

# Prosocial Behavior, Job Complexity, and Suggestion Contribution under Gainsharing Plans\*

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*This article reports a study of five manufacturing organizations with performance gainsharing plans, in which 100 manufacturing employees responded to job characteristics scales from the Job Diagnostic Survey and were evaluated by their supervisors with respect to prosocial or relational behavior. The number of suggestions employees contributed to formal employee involvement systems was found to be positively related to perceptions of job complexity. A significant interaction revealed that suggestion making was also positively related to assisting behavior (a measure of extra-role prosocial behavior), but only for employees reporting that they experienced relatively high levels of job complexity. Suggestion making was not found to be related to compliance (a measure of rule-prescribed prosocial behavior). The authors present implications for further research on prosocial or relational behavior and the management of high-involvement gainsharing plans.*

Prosocial organizational behaviors are activities intended to promote the welfare of others within a work context. These include various helpful and altruistic gestures necessary for the effective operation of an organization, such as assisting other employees who have fallen behind, volunteering for assignments, giving

advance notice when one is unable to attend work, and other positive acts valued by organizations but not necessarily related to mic-

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prescribed tasks. This article reports an investigation designed to identify some of the correlates of suggestion contribution, an activity that has received relatively little attention in the literature reporting research on prosocial or organizational behavior.

#### OVERVIEW

In a recent review, Brief and Motowidlo (1986) discuss 13 forms of prosocial organizational behavior, suggesting that these activities may be classified according to the intended benefactor of the gesture, the extent to which the action is functional or dysfunctional for the organization, and the extent to which the behavior is role prescribed or "extra-role." Although Brief and Motowidlo (1986) describe prosocial behavior as a diverse, multifaceted concept, published research reports have tended to focus on relatively few of the 13 forms identified. For example, job-related assisting behavior (i.e., helping co-workers with matters related to the work itself) has been investigated in several studies (Berikowitz & Daniels, 1963; Puffer, 1987; C. Smith, Organ, & Near, 1983), as has compliant behavior (i.e., employees' adherence to the organization's regulations, norms, and values) (O'Reilly & Chairman, 1986; Puffer, 1987; C. Smith et al., 1983). But other forms of prosocial behavior, such as assisting other employees with personal matters, helping consumers with matters not related directly to products and services, and representing the company in a positive way to outsiders, have received little or no attention as separate dependent variables in research.

#### Suggestion Contribution under Gainsharing Plans

One of the 13 forms that seems especially worthy of research as a separate construct is the contribution of suggestions for procedural, administrative, or organizational improvements. According to Brief and Motowidlo (1986):

Attempting to change aspects of the organization in the way it operates to help it become more successful is another prosocial expression. An organizational member might suggest changes for improvement in job design, production procedures, administrative procedures, management practices, organizational structure, or organizational strategy (p. 715)

Suggestion making is a potentially important activity in any organization, but it is particularly valued in companies with performance gain-sharing plans (Frost, Wacziarg, & Kuh, 1974; Graham-Moore & Ross, 1983). The Scanlon, Rucker<sup>®</sup>, and Improshare<sup>®</sup> plans are examples of gainsharing plans, other gainsharing plans are custom designed for specific organizations. Gainsharing plans pay frequent bonuses to employees for improvements in organizational performance. Many plans also include highly structured involvement systems that allow employees to submit formal, written suggestions for ways to improve productivity, quality, service, or other aspects of performance.

Suggestion making is encouraged under gainsharing because many believe it produces improved work methods that, in turn, increase levels of productivity. This reasoning reflects the human resources model of participation, which assumes that involvement leads to productivity improvement because it makes better use of the job knowledge and problem solving skills of the work force (Rosenberg & Rosenlein, 1980).

Despite the popularity of gainsharing suggestion systems, the research literature presents only mixed evidence that such employee participation affects productivity. For example, Locke and Schweiger (1979) reviewed several dozen studies of employee involvement and found no convincing evidence that participative decision making improves productivity. Using a slightly different approach, Cannon, Vollrath, Froggatt, Lengnick-Hall, and Jennings (1988) found that some types of participation affect performance, but were unable

to evaluate the effectiveness of participation under gainsharing because of the weak research designs often used in those investigations. Even when productivity improvements have been documented with rigorous methods (Schuster, 1983), researchers have not been able to determine whether the changes resulted from suggestion contribution or from the motivating effect of the gainsharing bonus.

Fortunately, however, Katz, Kochan, and Wehr (1985) report an investigation of 25 organizations that used suggestion systems without any provision for organization-wide incentives. Their analyses showed that the percentage of employees contributing to the suggestion system was related significantly to both direct labor efficiency and product quality, which supports the position that participation and performance may be related similarly under gainsharing. Katz et al. found that suggestion system activity accounted for 14% of the variance in direct labor efficiency and 53% of the variance in product quality. In contrast, the forms of prosocial behavior that have traditionally been investigated in organizational settings (e.g., assisting behavior and compliant behavior) typically have accounted for much smaller proportions of the variance in objective performance measures (Puffer, 1987). These findings emphasize the role of suggestion making as a potentially important, although largely ignored, form of prosocial behavior.

Suggestion contribution also warrants further investigation because of the role it presumably plays in facilitating organizational change under gainsharing. The type of high-involvement plan described in this article often is designed as a comprehensive organization development intervention capable of changing the company's culture. According to Frost et al. (1974), the ultimate goal of such plans is for every employee to become a "manager"—that is, to identify with the organization, internalize its goals, and assume responsibility for its success. Employees generally assume this respon-

sibility only when they have been empowered to make any necessary changes in how they will perform their work, thereby achieving some sense of self-determination. According to this notion, as employees contribute suggestions and receive positive reinforcement in the form of bonuses, recognition, and other rewards, their sense of identity with the organization grows stronger. This in turn leads them to make further contributions toward the firm's success. One can, therefore, view the plan as a comprehensive intervention involving many aspects of the employee's work life and consisting of three mutually reinforcing components: identity, equitable incentives, and participation (Frost et al., 1974). Because of its central role in facilitating this sense of identity, knowledge participation from the work force is considered essential to the plan's success.

We conducted a study to identify some of the correlates of participation in gainsharing plan involvement systems. We believed that identifying such correlates would not only help guide the implementation of future gainsharing systems, but would also contribute to our understanding of the emerging area of prosocial or organizational behavior. Structured involvement systems of the type we studied provide an excellent area of research for two reasons: they produce an objective measure of prosocial behavior—the number of suggestions contributed—and they typically generate the participation of a majority of employees (National Center for Productivity and Quality of Working Life, 1975).

#### THE STUDY

##### Job Complexity and Suggestions

We expected to find that employee perceptions of their work environment, particularly their perceptions of job complexity, would be related to suggestion contribution. For this study, we defined complex jobs as those that make sub-

stantial cognitive demands of the jobholder. They are characterized by higher levels of skill variety and performance feedback and allow higher levels of autonomy than do simple jobs. We predicted that perceived job complexity and suggestion making would be related positively because when a job is simple and the best way of performing a task is obvious, worker involvement and suggestion contribution are unnecessary. Simple tasks have relatively few interdependent components and require fewer skills; decreasing the likelihood that useful alternative work strategies could be discovered even if the employee's ideas were solicited. In contrast, complex tasks are characterized by multiple desired outcomes and multiple potential paths for achieving those outcomes (Campbell, 1988), which creates more opportunities for suggestions and innovative work methods. To support these predictions, we note that participation in work decisions has been shown to be associated more strongly with favorable outcomes for individuals performing complex tasks than for those performing simple tasks (Abdel-Halim, 1983; Campbell & Ginrich, 1986).

We emphasize that this study investigated subjective—rather than objective—job complexity. Although subjective complexity may be influenced largely by objective task characteristics (Hackman & Lawler, 1971), this relationship is believed to be moderated by the employee's short-term memory, familiarity with the task, span of attention, cognitive complexity, and other variables (Campbell, 1988; Schneider, Driver, & Streufert, 1967). For our study, we viewed experienced complexity as an interaction of objective job characteristics and personal characteristics. For example, two employees working at the same task may report different levels of experienced complexity depending on their information processing capabilities. The employee who considers the job complex will see multiple paths for arriving at an end state and should be able to generate

innovative suggestions, prescribing a better way for arriving at that end. The employee who considers the job simple will see only one path to the end state and, therefore, should be less able to contribute suggestions. For these reasons, Hypothesis 1 focuses on experience, rather than objective, job complexity.

**HYPOTHESIS 1:** Perceived job complexity is related positively to suggestion contribution.

#### Role-Prescribed versus Extra-Role Prosocial Behavior

If suggestion making is indeed a prosocial behavior, one can expect it to be correlated with at least some other types of prosocial activity. C. Smith et al. (1983) have identified two qualitatively different dimensions of prosocial organizational behavior: we expected suggestion contribution to be related positively to one of these and essentially unrelated to the other. Briet and Morowidlo's (1986) distinction between role-prescribed and extra-role prosocial behavior is helpful for understanding these dimensions and for predicting likely patterns of relationship.

##### Extra-role Prosocial Behavior

According to Briet and Morowidlo's (1986) taxonomy, an extra-role prosocial activity is always performed within a work context, but is not articulated as a formal job requirement. It involves going beyond mandatory job assignments to perform some voluntary activity with the intention of benefiting others. Extra-role prosocial activities include such gestures as assisting co-workers in job-related matters (Puffler, 1987; C. Smith et al., 1983) and showing consideration and sensitivity to other employees (Morowidlo, 1984). For most management personnel, investigating a problem and preparing a formal suggestion to correct it is not a formal job requirement. Instead, it is a voluntary gesture that goes beyond those duties specified in one's official job description. For

these employees, suggestion contribution is clearly an extra-role activity.

When employees are rated in terms of their performance of various prosocial organizational behaviors, the items describing extra-role activities typically load on the same factor, suggesting some degree of intercorrelation and, presumably, a common underlying motivation-base (Organ & Konovsky, 1989; C. Smith et al., 1983). If gaining suggestion contribution is indeed a form of extra-role prosocial behavior, one can expect it to be correlated with these other types of extra-role behavior. To test these other types of extra-role activity and suggestion making and an extra-role activity called *assisting behavior* for a sample of non-management employees. Assisting behavior consists of voluntary acts (i.e., acts not required by one's job description) intended to benefit peers, supervisors, and other co-workers by helping them perform job-related activities. We predicted that suggestion making and assisting behavior would be related positively, but only whenever certain "situational constraints" did not exist in the work setting.

We based this prediction on a conceptual framework proposed by Peirca and O'Connor (1980) and further developed by Blumberg and Pringle (1982) that suggests that certain aspects of the work environment act as situational constraints that interact with personal variables in predicting work performance. Peirca and O'Connor (1980) have hypothesized that situational constraints (e.g., adequacy of physical conditions, materials, tools, equipment) can effectively "lower the ceiling" on the performance of good workers. That is, even those employees who are able and highly motivated to perform will be unable to do so if they are constrained by environmental conditions beyond their control. When faced with substantial situational constraints, unmotivated employees cannot outperform less-motivated individuals. Under those conditions, motivation is no longer correlated with performance. Essentially,

this framework predicts an interaction between motivation (or other task-relevant personal attributes) and situational constraints in the prediction of performance. Personal attributes and performance are related when few constraints exist, and are unrelated when significant constraints exist.

For this study, we expected job complexity to serve as a situational constraint that would moderate the relationship between assisting behavior and suggestion making. We note above the argument that employees who are motivated to engage in prosocial extra-role activities will both contribute suggestions and assist co-workers, whereas employees who are not so motivated will do neither. For this reason, assisting behavior and suggestion making should be related positively. This correlation should be found, however, only when workers believe that their jobs are sufficiently complex to benefit from their contributing suggestions. When they do consider their jobs complex, we expect that they will find themselves able to contribute ideas, and that suggestion contribution will be free to covary with assisting behavior as predicted.

If workers consider their jobs simple, however, even those who are motivated to perform extra-role prosocial acts will find themselves unable to submit ideas. They will not see alternative paths for performing work and will believe that the "ceiling" has been lowered on the number of useful ideas they can generate. Motivated employees may still show high levels of assisting behavior (because this is still possible even for those with simple jobs), but the level of assisting behavior should be unrelated to suggestion making. That is, in such situations helpful employees will be no more likely to submit ideas than unhelpful ones. From this perspective, assisting behavior indicates an employee's general orientation toward extra-role prosocial behavior, whereas a low level of job complexity acts as a type of situational constraint limiting the number of suggestions one

can contribute and constraining the correlation between suggestion making and assisting behavior. These predictions are summarized in Hypothesis 2.

**HYPOTHESIS 2:** Job complexity will moderate the relationship between assisting behavior and suggestion contribution so that a positive relationship will exist between these variables when employees consider their jobs relatively complex, and essentially no relationship will exist when they consider their jobs relatively simple.

#### Role-Prescribed Prosocial Behavior

In contrast to extra-role activities, role-prescribed prosocial behavior is that which is expected of an employee as a condition of employment. Such activities may be listed explicitly in job descriptions or performance appraisal instruments, and may include compliance with organizational rules and policies (Puffer, 1987; C. Smith et al., 1983), attendance (F. Smith, 1977), and housecleaning (Baileman & Organ, 1983). We evaluated the subjects of our study in terms of a role-prescribed activity labeled *compliant behavior*, which we defined as the willingness to follow formal policies and regulations established by the organization.

We assumed that the motivation to comply with organizational policies would be qualita-

tively different from the desire to contribute voluntarily, extra-role prosocial gestures. This assumption is supported by the finding that items measuring role-prescribed behavior and extra-role behavior typically load on different factors (Organ & Konovsky, 1989; Puffer, 1987; C. Smith et al., 1983). For these reasons, we expected to find no relationship between compliant behavior and suggestion contribution.

**HYPOTHESIS 3:** Nurelationshipexists between compliant behavior and suggestion contribution. Compliant behavior does not demonstrate a significant linear relationship with suggestions, nor does it interact with job complexity in predicting suggestions.

#### Method

##### Setting

The study was conducted in five manufacturing organizations in the midwestern U.S., which we call Companies A, B, C, D, and E. Table I provides some descriptive information for each firm. Labor unions represented hourly non-management personnel in Companies D and E only.

Each firm operated a gainsharing plan that paid financial bonuses to employees when the company's overall performance improved above some targeted level. Performance was

Table I  
Characteristics of the Organizations Studied

Company	Primary Product	Total Number of Employees	Number of Subjects	Number of Months under Gainsharing	Total Number of Suggestions Contributed
A	Heavy truck axles	130	14	40	680
B	Hydraulic cylinders	100	15	16	159
C	Mechanical analysis equipment	271	20	72	1,811
D	Active equipment	122	24	49	1,678
E	Car exhaust systems	241	27	25	953

assessed, and bonuses were paid, at the end of every two-month period in Company D. In the other firms, performance and bonuses were calculated on a monthly basis. Each plan also included a structured involvement system used to solicit, investigate, and implement employees' performance-improvement suggestions. Groups of two to four nonmanagement employees each met at least monthly to review formal, written suggestions contributed by employees in their work units. In Companies B, C, D, and E, department supervisors usually chaired these meetings. Employees in Company A worked in autonomous work groups without supervisors, so middle-level managers chaired the meetings. The departmental teams were free to implement any idea if it cost less than a fixed amount (usually a few hundred dollars) and did not affect another work unit. Ideas exceeding the authority of the departmental teams were referred to a company-wide review board that consisted of a cross-section of management and nonmanagement employees. The bonus calculations and involvement systems these companies used were representative of those typically associated with gainsharing plans (Frost et al., 1974; Graham-Moore & Ross, 1983).

#### Subjects

The study investigated suggestion making among employees who are not normally expected to contribute performance-improvement ideas as a formal part of their jobs. Because this activity is often expected of supervisors, managers, and engineers, these groups were not included as study participants. To ensure that all subjects had experienced equal opportunities to contribute to the involvement system, employees served as study subjects only if they were stationed on site at the company most of the time. Because suggestion making activity tends to be heaviest during the first months following program implementation, we feared that employees who had joined

the firm after this start-up period would have fewer opportunities to contribute suggestions. For this reason, only those employees who had been employed continuously since the gainsharing plan began were considered potential study subjects.

We obtained measures for a subset of employees at each organization—rather than from the entire population—so as to minimize the disruption of work caused by the study. Because these samples were relatively small, we employed stratified random sampling to ensure that each work unit was represented both by employees who had been more active and by employees who had been less active in contributing suggestions. Across the 5 organizations, we identified 39 departments with an adequate number of eligible employees. Using company records, we tabulated the number of suggestions contributed by each employee. Employees in the larger departments were randomized according to the number of ideas contributed, and approximately equal numbers of employees were selected randomly from each group. In smaller departments, workers were divided at the median according to the number of suggestions contributed, and one employee from each group was selected randomly. A department was sampled only if it contained at least two eligible subjects, and if we knew that the supervisor also would be available to participate in the study. The number of employees sampled from each work unit was proportional to the number of employees in that unit.

We forwarded the names of 111 potential subjects to gainsharing plan coordinators in the five companies, who then informed these employees of the nature of the study and requested their participation in it. Of these, 24 (22%) were unable or unwilling to participate; each was replaced by another employee from the same work unit who had contributed a similar number of suggestions. An additional six (5%) did not participate and could not be replaced

The gainsharing coordinators indicated that relatively few of the nonparticipants had been unwilling to participate. Conflicts with scheduled vacations were reported as the reason for refusal in the majority of the cases. The responses of five subjects who did not provide complete data for all relevant variables were deleted. The final sample consisted of 100 subjects. Of these, 78% were male, 82% worked on the shop floor rather than in the office, and 80% worked on the first shift rather than second or third. Average tenure at the company was 157.70 months ( $SD = 117.31$ ).

#### Measures

We measured job complexity by using the Skill Variety scale, the Autonomy scale, and the Feedback from the Job scale of the Job Diagnostic Survey (Hackman & Oldham, 1975). We made two modifications to these: We used a five-point response format rather than a seven-point format, and we changed the word "autonomy" to "freedom" on one item to facilitate workers' understanding. Dunham (1976) has expressed reservations about the independence of these scales, so we investigated the factor structure of the present responses by performing a principle axes factor analysis, using squared multiple correlations as prior communality estimates. The first factor extracted displayed an eigenvalue of 3.07 and accounted for 80% of the common variance. No other factor displayed an eigenvalue greater than 1.00, and each item had a loading greater than .40 for this factor. Therefore, responses to the nine items constituting these three scales were averaged to arrive at a single score of job complexity (coefficient alpha = .81). Higher scores thus indicate perceptions of greater complexity.

We measured assisting behavior and compliant behavior by using 13 items adapted from C. Smith et al. (1983). Subjects participating in the study were rated by their supervisors, and we subjected these evaluations to a principal axes factor analysis, using squared multiple

correlations as prior communality estimates. Factors 1 and 2 accounted for 71% and 18% of the common variance, respectively, so two factors were retained using a varimax (orthogonal) procedure. We considered an item to have a significant loading for a factor if the loading was greater than .50 for that factor and that factor only. These criteria resulted in a measure of compliant behavior (coefficient alpha = .86) consisting of the following eight items:

1. is punctual;
2. takes undeserved breaks (this was reverse scored);
3. has attendance at work that is above the norm;
4. gives advance notice if unable to come to work;
5. spends a great deal of time with personal phone conversations (this was reverse scored);
6. does not take unnecessary time off work;
7. does not take extra breaks; and
8. does not spend time in idle conversation.

The second factor provided a scale of assisting behavior (coefficient alpha = .85) consisting of the following five items:

1. helps others who have been absent;
2. volunteers for things that are not required;
3. orients new people even though it is not required;
4. helps others who have heavy work loads; and
5. assists supervisor with his or her work.

In rating employees, supervisors indicated the extent to which each item was descriptive of each employee, using a five-point scale for which 1 = strongly disagree and 5 = strongly agree. Responses to the items were averaged to arrive at an employee's score for each scale.

Higher scores indicated greater levels of either compliance or assisting behavior.

We reviewed company records of formal written suggestions submitted to departmental teams to determine scores for the predicted variable. In each company, the gainsharing plan coordinator maintained a log of all suggestions contributed since the plan was implemented. For each subject, the number of ideas contributed was summed and then divided by the number of months the plan had been in effect at that person's organization. This provided a measure comparable across companies.

Although the mean suggestion contributed per month was .24 ( $SD = .46$ ), the median was 0K, suggesting a positively skewed distribution. We had expected this because of a lower bound of zero—and no real upper bound—on the number of ideas an employee could contribute. Because a skewed distribution on the predicted variable may violate formal statistical assumptions of regression analysis (Cohen & Cohen, 1975), we used a common (base 10) logarithmic transformation to normalize the data. A common log transformation can be performed only on values greater than zero, so we added a constant of 1 to each observation prior to transformation, as recommended by Rummel (1970). We used this log-transformed measure of suggestions for each of the analyses reported below.

In addition to assessing the number of suggestions contributed, we also attempted to obtain some estimate of the value of the suggestions, but quickly found this unfeasible. Often, the contributor and team representatives had made no effort to estimate the dollar savings likely to result from an idea. For many proposals, such estimates were probably not even possible. We also found it impossible to accurately measure the number of accepted suggestions actually implemented because many teams failed to record their final disposition. Some plan coordinators and other employees argued that such a measure would have been somewhat misleading anyway because the decision to decline a suggestion does not always indicate that the proposal lacks merit. For example, a suggestion might address a production problem that previously had been ignored by the company, but open discussion of this idea in team meetings could lead to a better solution than that proposed by the original contributor. In such cases, the first idea was recorded formally as being declined, although it ultimately had a beneficial effect on the company.

Finally, we note that despite the poor record keeping of some teams, we were confident that our measure of total suggestions was accurate because we had access to the plan coordinator's original paperwork.

#### Procedure

On company time, each nonmanagement employee met alone with one of two interviewers. During a 15–30 minute period, the interviewer obtained general information and learned the employee's views of the gainsharing plan. During the remainder of the session, the subject responded to a questionnaire that included the job complexity items. The management personnel ( $N = 34$ ) who supervised these subjects also were interviewed *in situ*; then used the assisting behavior and compliant behavior scales to rate the nonmanagement participants. A supervisor rated only those individuals in his or her own work unit (typically three or four employees). All subjects were told that the purpose of the study was to assess the effectiveness of their firms' gainsharing plans. None were informed of the hypotheses being investigated. The nonmanagement subjects and supervisors both were told that their responses and evaluations would remain confidential.

#### RESULTS

Table 2 presents the means, standard deviations, reliability estimates, and intercorrela-

Table 2  
Means, Standard Deviations, and Intercorrelations of Job Complexity, Assisting Behavior, Compliant Behavior, and Suggestion Contribution Variables\*

Variable	M	SD	1	2	3	4
1. Job complexity	3.06	.68	(.81)			
2. Assisting behavior	3.78	.77	.23*	(.84)		
3. Compliant behavior	3.92	.74	.00	.55**	(.86)	
4. Suggestions	.08	.10	.25*	.22*	-.07	(.7)

\*N = 103, correlations dipha reliability estimates reported in parentheses.  
\*p < .05.  
\*\*p < .001.

tions for this study. Prior to testing the study's three hypotheses, we performed analyses to determine if the organizations differed as to suggestion contribution. To do this, we created four dummy variables to code membership in the five companies, and regressed the suggestions criterion on these predictors (Kerlinger & Pedhazur, 1972, pp. 102-109). The resulting F ratio was statistically significant ( $F(4, 93) = 3.87, p < .01, R^2 = .14$ ), and subsequent analyses showed that the number of suggestions (in log form) contributed per employee per month was higher at Company B ( $M = 1.66$ ) than at the other four firms ( $M = .060$ ). We had expected this because Company B had been operating under gainsharing for a shorter period of time than had any of the other firms, and previous investigations have shown that suggestion activity tends to peak during the first year and level off thereafter (National Center for Productivity and Quality of Working Life, 1973). Therefore, we controlled for company membership in all subsequent analyses.

Hypothesis 1 predicted a positive relationship between perceived job complexity and suggestions. To control for company effects while testing this hypothesis, we developed two multiple regression equations. First, the suggestions measure was regressed on the four dummy variables coding company member-

ship, as described above. The second equation included these predictor variables, as well as the measure for job complexity. Adding job complexity to the model increased the variance accounted for from .14 to .19 (adjusted  $R^2 = .10$  and .15, respectively). The increment in  $R^2$  was statistically significant ( $F(1, 94) = 5.92, p < .05$ ), and the standard partial regression coefficient for job complexity was both positive and significant ( $\beta = .23, t = 2.41, p < .05$ ). Combined, these results provide support for the proposed complexity-suggestion relationship.

We also performed moderated multiple regression analyses (Cohen & Cohen, 1975; Kerlinger & Pedhazur, 1972) to test for the assisting behavior  $\times$  job complexity interaction predicted in Hypothesis 2. We added variables to a regression model in a predetermined order. In the first step, the measure of suggestions was regressed on the four previously described dummy variables to control for the effects of company membership. In step two, job complexity and assisting behavior were added to the equation. Table 3 shows that this resulted in an increase in  $R^2$  of nearly 7%. In the third step, the job complexity  $\times$  assisting behavior cross-product interaction term was added to the model, raising the value of the  $R^2$  from .21 to .30 (adjusted  $R^2 = .16$  and .24, respectively).

Table 3 shows that this increment was statistically significant, suggesting an interaction between the two variables.

Figure 1 displays this interaction, using a procedure recommended by Cohen and Cohen (1973). From a single regression equation, separate regression lines were developed for employees scoring high on job complexity (1 SD above the mean) and for those scoring low on job complexity (1 SD below the mean). Predicted values of suggestions were calculated for those scoring high and low on assisting behavior (again, 1 SD above and below the mean, respectively). Consistent with Hypothesis 2, the figure illustrates a positive relation between assisting behavior and suggestions for employees reporting higher levels of job complexity and a slightly negative relation for those reporting lower levels of complexity.

Hypothesis 3 predicted no interaction between compliant behavior and job complexity, so the moderated regression procedure was repeated using this combination of predictors. Table 3 shows that the analysis once again began by regressing suggestions on the variables coding company membership. At step two, job

complexity and compliant behavior were added to the model, resulting in an increase in  $R^2$  of 6%. Finally, the job complexity  $\times$  compliant behavior cross-product term was added, causing the  $R^2$  to increase from .20 to .22, a nonsignificant increment.

Although compliant behavior did not interact with perceived complexity, it still could have demotivated a simple linear relationship with suggestion contribution. To determine this, we repeated the regression analyses that had been used to test the relationship between job complexity and suggestions. The suggestion measure was regressed first on company membership, then the measure of compliant behavior was added to the model in a separate step. The addition of compliance increased the value of the  $R^2$  from .14 to .15, a nonsignificant amount ( $F(1, 94) = 0.84, n.s.$ ). The standard partial regression coefficient for compliant behavior was similarly nonsignificant ( $\beta = -.09, t = -0.91, n.s.$ ). With respect to Hypothesis 3, these results combine to suggest that compliance neither correlated with suggestion making nor interacted with perceived complexity in the prediction of suggestions.

Table 3  
Variance in Suggestions Accounted for by Multiple Regression Models\*

Variables added in model at each step	$R^2$	$\Delta R^2$	df	F(1,99)
Assisting behavior model	.140	.140	4, 95	3.87**
Company	.209	.069	2, 93	4.06*
Job complexity, assisting behavior	.298	.089	1, 92	11.60**
Job complexity $\times$ assisting behavior				
Compliant behavior model	.140	.140	4, 95	3.87**
Company	.198	.058	2, 93	3.17*
Job complexity, compliant behavior	.222	.024	1, 92	2.75
Job complexity $\times$ compliant behavior				

\*N = 100.  
\*p < .05.  
\*\*p < .01.

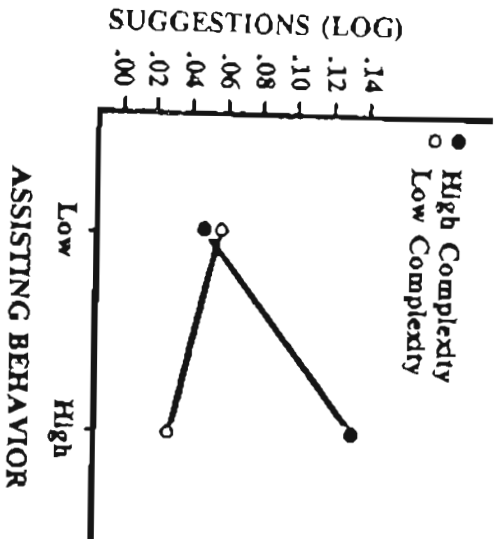


Figure 1. Interaction of assisting behavior and job complexity in predicting suggestions.

#### DISCUSSION

##### Implications for Research on Prosocial Organizational Behavior

As predicted, suggestion contribution was correlated positively with assisting behavior (at least when jobs were sufficiently complex), but essentially was uncorrelated with compliant behavior. These findings add to our understanding of prosocial organizational behavior because they show that Brief and Motowidlo's (1986) distinction between extra-role and role-prescribed activities continues to be useful. Employees willing to engage in one extra-role activity (e.g., assist fellow employees) are also likely to engage in another (e.g., contribute suggestions). Moreover, their willingness to comply with workplace rules is not predictive of suggestion making.

Suggestion making and assisting behavior could have been correlated because of an underlying "prosocial orientation" shared by some employees. Such an interpretation would

be consistent with Staub's (1981) distinction between two types of value systems leading to prosocial expressions. One system, which Staub labelled prosocial orientation, involves a feeling of personal responsibility for the welfare of other people and motivates individuals to be helpful to others, reduce their distress, and enhance their welfare. If the relationship between assisting behavior and suggestion making does indeed result from this underlying value system, then research on empathy in organizations seems indicated, because prosocial orientation appears to be characterized by feelings of empathy (Sorrentino & Rushton, 1981).

Staub's second value system involves an orientation toward duty or obligation and is characterized by a desire to act according to socially prescribed standards of appropriate behavior. If this orientation were responsible for the type of compliant behavior we studied, it should be unrelated to helping behavior or suggestion making. Future investigations assessing em-

ployee values and prosocial behaviors are needed to test these hypotheses.

Also consistent with our predictions, experienced job complexity moderated the relationship between assisting behavior and suggestion contribution. Although the regression model including company membership, job complexity, and assisting behavior accounted for only 21% of the variance in suggestions, the full model—including these variables and the job complexity  $\times$  assisting behavior interaction—accounted for 30%. The pattern of interaction, as displayed in Figure 1, shows that generally helpful, assisting employees are likely to contribute suggestions, but only if they consider their jobs relatively complex.

This interaction was consistent with findings presented in the social psychology literature indicating that personal and situational variables sometimes interact in predicting prosocial behavior (Gergen, Gergen, & Meier, 1972; Satow, 1975). These results also point to the need for additional research on interactions in organizational settings. Prior investigations have identified several individual difference variables related to helping behavior, including self-esteem (Burke, 1982), extraversion (Cattell & Hornowitz, 1952), and social adjustment (Krebs, 1970). The correlations obtained, however, tend to be inconsistent and generally weak. Our study suggests that this inconsistency may result from the effects of unmeasured situational constraints that attenuate correlations in the manner described by Peters and O'Connor (1980).

In searching for additional determinants of suggestion contribution, researchers may do well to acknowledge that a gainsharing incentive structure presents a type of "social dilemma" (Dawes, 1980) for employees. Because all workers receive bonuses for aggregate improvements in company performance, not on the basis of the value of their own specific suggestions, a gainsharing plan may create a situation in which the dominating strategy is for an

employee to "free ride"—that is, for the employee to conserve her or his individual effort while others perform the work and submit the suggestions needed for bonuses.

Dawes (1980) has reviewed the literature on social dilemmas and concludes that individuals are less likely to free ride in these situations when

- they have adequate knowledge about the nature of the dilemma;
- they trust that other group members will act cooperatively; and
- they are influenced by concerns about morality.

Perhaps these variables have organizational counterparts that similarly lead an employee to contribute suggestions (rather than free ride) under a gainsharing plan when that employee

- has knowledge of the nature of the plan;
- trusts that other employees support the plan actively; and
- is convinced that suggestion making is the right and "moral" thing to do.

Because 70% of the variance in the present criterion was not explained by the predictor variables used in this investigation, social dilemmas theory may provide a useful framework for identifying additional determinants of suggestion contribution under gainsharing.

##### Implications for the Management of Gainsharing Plans

A high level of employee involvement under gainsharing is generally desirable because this has been shown to be related to both productivity (Rosenberg & Rosenstein, 1980) and rated plan success (White, 1979). Unfortunately, little is known about ways to increase the frequency of suggestion making. Based on the relationship between extra-role prosocial be-

havior and suggestion making determined in this study, however, one could reasonably conclude that those personal attributes and environmental conditions that facilitate one behavior will also facilitate the other. Because of the growing literature on the antecedents of related forms of prosocial organizational behavior, we reviewed those findings so as to make tentative recommendations for managers operating gainsharing plans.

Organ (1988) discusses a subarea of prosocial activities called organizational citizenship behavior (OCB). The concept of OCB is virtually identical to that of extra-role prosocial behavior. OCB includes activities that are discretionary, promote organizational effectiveness, and are not recognized directly by formal reward systems. Several personal characteristics have been shown to distinguish employees who engage in OCB from those who do not. "Good citizens" tend to be better educated and to come from rural—rather than urban—backgrounds (C. Smith et al., 1983); they tend to have greater needs for achievement and to perceive lower levels of peer competition (Puffer, 1987); they tend to identify with their companies and to have internalized their companies' values (O'Reilly & Charman, 1986); and they tend to be more satisfied with their jobs and with the material rewards associated with them (Puffer, 1987; C. Smith et al., 1983). One thus could reasonably conclude that employees who demonstrate these characteristics will also respond more positively to high-involvement gainsharing plans.

Following a review of the literature on citizenship behavior, Organ (1988) offers several recommendations about how higher levels of OCB may be encouraged. Because many of these recommendations should also facilitate greater suggestion contribution under gainsharing, we present some of the more relevant ones. To summarize, Organ (1988) recommends the following:

- selecting employees who possess the personal characteristics known to be associated with OCB;
- adhering to a "mechanism" of fairness in dealing with employees, customers, and other agents, even when such adherence means short-term setbacks in efficiency and profitability;
- having higher-level managers model desired citizenship behavior;
- creating more positive mood states among employees by engaging them in challenging tasks and eliminating the causes of stress and dissatisfaction, and
- eliminating pay and performance appraisal systems that lead to feelings of inequity.

We refer interested readers to Organ (1988) for a more detailed discussion of these points.

The assisting behavior  $\times$  job complexity interaction obtained in our study also has implications for managing gainsharing plans. Figure 1 shows that employees—even those who are generally helpful and assisting in other ways—will not contribute suggestions if they consider their jobs relatively simple. This is an important, because allowing these employees to feel uninvolved in the process may hurt the overall effectiveness of the gain sharing plan. The process of participation itself is what facilitates the employee's development as a responsible organizational "citizen" (Frost et al., 1974).

Even employees with relatively simple jobs, however, can be assigned to steering committees, departmental review teams, special task forces, and other formal groups within the gainsharing plan framework. These agencies should provide an effective alternative means of increasing their involvement and commitment to the change process because research has shown that membership in formal, task-oriented groups often is associated with

the development of more positive work-related attitudes (Maey & Peterson, 1983; Nunnick, 1982).

#### Limitations

Because of the limitations of the cross-sectional, correlational methods used in this study, research using experimental manipulations is needed to identify any causal relationships between the variables studied. In addition, some unmeasured, underlying third variable may have been responsible for some of the observed relationships. For example, one could argue that employees with less ability to make suggestions (e.g., less education, skill, or political power within the firm) tend to gravitate toward less complex jobs. If an underlying variable such as power was operating in this fashion, it could have caused a spurious correlation between the job complexity and suggestion making measures. The research methods reported in this article were not capable of ruling out such an alternative explanation of the results.

An additional limitation is the possibility that rater bias, in the form of halo error, may be partly responsible for some of the correlations observed. If supervisors were aware of the number of suggestions contributed, this knowledge may have influenced their ratings of employees on the two prosocial behavior scales. Readers should note, however, that the average subject in the study contributed only .24 suggestions per month, or fewer than three per year. Therefore, such an infrequent activity seems unlikely to have influenced supervisors when they rated employees as to other, fairly concrete, behaviors (e.g., "helps others who have been absent," "helps others who have heavy work loads"), many of which may occur every day. Nonetheless, the moderate correlation between the assisting behavior and compliance scales indicates the possibility that

some form of halo error may have existed. Given that relatively high correlations between these dimensions have been reported in other studies using similar scales (C. Smith et al., 1983; Organ & Konovsky, 1980), future researchers may wish to investigate alternative means of evaluation which would be less subject to rating error.

For this study, subjects were selected so that the sample would include employees who had been relatively active as well as employees who had been relatively inactive in contributing suggestions. Therefore, the present sample could have been unrepresentative of the population of employees in terms of involvement system activity. For example, if the study were to be repeated in an organization in which all employees contributed roughly the same number of suggestions, the present findings probably would not be replicated because the retention of range on the criterion variable would attenuate any obtained correlations. Such a scenario is unlikely, however, because our experience has shown that there is typically much variability in employees' willingness to contribute gainsharing suggestions.

Similarly, because this study focused primarily on nonmanagerial employees working in the shop areas of manufacturing firms, one could argue that the present results cannot be generalized to dissimilar organizational settings. For example, job complexity could be more variable, or even have a different meaning, in a service organization. We do not, however, consider this a serious limitation, either, because gainsharing seldom is implemented outside manufacturing companies (Bullock & Lawler, 1984). Moreover, the only constituent groups that were eliminated systematically from the subject pool (managers, supervisors, and engineers) typically constitute only a small minority of employees in manufacturing firms. Therefore, the subjects described in this study should be fairly representative of the majority



of employees in gainsharing firms, and we believe that our study's results will have general applicability to those settings.

#### CONCLUSION

Although our study identified some of the correlates of suggestion making under gainsharing plans, much remains unknown about how employee behavior is influenced more generally by the processes and structures directly related to the plan itself. For example, we need to understand how employee involvement and commitment to the plan are influenced by such variables as the size and frequency of bonuses, the type of participative system used, and the quality of plan-related education and training. Hammer (1988) and Schuster (1984) have provided models that may be helpful for developing relevant research questions and hypotheses, and the procedures and research design used in Klein's (1987) multiple-firm study of employee stock ownership plans could serve as a blueprint for conducting the research itself. An investigation addressing these issues would require a sample of at least several dozen gainsharing firms that differ on the predictor variables of interest. Although this would constitute an ambitious undertaking, such an investigation seems to be the next logical step toward an understanding of how employees respond to gainsharing.

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## New Technology, Bureaucracy, and the Social Construction of Medical Prices

W. BOYD LITRELL

*This article presents an analysis of the social roots of medical service price inflation. The author argues that a struggle between hospital managers and physicians to control medical services has influenced consequences. The author also contends that new technology acts as a strategic resource for managers in this struggle. Because the technology is new, few data exist for evaluating the demand for it and its medical and financial effects. Managers thus play a "hypothetical game," and set prices through bureaucratic means that reflect their preferences for technology and help pay for the equipment. An empirical case study involving the purchase of nuclear magnetic resonance equipment in Omaha, Nebraska, supports and illustrates the argument.*

### OVERVIEW

Almost all experts agree that the price of medical services has risen far more rapidly than have the prices of other goods and services in the U.S. (e.g., Aaron & Schwartz, 1984; Callano, 1986; Feldstein, 1971; Gimberg, 1985; Lee, 1971; Reinhardt, 1988), and that this disproportionate medical service price inflation has occurred continuously, if variably, for three or four decades. This has created serious problems for public policy makers, par-

ticularly for those setting policies regarding access to medical services and the financing of these services. Nearly all policies related to medical services—in both the public and private sectors—were greatly revised during the late 1960s and early 1970s and again in the mid-1980s. None of these revisions reduced medical service price inflation to the level of other price changes.

That so much discussion and agreement has produced so little control over medical service price inflation suggests that the problem itself may require reconceptualization. In this article, I outline a sociological explanation of how

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