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ABSTRACT

The leadership substitutes hypothesis has been used to explain the occasional successes and frequent failures of leadership predictions. Three hypotheses were formulated to test the viability of the leadership substitutes concepts. Questionnaires were administered to hospital managers (N=63) and engineers (N=71). Instrumental and supportive leader behaviors were defined by scales developed specifically for hypothesis-testing with the Path-Goal Theory. Potential substitutes for leadership were measured by scales developed by Kerr and Germier. The two subordinate criterion measures consisted of organizational commitment based on data from the Organizational Commitment Questionnaire, and general job satisfaction based on results from the Minnesota Satisfaction Questionnaire. Statistical analysis indicated that the two samples differed on many dimensions. The results provided only limited support for the concept of leadership substitutes as suggested by previous research. (RC)

SUBSTITUTES FOR LEADERSHIP: AN EMPIRICAL STUDY

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Several writers have recently pointed out an apparent assumption in all current theories of leadership--that some form of hierarchical leadership is always important in influencing subordinate satisfaction and/or perfonmance (Kerr, 1977; Kerr and Jermier, 1978). Although the theories vary somewhat in their prescriptions regarding the appropriateness of different leader behaviors in a given situation, all seem to assume the effective leader provides some type of needed guidance and/or good feelings for subordinates as they carry out their job tasks (House and Mitchell, 1974; Schriesheim, 1978). Notwithstanding the inherent logic and empirical support for alternative leadership paradigms, leadership variables continue to account for only a small portion of the criterion variance in most empirical studies.

Kerr (1977) has suggested the concept of substitutes for leadership to help explain the occasional successes and frequent failures of leadership predictions. An example of a leadership substitute is described by Kerr (1978) in relation to Hawkeye Pierce, a well-known television character (M.A.S.H.). Pierce, a military surgeon, possesses personal ability, experience, training and job knowledge which obviates the need for any leader provided structure. He is also indifferent to organizational rewards which are presumably available, further inhibiting the ability of his hierarchical superior to guide and direct his behavior. Jermier and Berkes (1979) have described other examples of leadership substitutes in a police organization. The reliance on closely-knit, cohesive work groups (two-man patrol units) during the evening shift was seen as

preventing hierarchical leadership from having an impact on subordinate morale. In each of these cases, a characteristic of the organization, the subordinate, or the subordinates' job task may have "acted in place of" (substituted for) the hierarchical leader by impacting on important subordinate outcomes and by preventing the hierarchical leaders' behavior from having an impact.

Several variables which characterize professionals working in organizations have been suggested as potential substitutes for hierarchical leadership. These include: the degree of professionalism of organizational participants; their ability, experience, training and knowledge; their indifference toward organizational rewards; task provided feedback concerning accomplishment; the degree of intrinsic satisfaction derived from task accomplishment; and the presence of a closely-knit, cohesive work group. In preliminary validation studies, Kerr and Jermier (1978) obtained findings which indicate that two additional variables may also be important leadership substitutes. These are the degree of organizational formalization which is present (e.g., clear written job goals, objectives, and responsibilities; written performance appraisals and work schedules; etc.) and the existence of unambiguous, routine, and methodologically invariant tasks. Clearly, these individual, organizational and task characteristics have the potential to provide the necessary task guidance and direction for subordinate performance often provided by a hierarchical superior in other organizational situations.

Although there is a clear rationale for the concept of substitutes for leadership, the empirical data is not strong. Attempts by Kerr et al. have only been partially successful in providing support for the concept. For example, Kerr and Jermier (1978) found only a few

possible substitutes when using a shotgun regression approach. To our knowledge the studies by Kerr et al. are the only thus far to address the issue. The purpose of this study is to: (a) further elucidate the substitutes concept, (b) empirically test hypotheses which match specific substitutes with a given leader behavior, (c) provide a logical rationale to determine the relative strength of a substitute vis-a-vis a specific leader behavior.

The above theoretical and empirical developments suggested the following hypotheses as meaningful for testing the viability of the leadership substitutes concept:

Hypothesis 1: The presence of: intrinsically satisfying work-tasks, indifference toward organizational rewards, and/or closely-knit cohesive work groups may replace or substitute for a leader's supportive behaviors in predicting important subordinate outcomes.

Hypothesis 2: The presence of a high degree of organizational formalization may replace or substitute for the instrumental leader behaviors of work assignment and specification of procedures.

Hypothesis 3: The presence of a highly professional orientation among subordinates, of a high degree of ability, experience, training, and knowledge among subordinates; of closely-knit cohesive work groups; of a high degree of organizational formalization; and/or of routine, methodologically invariant work tasks may replace or substitute for the instrumental leader behavior of role clarification.

These hypotheses were tested in this study. Although several potentially important elaborations of the substitutes construct are not addressed in the above hypotheses, these will be discussed in the concluding section.

Method

Sample

Questionnaires were administered to hospital managers (N=63) during a management development seminar conducted by an outside consultant. Managers were represented from all organizational levels within a privately owned and operated hospital system in the southwestern United States. The hospital system includes facilities covering a major portion of the state. Data were collected from all three hospital shifts and across all hospital divisions.

Engineers (N=71) completed their questionnaires during normal working hours. This sample consisted of various types of engineers conducting test and evaluation procedures on weapons systems for the Department of Defense. Most of the engineers were civilian personnel--either civil service or on contract with the federal government.

Measures

Instrumental and supportive leader behaviors were measured using scales developed specifically for hypothesis testing regarding Path-Goal Theory (Schriesheim, 1978). Potential substitutes for leadership were measured using scales recently developed by Kerr and Jermier (1978). The two subordinate criterion measures utilized in this study were organizational commitment, using the Organizational Commitment Questionnaire by Porter and Smith (1974), and general job satisfaction using the Minnesota Satisfaction Questionnaire (Dawis,

Lofquist (1967). These organizational and individual dimensions are briefly described below:

Instrumental Leader Behavior:

Work Assignment (ILBWA)	Assignment of subordinates to specific tasks.
Specification of Procedures (ILBSPEC)	Enforcing rules, procedures and work methods.
Role Clarification (ILBROLCL)	Clarifying management expectations of subordinates.
Supportive Leader Behavior (SUPPORT)	Warmth, trust and concern shown by leader for subordinates.

Potential Substitutes

Of the subordinate:

Professional orientation (PROF)

Indifference toward organizational rewards (INDOR)

Ability, experience, training and knowledge (AETK)

Of the task:

Provides its own feedback concerning accomplishment (TSKFB)

Intrinsically satisfying (INSAT)

Routine and methodologically invariant (ROUTIN)

Of the organization:

Closely-knit, cohesive work groups (CLOSE)

Organizational formalization - explicit plans, goals, and areas of responsibility (ORFORM)

Criteria

Organizational Commitment	Individual's identification with organizational values and goals, desire to stay and work hard.

General Job Satisfaction	Individual's overall satisfaction with job and organization.

Analysis Strategy

The analysis strategy used here was a refinement of the approach used in previous substitutes research. Previously, researchers included all the above described leader behaviors and twice the number of potential substitutes in a single regression model (Kerr and Jermier, 1978). Although these researchers obtained several statistically significant findings, their results did not indicate which substitutes replaced a given leader behavior or how much of a substitute was required to alleviate the need for leadership. In this study, we attempted to develop a logical strategy to assess the degree of substitutability of a particular individual, task or organizational characteristic for a specific leader behavior.

The analysis procedure was stepwise in nature, involving a series of increasingly rigorous tests for a variable to qualify as a substitute for leadership. The series of tests resulted in classifying a variable as a non-substitute, weak substitute or strong substitute. A substitute's form depends on its relative ability to replace a particular leadership behavior (using the MRR model) in explaining the variance of a criterion measure.

The rationale and tests are outlined below:

1. For a variable to qualify as a potential substitute for leadership, there must first be a logical explanation of how the variable can possibly "take the place of" a specific leader behavior and therefore make the leader behavior unnecessary.

2. To provide an adequate test for a potential substitute, we must investigate situations where we have reason to believe that the leader behavior in question is important. That is, the leader behavior must explain a significant amount of criterion variance. This may be established by requiring the bivariate correlation coefficient between the leader behavior and the criterion measure to be statistically significant for the sample being studied.

3. If the above two conditions are met, then a test of the potential substitute is feasible. The next step is to determine if the potential substitute is significantly correlated with the criterion. If this bivariate correlation is not significant, then the variable is not a substitute (and is therefore classified as a non-substitute) because it cannot replace the leader behavior which does correlate with (predict) the criterion. If this bivariate correlation is significant then the MLR model is used for the analysis.

4. The following general form of the MLR model was used:

(1) CRITERION = $b_{PS} + b_{LB}(LB) + K$

where: PS = potential substitute

b_{PS} = regression coefficient (beta) for potential substitute

LB = leader behavior

b_{LB} = regression coefficient (beta) for Leader Behavior

K = regression constant

The potential substitute was entered first in the modified stepwise regression model and was "forced" to remain in the predictor set. The leader behavior, on the other hand, was allowed to drop out if it did not add significantly to the explained criterion variance.[1]

The following criteria were utilized during this phase of the analysis:

(4.1) If b_{PS} is not significant, the PS is a non-substitute - terminate the analysis.

If b_{PS} is significant, then PS is a substitute of some form - proceed to 4.2.

(4.2) If b_{LB} is not significant, then PS is a strong substitute - terminate the analysis. If b_{LB} is significant, then PS is a weak substitute (that is, although PS is a significant predictor and may be considered at least a partial replacement for the LB, it has not totally eliminated the ability of LB to impact on the criterion variance.) Terminate the analysis.

In addition to the above series of tests, where each model focused on the substitutability of a single variable for a specific leader behavior, further MLR models were planned which reflect the possibility that more than one individual, task or organizational characteristic may combine to replace the explanatory power of a given leader behavior. The general form for these models was:

(2) CRITERION = b_{PS1} (PS1) + b_{PS2} (PS2) + b_{PS3} (PS3) + b_{LB} (LB) + K

WHERE: b_{PS1} = regression coefficient for potential substitute number 1.

PS1 = potential substitute number 1.

b_{PS2} = regression coefficient for potential substitute number 2.

PS2 = potential substitute number 2.

b_{PS3} = regression coefficient for potential substitute number 3.

PS3 = potential substitute number 3.

b_{LB} = regression coefficient (beta) for Leader Behavior

LB = Leader Behavior

K = regression constant

Beta values again indicated if the data supported the hypotheses when more than one potential substitute was included. With Equation 2 if the b_{LB} is not significant and b_{PS1}, b_{PS2}, and/or b_{PS3} are significant, it can be concluded that these variables combine to form a strong substitute for the leader behavior.

Results and Discussion

The two samples studied here were selected for analysis due to their differences in background, type of work and employing organization. It was expected that the two samples would differ on many of the dimensions measured. Analysis of the two sets of sample means confirmed this expectation with regard to potential substitutes and criteria. Two-tailed t tests resulted in significant differences between hospital managers (HM) and engineers (E) on the degree of indifference toward organizational rewards (E > HM), organizational formalization (HM > E) and the existence of closely-knit cohesive work groups (HM > E). The two groups were not significantly different on the degree of task provided feeback concerning performance or the existence of intrinsically satisfying work tasks. There were also highly significant differences between the two groups on organizational commitment (HM > E) and general job satisfaction (HM > E), but no significant differences on the instrumental and supportive leader behaviors measured. Although the analysis of sample means was not directly related to the hypotheses tested in this study, the results showed that the samples did differ on five of the eleven dimension measured.

Each of the potential substitutes has previously been suggested to imply a logical explanation of how the variable (potential substitute) takes the place of a specific leader behavior (Kerr, 1977; Kerr and Jermier, 1978; Jermier and Berkes, 1979). These potential substitutes were thus assumed to pass the first test in our analysis procedure.

Table 1 presents intercorrelations among all the individual variables included in this study. Some leadership behaviors correlated

significantly with one another. The highest intercorrelation was between support and role clarification (.41 for hospital managers, and .55 for engineers, both are considerably smaller than that reported by Jermier and Berkes, 1979). Since no more than one leader behavior was included in any MLR model, multicollinearity of the leadership behaviors was not a problem in this study. For the potential substitutes, 19 of the 20 intercorrelations were below .31, the single intercorrelation exceeding this was between INSAT and INDOR (r = .51) for engineers.

As shown in Table 1, only two leader behaviors were significantly correlated with organizational commitment--SUPPORT and ILBROILCL. This was true for both samples. The same two leader behaviors correlated significantly with general job satisfaction but only for hospital managers. No leader behaviors correlated significantly with general job satisfaction for engineers. According to the second test of our analysis procedure, hypothesis testing regarding leadership substitutes is possible with both samples for SUPPORT and ILBROILCL vis-a-vis organizational commitment. Hypothesis testing may also be conducted for the same leader behaviors vis-a-vis general job satisfaction, but only with hospital managers.

The third test of the analysis procedure involved testing the significance of the bivariate correlations between potential substitutes and criteria variables. As shown for hospital managers in Table 1, two of eight potential substitutes correlated significantly with organizational commitment -- indifference toward organizational rewards and organizational formalization, whereas three of eight potential substitutes correlated significantly with general job satisfaction -- indifference toward organization rewards, intrinsic task satisfaction, and

organizational formalization. These same three of eight potential substitutes correlated significantly with organizational commitment for engineers. Thus, these three potential substitutes were included in the fourth test of the analysis procedure - the MLR analysis involving a potential substitute and a single leader behavior.

The results of the MLR analysis are presented in Tables 2 and 3. We believe that those potential substitutes which add to the predictability of the criteria, but do not eliminate the predictive power of the leadership behavior, warrant classification as weak substitutes for leadership. These variables do explain significant portions of the variance in the criteria and in the absence of any leadership, may be viewed as substituting for the potentially important explanatory power of supportive or instrumental leader behaviors. When a potential substitute predicts a criteria and eliminates the predictive ability of the leadership behavior, we classify it as a strong substitute for leadership.

According to our findings, the following variables may thus be classified as weak or strong substitutes for leadership under specified conditions: For hospital managers, indifference toward organization rewards is a weak substitute for supportive leader behavior when predicting organizational commitment and general job satisfaction. For engineers, this variables is a strong substitute for support when predicting organizational commitment. For hospital managers, intrinsic task satisfaction is a weak substitute for support when predicting general job satisfaction. For engineers, this variable acts as a weak substitute for support when predicting organizational commitment. For hospital managers, organizational formalization

acts as a strong substitute (with a low R^2) for instrumental leader behavior--role clarification when predicting organizational commitment (it is a non-substitute when predicting general job satisfaction). For engineers, this variable is a weak substitute when predicting organizational commitment.

The findings from this study provide limited support for the leadership substitute construct as suggested and described by Kerr (1977) and Kerr and Jermier (1978). Several potential substitutes suggested by previous researchers were found to be important predictors of subordinates' job satisfaction and organizational commitment. This data provided limited evidence, however, that potential substitutes render supportive and/or instrumental leadership either impossible or unnecessary in terms of the impact of these leader behaviors on important subordinate outcomes.

For hospital managers, indifference toward organizational rewards was an important predictor of both organizational commitment and job satisfaction. Intrinsic task satisfaction also predicted general job satisfaction. For engineers, both indifference toward organization rewards and intrinsic task satisfaction predicted organizational commitment. In only a one case (INDOR substituting for SUPPORT, with engineers) did a potential substitue eliminate the importance of supportive leader behavior in predicting the criteria.

Organizational formalization was an important predictor of both criteria for hospital managers, and of organizational commitment for engineers. Again, in only one case (ORFORM substituting for ILBROLCL, for hospital managers) did the potential substitute eliminate the importance of instrumental leader behavior--role clarification

in predicting the criteria. Furthermore, in this single case the amount of criteria variance explained was not high (R^2=.10). These findings thus provide limited support for conclusions by Kerr and Jermier (1978) regarding the ability of these potential substitutes to render instrumental and supportive leader behaviors as superfluous.

There are several potentially important elaborations of the substitutes construct which were not directly dealt with in this investigation. Kerr and Jermier (1978) have distinguished between leadership neutralizers (". . . characteristics which make it effectively impossible for . . . leadership to make a difference.") and leadership substitutes (". . . characteristics which render . . .leadership not only impossible but also unnecessary.") Several authors have apparently assumed a variable must first be a neutralizer in order to become a substitute (Kerr and Jermier, 1978; Jermier and Berkes, 1979). It is not clear to the present investigators that a variable must be a neutralizer in order to qualify as a substitute. It seems more likely, especially in light of the current contingency approaches to leadership and the findings reported here, that both a supervisor's leadership behavior and a potential substitute may co-exist "side by side" --filling in for one another as the situation dictates. This view is supported by most of the MLR model results reported here. Perhaps some of these individual, task, or organizational characteristics might best be termed supplements to leadership. The hypothesized distinction between neutralizers and substitutes might fruitfully be studied using laboratory techniques to create the "influence vacuum" suggested by Kerr and Jermier (1978) as resulting from the existence of certain powerful neutralizers.

No distinction was made in this study between direct and indirect effects of either leadership behavior or of the potential substitutes. This potentially valuable distinction, as well as the question of the direction of causality, is probably best dealt with by path analysis and/or longitudinal investigations using cross-lagged correlation procedures.

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Footnote

[1]The question in statistical terms is simply, does the addition of the leadership variable (when entered as the last predictor) add to the predictability of the criterion? Using a statistical test (F) to evaluate the relative efficacy of different variables is a powerful method of analysis. However as Kerlinger (1973) notes, the relative efficacy of a variable is affected by the order of the variables in the equation. This is precisely the point in the present analysis. The leadership variable is always entered last to determine if the predictability of the leadership variable can be obviated by the substitute. Thus, variables are placed in the regression equation according to a logical and theoretical framework.

TABLE 1

INTERCORRELATIONS FOR LEADERSHIP AND SUBSTITUTE SCALES

Scale		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	ILBWA	-	-.03	.23	.00	-.22	.14	.11	.19	.03	-.10	-.03	-.10	-.08	.07
2.	SUPPORT	.04	-	-.40	.55	.11	.11	-.55	-.01	.12	.54	.31	-.29	.51	.18
3.	ILBSPEC	.31	-.06	-	.01	-.09	.08	.12	.10	-.21	-.19	.03	.35	-.21	-.19
4.	ILBROLCL	.23	.41	.24	-	-.04	.06	-.59	.25	.10	.45	.51	-.12	.53	.18
5.	AETK	-.19	-.14	-.20	-.14	-	.29	.02	-.30	.06	.19	.09	.04	.20	-.12
6.	PROF	.03	-.11	.27	.15	.14	-	.00	-.10	-.13	.25	.04	.03	.09	-.03
7.	INDOR	.19	-.39	.01	-.36	-.07	-.25	-	-.12	-.18	.51	-.30	-.03	-.69	-.19
8.	ROUTIN	.08	-.04	.23	.03	.08	.12	.00	-	.25	-.16	.40	-.15	.13	.24
9.	TSKFB	.00	-.17	.03	.10	.25	.21	-.10	.42	-	.05	.11	-.14	.16	.36
10.	INSAT	.02	.05	.05	.22	.05	.15	-.28	.20	.17	-	.21	-.13	.49	.09
11.	ORFORM	.20	.22	.14	.50	-.30	.20	-.25	.30	.22	.16	-	-.16	.44	-.01
12.	CLOSE	.04	.00	-.02	-.04	-.04	.41	-.08	-.10	.09	-.15	.17	-	-.15	.03
13.	ORGCOM	-.20	.44	-.06	.32	-.06	.06	-.60	.08	.05	.21	.31	-.13	-	.18
14.	SGENSAT	-.12	.47	-.06	.45	-.14	.02	-.63	.01	.15	.35	.32	-.11	.59	-

Note: Intercorrelations for hospital managers (N=63) are shown below the main diagonal, intercorrelations for engineers (N=71) are above the main diagonal. $P < .05$ for $r \geq .23$ for engineers and $P < .05$ for $r \geq .25$ for hospital managers.

TABLE 2

MULTIPLE REGRESSION RESULTS:
ORGANIZATIONAL COMMITMENT AND GENERAL JOB SATISFACTION REGRESSED UPON LEADER BEHAVIOR AND POTENTIAL LEADERSHIP SUBSTITUTES[a]
(HOSPITAL MANAGERS N=63)

Criteria	Predictors				R^2	Form of Substitute
	Potential Substitutes			Leader Behavior		
ORGCOM	INSAT B=NS			Support B=.43	.23	Non-Substitute
	CLOSE B=NS			Support B=.43	.21	Non-Substitute
	* INDOR B=-.51			Support B=.24	.41	Weak
	INDOR B=-.52	CLOSE B=NS	INSAT B=NS	Support B=.23	.44	Weak
	TSKFB B=NS			ILBROLCL B=.32	.10	Non-Substitute
	CLOSE B=NS			ILBROLCL B=.32	.12	Non-Substitute
	* ORFORM B=.31			ILBROLCL B=NS	.10	Strong
	TSKFB B=NS	CLOSE B=NS	ORFORM B=.35	ILBROLCL B=NS	.13	Strong
SGENSAT	* INSAT B=.32			Support B=.45	.32	Weak
	CLOSE B=NS			Support B=.46	.23	Non-Substitute
	* INDOR B=-.53			Support B=.26	.46	Weak
	INDOR B=-.49	CLOSE B=NS	INSAT B=NS	Support B=.26	.51	Weak
	TSKFB B=NS			ILBROLCL B=.44	.22	Non-Substitute
	CLOSE B=NS			ILBROLCL B=.45	.21	Non-Substitute
	* ORFORM B=NS			ILBROLCL B=.39	.22	Non-Substitute
	TSKFB B=NS	CLOSE B=NS	ORFORM B=NS	ILBROLCL B=.37	.24	Non-Substitute

[a]All beta (B) weights shown are significant at $p<.05$

Only these substitutes passed the first two criteria for inclusion into the regression analysis. Others are presented only to indicate potential substitutes from a logical perspective and to test the possibility that they act as suppressor variables when included with the leadership variables.

TABLE 3

MULTIPLE REGRESSION RESULTS:
ORGANIZATIONAL COMMITMENT AND GENERAL JOB
SATISFACTION REGRESSED UPON LEADER BEHAVIOR AND
POTENTIAL LEADERSHIP SUBSTITUTES[a]
(ENGINEERS N=71)

Criteria	Predictors				R^2	Form of Substitute
	Potential Substitutes			Leader Behavior		
ORGCOM	*INSAT B=.30			Support B=.35	0.32	Weak
	CLOSE B=NS			Support B=.51	0.26	Non-Substitute
	*INDOR B=-0.58			Support B=NS	0.50	Strong
	INDOR B=-.61	CLOSE B=NS	INSAT B=NS	Support B=NS	0.51	Strong
	TSKFB B=NS			ILBROLCL B=.52	.29	Non-Substitute
	CLOSE B=NS			ILBROLCL B=.52	.29	Non-Substitute
	*ORFORM B=.23			ILBROLCL B=.41	.32	Weak
	TSKFB B=NS	CLOSE B=NS	ORFORM B=NS	ILBROLCL B=.40	.33	Non-Substitute
SGENSAT	INSAT B=NS			Support B=NS	.01	Non-Substitute
	CLOSE B=NS			Support B=NS	.04	Non-Substitute
	INDOR B=NS			Support B=NS	.04	Non-Substitute
	INDOR B=NS	CLOSE B=NS	INSAT B=NS	Support B=NS	.04	Non-Substitute
	TSKFB B=.36			ILBROLCL B=NS	.13	Strong
	CLOSE B=NS			ILBROLCL B=NS	.00	Non-Substitute
	ORFORM B=NS			ILBROLCL B=NS	.04	Non=Substitute
	TSKFB B=.36	CLOSE B=NS	ORFORM B=NS	ILBROLCL B=NS	.17	Strong

[a]All beta (B) weights shown are significant at $p<.05$
*See Table 2