THE EFFECTS OF PERSONALITY-SITUATION CONGRUENCE IN A MANAGERIAL CONTEXT: LOCUS OF CONTROL AND BUDGETARY PARTICIPATION

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ABSTRACT

Forty-six undergraduate business school students and forty-eight middle-level management personnel from a large manufacturing company took part in a laboratory experiment designed to examine the impact of internal-external locus of control on the relationship between budgetary participation and performance. Results indicated that, as hypothesized, internally-oriented subjects performed best in conditions of high participation (corresponding to substantial situational control) and externally-oriented subjects performed best in conditions of low participation (corresponding to limited situational control). In addition, the subjects in these two highest performing groups indicated more enjoyment in the experimental task than did their counterparts in less-preferred, or incongruent conditions. These results are consistent with previous literature which has shown task performance to be subject to the interaction between generalized expectancies in terms of I-E locus of control, and the source of control in a particular situation. The implications of these results for personnel selection and placement in organizations is discussed.
The Effects of Personality-Situation Congruence in a Managerial Context: Locus of Control and Budgetary Participation

Personality variables generally have been found not to be very powerful in accounting research (see McGhee, Shields and Birnberg, 1978; Foran and DeCoster, 1974, for example). It is likely that one reason for their disappointing explanatory power is due to a neglect on the part of researchers to exercise care in the choice of a situation within which to observe the effects of personality differences. An example of an exception to this was the seminal work in the managerial area of Vroom (1960) who studied the effects of authoritarianism on the relationship between participation in decision making, and performance and job satisfaction. While observing no particular direct effect of authoritarianism on performance and job satisfaction (nor any for participation for that matter) a very powerful interaction effects was found.

This paper reports the results of a laboratory study of the effects of internal-external locus of control (Rotter, 1966) on the relationship between participation and performance in a budgetary context. The motivation for this study stems from two differing sets of considerations. Firstly, academicians in the management accounting area are plagued by the inability to conclusively claim an understanding of the effects of participation in budgeting, or, rather, the conditions under which differing effects can be expected. The literature in the area is replete with conflicting results. Secondly, in the area of psychology, several studies have formed a line of research showing that internal-external locus of control is likely to interact with certain situational characteristics,
specifically the source of control over task performance inherent in a given situation. Varying degrees of budgetary participation, it was felt, would tend to elicit a range of attributions on this dimension.

The paper is organized as follows: in the next section, previous literature, elaborating on the two motivations for this study discussed above will be summarized. Sections dealing with the hypothesis, method, results and finally, discussion, will follow in turn.

PREVIOUS LITERATURE

Budgetary participation refers to the extent to which an individual perceives involvement in and influence on the decisions which result in the formulation of a plan or target, such as a certain level of profits or sales. This is an important management accounting issued because it is generally felt that to gain the commitment of organizational members to budgets, management needs to incorporate the viewpoints and ideas of the former. In spite of the intuitive appeal of this notion, research results are mixed. While positive effects of participation have been observed in the areas of attitudes (Kenis, 1979), job satisfaction (Cherrington and Cherrington, 1973), motivation (Hofstede, 1967) and performance (Coch and French, 1948), conflicting evidence can also be found. French, Israel and As (1960) were unable to replicate the Coch and French results in a different cultural setting, and Bryan and Locke (1967) actually found that performance may even be higher under conditions of low participation. Charnes and Stedry (1963) concluded that "it is not clear from recent evidence ... that participation ... is so advantageous as to preclude the inclusion of non-participatively set goals", Hopwood (1976) reiterated this viewpoint and exhorted researchers to try to "identify which conditional
factors determine the wider impact of a particular type of participative management programme". This is the aim of this paper.

Turning to relevant literature in psychology, several studies confirm the importance of giving consideration to the "congruence" between individual personality in terms of internal-external locus of control, and the control characteristics inherent in a particular task-related situation. In an early study (Cromwell, et al. 1961), it was found that internals performed better in a reaction-time test under self-controlled experimental conditions while externals performed better under experimenter-controlled conditions. Both high performing groups additionally indicated a verbal preference for their congruent condition. In a slightly different, but related vein, Rotter and Mulry (1965) found a significant interaction between locus of control and the use of "skill" or "chance" instructions affecting subjects' perserverance in the pursuit a desirable outcome. Internals exerted more effort (measured by decision time) when they were instructed that performance in the experimental task was a function of skill, or under their own control. Externals displayed similar behavior in the "chance", or "other" controlled conditions, by contrast. Pursuing the same basic question, Watson and Baunal (1967) found that recall error in a paired-associate nonsense syllables task was substantially higher for subjects in incongruent conditions. Similar conclusions are due to Houston (1972) who used a digit-reversal test, and also to Baron and Ganz (1972) who employed an "acorns and pea" type of task.

The relevance of locus of control in the context of budgetary participation stems from the connection between participation and source of situational control. Under high participation conditions, an individual
will likely perceive substantial control over the selection of a goal and hence performance, where performance is defined as extent of departure from goal (budget). By contrast, low participation is likely to induce feelings of very little situational control.

HYPOTHESIS

Following the reasoning presented above, high participation, characterized as substantial situational control, is expected to represent a congruent condition only for internals and performance is expected to reflect this congruence. Conversely, low participation is expected to be congruent only for externals and, again, performance is expected to reflect this. Presented in null form, the hypothesis can be stated as follows:

There will be no interaction between locus of control and participation affecting performance.

METHOD

Subjects

Two separate samples were recruited to take part in the study. 46 undergraduate accounting students, typically sophomores or juniors, formed the first sample, while for purposes of systematic replication, 48 middle-level managers from a large San Francisco Bay Area manufacturing Company formed the second sample. By replicating with a sample of the population of ultimate interest, it was hoped that the generalizability of the results could be enhanced.

Method

An experimental session began with the subjects reading a set of instructions to a computerized business game which formed the task in the experiment. Following any necessary clarification of these instructions,
subjects were left alone in small, sound-proof cubicles, serviced by a computer terminal via which the business game would be conducted. The subjects' interaction with the computer began with the administration of Rotter's 29-item locus of control measure. Subjects were required to type "A" or "B" indicating which of the two alternative forced-choice items in each of the 29 pairs they more strongly endorsed. Unlike the pencil-and-paper versions of this test, this method made it considerably more difficult for subjects to refer back to previous responses when addressing a particular pair of items. To do so, subjects would have to retrieve the hard-copy computer output conveyed into a tray behind the terminal. Upon completion of the 29-item measure, the business game started.

In the game, subjects assumed the role of one of four senior managers in an organization which manufactures and sells a single perishable product. For each of twenty fiscal quarters, the subjects were required to make two decisions; one regarding a recommendation for the budgeted level of sales in units for the quarter, and one regarding the price to be charged for the product during the quarter. The game procedure for a sample quarter will now be detailed.

First, the subjects were asked to make their first decision, a submission of their recommendation for the sales budget in units. To guide subjects in the first few quarters of the game, the results of the previous four quarters were provided on a sheet of paper in the laboratory cubicle. These were the only data subjects had available to work with in the first of the twenty quarters. As the game proceeded, however, the results of each completed quarter became available in hard copy, and the subject could refer back to these data as desired.
Following the subject's submission of a budget volume recommendation, the recommendations of each of the other three managers were presented and, after a short delay, the final determination of the budget by top management was presented. Subjects had been informed in the instruction sheet that top management would make the final decision, giving consideration to the four managers' recommendations.

It was at this point that the participation induction took place. The final determination of top management was a weighted average of the four recommendations; however, the weights differed in each of two participation conditions. In the high participation condition, a weight of 0.9 was attached to the subject's recommendation and a weight of 0.1 was attached to the average of the other three recommendations. In the low participation condition, the weights were, respectively, 0.05 and 0.95. Subjects were randomly assigned to one of these two conditions for the duration of the game.

After being informed of top management's determination of the budget, the subjects were presented with a statement of the percentage deviation of each of the four recommendations from the final decision of top management. Due to the nature of the manipulation, subjects in the high participation condition would typically observe a much smaller percentage deviation of their own recommendation from the final budget than the percentage deviation of any of the other three managers. The purpose of this statement of percentage deviations was to highlight the extent to which the subject's recommendation was reflected in the final budget, thereby strengthening the participation induction.

In the present context, participation is therefore operationalized as the amount of influence an individual has on a final budget which is
jointly set. In order to check the level of perceived participation, some important items (numbers 2, 4 and 6) were included in the post-experimental check questionnaire, presented in Appendix 1.

Subjects were next informed of the level of advertising expenditure to be undertaken in the forthcoming quarter. This was followed by a request for the subjects' second decision, the price to be charged. Each subject, alone, was responsible for this decision. The objective was to select a price which, combined with the advertising expenditure, would produce an actual sales volume exactly equal to the final budget of top management.

In the instruction sheet mentioned earlier, subjects were told to view departures from budget in either direction as equally undesirable. Sales levels which fell short of budget (due to too high a price) led to unsold product which was dumped due to its perishable nature. Conversely, to charge too little would result in the sale of all available product but would also generate unfilled orders. The game objective was, therefore, to minimize the departure, in either direction, of actual sales from budget and performance was measured in this way.

The underlying functional relationship between sales volume and price and advertising was as follows:

\[ Q = 40,000 - 20p + A/2 \]

where \( Q \) is quantity sold (including unfilled orders)

\( p \) is the price charged in cents, and

\( A \) is the advertising expenditure

Pilot testing of several functional relationships indicated that an appropriate level of complexity was captured by this function.

In the final phase of a quarter, a performance report was presented. This report summarized the decisions made and the budget variance which
resulted, performance being measured by the absolute value of the budget variance. A sample output for a high participation subject is presented in Appendix 2.

An important point to note in connection with the game design is the fact that no budgeted sales level was any more difficult to achieve than any other. For all possible budget levels, there existed one price which would "clear the market" and produce the desired zero variance. Therefore, irrespective of whether the final budget of top management was arrived at under conditions of high or low participation, one single price (in combination with the given advertising expenditure) would produce an actual sales level identical to budget. No systematic difference in task difficulty therefore existed between the high and low participation groups.

RESULTS

Descriptive statistics from the I-E locus of control scale responses are presented in Table 1. Note that students are significantly more external than managers (t=2.84, p<0.01). For both subject groups, the participation manipulation appeared successful. The responses to questions 2, 4 and 6 of the post-experimental questionnaire indicated significant differences between subjects in the two treatment groups both for students (t=9.15, p<0.01; t=8.87, p<0.01 and t=11.34, p<0.01, for questions 2, 4 and 6 respectively) and managers (t=9.27, p<0.01; t=8.44, p<0.01 and t=6.18, p<0.01).
Following the exhortation of Rotter (1975, p. 62) it was decided not to categorize locus of control scores into internal and external. Instead, a multiple regression approach was used, and the model set out in equation (1) was tested:

\[ Y = \beta_1 + \beta_2 X + \gamma Z + \delta XZ \]  

(1)

where \( Y \) is performance, the average budget variance over the twenty trials of the game for each subject. Note that larger values of \( Y \) denote inferior performance.

\( X \) is locus of control score

\( Z \) is a 0/1 binary variable for participation

\[ Z = \begin{cases} 
0 & \text{for low participation} \\
1 & \text{for high participation} 
\end{cases} \]

and \( XZ \) is the interaction between locus of control and participation.

**Student Sample**

The results of the regression in equation (1) are presented in Table 2. The null hypothesis is tested via examination of \( \delta \), the coefficient for the interaction term in equation (1). It was found that \( \delta \) departed from zero significantly, permitting rejection of the null hypothesis of no interaction. In order to further explore the nature of the interaction, equation (1) was decomposed into two separate equations.

For \( Z = 1 \), i.e. high participation,

\[ Y = (\beta_1 + \gamma) + (\beta_2 + \delta)X + \epsilon \]  

(2)

For \( Z = 0 \), i.e. low participation,

\[ Y = \beta_1 + \beta_2 X + \epsilon \]  

(3)

**INSERT TABLES 2 AND 3 HERE**
Table 3 presents the composite coefficients together with their standard errors derived from the variance/covariance matrix of the coefficients computed with the use of equation (1). Diagrammatic representation of these results is provided in Figure 1. Examination of the coefficients and their standard errors permits the conclusion of a disordinal interaction between locus of control and participation.

The Johnson-Neyman technique (see, for example, Kerlinger and Pedhazur, 1973, p. 256) was employed as a further test of interaction ordinality. The difference between performance of the high participation group and the low participation group is significant outside the range of I-E scores, 8.46 to 13.00 or, respectively, -0.02σ and +1.20σ in relation to the mean score of 8.52. This result is also consistent with a disordinal interaction.

**Manager Sample**

The same set of techniques was employed to analyze the data of the forty-eight managers who formed the sample for a "systematic replication" (Carlsmith, et al., 1976). The results of the analysis are presented in Table 4, and the coefficients formed for equations (2) and (3) are presented in Table 5. Again, the evidence points to a disordinal interaction, and the Johnson-Neyman technique confirms this result. Outside the range of I-E scores 2.56 (-0.74σ) to 6.35 (+0.54σ), the performance differences between high and low participation conditions reach significance.
Of further interest were other results obtained from the post-experimental check questionnaire. The responses to question 1 of the post-experimental check questionnaire were employed as a surrogate for "preferred conditions of participation". The response to this question was employed as the dependent variable in a regression identical to equation (1) for both groups, and the interaction term, was significant for both students (t=-1.71, p<0.05) and managers (t=-1.95, p<0.01). Notice, that unlike the interaction coefficients (\(\beta\)) reported in Tables 2 and 4, these coefficients are negative. This is due to the fact that performance (budget variance) is scaled in reverse fashion to "preferred conditions" (game enjoyment).

One final test conducted was to assess the homogeneity of the two regressions (the regression for student subjects and the regression for manager subjects). The Chow test (Chow, 1960) is based on the sums of squared residuals in each regression and the sum of squared residuals from a single, pooled regression (that is a regression with N=94; 46 students and 48 managers). The derived test statistic was \(F(4, 86) = 10.42 (p<0.01)\) indicating that the two regressions are significantly different. An examination of the means for the dependent variable in each sample is consistent with significantly different regression coefficient values for each sample. \(\bar{y}\) for the student subjects was 2535 and for the managers, \(\bar{y}=3899\), a difference which is statistically significant (p<0.01).

DISCUSSION

Internal subjects in the high participation condition (substantial situational control) and external subjects in the low participation condition (limited situational control) were the two best performing
groups, and each reported significantly more enjoyment of the experimental task than did the subjects in incongruent conditions.

It has been suggested that the impact of incongruence is on anxiety. Rotter and Mulry (1965) indicated that such anxiety will occur when an individual's expectations and preferences concerning means to ends are not met. Mandler and Watson (1966) offer a similar interpretation, suggesting that anxiety occurs when an organized response sequence is interrupted and no alternative is available. Unfortunately, the data of this experiment offer no new evidence of the precise nature of the processes responsible for the result.

In the managerial realm, the implications of these results probably bear on personnel selection and placement issues. The degree of participation in the budgeting process may be regarded as a major element in the role description for an individual in an organization. Increasingly, personnel theorists and empiricists are pursuing the question of what types of individuals are appropriate for various organizational roles? Figler (1977) has described this task as one of creating the right "chemistry" between the characteristics of individuals and the characteristics of organizational roles. Importantly, if significant interactions between elements of the two sets of characteristics can be uncovered, personnel selection and placement activities can be better supported with a knowledge of the right "fit" between individuals and occupations, both between and within organizations.
**TABLE 1**

**SUMMARY STATISTICS - LOCUS OF CONTROL MEASURES**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>8.52</td>
<td>3.63</td>
<td>46</td>
</tr>
<tr>
<td>Managers</td>
<td>4.75</td>
<td>2.94</td>
<td>48</td>
</tr>
</tbody>
</table>
TABLE 2
RESULTS OF REGRESSION - HYPOTHESIS TEST

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Value</th>
<th>Standard Error</th>
<th>t</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_1$</td>
<td>4899.46</td>
<td>707.48</td>
<td>6.93</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>-228.37</td>
<td>74.99</td>
<td>-3.05</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>-4475.54</td>
<td>973.88</td>
<td>-4.60</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\delta$</td>
<td>438.28</td>
<td>105.31</td>
<td>4.16</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

$R^2 = 0.335$, df=42
<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Value</th>
<th>Standard Error</th>
<th>t</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>((\beta_1 + \gamma))</td>
<td>423.92</td>
<td>669.26</td>
<td>0.63</td>
<td>N.S.</td>
</tr>
<tr>
<td>((\beta_2 + \delta))</td>
<td>209.92</td>
<td>73.93</td>
<td>2.84</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>(\beta_1)</td>
<td>4899.46</td>
<td>707.48</td>
<td>6.93</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>(\beta_2)</td>
<td>-228.37</td>
<td>74.99</td>
<td>-3.05</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
TABLE 4
RESULTS OF REGRESSION - HYPOTHESIS TEST

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Value</th>
<th>Standard Error</th>
<th>t</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_1$</td>
<td>5846.64</td>
<td>834.67</td>
<td>7.00</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>-439.45</td>
<td>150.01</td>
<td>-2.93</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>-3779.27</td>
<td>1247.8</td>
<td>-3.03</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\delta$</td>
<td>832.44</td>
<td>222.74</td>
<td>3.74</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

$R^2 = 0.246$, df=44
<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Value</th>
<th>Standard Error</th>
<th>t</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_1 + \gamma$</td>
<td>2067.37</td>
<td>927.11</td>
<td>2.23</td>
<td>&lt;0.025</td>
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<td>$\beta_2 + \delta$</td>
<td>392.98</td>
<td>164.64</td>
<td>2.39</td>
<td>&lt;0.025</td>
</tr>
<tr>
<td>$\beta_1$</td>
<td>5846.64</td>
<td>834.67</td>
<td>7.00</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>-439.45</td>
<td>150.01</td>
<td>-2.93</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
FIGURE 1

DIAGRAMMATIC REPRESENTATION OF RESULTS - STUDENT SAMPLE

Budget Variance (i.e. performance)

\[ \beta_1 \]

\[ (\beta_1 + \gamma) \]

\[ (\beta_2 + \delta) \]

< internal Locus of Control external >

High Participation

Low Participation
FOOTNOTES

1. In actual fact, these were robots, and their recommendations were randomly generated from a uniform distribution.

2. The residuals of this regression were tested for constant variance. Bartlett's test, \( \chi^2 = 18.06 \) fails to permit rejection of the null hypothesis of homoscedastic error structure. However the direction of the test result did reveal a (statistically insignificant) tendency for error variance to be larger among externals in the high participation condition and internals in the low participation condition. This result is interesting because the notion that incongruence should produce erratic performance is consistent with the expectations for the major hypothesis.

3. This decomposition follows Kmenta's (1971) use of equation 1 to specify peace-time and war-time consumption functions. See Kmenta p. 421.

4. Equation 1 again proved satisfactory statistically. Bartlett's test \( \chi^2 = 17.34 \) fails to permit rejection of the null hypothesis of constant error variance.


Rotter, J.B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, 1, whole No. 609.


APPENDIX 1  POSI-EXPERIMENTAL CHECK QUESTIONNAIRE

The following set of questions is intended to elicit your opinions and impressions of the business game in general. Each question is responded to by circling the number on the scale which corresponds to the point which you feel best indicates your belief. It is important that you carefully consider your responses, since they will be taken into consideration in the improvement of the game for future use.

1. Indicate the extent of which you enjoyed playing the game.

   Minimal   Moderate   Great
   Enjoyment  Enjoyment  Enjoyment

2. Indicate the extent to which you felt your input to the BUDGET formulation influenced top management in their final determinations on the budget.

   Great   Moderate   Minimal
   Influence Influence Influence

3. Indicate the extent to which you felt confident about the decisions for PRODUCT PRICE which you were required to make during the game.

   Great   Moderate   Minimal
   Confidence Confidence Confidence

4. Indicate the extent to which you felt that your recommendations for the BUDGET were reflected in the final determinations of top management.

   Minimal   Moderate   Great
   Reflection Reflection Reflection

5. Indicate the extent to which you felt that your PRICE decisions had an impact on the demand for product.

   Great   Moderate   Minimal
   Impact  Impact  Impact

6. Indicate the extent to which you feel that your recommendations for the BUDGET dominated those of the other managers.

   Minimal   Moderate   Great
   Dominance  Dominance  Dominance
APPENDIX 2

SAMPLE OUTPUT FOR ONE PERIOD OF GAME - HIGH PARTICIPATION SUBJECT

BUDGET FORMULATION FOR QUARTER #1

PLEASE ENTER YOUR RECOMMENDED SALES BUDGET:

$$24600$$

IS $$24600$$ CORRECT? (Y/N) Y

OTHER MANAGERS' RECOMMENDATIONS:

$#2$ ........................................... 28000
$#3$ ........................................... 27800
$#4$ ........................................... 31400

THE FINAL DETERMINATION BY TOP MANAGEMENT IS 25000. THIS IS YOUR TARGET FOR THE FORTHCOMING QUARTER.

THE PERCENTAGE DEVIATION OF EACH MANAGER'S RECOMMENDATION FROM THIS FINAL DETERMINATION IS AS FOLLOWS:

YOUR RECOMMENDATION ....................... 0.02%
MANAGER #2 .................................. 12.00%
MANAGER #3 .................................. 11.20%
MANAGER #4 .................................. 25.60%

OPERATING DECISIONS FOR QUARTER #1

THE MARKETING DEPARTMENT HAS ADVISED THAT ADVERTISING EXPENDITURE FOR THE COMING QUARTER WILL BE $14000. BASED ON A SALES BUDGET OF 25000 UNITS AND AN ADVERTISING EXPENDITURE OF $14000,

PLEASE ENTER YOUR DECISION FOR THE QUARTER'S PRICE:

$$10.00$$

IS $$10.00$$ CORRECT? (Y/N) Y

PERFORMANCE REPORT FOR QUARTER #1

PRICE CHARGED DURING QUARTER ($) ............. 10.00
ADVERTISING EXPENDITURE ($) ................... 14000
SALES BUDGET (UNITS) .......................... 25000
ACTUAL SALES PLUS UNFILLED ORDERS (UNITS) ... 27000
UNFILLED ORDERS (UNITS) ........................ 2000
BUDGET VARIANCE (UNITS) ....................... 2000