Usable response rates from each organization were 81% (n = 112) and 87% (n = 103) respectively. The characteristics of the respondents and their organizations are summarized in Table 3.

Reliability and Validity

The usefulness of the IMBOSQ can be established as follows: first, by examining its reliability; second, by determining its validity via factor structure and the degree to which the emerging factors exhibit similarity between the two organizations; and third, by measuring the discrepancies between current and desired MBO practices as perceived by the managers in the two organizations.

The question of "reliability" may be resolved into a question of accuracy of generalization, or generalizability (Cronbach, Gleser, Nanda and Rajuruthnam, 1972). However, Nunnally (1967, p. 196) argues that "coefficient alpha is a very important formula in theory of reliability.* It is so pregnant with

* $r = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_j^2}{\sigma_y^2} \right)$

TABLE 3

Characteristics of the Respondents and Their Organizations

Item	Organization I	Organization II
Respondents:		
Managers	100%	100%
Age (mean)	42.3	41.1
Years of Education	14.7	15.4
Number of Responses	112	103
Number of Managers	138	119
Rate of Response	81%	87%
Organizations:		
Number of Employees	582	490
Number of Managers	138	119
Total Budget (in 1000's)	7,822	6,300
Experience with MBO (months)	20	9

meaning that it should routinely be applied to all new tests." It is superior to other internal consistency estimates, including odd-event and split-half methods. Coefficient alpha was used as an estimate of the generalizability of the IMBOSQ. The reliability estimates of the seven dimensions of the IMBOS model (B-Type questions) in Organizations I and II are shown in Table 4.

Nunnally (1967) also suggests that reliabilities as low as .50 or .60 are within an acceptable range for research which develops a new construct. However, he cautions that an instrument used to measure a person's attributes for applied decision-making (e.g., psychological tests) should have reliabilities in excess of .90. Since the present research deals with a new construct, and is related to managerial practices rather than personal attributes, the scale reliabilities of coefficient alpha for the seven IMBOS dimensions are all above the minimum acceptable range. The fact that their magnitudes range from .65 to .83 across both organizations indicates a moderately strong stability in the reliability properties of the instrument.

Factor analytic techniques were used to find some small number of independent factors (dimensions) with a significant proportion of the variance represented in the data. For this purpose, a principal component solution with orthogonal rotation using the varimax criterion was employed (Nie, Hall, Jenkins, Steinbrenner, and Berit, 1975; Rummel, 1970). The varimax criterion tends to lead to a simple structure by attempting to reach .0 or 1.0 loadings on each rotated factor. Only factors with eigen values in the excess of 1.0 were considered. By the use of this common rule, seven factors emerged in each of the two data sets (B-Type questions) and are presented in Tables 5 and 6.

TABLE 4

Reliability Estimates of the IMBOSQ Dimensions Using Standardized Coefficient Alpha: Organization I and II

IMBOS Dimensions	No. of Items	Organizations	
		I	II
D1. Clarity of Goals	2	.65	.71
D2. Practicality of Goals	3	.69	.66
D3. Action Plans	2	.73	.69
D4. Support for Implementation and Accomplishment	4	.78	.81
D5. Performance Appraisal	4	.80	.83
D6. Training and Self-Development	2	.81	.74
D7. Support for the MBO System	4	.73	.78

The seven emerged factors explain 70.3 percent of the scale variance in Organization I and 72.5 percent in Organization II. Based on this particular solution and finding, the hypothesis that seven factors would emerge from the scale corresponding to the seven IMBOS dimensions is supported. The inductive inferences regarding the construct validity of the factors are also supported. The factors contain certain domains that are related to the characteristics of the Integrative MBO System concept.

The similarities of factor properties and coefficient alpha properties in both Organizations I and II satisfy the criterion of comparability of the instrument across the two situations. Osgood, Suci and Tannenbaum (1957) explain that the criterion of comparability is an extension of the notion of validity and involves the extent that an instrument can be applied across a range of situations and results interpreted in constant fashion. Kerlinger (1973, p. 468-469) asserts that factor analysis is a refined method of investigating construct validation. It tells us, in effect, what measures measure the same thing and to what extent they measure what they measure.

TABLE 5

Factor Analytic Properties of IMBOSQ: Organization I

Construct	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇
D1							
C01	.02	.05	.73	.16	.06	.14	.02
C02	.17	.05	.60	.17	.13	-.11	.05
D2							
C03	.02	.08	.00	.07	.58	-.05	.09
C04	.20	.20	.17	.37	.56	.16	.12
C05	.10	.17	.34	.12	.59	.27	.12
D3							
C06	.11	-.01	.06	.23	.06	.00	.77
C07	.11	.21	.04	.08	.39	.14	.67
D4							
C08	.11	.67	-.05	.20	.17	.06	-.02
C09	.07	.72	.13	.10	.19	.18	.08
C10	.37	.59	.13	.14	-.12	.35	.13
C11	.36	.42	.06	.15	.17	.16	.13
D5							
C12	.43	.31	.26	.08	.03	.26	.21
C13	.76	.19	.19	.18	.16	.05	.08
C14	.67	.17	.07	.17	.25	.19	.10
C15	.62	.04	-.02	.25	-.12	.25	.04
D6							
C16	.20	.22	.03	.30	.10	.70	.12
C17	.32	.24	.02	.11	.11	.71	-.02
D7							
C18	.22	.04	.15	.66	.22	.10	.08
C19	.13	.23	.10	.60	.14	-.01	.07
C20	.24	.14	.22	.57	-.02	.34	.16
C21	.08	.09	.10	.42	.04	.15	.13
Accumulated % Variance	32.5	41.2	48.4	54.6	60.3	65.4	70.3

TABLE 6
Factor Analytic Properties of IMBOSQ: Organization II

Construct	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇
D1							
C01	-.08	.01	.06	.80	.02	.07	.08
C02	.00	.08	.17	.67	.00	.14	.07
D2							
C03	.18	.09	.73	-.07	-.04	-.09	-.10
C04	.14	.18	.52	.14	.20	.10	.12
C05	.18	.24	.56	.15	.14	.09	.26
D3							
C06	.09	.14	.02	-.04	.12	.13	.74
C07	.09	.14	.08	.04	-.00	.06	.61
D4							
C08	.18	.67	.13	.01	.02	.26	.15
C09	.17	.75	.09	-.05	.00	.20	.08
C10	.19	.75	.10	.09	.12	.30	.11
C11	.36	.66	-.08	.02	.15	.01	.18
D5							
C12	.62	.21	.13	.02	.03	.20	.10
C13	.81	.19	.22	.11	.06	-.02	.06
C14	.71	.11	.07	-.07	.07	.06	.08
C15	.79	.21	.09	.07	.08	.01	.03
D6							
C16	.10	.11	.08	.04	.74	.12	.07
C17	.07	.03	.09	-.02	.72	.20	.04
D7							
C18	.07	.19	-.07	.28	.16	.60	.17
C19	.19	.30	.00	.19	.17	.66	.10
C20	.13	.22	-.09	.10	.18	.77	-.07
C21	-.10	.07	.26	-.10	.05	.55	.19
Accumulated % Variance	27.3	38.9	47.5	54.6	61.4	67.4	72.5

APPRAISAL OF THE TWO SYSTEMS

The general properties of the responses and perceived discrepancies between B-type and A-type questions for each item are presented in Tables 7 and 8. The results indicate that the responding managers tend to favor improvements in their present MBO systems toward IMBOS characteristics for each item (i.e., a shift toward the right of the scale).

TABLE 7

Properties of the MBO System in Organization I: The Existing Practices, Desired Practices and the Resultant Discrepancies

Construct	A-Type	B-Type	(B-A) Type	
	\bar{A}	\bar{B}	Δ	t*
D1				
C01	3.20	4.43	1.23	8.29
C02	4.17	4.97	.80	5.95
D2				
C03	4.82	5.40	.58	5.38
C04	4.80	6.16	1.36	13.13
C05	4.54	5.19	.65	5.31
D3				
C06	5.50	5.83	.33	4.27
C07	5.45	5.84	.38	5.43
D4				
C08	5.27	5.85	.58	5.27
C09	5.15	5.89	.74	9.14
C10	4.41	5.91	1.50	13.20
C11	5.05	6.12	1.07	9.11
D5				
C12	5.08	5.97	.89	10.48
C13	4.45	5.73	1.28	8.67
C14	4.78	5.80	1.02	7.54
C15	4.73	5.72	1.00	8.10
D6				
C16	5.22	6.06	.84	7.70
C17	4.98	5.93	.95	7.59
D7				
C18	4.89	5.99	1.09	9.50
C19	5.04	5.80	.76	8.06
C20	4.66	5.56	.91	7.09
C21	4.86	6.00	1.14	11.36

*All are significant @ P = .001 (two-tail test).

TABLE 8
Properties of the MBO System in Organization II: The Existing Practices, Desired Practices and the Resultant Discrepancies

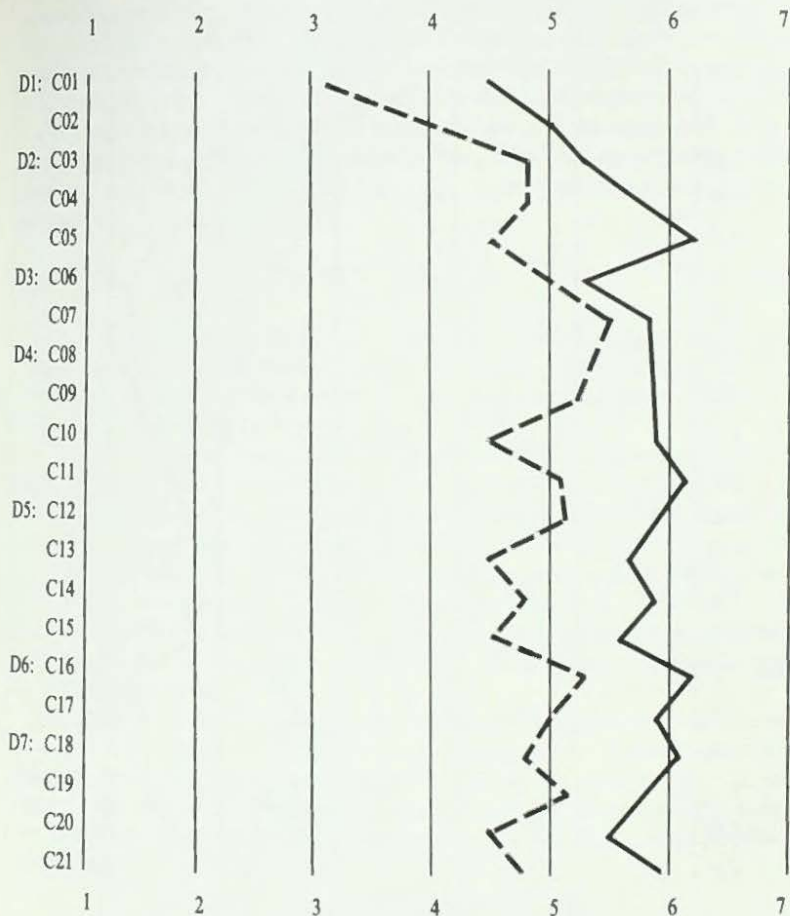
Construct	A-Type	B-Type	(B-A) Types	
	\bar{A}	\bar{B}	Δ	t^*
D1				
C01	3.25	4.27	1.02	6.05
C02	4.18	4.63	.45	2.89
D2				
C03	4.52	5.27	.74	4.97
C04	4.26	5.24	.98	6.95
C05	4.43	5.66	1.22	7.99
D3				
C06	5.30	5.78	.48	4.02
C07	5.24	5.69	.45	4.21
D4				
C08	4.52	5.86	1.34	10.35
C09	4.98	5.78	.80	6.18
C10	4.97	5.69	.72	7.31
C11	4.05	5.60	1.55	11.45
D5				
C12	4.05	5.34	1.29	9.28
C13	4.53	5.55	1.01	8.20
C14	3.56	5.47	1.91	11.82
C15	4.23	5.37	1.14	8.95
D6				
C16	4.58	5.88	1.29	9.96
C17	4.14	5.62	1.48	10.79
D7				
C18	3.90	5.66	1.76	12.93
C19	4.72	5.60	.88	7.51
C20	4.37	5.48	1.11	9.01
C21	4.87	5.60	.73	6.05

*All are significant @ $P = .001$ (two-tail test).

These perceived differences (between A-Type and B-Type questions) are significant ($P < .001$) in both organizations. Summaries of these properties are presented in Graphs 1 and 2.

GRAPH I

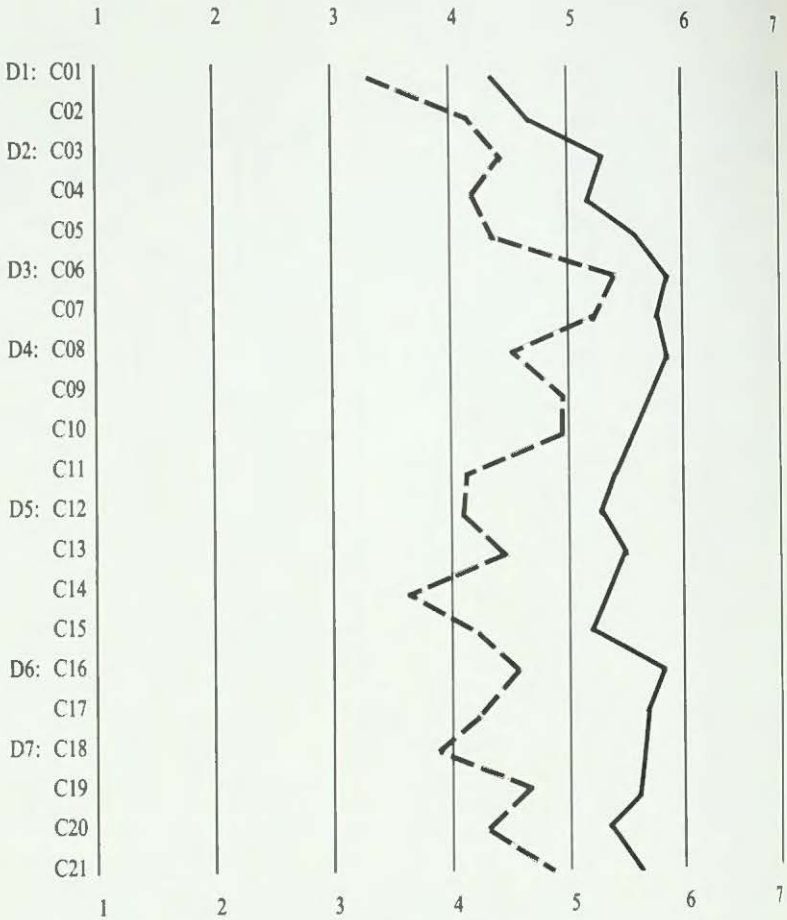
Graphical Characteristics of The MBO System in Organization I*



* Legend: (- - -) How it is; (——) How it should be

GRAPH II

Graphical Characteristics of The MBO System in Organization II*



* Legend: (- -) How it is; (—) How it should be

These graphs indicate that the managers of both organizations desire to move to a more integrative MBO system. In addition, with the exception of item C10 (feedback about performance), current MBO practices appear to be better in Organization I than those in Organization II. It is also interesting to note that, except for item C05 (objectives define responsibility authority), the managers of Organization I desire an even more integrative MBO system than do the managers of Organization II. One may speculate that these differences are due to the fact that the managers of Organization I had longer exposure to MBO (20 months) than did the managers of Organization II (9 months). So it is not surprising that both their current practices and their expectations about MBO are higher than those of the other managers.

SUMMARY

In this paper we have developed a conceptual model of integrative MBO systems and discussed the underlying components, characteristics, and rationale. An instrument based on the model was then constructed and tested in two different organizations.

The standardized coefficients alpha of the IMBOS questionnaire were high enough to render its acceptance as a new instrument for the measurement of management by objectives systems. Furthermore, these reliability estimates cross-validated across the two organizations and the factor analysis resulted in a structure consisting of seven factors and supported the existence of the seven dimensions of IMBOS conceptual model. The results of the factor analysis suggest that the seven dimensions explain a sufficiently large proportion of the instrument variance. These results were replicated in both organizations.

Managerial perceptions of current and desired MBO practices were measured and discrepancies between the two systems noted. It was found that managers of both organizations significantly ($P < .001$) prefer a more rigorous application of the IMBOS concept. The IMBOSQ has potential for use as a diagnostic tool for assessing the practice and desirability of MBO in organizations.

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