Effective Construction Site Management: A Review

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Abstract: The contribution of site management to the achievement of construction performance objectives is examined. Drawing upon existing empirical data and linking them with research findings in the social sciences, the writers argue that there is often insufficient attention paid towards the range of complex and interdependent variables that can influence construction site activity. As a consequence, the predictive capacity of such research is limited, and the recommendations often derived, particularly concerning appropriate managerial actions, often fail to account for significant variability in circumstances. The applicability of the concept of "leadership" to the construction site situation, and its relationship with key component variables are singled out for attention.

Introduction

In recent years a good deal of attention has been directed towards the issue of how construction site performance may be improved, given the many complex and uncertain conditions under which the construction firm inevitably operates. Much of this attention has been focused upon the motivational correlates of improved site performance, and upon the role played by management—particularly site management—in creating and fostering appropriate conditions on site. While much of the research cited will refer to the U.S. construction industry, it is assumed that—in spite of the differences in specific features of construction organization across countries—the themes explored (i.e. motivation and productivity) are common to the construction process across countries. The inferences drawn from empirical data and more general observation often point to the 'style' of management as being an important determinant of the level of productivity on a construction site via its motivational consequences for the workforce and supervisory staff on site. In particular, many stud-

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ies highlight the importance of the 'leadership' given by construction site management and suggest that efforts should be made to harness the effects that this will have upon construction site performance. Indeed, research within the construction management field parallels concern within other industrial settings to analyze the performance effects of various leader behavior in various settings. While 'leadership' as such is not entirely (and often not explicitly) adopted as the central concern facing researchers in the field, where the central focus is more commonly upon the motivational correlates of productivity performance [see, for instance, Laufer and Jenkins (34)], it will be taken as the central concern of this paper for the reasons mentioned previously. In doing so, an attempt will be made to address two issues: firstly, the relationship between behavioral factors (namely satisfaction, motivation, morale, etc.) and performance; and secondly, the impact that leadership styles have upon these variables. Particular attention will be directed toward findings in the field, which will be reviewed in the light of more general social science approaches to the concepts of 'motivation' and 'leadership' that have been pursued in other industrial settings.

Satisfaction, Motivation and Performance

Most empirical studies, with a few exceptions (e.g. 18, 25) have focused their attention upon productivity improvements, generated by more effective management on site (7). It is commonly suggested that, apart from the significant *direct* impact of management upon productivity—achieved by planning, coordinating and controlling activity more effectively to provide conditions conducive to enhanced labor productivity—management can have, through this, a significant *indirect* impact upon productivity by increasing the satisfaction, morale and motivation of the workforce and field supervisory personnel (34). This is achieved in combination with various management practices adopted on site to increase recognition and participation (6,7).

Support for this assertion is based upon findings that the major sources of dissatisfaction commonly expressed by both tradesmen and supervisors are factors such as the delays and reworkings attributed to inadequate managerial, technical and administrative support in the field (7,8). Frequently cited problems included the lack of tools and materials, delayed decisions and late information, delays in inspection, change orders, design errors and inadequacies, overcrowding and interference caused by spatial constraints on site (4,7,8,9,46). Satisfaction is reported as particularly low on large (e.g. nuclear power plant) sites, where the planning and coordinating of activities becomes more complex, and where greater size, increasing specialization and more flexible administrative procedures combine to produce feelings of loss of identification with the work, lack of individual recognition and managerial insensitivity to individuals' needs (4,6).

The link between satisfaction and improved productivity is based upon the impact that such conditions are assumed to have on workers' and supervisors' motivation. To some extent this assumption is based upon findings that construction workers and supervisors operate generally at 'high-level needs' (24) compared, for instance, with personnel in other

industries (5,12). More frequently, the motivational consequences for productivity are either assumed or inferred directly from respondents' own accounts, from which interpretations are developed based closely upon the motivational theories of Maslow, Herzberg and McGregor (8,46). Individual needs for responsibility, opportunities for advancement, achievement recognition and satisfaction from the work itself are interpreted as being frustrated, and consequently the potential for significant productivity gains is seen to be often thwarted by inappropriate or inadequate managerial actions (23).

Individual and Situational Variables

In a review of studies of motivation and productivity, Maloney (39) has identified a major underlying conceptual weakness. In questioning the causal assumption—taken as axiomatic—that high satisfaction increases motivation which therefore improves productivity, he argues that the prescriptive approach commonly adopted presupposes the impact of satisfaction upon productivity, and leads to general claims which are not sufficiently supported by the evidence, nor by the way in which that evidence has been collected. Maloney cites Lawler and Porter's (35) finding—that high job satisfaction is a function of a productive day—to suggest that the assumed causal relationship is in fact the reverse of that taken for granted by construction management researchers. In reconciling their own, similar finding (3), Borcherding et al. (9) switch their attention to job satisfaction as the criterion for effectiveness, treating as given the impact that job satisfaction *then* has upon productivity, but without providing any evidence in support of this assertion:

> the lines of communication can be opened and a greater feeling of company membership and job commitment could emerge on the site . . . if the workforce becomes motivated, it will begin to make things happen rather than just waiting whenever a problem arises. Previous studies by the writer show how high job satisfaction for craftsmen is a result of a productive day that contributes to a tangible structure (p. 86).

Maloney notes that one consequence of this approach is the ambiguity of the constructs used, and the lack of a coherent conceptual scheme for explaining the relationships between key variables. Specifically, he notes that the terms 'morale,' 'satisfaction' and 'motivation' tend to be used interchangeably, and that key constructs, like 'motivators' and even 'productivity' itself are left ill-defined (38). Indeed, the link between satisfaction and performance is increasingly coming to appear to be a highly complex one. Quite aside from the problem of causal direction, it appears that the degree of stimulation that a job entails affects the relationship. Further, research makes clear the need to distinguish between intrinsic and extrinsic satisfaction, since their relationships with performance differ (29).

Another consequence Maloney notes is the omission of potentially important variables—specifically individual differences. Borcherding and Garner (7), for instance, state that:

since most construction work inherently offers high level satisfiers the workers should be frequently identifying with motivators such as the work itself, feelings of accomplishment etc. . . . Lower level motivators including pay . . . should not be included with their prime motivator (p. 451).

Such a generalization fails to account for what may be highly significant differences in individual responses to the same situation. The idea that the relationship between satisfaction and productivity is complex due to the complexity of 'needs' and the ranges of satisfaction for individual workers (10) gains some attention (23), but is more frequently ignored in the interpretation of findings.

'Satisfaction' is an affective reaction to conditions encountered—not a prerogative arising from those circumstances—and as such is necessarily determined in part by the perceptions, values, feelings and expectations held by the individual experiencing it. The existence of 'satisfiers' generally may not necessarily determine the satisfaction experienced in particular cases. Different individuals—the laborers in the aforementioned study, for instance, compared to the carpenters, pipefitters and electricians—may perceive the same situation in very different ways, as may different groups of the same trades in the same situation. The same task which is 'intrinsically satisfying' may offer for one individual the prospect of greater 'self-actualization'—for another the prospect of continual stress and anxiety (30). It is important to realize that the *extent* to which an 'intrinsically-satisfying' task is transmitted into 'satisfaction' is an empirical question when it comes to analyzing its impact in particular cases. The point is important since, by assuming that the generalization holds across and within cases, a potentially significant source of variation is excluded from analysis. Moreover, such generalizations may prove suspect: in comparing the job of foreman in construction with the job in other industries, Borcherding (6) for instance, compares the perceptive assessments of foreman to the role of foreman in his own study, with the *affective* reactions to the job cited in a study by Roethlisberger (45).

Methodologically, these studies have also been strongly criticized for violating the principles upon which the ability to draw statistical inferences from sample data depends (38,39). In particular, the use of group interviews to obtain individual-relevant data, and the nonrandom selection of individuals for interview are cited as generating a significant nonrandom bias in the sample (38).

Two additional points concern the representativeness of the projects that were chosen. Firstly, since most are case studies or studies of a small number of (usually large) projects, it may be the case that the conclusions drawn refer only to them or to a small group of similar cases. While a case study or small sample approach does not of itself invalidate the findings, it does severely restrict the ability to draw any general conclusions and limit the predictive value of those findings. This is particularly so in the absence of any systematic sampling framework.

Secondly, in pursuing a research strategy aimed at identifying problems there may be a tendency to overestimate or misjudge their effects. If subjective assessments of problems encountered are to be taken as the basis for policy prescriptions as in some studies, then such assessments

need somehow to be set in the context of their relative or total impact upon actual performance in those cases. Otherwise, one can never be sure whether such problems—individually and combined, or both—reflect marginal or major issues in the management of work on those construction sites.

Laufer and Jenkins (34) have extended Maloney's critique by pointing to the omission of situational variables from such analyses. Laufer and Jenkins develop a more detailed interpretation of findings based upon the analytical framework of 'expectancy theory' (50). This asserts that motivation is a combined function of the extent to which an individual perceives that: (1) His work effort will lead to performance; and (2) that performance will lead to rewards ('intrinsic' or 'extrinsic'). Individual and situational differences then play a central role in moderating these expectancies. However, their analysis and recommendations then presuppose the answers to the questions they address. For instance, in suggesting that to improve motivation/productivity, employers should become more aware of what their employees regard as having high value, they then suggest there is little variation due to similarity amongst organizational members. In looking at job factors, they accept Borcherding's finding, reviewed previously, that construction work generally offers more intrinsically-satisfying jobs. In recommending greater employee involvement and participation in decision-making, they seem to imply that this necessarily increases motivation and productivity, or both, in all circumstances.

Nevertheless, the impact of situational variables has received scant attention in the construction management literature, despite its recognized importance in studies of organization, management and leadership (14). This is surprising since a number of those studies make explicit the extent to which situational conditions—notably size, technology and structure—affect employee satisfaction and workforce 'morale.' Yet it is the comparative examination of the differential impact of the situation within cases—and perhaps more importantly *between* cases—which is missing. Within cases, for instance, to what extent is the work of pipefitters, carpenters and electricians intrinsically more satisfying than the work done by others on the same site due to lower specialization or greater autonomy? Between cases, how do variations in size, technology and structure differentially affect the degrees of satisfaction which work on different sites?

While characteristics of the situation are used to identify sites where problems which arise are deemed to be particularly acute (and therefore more interesting to study) the situation itself is rarely used as an explanatory mechanism to investigate the differential impact of situational conditions upon site performance through its effects upon motivation and productivity. In general, the *extent* to which particular factors contribute towards improved motivation, the *extent* to which this is translated into greater productivity, and the *extent* to which situational and individual differences play a part in moderating either or both relationships are empirical questions that are rarely asked, but whose absence critically weakens the basis for the generalizations made about the correlates of motivation and productivity.

Role of Management

The second major question, following on from this, concerns the role of management in contributing to improved site performance. This is regarded as vital in managing motivational processes at work (34). Concerning productivity, Borcherding and his colleagues consistently point to removing the sources of job dissatisfaction as a main priority—by improving communications and adopting more appropriate planning and scheduling systems (9). They tie this in with the need—particularly in large projects—for a management 'style' that extends the decision-making responsibility of field supervisors and which provides for greater recognition of individuals' efforts (5,6). The theme of participative or consultative decision-making is supported by Hinze and Keuchenmeister (26) who found that crews which rated high in productivity had foremen who allowed more participative decision-making and by a study conducted by the Building Research Establishment (18) which noted quality improvements on more 'consultative' sites. Other evidence points to positive correlations between the quantity of on-site managerial supervision and crew work rate (36) and to a relationship between the method adopted by foremen in 'handling' their crews and injury rates on site (25). Such results are taken to indicate that improved productivity—and perhaps, quality, absenteeism, safety and turnover (46)—are determined to a significant extent by the supervisory practices of site management personnel (6,26). Hinze and Keuchenmeister for instance suggest that foremen can increase workers' identity with the project (and therefore productivity) by 'providing solid leadership'—said to entail more effective communication greater personal attention, setting high but reasonable goals, and sharing information with subordinates (26). Several others point to the key role of the first-line supervisor as the person most likely to be able to improve morale and motivation and to translate these into productivity improvements (5,6,46).

The common presumption is, therefore, that 'management' *can* foster appropriate conditions for improved performance on site. Yet if the commonly-presumed relationship between 'satisfaction' and 'productivity' is problematic due to the aforementioned factors, one needs to question the validity and appropriateness of the claims made as to what action this entails. If one assumes that satisfaction *does* improve performance, then one has to account for the fact that individual and situational circumstances *moderate* this relationship. For instance, if managerial action to improve performance by increasing motivation has differential effects as a consequence of such conditions, one might expect significant differences in the extent to which management can improve productivity by the *same* actions in different circumstances. Conversely, to improve productivity, *different* managerial behavior may be required according to the nature of those circumstances.

A review of the empirical findings would seem to suggest several common ambiguities when the previous considerations are accounted for. Firstly, to what extent does 'management' have scope for productivity improvements on site? A recent review argues that there is in fact little scope for improvement:

> At the micro-micro level only effective employment of labour and equipment offers any hope of improving productivity as the project is executed . . . much has already been accomplished in this area and productivity improvements henceforth are likely to be marginal at best (Kellog et al. 1981, p. 144).

Borcherding's own results (9) suggest that productivity parameters are largely pre-determined. He cites engineering design features, short construction lead times, and too elaborate planning and scheduling systems, as principal causes of lower satisfaction (and therefore reduced productivity).

A related point is the extent to which such factors are controllable by management. It is asserted that performance is improved, by providing or removing:

> the various facilitating and inhibiting work conditions that are controlled to a great extent by management (Laufer and Jenkins 1982, p. 43).

Yet the findings illustrate the impact that the design team has upon site productivity—which, except for design and building organizations, may not be under the direct control of construction management. A similar inference may be drawn about findings that point to trade union practices as causing significant problems for construction managers (8,40). Moreover, if the focus is upon *site* management, the extent to which the planning and scheduling practices adopted by the contractor are controllable at site level becomes a significant variable. The foregoing would seem to suggest that the extent to which there is scope for improved performance on site is itself variable depending upon the nature of the situation, including the adequacy of plans and planning systems and the locus of control over these within the 'building team' as a whole. Secondly, at what level within the construction organization do the recommendations apply? The foregoing would suggest that, for *site* management personnel, many of the factors which contribute towards improved performance are beyond their immediate control—in which case there is no a priori reason to expect that efforts by them to improve morale and motivation on site will significantly increase productivity. If recommendations are directed towards higher-level management, the question then becomes one of how they might be transmitted into action at site level.

The relationship between site and central office management has been investigated by Borcherding (5,6). He suggests moving the point of decision-making on large sites closer to where it is most needed in order to avoid the stifling and counter-productive effects of excessively bureaucratic administrative procedures (6). He recommends that foremen should be more closely involved in decisions relating to methods selection, evaluation of field suggestions and job policy formulation—particularly concerning labor. He also notes that conditions on the 'super project' are not conducive to greater participation but that participation frequently occurs—often more for subcontract foremen than the firms' own supervisory personnel.

As before, the link between participative decision-making and productivity is based upon the presumed impact upon supervisor's job satisfaction. While asserting the 'demotivating' effects of stifled initiatives and reduced influence, he also notes:

> When questioned, however, foremen did not articulate this high level of involvement in decision-making as an important element of their job or of their job satisfactions, because they take it for granted when they are made responsible for the job (6, p. 574).

If this is the case, it is easy to see how restriction may promote dissatisfaction, but it is not so easy to see how increased participation will—necessarily—increase satisfaction, and, following that logic, productivity. As mentioned earlier, an alternative outcome may be heightened anxiety or stress stemming from work overload on an already overworked foreman (5).

In reporting such findings, two further points appear frequently to be missed. Firstly, if participative management is requisite at both levels in the construction firm hierarchy, to what extent is the extension of decision-making responsibility to first-line superiors conducive to participation in the field? The common presumption is of a 'diffusion' of participative influence (in certain substantive areas) to lower levels. Yet circumstances—such as the experience or personality of the supervisor and conditions in the field—may point to situations in which either the supervisor is unwilling or unable to extend the greater influence he has to his subordinates, or is both willing and able to extend the limited influence he has. Nevertheless, both strategies may be consistent with improved performance if, for instance, the nature of the work on site is included as a moderating variable. Specifically, differences in the technological complexity or 'routineness' associated with work on otherwise comparable sites may determine the extent to which varying degrees of participative management are seen as effective. For instance, where work is relatively standard or routine, greater participation may have no benefits in terms of productivity compared with situations where the work is technologically complex and conditions are unpredictable.

Secondly, from the point of view of higher-level management, securing firmer control over site activity that is large scale and complex may be deemed highly functional, and the benefits of centralized control may appear to far outweigh the costs associated with dissatisfaction of supervising personnel, particularly if it is the case that productivity parameters are largely predetermined. Greater delegation of authority in those circumstances may be then viewed as potentially highly dysfunctional if it creates ambiguities or promotes conflict between higher- and lower-level supervisory personnel. It may be the case that the conditions—less often studied—of smaller sites, with more complex technology and less bureaucratic organization are the conditions most conducive to decentralization and where its benefits are more commonly secured.

It is these apparent ambiguities that are not sufficiently addressed by researchers in the field. It is assumed—implicitly or explicitly—that the 'leadership' given by site management can be divorced from, and understood irrespective of, the conditions both on site and within the orga-

nization (and beyond) which define the situation in which site management is expected to act. This is most clearly expressed in a study by Logcher and Collins (36) who explain the difficulty in studying construction productivity due to the variety and complexity of factors that affect the workings of a site. But, in analyzing tile laying as a 'surrogate activity' on five U.S. construction sites, they then attempt to separate the impact of management strategy on performance from the impact of other (situational) variables:

> What is needed is a basic knowledge of how major factors of a management strategy, divorced from means, methods, materials and job conditions, independently affect labour productivity . . . Other management decisions significantly affect labour productivity . . . However these actions are peculiar to the job conditions encountered (p. 448).

Yet by divorcing 'management strategy' from the conditions under which management operates, one is left with both a rather vague idea of what exactly management is, together with no clear understanding of the conditions under which particular management strategies may be more or less effective, let alone feasible. Moreover, one is left with no clear idea of the level in the organization at which 'bad' management is translated into 'good' management, or the distribution of control within the organization over factors which affect satisfaction.

It would seem to be the case that, while it is possible to make generalized statements identifying relationships between various behavioral factors and performance criteria, there is a real problem in using such statements predictively, due to the importance of intermediate variables in influencing the strength of the association. This implies that while current research can be used to help explain and understand aspects of performance within the construction industry, there is an insufficient understanding of the systematic relationship between variables to allow recommendations for improved performance of *individual* sites to be made.

'Leadership' on Construction Sites

This leads to a third ambiguity: namely, what is "leadership" in these circumstances, and what 'styles' of management or leadership create conditions conducive to enhanced performance. Too frequently the conclusions drawn point to the outcomes to be achieved rather than to the specific ways in which different strategies may differentially achieve these outcomes. Borcherding and Garner (7) for instance conclude by advocating:

> providing adequate support and assistance to the workforce and establishing a cooperative atmosphere among all levels and parties involved (p. 453).

Several broad strategies can be discerned, with varying emphases, and summarized in Hinze and Keuchnmeister's (6) description of solid leadership (26). Interestingly, all four recommendations identify four distinct

'styles' of leadership recognized in the social science literature (27) though more often grouped into 'initiation'/'consideration' dimensions (15) or 'concern for results'/'concern for people' (2).

It is interesting to note that Borcherding's results tend to emphasize the "consideration" dimension

> . . . there is little, if any, recognition for good quality or productivity and suggestions are ignored . . . craftsmen are made to feel inferior to the office staff . . . lower level supervisors, as well as management, cause craftsmen dissatisfaction by constantly being on their back . . . allowing nepotism and friendship . . . in advancing craftsmen or assigning good work (9, pp. 85–86).

Indeed, in analyzing the role of foreman, he concludes that

> Recognition seems to be about the only way to provide an added satisfier-motivator for field supervision (5, p. 83).

This would seem to suggest three things: firstly, that the scope for increasing satisfaction is greater if a more consultative and personally considerate managerial style is adopted. Secondly, that such a style is a counter-balance to the more dissatisfying consequences stemming from inadequate or inappropriate managerial actions. Thirdly, that the scope that site management has to improve morale and satisfaction is limited to the adoption of this style, to the extent that the organization and structuring of site activity—possibly a 'directive' or 'initiating' style of leadership—is the province of higher-management personnel. Indeed, research suggests the importance of interpersonal, as well as technical and administrative skills, in training for site management (19).

This has a number of important implications. Firstly, it suggests that 'leadership' in the context of a construction site is neither concentrated on site nor at head office. It is distributed according to the role that individuals play in, among other things, the formulation and development of plans, policies and procedures for managing site activity. By concentrating upon the key role of foreman as 'leader' of his crew, the point is missed that the 'functions' of leadership—including goal-setting and organizing, coordinating work, etc.—do not necessarily come within his jurisdiction. However, the 'position power' of the leader in group-task situations has been shown to be a relevant variable in determining the extent to which his actions prove effective (14,43).

This consideration is especially important if one accounts for the tendency within the industry towards more extensive use of subcontracted firms and the growing proportion of self-employed and subcontract labor (4). To the extent that a substantial proportion of the workforce employed on site fall outside the formal jurisdiction of the main contractor's supervisory personnel, one would expect this to have implications for managerial techniques adopted to improve communications, motivation and morale on site. One obvious implication is that efforts to promote a 'greater feeling of company membership and job commitment' become irrelevant in the circumstances. More importantly, does the absence of full, direct managerial control over certain sections of the workforce re-

strict or change priorities within the range of options available to site management?

A second implication is that different 'styles' of leadership are not necessarily mutually consistent or complimentary. The breakdown of elaborate planning and scheduling systems for instance is cited as one major cause of dissatisfaction, and Borcherding's results consistently point to the alienating effects of greater specialization and administrative rigidity. It has already been argued that these situations may in fact be conducive to effectiveness in certain circumstances, the implication being that a more 'considerate' style may be a response to dissatisfaction caused, rather than being necessarily a means to achieve greater productivity. This interpretation is supported strongly by findings which show that leader behavior is a *response* to performance outcomes, rather than—or as well as—a determinant (20,37,47).

This interpretation appears more plausible when account is taken of the possibility, mentioned earlier, that in fact satisfaction is the outcome of performance. If this is the case, then one can infer that efforts to provide 'satisfiers'—perhaps by adopting a more considerate or consultative style—serve mainly to enhance morale and job satisfaction per se, and not necessarily to improve productivity.

A third implication is that different styles of leadership produce different effects. This is borne out in part by the results on quality improvement and safety mentioned earlier, and brings out a fourth common ambiguity—namely, what do researchers mean by effectiveness in such circumstances? The use of productivity as a primary measure of improved performance restricts the definition of effectiveness to a narrow range, and misses the essential point that different measures of performance—productivity, quality, turnover, safety, may be affected in varying degrees and in various ways by the particular managerial style adopted. Moreover, a common presumption is that performance criteria are themselves mutually consistent (46). Yet it is not at all clear how, for instance, higher productivity may be consistent with higher quality production, or more effective safety measures.

Fourthly, the results point tangentially to the prospect that the effects of different styles of leadership are dependent, in part, upon characteristics of the situation. The effects that management has upon improving morale and satisfaction in conditions described by Borcherding are clearly determined by the extent to which that strategy overcomes the alienating consequences of work on large scale projects. If a more considerate and consultative style does increase morale and satisfaction, then one would expect any improvements in productivity to occur subject to the constraining conditions experienced on that site. For instance, if work is complex and unstructured one might expect greater gains from a participative style, than if work is relatively straightforward and routine. The extent to which the degree of structuring of the task moderates the impact of 'styles' on performance has been shown to be a significant variable in studies of leadership (14,28).

'Leadership' in Other Contexts

These points are important, since it is too often expected that 'more

effective leadership'—treated as a unitary concept and without full regard to characteristics of the situation and of the individuals involved—constitutes the means of achieving better site performance. The implicit treatment in the literature owes much to Blake and Mouton's (4) '9,9 man,' or in its less sophisticated forms to the search for a 'great man' who embodies those traits that produces an effective first- or second-level manager. The search for the 'ideal' site manager is heavily discounted by Hatchett (21), who points to the variety of ambiguous and conflicting circumstances in which the present day site manager is expected to lead:

> The quest if . . . for the ideal site manager. There is no shortage of views on what is 'ideal' but attempts such as abstract job specifications and models of ideal site systems tend to be unrealistic (p. 28).

He also notes specifically the dangers in assuming full consistency between views about what effective site management actually means:

> the different interests and priorities held by the various parties will motivate them towards trying to change the patterns of behaviour of site management personnel. The bigger the difference between what an observer sees as a result of site management and his own perceptions of what site management 'ought' to be doing, may stimulate his attempts to bring about change. However (they) may not be seen as improvements by other observers or interested parties (p. 28).

The search for desirable traits, however, continues—with some interesting results. Borcherding, for instance, identifies an 'inborn ability for leadership' as a trait identified by construction firm owners as important (5). His own categorization of personality attributes important in productive foremen, interestingly includes 'gaining respect' and 'crew motivation' as personality characteristics. Yet these are outcomes of a two-way interaction between superior and subordinate, not personality characteristics per se—and therefore perhaps significantly determined by the situation, including subordinate characteristics. Also, the tendency to establish 'leadership abilities' as a separate category from other features which may be significantly related—such as 'ability to plan ahead' and 'care about the job'—further serves to illustrate the confusion surrounding the concept of leadership as applied in the construction management literature. In the social science literature, such attributes tend to be included as aspect of particular dimensions of leadership—such as 'initiation' and 'consideration'—rather than being separated out as independent and unrelated elements.

The topic of leadership is occasionally addressed in general text-books on construction management. While many fail to deal with the topic at all, or alternatively somewhat inferentially (1,13,22,44,49) sometimes writers provide more extended treatments (11,17). One of the chief difficulties with these reviews is that they are rarely more than extended catalogues of the leadership qualities that a good construction site man-

ager should possess. In addition to being highly task-oriented, they are also supposed to show consideration to their subordinates, know when and how much to delegate, be capable of assessing and creating the right morale, etc. While many of these compendia of leadership characteristics or patterns may be highly laudable, it is difficult to see what purpose they serve. Research on leadership styles has made clear the enormous range of variations in leadership styles that exist. Leaders are unlikely to be found, or made, who can exhibit all of the attributes that some writers on construction site management recommend. In view of this, the extended catalogues of leadership functions and styles are mere exhortations, and unproven ones at that. The evidence supporting the notion that, for example, leaders who are both considerate and who structure the tasks of their subordinates tightly—consideration and initiating structure in the language of the Ohio studies—are necessarily the best leaders is not at all clear-cut. As Kerr, Schriesheim, Murphy and Stogdill (32) have emphasized, the effectiveness of leaders exhibiting either of these styles seems to be heavily influenced by a range of circumstantial factors. Even the universal superiority of the two styles in combination has been questioned (33,42). Moreover, what is interesting about the relatively little concern for issues of leadership in text-books on construction management is the fact that this stands in stark contrast with the preoccupations of manufacturing industry. Textbooks in this latter area often display a deep concern for and knowledge of behavioral science issues and concepts in relation to management in the manufacturing sector.

While research conducted in the social science field is no less confusing and ambiguous, certain themes have emerged. Notably, early investigations of the relevance of traits to studies of leadership have found little consistency in their relevance or desirability (48) resulting effectively in the closing off of that avenue of research. More significantly perhaps, the search for a '9,9' man has foundered on the realization that attaining high scores on one dimension is not necessarily compatible with high scores on another and that the effectiveness of various styles is in large part dependent upon characteristics of the situation (14,28). As has just been noted, research has also indicated that the '9,9' or 'high-high' combination is in fact not necessarily the best combination. Consequently, research into leader effectiveness continues, but with the supposition that there is no one best way to lead, and that the effectiveness of various styles, and their impact upon different aspects of performance vary according to the situation, including the personality characteristics of the leader and those he is expected to lead. It is such considerations that are largely absent from the bulk of the research reported in the construction management literature.

Recommendations

Researchers into construction site management need to attempt to forge models of the construction industry which are not simply extrapolations from manufacturing and commercial situations, and which give greater recognition to the contentious nature of many behavioral concepts and research findings in the social sciences. While the social and behavioral

sciences can and should provide bases for such models, greater attention should also be given to the circumstances that face construction.

There is a particular need to investigate further the role that situational variables may play. Factors such as variations between projects in size, technology, organization structure, and patterns of manpower allocation and provision may be important explanatory mechanisms in exploring the relationships between key behavioral variables relating to motivation and leadership. There is also the need to look at more closely what is meant by 'leadership' in such circumstances, how the exhortation to provide leadership is translated (or translatable) into action, and how the impact of different leadership 'styles' may be affected by different sets of conditions.

Finally, attention should be directed towards the inherent ambiguities and contradictions associated with measures of performance. Performance is a multi-faceted and often elusive concept and an emphasis on productivity as the main criterion may lead to a neglect of the impact that managerial action may have upon different measures of performance (e.g. quality).

Conclusion

This article has sought to demonstrate some of the problems associated with recent social scientific research on the construction industry. There is an irony in much of the analysis. On the one hand, many accounts of the behavioral factors which impinge upon the construction industry are informed directly by theoretical and empirical work in the social sciences. On the other hand, many of the criticisms levelled previously at these reviews are *themselves* informed by the work of social scientists. The irony derives from the tendency for many writers on the social scientific aspects of the construction industry to delve selectively in the literature dealing with questions of morale, satisfaction, leadership, and the like. One of the messages that should have come across from this article is that many of the findings and conclusions developed by social scientists are highly contentious. Conflicting schools and conflicting empirical results abound in the literature which deals with the behavioral aspects of organizations and industry in general. Many writers fail to recognize the contentious nature of much of this research, so that embracing particular schools of thought or principles and seeking to apply them to the construction industry without adequate attention to the range of controversial debate and evidence is a dangerous enterprise indeed. It would be particularly dangerous if such reviews were seen as forming a basis for action when their theoretical and empirical foundations are weak. Further, insufficient attention is given to the question of how far the construction industry differs from other commercial sectors. Most behavioral research on organizations is conducted in manufacturing, retailing, banks, and the like. Our impression is that many people within construction regard their industry as generically different from other spheres of industry. If they are correct, though the criteria for deciding whether they are correct are most unclear, then this element would have to be taken into account too. The specter of applying possibly inconclusive principles to a possibly inappropriate instance

(i.e. the construction industry) is one which nobody should seek to help materialize.

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