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BUDGETARY PARTICIPATION, MOTIVATION AND MANAGERIAL PERFORMANCE

by

Peter Brownell
and
J. Morris McInnes

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MASSACHUSETTS
INSTITUTE OF TECHNOLOGY
50 MEMORIAL DRIVE
CAMBRIDGE, MASSACHUSETTS 02139

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Abstract

The paper proposes an "indirect-effects" model linking participation in budget-setting with managerial performance. Motivation was selected as an intervening variable to explore the proposed model in a field study setting. A significant positive association between participation and performance was observed. However, the indirect path linking participation and performance through motivation was found to explain only a small amount of the relationship. In the study, motivation was measured using an expectancy model. Further analysis revealed that greater participation in budget-setting was positively associated with the extrinsic components of motivation, but negatively with the intrinsic components. Contrary to wide-held beliefs, the results seemed to suggest that participation reinforces the contractual nature of the budget at the expense of the personal satisfactions derived from goal-directed behavior and goal-accomplishment. The managerial implications of the "indirect-effects" model, and of the findings of the study, are discussed in the final section of the paper.

Budgetary Participation, Motivation And Managerial Performance

Early theorists (e.g., Argyris, 1952; Becker and Green, 1962) tended to the view that participation in the budget-setting process was a major means available to organizations to gain the commitment of managers to budgets, with consequent improvement in performance. Hopwood (1976) summarized this earlier sentiment when he suggested that participation was viewed by many as "...a panacea: a cure for all the many ills which have been associated with traditional budgetary systems" (p. 74). Nonetheless, even in the non-empirical realm in which much of this debate was conducted disagreement was evident. The reply to Becker and Green by Stedry (1964), together with Becker and Green's (1964) rejoinder, illustrates the controversial nature of the debate.

As subsequent empirical evidence accumulated, it became clear that these earlier disagreements were well founded. While evidence emerged of positive relationships between participation and criteria such as job satisfaction (Cherrington and Cherrington, 1973), attitude towards job (Milani, 1975), motivation (Hofstede, 1967; Searfoss and Monczka, 1973), and attitude towards the budget system (Collins, 1978; Kenis, 1979), no consistent relationship with performance was found.

A possible explanation for the lack of an observed association between participation and performance revolves around the role of moderating variables, that is, variables which interact with participation jointly to affect performance. This view gained formal recognition in the literature with the emergence of the contingency framework for control system design (see, for example, Waterhouse and Tiessen, 1978; Otley, 1980). Specifically with regard to participation, Brownell (1982a) has reviewed and synthesized the literature within a framework which explicitly provides for interactive

effects of participation with organizational, interpersonal, and individual variables. Recent empirical work (Brownell 1981, 1982b) has produced results consistent with this "moderated-effects" framework.

A second possible explanation, and the one pursued in this paper, emerges from literature in organizational behavior. In a review of literature in the area of goal setting and routine task performance, Locke and Schweiger (1979) could find no evidence of a systematic association between participation and performance. Locke, et. al. (1981, p. 138) went on to propose that to the extent it is found to be associated with performance, participation may be influencing this through the joint mechanisms of inducing higher goals and enhanced goal-commitment on the part of workers. In other words, these authors imply an "indirect-effects" model in which some other condition, aroused by participation, is positively associated with performance.

The difference between the "moderated-effects" and "indirect-effects" frameworks is significant, and deserves brief elaboration. The "moderated-effects" model posits the existence of variables which may interact with participation to affect performance; but these variables are viewed as neither directly affecting performance, nor being affected by participation. To illustrate, Brownell (1981) found that the individual variable, internal/external locus of control[1], interacted with participation to affect performance. Internals were found to prefer, and perform better, under conditions of high participation while externals preferred, and performed better, under low participation conditions. However, participation and locus of control were themselves unrelated, and no effects of the latter on performance were found. By contrast, the "indirect-effects" model posits the existence of variables which are associated with participation and which, in turn, affect performance. In

this framework, it is possible that statistically significant associations between participation and some intervening variable on the one hand, and between the intervening variable and performance on the other, could combine in such a way as to yield an insignificant association between participation and performance.

In this study, motivation was chosen as an intervening variable in an empirical investigation of the "indirect-effects" model.[2] Apart from the intuitive plausibility of motivation as an intervening variable, there is ample justification in the literature for its choice. This is dealt with in the next section of the paper.

Review of Previous Literature

Hofstede (1967), in his seminal study of budgeting, observed that, "Of all variables studied, budget participation is the one with the strongest effect on all measures of motivation" (pp. 181-182). Hofstede used four measures of motivation, dealing with the perceived relevance of the budget and the existence of favorable attitudes towards the budget on the part of budgeted managers. Similar results were found by Searfoss and Monczka (1973) who studied the effects on motivation of participation by general foremen in the development of their budgets; motivation was measured through the use of subordinates' ratings of the level of effort expended by the foremen in goal-directing and evaluative activities based on the budget.

In both these studies the concept of motivation was operationalized in terms of acceptance of, and effort expended to achieve the budget. In this study motivation is operationazlied by use of the expectancy model (see, for example, Galbraith and Cummings [1967], House [1971], and Ronen and Livingstone [1975]). The model, shown in Equation (1), is considerably more general in its interpretation of motivation than the constructs used by Hofstede and by Searfoss and Monczka. It posits that individuals will exert

Equation 1

Expectancy Model of Motivation:

$$M = IV_b + P_1 \left(IV_a + \sum_{i=1}^{n} P_{2i}\, EV_i\right)$$

Where: M is motivation

Iv_b is the intrinsic valence associated with goal-directed behavior

P_1 is the instrumentality, or probability, that goal-directed behavior will result in goal accomplishment

IV_a is the intrinsic valence associated with goal accomplishment

P_{2i} is the expectation, or probability, that goal accomplishment will result in the ith extrinsic outcome, $i = 1,\ldots\ldots,n$.

EV_i is the valence of the ith extrinsic outcome, $i = 1,\ldots\ldots, n$.

effort towards goal achievement to the extent that such effort is perceived likely to be instrumental in achieving the goal, and additionally, to the extent that positively valent (desirable) outcomes are perceived likely to result from goal-directed behavior and from goal-achievement.

The intrinsic valences, or rewards, arise from within the individual - essentially the personal satisfactions derived from goal-directed behavior and goal-accomplishment. The extrinsic valences are proferred by some agent external to the individual, such as the organization (e.g. additional pay, promotion, etc.), peers, subordinates, or parties outside the organization.

Some possible effects of budgetary participation on the elements of the expectancy model have been suggested by Ronen and Livingstone (1975). They speculate, for example, that ego-involvement associated with pursuing a

self-set goal will enhance IV_a, and possibly also IV_b. To the extent this is true, however, attendant adverse conseqences for the EV's may arise, following from attribution theory (see, for example, Staw, [1980] and Kruglanski [1978]), which posits that extrinsic and intrinsic rewards are in some state of psychological balance in respect to an individual's self-perception. In other words, a strengthening of the attribution of effort to the receipt of intrinsic rewards is a possible consequence of the removal or reduction of extrinsic rewards, and vice versa.

A relationship of participation with P_1 is also likely. Raia (1965) has suggested that more difficult goals emerge from participative budgeting. This might translate into reduced perceptions of P_1, but might increase IV_a due to the enhanced internalized value of achieving more difficult goals (Locke et. al., 1981, pp. 127 - 129).

How, or whether these opposing tendencies balance out in their effects on motivation is unclear. Overall, however, an assessment of the possible effects of participation suggests that there are more opportunities for enhancing than for diminishing motivation. This judgment is consistent with the empirical findings referred to earlier.

Turning to a consideration of the effects of motivation on performance, this question is dealt with largely within the domain of organizational behavior. Nevertheless, in the accounting literature some attention has recently been given to the issue (Ferris, 1977; Rockness, 1977). Ferris, using a relatively simple construction of motivation, found inconclusive results regarding the association between motivation and performance. On the other hand, Rockness, in an experimental study, and using a more complex formulation of the expectancy model, found relatively strong support for a positive relationship.

In the organizational behavior area, much of the research examining the

relationship between motivation and performance stems from the work of Porter and Lawler (1968). They posit that motivation should contribute to an explanation of performance and also, under specified conditions, to job satisfaction. A great deal of subsequent research has been conducted and is summarized in several review articles (Mitchell, 1974; Wahba and House, 1974; Connolly, 1976). Mitchell (1979) concludes that most of the research results support a positive relationship between motivation and performance.

Method

Data for the study were collected by a survey questionnaire from 224 middle-level managers drawn from three separate companies - two in the electronics industry and one in the steel industry. The managers held positions in a variety of functions, including marketing, production, research, and administration. One selection criterion was used, namely that activities of the managers should be controlled, at least in part, via the use of budgeting. Final sample selection was left to top management of each company; thus the sample was not strictly random.

The questionnaire measured participation in budget-setting, motivation and performance.

Budgetary Participation

The participation measures developed by Milani (1975) and by Hofstede (1967) were both employed in this study. The Milani measure is a six item Likert type scale, each item calling for a response from one to seven. The scale is designed for an additive construction of the overall score, and a previously performed factor analysis of the scale (Brownell, 1982b) provides adequate confirmation of the single factor nature of the measure. The Cronbach alpha reliability coefficient computed from its use in this study

was 0.76.

The Hofstede measure is an eight-point, single-choice scale, with full verbal anchoring. It was used in this study simply to validate the Milani measure, with which it correlated at 0.59 ($p<0.01$).

Motivation

The questionnaire items were designed to elicit measures on each construct of the model presented in Equation (1). In the following discussion, we first address valences, and then instrumentalities/expectancies.

Valences: The approach to the measurement of the valences was adapted from the procedure developed by Lawler and Suttle (1973) in such a way as to distinguish between the three classes of valence (IV_b, IV_a, and EV's). Seventeen outcomes were used, classified a priori as either intrinsic (eight outcomes) or extrinsic (nine outcomes). The outcomes are listed in Appendix A. For each outcome, respondents were twice asked to indicate on a scale from one to nine (extremely desirable to extremely undesirable)[3] the strength of their preference for that outcome. First respondents were asked to value each outcome as it might result from "working hard" (goal-directed behavior), and then to value each outcome as it might arise from "meeting or beating budgeted goals" (goal-accomplishment). IV_b was measured by averaging the eight responses to the intrinsic items from the first set of responses. IV_a was measured by averaging the responses to the same eight items, but from the second set of responses. The use of the same eight intrinsic outcomes in the measurement of IV_b and IV_a pre-supposes that a given outcome may arise from either goal-directed behavior or goal-accomplishment; and moreover, that the value placed on it might vary depending on how it arises.

The valences associated with the nine extrinsic outcomes (EV's) were assessed from the second set of responses (outcomes resulting from

goal-accomplishment).

Instrumentalities/Expectancies: Equation (1) requires the assessment of nine specific instrumentalities associating goal-accomplishment with extrinsic outcome (P_2's). These instrumentalities were assessed by asking respondents to indicate on a scale from one (never) to seven (always), how often "meeting or beating the budget" would result in each outcome. Three additional questionnaire items elicited measures of P_1, the perceived probability that goal-directed behavior would result in goal-accomplishment. For ease of interpretation, the instrumentality responses were converted to probabilities in the range of zero to one. The three assessments of P_1 were significantly ($p < 0.01$) correlated, with a mean correlation of 0.35. A single measure of P_1 was derived by averaging the three responses.

The final measure of motivation was then obtained by aggregating the individual constructs following Equation (1).

Performance

A self-rating version of the performance measure developed by Mahoney et.al. (1963, 1965) was used. The measure calls for ratings on a nine-point scale for each of eight separate dimensions of performance[4], together with a single overall rating. In developmental work, Mahoney et al. (1963 pp. 106-107) indicated that the eight separate dimensions were conceived of as being independent, and that jointly, the dimensions should explain at least 55 per cent of the overall rating (the remainder being explained by job-specific factors). Each of these claims was tested in the current study. To assess dimensional independence, a rule of thumb suggested by Pindyck and Rubinfeld (1976, p.68) was used. Multi-collinearity among an independent variable set is likely to be a concern if the sample correlation between two of the independent variables (dimensions) is larger than the correlation of either or

both with the dependent variable (in this case, the overall rating). Of 28 possible comparisons, only three intercorrelations violated this criterion, indicating that the eight dimensions are reasonably independent. To test the second claim, the overall performance rating was regressed on the eight sub-dimensions. The regression explained 78 percent of the variance in the overall ratings, implying that only 22 per cent of the functions critical to effective performance were job-specific in the current sample.

Approach to Analysis

Because of the hypothesized collinearity between participation and motivation, ordinary multiple regression cannot be used in the analysis. Instead, partial regression, in the spirit of path analysis, was used. The major benefit of path analysis is that it allows a decomposition of the relationship between two variables in a structural model into the direct effects of one on the other, as well as the indirect effects of the first on the second, via one or more intervening variables.

The basic form of the structural model hypothesized earlier is depicted in Figure 1, where participation, the exogenous variable in the model, is denoted as X_1, motivation as X_2, and performance as X_3. The path coefficients in the model are denoted p_{ij}, and R_k denotes the unexplained portions of the endogenous variables, motivation and performance.

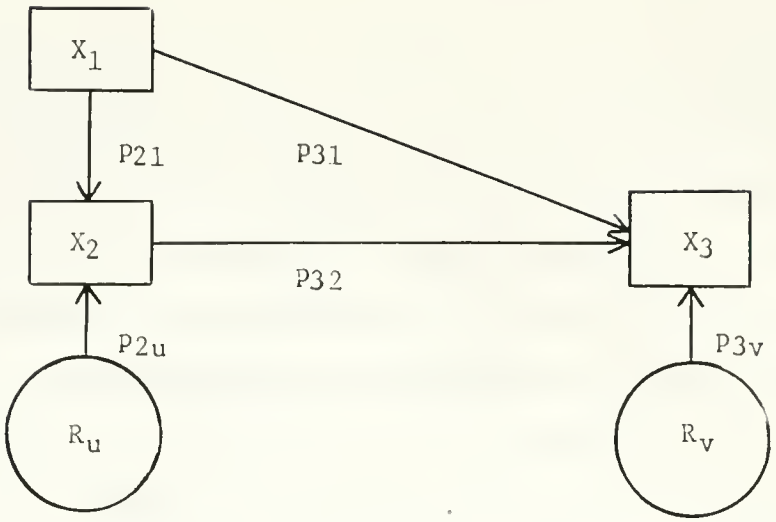

Figure 1: Structural Model

The equations to the structural model are as follows:

$$X_2 = p_{21}X_1 + p_{2u}R_u \qquad (2)$$

$$X_3 = p_{31}X_1 + p_{32}X_2 + p_{3v}R_v \qquad (3)$$

The solution for p_{21} can be directly assessed by computing the correlation r_{12}. A path coefficient between two variables will equal the zero-order correlation between them in circumstances where a variable is viewed to be dependent on a single cause and a residual. This is true for X_2 (motivation) which, in the model, is conceived of as being dependent only on X_1 (participation).

The solutions to p_{32} and p_{31} can be obtained in several equivalent ways. One possibility (Stokes, 1974) is by means of an instrumental variable procedure. This involves multiplying equations by suitable

instruments, taking expected values, and solving. Suitable instruments are variables contained in a particular equation which are uncorrelated with the residual variable of that equation. In equation (3), for example, X_1 and X_2 are suitable, but X_3 is not.

A second approach, and the one used here, involves partial regression. If, as above, it is assumed that the residuals are uncorrelated with the explanatory variables in the equations in which they appear, and all variables are expressed in standard form, then the p_{ij}'s can be estimated by ordinary least squares procedures; they are in fact equal to the standardized partial regression coefficients. Equations (2) and (3) can be rewritten as follows:

$$X_2 = \beta_{21}X_1 + p_{2u}R_u \qquad (4)$$

$$X_3 = \beta_{31.2}X_1 + \beta_{32.1}X_2 + p_{3v}R_v \qquad (5)$$

The residual path coefficients can be calculated using the general form:

$$p_{ie} = \sqrt{(1 - r_e^2)}$$

where r^2 is the square of the appropriate multiple correlation coefficient. In the present context, we have:

$$p_{2u} = \sqrt{(1 - r_{12}^2)} \qquad (6)$$

and

$$p_{3v} = \sqrt{(1 - r_{3.12}^2)} \qquad (7)$$

Finally, the decomposition of the total effect of one variable in the model on another is obtained using the computed path coefficients and zero-order correlations:

$$r_{12} = p_{21} \qquad (8)$$

$$r_{13} = p_{31} + p_{32}r_{12} \qquad (9)$$

$$r_{23} = p_{32} + p_{31}r_{12} \qquad (10)$$

The second components on the right hand side of equations (9) and (10) capture the indirect effects, while the first components, the path coefficients themselves, capture the direct effects.[5]

Results

Of 224 questionnaires distributed, 140 were returned, a response rate of 62.5%. Of the 140 returned questionnaires 32 were excluded because of improper or incomplete responses. The final sample size was therefore 108.

The zero order correlations among the three variables, participation, motivation, and performance, are shown in Table 1. The probabilities reported in Table 1 are based on a two-tailed test, as are all the other results presented in the paper.

INSERT TABLE 1 HERE

The set of path coefficients of equation (3) were computed[6] following the procedure outlined in the previous section.[7] The approach involves regressing X_3 on X_1 and X_2 in a multiple regression in which all variables are standardized. The coefficient on X_1 is p_{31}, and on X_2 is p_{32}. The results of the regression are presented in Table 2. Both path coefficients, and the overall regression itself, are positive and significant.

INSERT TABLE 2 HERE

The path coefficients for the errors in Figure 1 are derived by the application of the formulae in Equations (6) and (7) to the results obtained:

$$p_{2u} = 0.990$$

$$p_{3v} = 0.984$$

Finally, the decomposition of total effects within the model presented in Figure 1 is performed following Equations (9) and (10), and the decomposition is summarized in Table 3.

INSERT TABLE 3 HERE

The results indicate that of the total effects of participation on performance, the effect through motivation accounts for only a small proportion, the majority appearing to be direct. The lack of explanatory power of motivation as a mediator of the effects of participation was, of course, first hinted at in Table 1, where the zero-order correlation between the two was found to be insignificant. It is, nonetheless, premature to conclude that the bulk of the effects of participation on performance are necessarily direct. Other variables, operating like motivation but unmeasured in this study, could account for some or all of what in the study has been accounted for as an apparent direct effect.

Further Analysis and Interpretation

In the aggregate analysis, participation and motivation are not significantly associated with one another. To examine this finding further, the associations between participation and the components of the expectancy model were explored. The results of the analysis are shown in Table 4.

INSERT TABLE 4 HERE

In the first column the simple correlation coefficients between participation and the nine extrinsic valences are shown. Four of the nine are negative and five are positive. There is no a priori reason to suppose that extrinsic valences should be influenced by the degree of participation, and this is borne out. However, the P_2's display an interesting pattern in relation to participation; the coefficients are shown in the second column. While only five of the nine coefficients are positive, three are significant, namely, the probability of pay raise, high pay and promotion. The third column shows the correlation coefficients between participation and the products of the P_2's and the extrinsic valences. It seems as if participation, largely through its effect on the P_2's, enhances the contribution of the extrinsic rewards to motivation - particularly those rewards within the official power of the organization to bestow.

An interpretation of this is that participation serves to legitimize the budget as a basis for performance evaluation and contingent administration of organizational rewards. Such a conclusion is consistent with previous findings (Brownell, 1982b), to the effect that a "budget-constrained" style of evaluation was appropriate in circumstances of high participation in budget-setting; conversely, managers were found to respond poorly to participation when the budget was not used as a salient basis for evaluation.

Column's 4 and 5 show the correlation coefficients between participation and the intrinsic valences, the eight IV_a's and the eight IV_b's. For both of these groups, six of eight of the coefficients are negative ($p <$

0.11, using a binomial test); overall, 12 of 16 correlations between participation and intrinsic valences are negative ($p < 0.03$). Contrary to the belief that participation is likely to enhance goal-commitment by increasing the level of ego-involvement associated with the pursuit of self-set goals, these results suggest that it appears to be acting in the opposite manner. Indeed, from an intrinsic perspective, participation appears to be associated with significant devaluation of the task and reduction of the satisfaction derived from goal-accomplishment. In line with the previous suggestions (Staw [1980] and Kruglanski [1978]), strengthening of the instrumentality between goal-accomplishment and extrinsic rewards appears to diminish, in some degree, the intrinsic valences.

The correlations between participation and the three measures of P_1 (the probability that goal-directed effort will lead to goal accomplishment) were all found to be positive. Participation correlates with the overall measure of P_1 at 0.18 ($p < 0.08$). Two explanations of this would be plausible. First, perhaps participation acts to strengthen goal commitment, effort, and therefore the perceived probability of goal-achievement. There is considerable evidence from the organizational behavior literature (see Locke et al., 1981) that the intrinsic value of goal accomplishment tends to increase as the level of goal difficulty increases. Indeed, this mechanism is central to the notion of goal-setting and motivation. In the current study, however, the negative association between participation and the intrinsic valences relating to goal-accomplishment is at odds with this explanation. A second explanation is that participation may provide an opportunity to negotiate easier goals; that is, budget slack may be introduced by participation (Schiff and Lewin, 1970; Onsi, 1973). This would be consistent with the observed negative association of participation

with the IV_a's, since achieving an easier goal would be likely to lead to less intrinsic satisfaction. Moreover, since participation appears to be connected with the use of the budget to evaluate performance as a basis for bestowing organizational rewards, it would be perfectly rational for managers to perceive it to be in their self-interest to negotiate as low a budget as possible (Lowe and Shaw; 1968).

The preceding interpretation of the research findings raises important questions about the benefits of participation in budget-setting. Nonetheless, the study does indicate a significant positive relationship between participation and the overall measure of performance. To explore this further, each of the eight sub-dimensions of performance was correlated with participation, and the results are shown in Table 5.

INSERT TABLE 5 HERE

All eight correlations are positive, and significant ($p < 0.05$). An examination of the pattern among the coefficients suggests that the dimensions of managerial performance which are most strongly associated with participation are precisely those which might be expected to be strengthened by judicious use of a budget as a managerial tool, in particular planning, investigating and evaluating.

Limitations and Conclusions

The aim of the study was to assess whether, compared with a "direct-effects" model, an "indirect-effects" model linking participation and performance has the potential to add to our understanding of the consequences of participation. In the interests of parsimony, a single

variable, motivation, was included as intervening between participation and performance. The results of the study show that the indirect path through motivation contributes relatively little to an explanation of the observed association between participation and performance. This evidence, however, is insufficient grounds for abandoning the "indirect-effects" model. Other intervening variables could enter the model. For example, ability and role clarity have been suggested as co-determinants, with motivation, of performance (Porter and Lawler, 1968; Lawler, 1971). Further research is necessary to resolve this matter.

The form of the expectancy model of motivation adopted in the study also requires further research and possible refinement. For example, Staw (1977) offers a rationale for recognizing the possibility of extrinsic valences being associated with goal-directed behavior, rather than simply with goal-accomplishment. Moreover, multiple extrinsic valences enter into the equation additively, whereas both the intrinsic valences enter the equation as single mean values. This has implications for the relative weightings accorded extrinsic and intrinsic valences respectively in the calculation of motivation.

Then there is the question of the appropriateness of the measure of performance in a research study such as this one. The criterion variable of ultimate concern is an organization's creation of profit potential and the realization of this through efficient operations. However, budgeting is primarily concerned with the regulation of managerial work within an organization. In this limited context, the appropriate criterion variable of direct interest is managerial performance, even if the connection between managerial performance and organizational effectiveness remains a broader concern. This still leaves the issue of the reliability of self-ratings of performance, compared with superior, peer or subordinate ratings. While

self-ratings have been shown to exhibit leniency error, provided the error is not systematic among the respondents in a manner which is collinear with any of the independent variables, the research findings will be unaffected. Furthermore, Kavanagh et al. (1971) have suggested that self-ratings provide greater discrimination among dimensions of performance than do other sources of rating, and may therefore be more reliable in analyzing the components of performance which contribute to the overall assessment. Having said this, however, exhortations (e.g. Steers, 1977) to devote more research effort to the development of better techniques for measuring performance are clearly valid.

Finally, there is the issue of causality and the direction in which effects among variables in the model proceed. The analysis done in the study does not permit any inference about the causalities; these can only be constructed from supporting theory. In this study, it is implied that perceived participation in budget-setting may cause higher levels of motivation, which in turn may cause higher levels of performance. But, in a dynamic, inter-temporal context a rationale could be constructed to argue for a reverse chain of causality - i.e. high performance leading to high motivation leading to a perception (and indeed perhaps a reality) of high participation in budget-setting. For example, it is entirely possible that participation might be viewed as a luxury affordable only to organizational units already performing satisfactorily.

Even recognizing the limitations of the study, the findings are potentially of significance in the design of control systems. Participation is a costly control strategy, since it consumes managerial resources. The findings of the study indicate that the control system cost may be compensated by improved managerial performance. But, on the other hand, the findings also indicate some latent costs in the participation process,

arising in two ways. First, some potential performance may be being sacrificed through the creation of budgetary slack. And secondly, costly organizational rewards, contingent on the achievement of budgets, may be supplanting intrinsic rewards. These latter rewards could be viewed as being costless to the organization; stated even more strongly, their suppression could induce hidden costs through, for example, diminished creativity within the organization.

It is precisely because of these hidden consequences that the "indirect-effects" model is potentially of considerable practical, as well as theoretical, interest. A greater understanding of the mechanisms through which participation affects performance should provide management with a basis for designing the participation process in such a way as to capture all the benefits, and to drive out the latent costs which the results of this study have indicated.

TABLE 1

Zero-Order Correlations Between Variables

Participation(X_1)/Performance(X_3), r = 0.369, p<0.01

Participation(X_1)/Motivation(X_2), r = 0.139, n.s.

Motivation(X_2)/Performance(X_3), r = 0.248, p<0.01

TABLE 2

Calculation of Path Coefficients p_{31} and p_{32}

Coefficient	Value	Standard Error	t	p
Intercept	0.000	0.088	0.00	n.s.
p_{31}	0.341	0.089	3.81	<0.01
p_{32}	0.201	0.089	2.25	<0.05

$R^2 = 0.176$, $F_{2,105} = 11.20$, $p < 0.01$

TABLE 3

Decomposition of Total Effects in Model

Linkage	Direct (=p)	Indirect	Total (=r)
X_1/X_2	0.139	---	0.139
X_1/X_3	0.341	0.028	0.369
X_2/X_3	0.201	0.047	0.248

TABLE 4

Correlations between Participation and

the Elements of the Expectancy Model

Outcome**	EV_i	P_{2i}	$P_{2i}EV_i$	IV_a	IV_b
1	.143	.232	.232	.025	.041
2	.075	.196	.159	-.033	-.072
3	.060	-.052	.037	-.042	.086
4	-.141	-.049	-.106	-.136	-.112
5	-.201	-.097	-.136	-.016	-.058
6	-.010	.104	.001	-.133	-.044
7	.049	-.201	.057	.011	-.098
8	-.024	.070	.061	-.042	-.155
9	.128	.192	.206	N/A	N/A

* The numbered outcomes are listed in Appendix A.

N/A Not Applicable

$.191 > r > .160$, $p < 0.10$

$.248 > r > .191$, $p < 0.05$

$r > .248$, $p < 0.01$

TABLE 5

Correlations between Participation and

the Eight Sub-Dimensions of Performance

Planning	0.297	Supervising	0.201
Investigating	0.219	Staffing	0.284
Coordinating	0.209	Negotiating	0.217
Evaluating	0.304	Representing	0.174

Appendix A

List of Outcomes

Eight intrinsic and nine extrinsic outcomes were used in this study.

Extrinsic	Intrinsic
1. Pay Raise	1. Personal growth and development
2. High Pay	2. Setting higher standards for yourself
3. Respect from boss	3. Giving help to others
4. Respect from other employees	4. Time at work passing fast
5. Receiving more compliments	5. Feelings of security
6. Greater chances for independent thought and action	6. Setting higher standards for others
7. Fewer chances to make friends	7. Feelings of accomplishment
8. Special reward or recognition	8. Being tired
9. Promotion	

Appendix B

The solution to equation (3) can be derived through the use of instrumental variables. As suggested earlier, X_1 and X_2 serve as suitable instruments since they are assumed uncorrelated with R_v.

Multiplying both sides of (3) by X_1 and then by X_2 gives:

$$X_1X_3 = p_{31}X_1^2 + p_{32}X_1X_2 + p_{3v}X_1R_v \qquad \text{(i)}$$

and

$$X_2X_3 = p_{31}X_1X_2 + p_{32}X_2^2 + p_{3v}X_2R_v \qquad \text{(ii)}$$

Taking the expected value of each of (i) and (ii) gives

$$r_{13} = p_{31} + p_{32}r_{12} \qquad \text{(iii)}$$

$$r_{23} = p_{31}r_{12} + p_{32} \qquad \text{(iv)}$$

(iii) and (iv) follow from (i) and (ii) since, for standardized variables,

(a) $E(X_iX_j) = r_{ij}$

and

(b) $E(X_i^2) = 1.$

The terms involving R_v disappear since

$$E(X_iR_v) = r_{X_iR_v} = 0.$$

(iii) and (iv) represent a system of two equations in two unknowns (p_{31} and p_{32}). Solving (iii) and (iv) simultaneously gives

$$p_{31} = \frac{r_{13} + r_{12}r_{23}}{1 - r_{12}^2} \qquad \text{(v)}$$

$$p_{32} = \frac{r_{23} + r_{12}r_{13}}{1 - r_{12}^2} \qquad \text{(vi)}$$

Substituting the values from Table 1 for the r's in (v) and (vi) gives $p_{31} = 0.341$, and $p_{32} = 0.201$, values identical to those shown in Table 2.

Footnotes

1. An internally controlled individual attributes the outcomes of his own actions to himself, while an externally controlled individual tends to attribute these outcomes to chance, luck, or fate. See Rotter [1966] for details of this variable, together with the instrument used to measure it.

2. Of course, we do not intend to imply, by its choice as a single intervening variable, that motivation is the only candidate for inclusion.

3. These raw scores were reversed and rescaled by subtracting five from all scores. As a result of this procedure, "neutral" responses score zero, while responses in the "desirable" direction score positively (one to four) and responses in the "undesirable" direction score negatively (minus one to minus four).

4. The dimensions were planning, investigating, coordinating, evaluating, supervising, staffing, negotiating and representing.

5. This procedure is also used to test the suitability of more parsimonious models which exclude one or more linkages. In general, the assessment of suitability is based on whether the original matrix of intercorrelations among the variables in the model can be reproduced by a more parsimonious model. For elaboration, see Land (1969).

6. As previously mentioned, it was not necessary to solve equation (2) since p_{21} is equivalent to r_{12}, the zero-order correlation between participation and motivation.

7. The equivalence of the coefficients derived here with those resulting from the instrumental variable procedure is demonstrated in Appendix B.

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