

**Gainsharing and Mutual Monitoring:
A Combined Agency-Procedural Justice Interpretation**

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Abstract

This study examines the behavioral consequences of gainsharing using a combined theoretical framework that includes elements of agency and procedural justice theory. The hypothesis tested is that gainsharing as a collective form of incentive alignment results in increased mutual monitoring among agents (employees) when the plan is perceived to be procedurally fair. The hypothesis was supported in two separate firms using a quasi-experimental field study. The implications of the study for future extensions of agency theory to examine intraorganizational phenomena are discussed.

Gainsharing has been in existence for more than two generations, yet its use has grown dramatically in recent years. A survey of Fortune 1000 firms by Lawler and Cohen (1992) found that 39% of these companies relied on some form of gainsharing program, a one-third increase over a previous survey conducted just three years earlier. While these programs come in many different forms (such as Scanlon Plan, Improshare, Rucker, or customized) they all attempt to encourage cooperative behaviors in situations where interdependency is critical in attaining desired outcomes. Bonus systems are designed to share financial gains with all employees in a business unit when improvements over historical performance measures are attained (Graham-Moore & Ross, 1990). In addition to the financial component, many gainsharing programs (such as the Scanlon plan) are hailed as "philosophies of management" where participation is formally encouraged through suggestion committees (Ross & Ross, 1991).

Despite its long history, our understanding of the behavioral processes induced by gainsharing is limited. Schuster (1983) examined over 40 years of gainsharing research. He concluded that this literature suffers from two major problems. First, most of the research is atheoretical and exploratory in nature. Second, most authors take an advocacy position, with very few studies describing situations that might be considered a failure.

Since the early 1980s, when Schuster's review appeared, several studies have corroborated earlier results by suggesting that gainsharing tends to be associated with positive organizational outcomes such as lower labor costs, greater productivity, better product quality (e.g., Schuster, 1984, 1985, Wallace, 1990) or improved employee attitudes (e.g., Hatcher, Ross, & Collins, 1989). While these favorable results are encouraging and provide important insights concerning the effects of gainsharing, much remains to be learned about the reasons why and the conditions under which gainsharing alters employee behaviors. Graham, Moore and Ross (1990: 16) put this simply: "Gainsharing has been a part of the incentive and industrial relations field for fifty years, yet full understanding of why it works has eluded behavioral science." Most of the existing literature is based on the notion that participation drives gainsharing results (e.g., Hammer, 1988). Often, however, participation models are loosely specified, reflecting the investigator's belief

that employee involvement is a necessary precedent to those behaviors conducive to greater organizational effectiveness (O'Dell & McAdams, 1987). In addition, participation models do not offer an appropriate analytical tool to examine gainsharing programs that are not predicated on active employee involvement (Fein, 1991).

This study offers a novel interpretation of how employees respond to gainsharing as an organizational intervention by drawing on arguments from agency and procedural justice models. This combined theoretical perspective not only improves our understanding of gainsharing but it also enhances the predictive value of agency theory when used to study intraorganizational phenomena. Second, a quasi-experimental design is employed to test the theoretical expectations in two independent firms that introduced gainsharing plans, one with a strong emphasis on participation and the other one with minimal worker involvement. This design allowed us to compare the results under two participation conditions to determine if this contextual factor influenced the findings.

THEORETICAL FRAMEWORK

Agency theory is concerned with the general problem of delegation, that is, when a principal(s) engages another individual(s) or agent(s) to perform tasks on behalf of the principal(s). This arrangement creates the possibility that the agent will not behave in the best interest of the principal because their goals or utilities may differ. This divergence between the parties gives rise to agency costs to be borne by the principal. To reduce these agency costs, principals may closely supervise the agent to prevent deviant behaviors or develop incentive schemes to align the interest of both parties. The cost of direct supervision increases as agents have more information than the principal about decisions made and actions taken (i.e., greater information asymmetries) and as tasks are difficult to structure (i.e., low task programmability). Thus principals tend to rely on incentive alignment as a form of monitoring in lieu of direct supervision when these conditions are present.

Since its inception in the early 1970s agency theory has spanned a large volume of research (see Eisenhardt's review, 1989). The empirical literature has been focused on a special case of the agency

relationship, principal-agent dyads, with the agent representing a single independent entity or party. With few exceptions, such as Eisenhardt's (1985) work with sales personnel or Gomez-Mejia and Balkin's (1992b) study on faculty pay, this research has concentrated on the relationship between Chief Executive Officer (CEO) as agent and firm owners as principal (e.g., Hill & Phan, 1991).

Interestingly enough, classical writings in the agency literature by Alchian and Demsetz (1972), Jensen and Meckling (1976), Fama (1980), and Fama and Jensen (1983) stress the role of mutual monitoring as a control mechanism in situations where no single identifiable agent exists, such as is the case when joint input or team production occurs among multiple agents. Jensen and Meckling (1976:307) note that "[the firm] serves as a focus for a complex process in which the conflicting objectives of individuals are harnessed into common goals . . . agency costs arise in any situation involving cooperative effort by two or more people even though there is no clear cut principal-agent relationship."

Unlike the vertical control system of the principal-agent dyad situation (such as the traditional case between firm owners and CEO) mutual or lateral monitoring deemphasizes dependence on superiors and instead places control in the hands of peers. Mutual monitoring is buttressed by the common bond of agents whose interests are intertwined. In other words, mutual monitoring results when agents pursue their self-interest through the accomplishment of joint tasks with other agents. In the words of Fama and Jensen (1983:310), "when agents interact to produce outputs they acquire low-cost information about colleagues, information not available to higher level agents. Mutual monitoring systems tap this information for use in the control process." Echoing these sentiments, Eisenhardt (1989) made a plea to management scholars that future research employing agency theory should focus on control problems where cooperative behavior, rather than solo agent behavior, is involved.

Within the agency theory framework, a gainsharing plan can be viewed as a collective "agency contract" that encourages mutual monitoring of agents' behavior within a work unit. This is predicated on an incentive alignment system that provides a monetary reward to agents based on collaborative achievements. Under gainsharing, management substitutes direct monitoring by supervisors with mutual monitoring by peers.

Mutual monitoring under gainsharing should result from the interdependence between agents who anticipate a financial incentive based on group outcomes (Fama & Jensen, 1983).

In other words, gainsharing programs alter the control system within the firm. Monitoring is diffused among participating employees who have valuable specific knowledge relevant to organizational transformation processes. Employees as agents represent a risk sharing as well as a work sharing community. Because of their common interests, each agent has a stake in the contributions of its peers and as a consequence engages in monitoring of those with whom it is cooperatively linked. Thus, by shifting common risks to the agents and creating a community of interest, collective monitoring under gainsharing replaces the hierarchical system of control.

However, mutual monitoring is not likely to occur automatically through the introduction of a gainsharing program. This is because agency relationships now exist within a more interdependent, intricate and fluid organizational network with diffused power. Under these conditions social and political forces (largely ignored in the principal/agent archetype dyad model) must be effectively managed for the program to have its intended effect. One normative force that is expected to exert a positive influence on the observed level of mutual monitoring is a shared belief in the fairness of the system among participating agents. Eccles (1985), writing from an economic perspective, was surprised at anecdotal evidence showing that "the problem of fairness-never considered in the literature on agency relationships-was frequently mentioned as an essential aspect of such relationships. Fairness is especially important to the agent . . . If agents believe they are treated unfairly, their incentives may be reduced and they may even work against the interests of the principal . . . agency costs may then rise." Unfortunately, neither Eccles or other agency theorists have pursued this issue much further.

An independent body of literature from a totally different tradition under the rubric of procedural justice in organizational behavior suggests that the perceived fairness of procedures (which is "abstracted out" in the agency models) may be even more important to agents than the level of outcomes received. Several excellent reviews of this literature are available elsewhere (Folger & Greenberg, 1985; Greenberg, 1987,

Greenberg, 1990) so that only a brief exposition follows. The process through which decisions are made forms the basis of perceived procedural justice. This is in contrast to the concept of distributive justice, which is concerned with the perceived fairness of the consequences of those decisions. After controlling for distributive justice, procedural justice has been found to be an important predictor of a wide variety of psychological constructs such as satisfaction with leaders (Tyler & Caine, 1981), reactions to layoffs (Brockner, Grover, Reed, DeWitt, and O'Malley, 1987), and acceptability of reward allocation decisions (Lissak, 1983).

Several studies suggest that the behavioral impact of an incentive system that is based on group accomplishments, such as gainsharing, is likely to depend on perceived procedural fairness. In other words, the context in which a financial outcome is received (which is ignored or "abstracted out" in the agency literature), may determine how agents respond to the aggregate incentive. Alexander and Ruderman (1987) report that procedural justice is more important when outcomes are more socially and interpersonally oriented. Research by Folger and Greenberg (1985), Folger and Konovsky (1989), and McFarlin and Sweeney (1992) confirm that procedures seem to be more important when outcomes are associated with group-level variables rather than individual criteria. Lind and Tyler (1988: 197), in their extensive review of this literature, conclude that "procedural justice acts to make individuals more willing to subordinate their own short term individual interests to the interests of the group or organization." Likewise, a laboratory study by Cooper, Dyck, and Frohlich (1992) hints that the effectiveness of gainsharing may be particularly sensitive to perceived fairness of procedures because individual contributions are not assessed and rewards cannot be privatized.

The preceding discussion suggests that gainsharing as an incentive alignment mechanism will not result in mutual monitoring, regardless of outcomes received, unless employees believe that the procedures used are fair. In other words, the "agency contract" as built into the gainsharing program will only produce its

intended behavioral effects if it meets agents' expectations of procedural fairness. This leads to the formal proposition to be tested in this study:

Other things being equal, employees' perceptions of the procedural justice of gainsharing will have a direct and independent effect on the observed level of mutual monitoring.

METHODS

Research Sites and Data Collection Procedures

The hypothesis was tested in two separate companies in the Western United States. The first research site was a high technology firm with over a billion dollars in annual revenues. Active employee participation was an integral part of the gainsharing program, which covered two hundred employees (N = 200). These were primarily service, maintenance, and security personnel. The second research site was a consumer products company which also generated over one billion dollars in annual revenues. Unlike the first research site, the gainsharing plan (covering 115 employees) did not explicitly include employee participation as a cornerstone of the program. Employees consisted mainly of skilled crafts, machine operators, and production supervisors.

In both firms, a survey was administered on site before the gainsharing plan was implemented and three quarters after the program was in effect. Discussions with management and employees at both firms revealed that the knowledge employees had about gainsharing after three quarters was adequate for assessing its effect on their attitudes and behaviors. In addition, during that period there were no changes in any other portion of the pay or benefits packages, and other forms of organizational intervention did not occur.

Mutual monitoring was assessed before the gainsharing plan was introduced and three quarters after the plan had been in effect. The procedural and distributive justice measures were gathered only after the payoffs for the third quarter were announced. This is due to the fact that procedural and distributive justice specifically addressed fairness of gainsharing, not simply fairness of pay, so that this data could only be

collected after the gainsharing program was in place for some time. These measures are described shortly. The surveys were administered during meetings on site with employees. In order to assure confidentiality to all participants, management required that employees would not be asked to identify themselves on the survey. Employees who participated in the survey were told that the findings would be used for research purposes only and that their responses would remain anonymous.

At the high technology firm a total of 172 surveys was collected (a 86 percent return rate) for the pre-gainsharing data collection, and a total of 151 completed questionnaires was obtained (a 76 percent return rate) for the post-gainsharing survey. Between the pre and post data collections 20 temporary employees left the organization. A Chi Square test of the distributions of the two samples over age, education, gender and tenure revealed no significant differences ($p \leq .05$). The typical respondent of the high technology firm was an individual between 31 and 40 years of age, with four or less years of tenure, with a high school education, and with an equal probability of being either male or female (see Table 1).

A total of 92 completed surveys were returned (a 80 percent return rate) at the consumer products firm for the pre-gainsharing data collection. A total of 70 completed surveys were returned (a 61 percent return rate) for the post-gainsharing survey. The Chi Square distribution of respondents and non-respondents for the pre and post samples at the consumer products company also revealed no significant differences ($p \leq .05$) for age, education, gender and tenure. The typical respondent at the consumer products firm was an individual over 40 years of age, with between four to ten years of tenure in the firm, with a high school education and a strong likelihood of being of the male gender. The slight decline of the response rates between the pre- and post-gainsharing samples at both research sites is attributable to attrition of temporary workers and vacations (note: post data collection was done during the summer).

The Gainsharing Plans

The two gainsharing plans, to be described next, allowed the investigators to test the hypothesis that mutual monitoring is a positive function of perceived procedural justice under both high/low participation and high/low incentive outcome conditions.

The high technology firm stressed employee participation both in the development and implementation phases of gainsharing. This plan was closer to the Scanlon version of gainsharing (Frost, Wakeley and Ruh, 1974). Suggestion committees were organized on the first day gainsharing was announced. The participative concept of gainsharing, the importance of active employee involvement, and the procedures for submitting and evaluating suggestions were explained to all employees and supervisors via formal training programs and other approaches (printed brochures, informal meetings, notice on bulletin boards, etc.) Suggestion activity was high, with 341 suggestions submitted during the three quarters in question.

In contrast to the high technology firm, the consumer products company did not emphasize employee participation in the initial design or implementation phases of gainsharing. In addition, suggestion committees played a minor role in the program. In fact, these were not in place until the beginning of the second quarter, and only a total of 20 suggestions were provided for the entire nine months. This gainsharing plan was closer to the Improshare version (Fein, 1991).

The bonus calculation in the high technology firm included a component for revenue and expenses, where improvements over the historical base resulted in contributions to the bonus pool. It also incorporated a customer service "gate," whereby only under conditions when the previous customer service levels were at least attained could the gains from the financial calculation actually be paid out to employees. Customer service was measured via a survey sent to a random sample of the department's customers. The bonus pool was equally split between the company and employees.

The consumer products company measured gains in revenues minus expenses as part of its gainsharing formula. Additionally, the bonus included cash contributions from the company for improvements in safety and quality. The amount of cash was determined a-priori by management based on previous cost figures associated with quality and safety problems. The bonus pool, once established, was distributed with 50% to the company and 50% allocated for employees. The net revenue gains were distributed as a percentage of base pay to employees. However, the amount of money derived from quality and safety was

allocated in equal payments to all workers in the gainsharing unit.

Both firms paid out bonuses on a quarterly basis. The amount received by employees was much higher in the consumer products firm. During the nine months period of the study the high technology firm paid \$474 per capita (\$380, \$63, and \$31 for the first, second, and third quarter respectively), while the consumer products firm paid a total of \$2,620 per employee (\$577, \$177, and \$1866 for the first, second, and third quarters respectively.)

Operational Measures

Mutual Monitoring

Mutual monitoring, the dependent variable in the study, is a theoretical construct in the agency literature for which no empirical measures exist. Therefore, the authors developed a set of nine behavioral items that tap the extent to which employees notice other co-workers' behaviors and respond to them as they reach, exceed, or fail to meet expectations. The items were pre-tested with a sample of managers involved in implementing gainsharing at each of the research sites.

Participants were asked to respond to all nine items (see Appendix A) immediately before the gainsharing plan was implemented and three quarters later. The response format consisted of a 1-5 Likert scale that ranged from (1) "strongly disagree" to (5) "strongly agree." A principal components factor analysis with a varimax rotation of the nine items was performed on both the pre and post-gainsharing samples for each of the two sites. The same factor structure emerged from both samples in each site. Appendix A shows the items that loaded on each factor (defined as 0.40 or higher) for the post-gainsharing samples at both sites (Note: The pre-gainsharing factor analysis table will be provided upon request). Two mutual monitoring factors reached an Eigenvalue of 1.0 or greater. The first factor examines the extent to which an employee is able to notice examples of both good and bad performance of other members of that individual's department. A second factor taps the extent to which an employee acts either directly or indirectly on a co-worker to let that individual know that he or she is either doing a good job or that it is necessary to improve the quality of the job performance.

We decided to merge all nine items into a single mutual monitoring scale to be used as the dependent variable for several reasons. First, on conceptual grounds it seems reasonable that in order to act on others' performance (Factor 2) one must also be able to notice that performance (Factor 1). Second, we are not hypothesizing differential predictions for various forms of mutual monitoring. Third, there are sound statistical reasons supporting the parsimony of a combined scale: (a) a scree test shows a large drop in Eigenvalues from the first to the second factor in all samples [see Appendix A]; (b) the alpha coefficients for the combined scales in both samples (.77 in each site) exceeded the alpha value for each of the individual factors [see Appendix A], indicating that there is no loss in internal consistency by creating a composite scale, and (c) the two factors correlated .42 and .47 in the high tech and consumer products samples respectively. Therefore, a composite mutual monitoring scale to be used as a dependent variable was constructed by unit weighing all nine items in both samples.

Procedural Justice

While empirical research on procedural justice is extensive, we could find no existing scales that would adequately assess procedural justice in a manner directly relevant or meaningful to gainsharing. For this reason we developed a set of 13 items that addressed specific aspects of gainsharing yet reflected the theoretical dimensions found in the procedural justice literature (e.g., see Leventhal, 1976; Thibaut & Walker, 1975; Alexander & Ruderman, 1987; and Tyler & Bies, 1989). These include consistency, decision structure, ground rules, bias suppression, accuracy, adequate explanation, ethicality, representativeness, feedback, and consideration of others' viewpoints.

The 13 items administered after gainsharing had been in place for three quarters are shown in Appendix B. The response format consists of a five point Likert scale ranging from (1) "strongly disagree" to (5) "strongly agree." All items were factor analyzed via principal components with varimax rotation. Two factors reached an eigenvalue of 1.0 in both sites. The first factor assesses procedural justice in relation to general rules and administration of the plan. The second factor is more narrow in scope, focused on the procedural fairness of suggestion committees.

For analogous reasons to those provided earlier for consolidating the mutual monitoring items into a single composite, all 13 procedural justice items in Appendix B were unit weighted and averaged into one score. First, we were not postulating differential effects of various procedural justice factors (as separate independent variables) on mutual monitoring (as a dependent variable). Also, the operation of suggestion committees (Factor 2) may be seen as a particular aspect of the design and administration of the plan (Factor 1). Second, statistical evidence supports the creation of a parsimonious procedural justice composite: [see Appendix B] (a) The eigenvalues show a large drop in both samples from factor 1 to factor 2; (b) the alpha coefficient reached .90 for the composite 13 item scale indicating that there was no loss in internal consistency by consolidating all items into a single score; and (c) the two individual factors were highly correlated (.60 and .69 for the consumer products and high tech samples respectively), making it difficult to attribute unique effects to either one in multivariate analysis because of collinearity.

Distributive Justice

A seven item scale was developed to assess perceptions of the distributive justice of the bonus itself (see Appendix C). The scale consists of seven items adapted from Alexander and Ruderman (1987) and Folger and Konovsky (1987). Analogous to the procedural justice items, a five point Likert agree/disagree format was used for each item. The seven items were completed along with the rest of the survey after the bonus for the third quarter was announced in both sites. A principal components factor analysis of the seven items indicate that only one factor reached an Eigenvalue exceeding 1.0 in both firms (see Appendix C). The alpha coefficient reached .80 and .85 for the high technology and consumer products firms respectively. A composite score was created by averaging all seven items.

Control Variables

Several control variables were included that may influence mutual monitoring. The control variables were self-reported by the survey participants. These include gender (0 = women, 1 = men), age, highest degree obtained, tenure, and income.

Analysis

The hypothesis was tested via hierarchical multiple regression (with mutual monitoring as the dependent variable) on the post-gainsharing sample in each of the two sites. The control variables were entered in Step 1, distributive justice was entered in Step 2, and procedural fairness was included in Step 3. This allowed the investigators to isolate the amount of unique variance in mutual monitoring associated with procedural fairness after partialling out other factors. A chow test was calculated to see if the differences in the regression coefficients between the two sites reached statistical significance for the distributive and procedural justice scales. This test allowed us to determine if the hypothesis held up under different participation and incentive outcome conditions.

A secondary, more aggregate procedure was used to examine the longitudinal relationship between mutual monitoring and procedural fairness. Because mutual monitoring would be expected to occur within work groups, an analysis was run to determine if groups that perceived procedural fairness as relatively high experienced positive changes in mutual monitoring. It should also follow that work groups perceiving gainsharing to be procedurally unfair might experience no change in mutual monitoring. This longitudinal analysis was conducted for each site as follows. First, a Sheffe test was calculated to determine which employee groups in each firm differed from each other on procedural fairness in the post-gainsharing survey. For those employee groups whose mean differences in procedural fairness scores reached statistical significance in the post-gainsharing survey, a change in mean scores of the mutual monitoring variable was calculated between the pre- and post-gainsharing samples. (Note: procedural fairness is only available for the post-gainsharing sample because employees knew nothing of gainsharing prior to its implementation.) This allowed us to determine if the observed differences in the procedural fairness means corresponded to a decrease or increase in mutual monitoring pre-post. To the extent that those employee groups showing the highest procedural justice scores in the post sample also exhibit the largest increases in mutual monitoring pre-post this provides further evidence in support of the hypothesis. Given the fact that it was not possible to match the responses of individuals between the two time periods (because of confidentiality) this aggregate

analysis is only suggestive, but in conjunction with the regression analysis it provides additional confirmatory evidence.

RESULTS

The correlation matrix for all variables and descriptive statistics appears in Table 1 for both samples. Table 2 summarizes the regression results in the high technology and consumer products firms. As can be seen in that table, procedural fairness is a statistically significant predictor of mutual monitoring in both types of gainsharing plans, after controlling for the demographic variables and distributive justice (beta = .36, $p \leq .01$ in high technology group; beta = .60, $p \leq .01$ in consumer products group). The results also show practical significance, with procedural fairness explaining 6 and 12 percent of the variance respectively in these two firms.

It is important to note that the findings confirmed the hypothesis in both research sites even though the participation intensity and the incentive outcomes received differed extensively between the two gainsharing plans. The chow tests (see last column of Table 2) for the differences in the regression coefficients between both sites were not statistically significant, supporting this conclusion.

Because the findings in the regression table are cross-sectional, and all the data was gathered from the same respondent, there is a danger that the regression results are artifactual due to common method variance. However, there are several reasons why this is not a plausible explanation for the obtained results. First, the dependent variable is not attitudinal, but behavioral in nature, reducing the possibility of a common affective response with the procedural fairness items. Second, there is no a priori reason to believe that procedural fairness should be more susceptible to common method variance than distributive justice. The fact that a differential impact on the dependent variable is shown in the regression table for procedural and distributive justice in two samples makes this an improbable interpretation. Third, and reinforcing the preceding point, results of a usefulness analysis (similar to that reported by Folger & Konovsky, 1989) indicate that distributive justice explains very little variance and is not statistically significant when entered as a last step in the regression, but the opposite is true for procedural fairness when forced last into the equation (see

lower portion of Table 2). Finally, the pre-post aggregate analysis to be discussed next, which is immune to method variance contamination, confirms the results of the regression analysis.

As can be seen in Table 3, the pattern of means by employee group supports the notion that those groups exhibiting the highest scores on the procedural fairness factor also experienced the most favorable changes in mutual monitoring pre and post in both companies. More specifically, the gainsharing plan per se did not result in increased levels of internal monitoring for all employee groups; in fact, decreased levels of mutual monitoring were observed for some groups. This cannot be easily explained in terms of agency theory alone (because it would predict greater monitoring across the board) or as a methodological artifact. This differential pattern of means can only be understood if procedural justice is taken into account as elucidated by the regression results in Table 2.

DISCUSSION

In summary, this study suggests that incentive alignment mechanisms as an organization-wide intervention, such as gainsharing, can affect mutual monitoring among agents under certain conditions. When procedures are seen as fair, mutual monitoring is greater, thus the agency costs borne by the principal are likely to be lower. The relationship between procedural justice and mutual monitoring held up in both sites, after controlling for demographic characteristics and distributive justice, in spite of differences in participation and incentive outcome levels.

This study expands the value of agency theory as an explanatory framework in several ways. First, it links agency theory to procedural justice, creating a powerful interdisciplinary model that may be used to study a variety of intra-organizational phenomena. Agency theory is essentially a theory of control and motivation (Eisenhardt, 1989), yet its applicability to the study of human behavior within organizations is limited by ignoring or "abstracting out" process issues and political forces that are central to any incentive alignment system. Jensen and Murphy (1990) refer to this as the "black box" problem in the agency literature, much of which has originated in economics with its restrictive assumptions of rationality and utility maximization. Conversely, this study broadens the horizon of the rapidly growing body of research on

procedural justice by linking a "micro" organizational behavior perspective to a well established "macro" paradigm of control and motivation, i.e. agency theory. Second, this investigation shows the generality of the agency relationship in the context of internal cooperative efforts and aggregate incentive programs, going well beyond the traditional principal-agent dyad and the contractual arrangement between owners and top management of a corporation. Third, the study illustrates how behavioral measures of mutual monitoring may be developed to study agency theory propositions. The vast majority of published research on agency theory relies on archival, inferential data (such as the use of ownership concentration as a proxy for the intensity monitoring), and this has impaired its empirical contributions in organizational studies.

From a methodological standpoint the study offers two major advantages. First, it uses a quasi-experimental design in two independent samples. Because the findings are essentially identical in two separate firms in two different industries, and with gainsharing plans that differ in their participation features and bonus outcomes, this greatly enhances the robustness and generalization of results. Second, potential contamination from method variance is reduced not only through multivariate analysis in the post sample, but also by confirming longitudinal evidence that examines changes in monitoring as a function of procedural justice.

As in any research, this investigation also has its limitations. Method variance cannot be totally ruled out as a partial explanation of the relationship between procedural justice and mutual monitoring in the post sample because all the data is gathered from a single respondent. The longitudinal analysis is very aggregate (employee group level) because we could not trace specific individuals over time (due to a covenant of confidentiality). Since the study takes place in two firms, it is possible that idiosyncratic features of the gainsharing programs used may influence the level of mutual monitoring. For instance, another firm installing an orthodox Scanlon plan with its fairly focused bonus calculation may experience different results. Lastly, mutual monitoring is self-reported, and no independent verification could be obtained. Despite these limitations, it is our belief that these potential problems are not severe enough to negate the essential findings of this study.

This paper suggests several avenues for future research. First, there is considerable innovation in industry in the use of alternative reward strategies, with particular emphasis on group based incentives for self-managed work teams (Lawler & Cohen, 1992). Most of that literature appears in the realm of practitioner publications and consultant reports. This presents an exciting opportunity for serious scholarly research. The conceptual logic used here for aggregate incentives at the plant level should be even more pertinent at the team level because the "line of sight" between individual behavior and group outcomes is much sharper. Second, little is known about the impact of mutual monitoring on organizational outcome measures, the proverbial "so what" question. Future research can examine the implications of mutual monitoring on such variables as firm performance, productivity improvements, level and type of employee attrition etc. Third, there is a growing body of research on compensation strategies in relationship to organizational strategies (see review by Gomez-Mejia & Balkin, 1992a). One can envision a stream of empirical work relating internal monitoring systems to a variety of organizational strategies using schemes such as Miles and Snow's (1978) taxonomy and Rumelt's (1974) diversification typology.

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APPENDIX A

Principal Components Factor Analysis With Varimax Rotation:
Mutual Monitoring Items

	High Technology (N=151)	Consumer Products (N=70)
Factor 1: Act on Others' performance		
When I notice a fellow employee doing an outstanding job, I congratulate that person.	0.79	0.85
When someone is working at an acceptable level, I find a way to communicate that to the individual.	0.74	0.75
When someone does good work, I let everyone in the department know it.	0.77	0.69
If I notice a worker doing a poor job, I let that person know right away.	0.60	0.64
Eigenvalue	3.25	3.27
Alpha	0.73	0.74
Factor 2: Notice Others' Performance		
I am aware of the overall performance of other employees in my department.	0.68	0.77
It is easy to notice an employee in my department whose performance is outstanding.	0.62	0.66
I always know when a fellow worker is doing a below average job.	0.65	0.63
I notice when someone in my department does an extremely good job.	0.63	0.47
Within my department it is obvious when someone does a below average job.	0.70	0.73
Eigenvalue	1.43	1.56
Alpha	0.71	0.71

Note: Varimax and oblimin rotations yielded similar results.

APPENDIX B
Principal Components Factor Analysis With Varimax Rotation
Procedural Fairness Items^a

Factor 1: Rules and Administration	High Technology (N=151)	Consumer Products (N=70)
The design of the gainsharing plan seems fair.	.82	.87
The gainsharing formula is fair for all employees.	.81	.82
The gainsharing plan is administered fairly.	.81	.81
The rules used for sharing the gainsharing bonus with all employees are fair.	.73	.79
The gainsharing plan developed by the company to reward employees for their performance is fair and impartial.	.81	.78
When determining whether a gainsharing bonus will be paid, the company uses accurate information about the department's performance.	.71	.44
The performance level required to receive a gainsharing bonus is clear to me.	.57	.50
Eigenvalue	6.21	5.91
Alpha	.90	.89
 Factor 2: Suggestion Committees		
People who provide suggestions are treated fairly.	.72	.42
Suggestion committees provide an opportunity for me to express "my opinion."	.69	.67
Members of the suggestion committees are ethical and honest.	.64	.68
The rules adopted by the suggestion committees are fair to all employees.	.59	.82
The suggestion committees and gainsharing program provide an opportunity for us to receive feedback and learn how well we are doing.	.51	.45
Suggestion committees are fair and impartial.	.43	.84
Eigenvalue	1.17	1.67
Alpha	.76	.83

Note: Varimax and oblimin rotations yielded similar results.

APPENDIX C

Principal Components Factor Analysis With Varimax Rotation:
Procedural Fairness Items

Items		
The size of our bonus is fair.	.88	.93
All in all, the bonus payment is what it ought to be.	.82	.91
The bonus we recieve is fair.	.87	.90
Our bonus is fair compared to what others are getting.	.75	.77
The extent to which the bonus gives us the full amount we deserve is fair.	.83	.70
Eigenvalue		
	Alpha	.90
		.91

TABLE 1

Correlation and Summary Statistics ^{a,b}

Variables	Means	s.d.	1	2	3	4	5	6	7	8	Means	s.d.
1. Gender	0.52	0.50	1.0	.12	.06	.19	.32	-.13	.03	-.05	0.87	0.34
2. Age	3.44	1.09	-.00	1.0	.39	.06	.12	.35	-.02	.30	3.31	1.02
3. Tenure	8.01	7.12	.03	.38	1.0	-.07	.24	.18	-.02	.28	4.72	2.24
4. Education	2.96	1.23	-.10	.10	.09	1.0	.42	.29	-.03	.15	3.24	1.42
5. Income	2.86	1.26	-.37	.26	.42	.40	1.0	.31	-.06	.34	3.49	1.00
6. Procedural Fairness	3.39	.59	.09	.02	-.04	-.02	-.15	1.0	.24	.58	3.46	.58
7. Mutual Monitoring	3.59	.49	-.10	.14	.02	.12	.13	.29	1.0	.09	3.44	.45
8. Distributive Justice	3.18	.73	.09	.01	-.06	-.00	-.17	.51	.16	1.00	3.26	.76

^aHigh Tech Sample (N=151) correlation and summary statistics are below the diagonal; $r's > .16$ are significant at $p < .05$; $r's > .21$ are significant at $p < .01$.

^bConsumer Products Sample (N=70) correlation and summary statistics are above the diagonal; $r's > .23$ are significant at $p < .05$; $r's > .31$ are significant at $p < .01$.

Table 2

Results of Hierarchical Regression Analysis with Mutual Monitoring as Dependent Variable^a

Variables	High Tech Sample (N=151)			Consumer Products Sample (N=70)			Chow Tests
	<u>Beta</u> ^a	<u>ΔR²</u>	<u>Overall F</u>	<u>Beta</u>	<u>ΔR²</u>	<u>Overall F</u>	
Step 1							
Gender	-.07			.19			
Age	.13			-.17			
Tenure	-.07			-.01			
Education	.06			-.10			
Income	.12	.04	1.18	-.17	.01	.08	
Step 2							
Distributive Justice	.08	.03*	4.16*	-.25	.02	1.22	.18
Step 3							
Procedural Fairness	.36**	.06**	9.65**	.60**	.12**	7.59**	.89
Usefulness Analysis							
Distributive Justice Entered in Step 3	.08	.00	.50	-.25	.02	1.50	.64
Procedural Fairness Entered in Step 2	.36**	.09**	13.64**	.60**	.12**	7.79**	.50

^aStandardized regression coefficients

*p<.05

**p<.01

Table 3

Observed Changes in Mutual Monitoring by Employee Group
and Average Procedural Fairness Score

	Average Mutual Monitoring			Average Procedural Fairness
	Pre	Post	Change	
High Technology				
Employee Group				
Facilities	3.74	3.61	-.13	3.22
Services	3.53	3.64	+.11	3.62
Consumer Products				
Employee Group				
Loadout	3.56	3.07	-.49	2.85
Production	3.55	3.56	+.01	3.13
Supervisors	3.41	3.67	+.26	4.05

Note: Mean differences in procedural fairness using a Sheffe test are statistically significant at $p < .05$ for consumer products and $p < .10$ for high technology.