Product Quality and Pay Equity between Lower-level Employees and Top Management: An Investigation of Distributive Justice Theory

Douglas M. Cowherd
University of Michigan
David I. Levine
University of California, Berkeley

The relationship between interclass pay equity and product quality is examined in a sample of 102 corporate business units. A small pay differential between lower-level employees and upper-echelon managers (after controlling for inputs) is theorized to lead to high product quality by increasing lower-level employees' commitment to top-management goals, effort, and cooperation. Interclass pay equity is determined by comparing the pay and inputs of hourly workers and of lower-level managers and professionals to those of the top three levels of managers. Consistent with the predictions of distributive justice theory, both measures of pay equity are positively related to business-unit product quality.

Lower-echelon employees are paid much less than upper-echelon managers in North American and Western European businesses. Moreover, the pay differential between the lower and upper strata of organizations in these countries is much larger than in Japan (Koike, 1988; Crystal, 1991), and it has substantially increased since the early 1970s (Harrison and Bluestone, 1988). Many lower-level employees believe that this interclass pay differential is inequitable.

The emotional significance of interclass pay equity is shown in the angry messages that were posted on Apple's internal computer bulletin board when Chief Executive Officer John Sculley's record 1989 compensation was announced at the same time that the profit-sharing formula was revised to be less generous to other employees. One employee commented, "Morale is somewhat like it must have been just before the French Revolution; everyone wants to overthrow the royalty" (Wolf, 1990: 6A). A similar situation occurred in 1982 when General Motors negotiated wage concessions from its unionized employees and then announced that executives would receive large bonuses. The employee outrage that ensued led General Motors to cancel the bonuses (Freeman and Medoff, 1984).[1]

As illustrated by the incidents at Apple and General Motors, research has shown that lower-level employees compare their pay to that of higher-status groups and that this comparison can result in feelings of inequity (for a review, see Dornstein, 1991). However, although there has been extensive research on distributive justice, there have been no studies of the effects of interclass pay equity on any aspect of organizational effectiveness. This relationship is gaining importance due to the conflict between widely used participative management practices and the growing economic inequality between lower and upper organizational strata. There is a fundamental ideological tension between the egalitarian premises that underlie participative management and the existence of large interclass reward differentials.

Product quality is a particularly important aspect of organizational effectiveness to examine in conjunction with interclass pay equity because quality is highly sensitive to motivational factors that are influenced by distributive justice. Moreover, product quality is critical to the economic

•

We are grateful to Jim Baron, Bob Cole, Karen Cook, Jane Dutton, Stan Harris, Anne Heise, Linda Pike, Lance Sandelands, Vincent Tong, Karl Weick, and three anonymous reviewers for their comments on this paper. We greatly appreciate the contributions of the following people and institutions to the OASIS Research Program, which was the source of the data for this study: Dean Askin, Beverly Clampit, Tony Clayton, April Connell, Brad Gale, Andy Geller, Lee Hawley, Michelle Kaminski, Bob Luchs, Sherry Nelson, Keith Roberts, Sid Schoeffler, Don Swire, Noel Tichy, Dave Ulrich, the Hay Group, PIMS Associates, the Strategic Planning Institute, and the University of Michigan Institute for Social Research and School of Business Administration. David Levine was supported in part by the Consortium on Competitiveness and Cooperation.

1

Interclass pay comparisons also occur in universities. In 1991, the University of California at Berkeley announced that it was eliminating merit pay increases for the second consecutive year and, in the same week, announced that the university's president would receive a $62,000 bonus as a reward for five years of service. A faculty member posted the article reporting the president's bonus with his own caption: "While Rome Burns."

performance of businesses and to consumer satisfaction. However, despite the importance of product quality to many organization stakeholders, little is known about how it is affected by organizational factors. In this paper, we integrate equity, relative deprivation, and quality-management theories in a model of the relationship between interclass pay equity and the product quality of business organizations.

DISTRIBUTIVE JUSTICE

Both equity and relative deprivation theories of distributive justice focus on the social comparison of rewards. These two perspectives provide the basis for the theoretical model examined in this study.

Equity Theory

Equity theory states that people in social exchange relationships believe that rewards should be distributed according to the level of individual contribution (Adams, 1965; Homans, 1974; Walster, Walster, and Berscheid, 1978). Individuals judge the fairness of their exchange relationships with their organizations by comparing the balance between the inputs they contribute (e.g., work effort and skills) and the outcomes they receive (e.g., pay) to the input-outcome balances of their reference groups. When individuals perceive that their ratio of inputs to outcomes is similar to that of their comparative referents, they feel that equity exists. Dissimilar ratios lead to perceptions of inequity. People attempt to reduce the distress caused by inequity in three ways. First, individuals may change their perceptions of either their own or their reference group's inputs and outcomes. Second, individuals can alter their actual inputs (e.g., decrease their work effort) or outcomes (e.g., get a pay raise). Finally, individuals can end inequitable relationships by leaving their organizations.

There has been extensive research on the effects of pay equity on work attitudes and behavior, such as pay and job satisfaction (e.g., Oldham et al., 1986), absenteeism (e.g., Dittrich and Carrell, 1979), sickness and accident compensation costs (e.g., Sashkin and Williams, 1990), turnover (e.g., Telly, French, and Scott, 1971), and work performance (e.g., Pritchard, Dunnette, and Jorgenson, 1972; Summers and Hendrix, 1991). However, equity theory research has not addressed the pay comparisons between lower and higher classes of employees that are the focus of this study.

Whereas interclass pay equity has been ignored, 19 studies have investigated the relationship between within-class pay equity (comparisons between people in the same job category) and product quality (Adams and Freedman, 1976). However, these studies provide little guidance, because two methodological shortcomings limit their external validity. First, all but three studies addressed conditions of piece-rate pay or overpayment inequity that are rare in contemporary organizations. Employees are typically paid on an hourly or salaried basis rather than on a piece-rate basis, and surveys show that fewer than 2 percent of employees consider themselves overpaid (Lawler, 1981). The three studies that investigated the more typical condition of hourly

wages and underpayment inequity produced little evidence of a relationship between within-class equity and product quality. Two laboratory studies (Cook, 1969; Valenzi and Andrews, 1971) found that underpayment inequity had no effect on quality, and the two experiments reported in the third study (Evan and Simmons, 1969) yielded mixed results.

The second limitation to the external validity of this line of research is that the studies have all been conducted in short-term laboratory situations. Typically, subjects have worked for less than one hour at simple clerical tasks, such as proofreading, that required little or no interaction with others. This minimal organizational context is unlikely to trigger the same equity evaluation process that people would employ in actual organizational settings. Moreover, responses to brief periods of inequity may reveal little about how people respond to the more common organizational experience of prolonged inequity (Martin and Murray, 1983). The exclusive use of college students as subjects further weakens the external validity of these studies, because significant differences between the responses of students and nonstudents have been found in many areas of research on organizational behavior (Gordon, Slade, and Schmitt, 1986).

Relative Deprivation Theory

Relative deprivation theory states that individuals experience deprivation when they compare the rewards they (or their groups) receive to the rewards received by reference groups and find that they have received less than they deserve (Martin, 1981; Crosby, 1984). Relative deprivation research typically deals with the upward comparisons made by low-status people. Their experience of deprivation is predicted to lead to behavioral reactions that can reflect either a hopeful or frustrated attitude toward the possibility of change. This reaction can be directed internally at one's self or externally at the social system. Most research on the consequences of relative deprivation has examined behavioral reactions directed externally at social systems, such as political protests, riots, and revolutions (e.g., Abeles, 1976; Isaac, Mutran, and Stryker, 1980).

Martin and her colleagues (Martin, 1981, 1982, 1986; Martin et al., 1987) have conducted a series of studies showing that lower-strata organization members compare their rewards to those received by upper-strata groups and that these interclass comparisons result in feelings of injustice. Crosby (1984) and Martin have suggested that the externally directed behavioral responses to this type of relative deprivation should include absenteeism, strikes, vandalism, and violence. Staw (1984) has noted that product quality may also be affected when organization members experience relative deprivation. Although many have suggested that research be conducted on the organizational consequences of relative deprivation, there have been no studies in this area.

Integrating Equity and Relative Deprivation Theories

Equity research has examined how social comparisons of input-outcome ratios affect product quality, but a focus on

comparisons with similar referents has greatly limited its scope by precluding the study of justice at the level of intergroup relations. In contrast, relative deprivation research has focused on the upward reward comparisons of disadvantaged groups but has discounted the role of inputs in justifying interclass reward differentials and has not examined the effects of relative deprivation on organizational effectiveness. Equity and relative deprivation theories can be integrated and expanded in a theoretical model of the relationship between interclass pay equity on product quality that incorporates both equity theory's focus on inputs and organizational effectiveness and relative deprivation theory's focus on the upward reward comparisons of people in lower social strata. In addition, this model must include a motivational component that explains how perceptions of inequity cause diminished work performance (Staw, 1984; Landy and Becker, 1987) and control variables that influence pay equity and product quality.

A THEORETICAL MODEL OF DISTRIBUTIVE JUSTICE AND PRODUCT QUALITY

The behavior of organizations and of organizational members is best understood as deeply embedded in both economic and social contexts (Granovetter, 1985). Thus organizations are simultaneously viewed as both economic exchange systems that produce goods and services and emotional hotbeds fueled by continual social comparison. From this perspective, an organization's product quality is determined not just by managerial control systems but by lower-level employees' motivation to contribute beyond what these systems are capable of requiring of them. Moreover, employee motivation is not just a simple function of the amount of financial inducement to individuals to contribute; rather, it is influenced by social comparisons, including those with upper-echelon executives who receive far greater rewards in exchange for their contributions.

Lower-level Employees' Equity-Evaluation Process

In this section we model how lower-level employees judge interclass pay equity by considering the differences in pay and inputs between themselves and upper-echelon managers. Feelings of inequity result to the degree that top managers' inputs do not justify the pay differential.

Interclass pay differential. Equity and relative deprivation theories indicate that individuals evaluate the justice of reward distributions by making social comparisons with a variety of referents (Kulik and Ambrose, 1992).[2] This study focuses on lower-level employees' comparisons with the top-management group of their organization. Extensive research has demonstrated that individuals who have multiple opportunities to make reward comparisons, as is typical in organizational settings, are likely to compare themselves with people higher in the structure of their social systems (e.g., Andrews and Henry, 1963; Martin and Murray, 1983; Dornstein, 1988).

A series of field experiments and surveys conducted by Martin and her colleagues (Martin, 1981, 1982, 1986; Martin et al., 1987) provides particularly strong evidence for the

2
Individuals may also make comparisons to their own internal standards, to coworkers, and to people outside their organizations. These comparisons are beyond the scope of this study.

importance of interclass comparisons in the formation of distributive justice judgments. These studies found that the pay-equity perceptions of secretaries and blue-collar workers were highly influenced by the differences between their wages and those of managers in their organizations. This conclusion is supported by research showing that lower-echelon employees prefer smaller pay differentials than do upper-echelon managers (Mahoney, 1979), and that people consider the dispersion of wages in the United States to be unjustly wide, even considering the upper strata's relatively high inputs (Jasso and Rossi, 1977; Alves and Rossi, 1978). Furthermore, Pfeffer and Langton (1991) found that people were more dissatisfied in university departments with greater salary dispersion even when pay was related to inputs such as productivity and experience. Thus, the pay differential between lower-level employees and upper-echelon managers should have a substantial influence on lower-level employees' perceptions of pay equity.

Interclass input differential. Equity and relative deprivation theories differ in their emphasis on the role of inputs in the justice-judgment process. Formal statements of equity theory specify that individuals compare themselves to their referents across multiple input dimensions. However, empirical studies have typically examined a much simpler justice-evaluation process in which one or two input dimensions (e.g., skills and occupational status) and a single outcome dimension (e.g., pay) are compared with one or two prespecified referents (Walster, Walster, and Berscheid, 1978; Martin, 1981). Although relative deprivation theory does not specifically include inputs as a factor in the justice-evaluation process (Martin, 1981), it highlights the importance of individuals' feelings of deservingness. Feelings of deservingness, in turn, can result from the comparison of inputs with those of referents (Crosby, 1984). Thus, although equity and relative deprivation theories differ in their treatment of the role of inputs in justice judgments, research based on these two perspectives is more congruent.

Our integrated distributive justice model includes five types of inputs that may legitimate a certain level of pay inequality from the perspective of lower-level employees: need (Jasso and Rossi, 1977), effort (Walster, Walster,, and Berscheid, 1978), human capital (Homans, 1974), productivity (Adams, 1965), and status characteristics (Berger et al., 1972). Lower-echelon employees are unlikely to believe that executives have greater financial needs or that they expend much more effort at work. However, lower-echelon employees are likely to believe that higher-level managers generally have greater ability to affect productivity, because executive roles have greater decision-making authority, and that top managers generally possess greater human capital (e.g., skills and experience). Top managers are also likely to be seen as having higher levels of individual characteristics (e.g., occupational prestige) that connote the high social status that normatively justifies high rewards. The model therefore includes the differentials between lower-level employees and top management in productivity, human

capital, and status characteristics as factors that lower-level employees consider in evaluating interclass pay equity.

The influence of interclass input differences on pay equity perceptions is limited because inputs (e.g., skills) are typically more ambiguous than outcomes (e.g., pay). Furthermore, inputs are subject to strong self-enhancing perceptual biases that cause people to give themselves more credit than is deserved, and others less (Cook and Yamagishi, 1983). This bias in social comparisons of work performance is demonstrated by five studies in which between 68 and 100 percent of employees rated their performance as being in the top quartile of those with similar jobs (Meyer, 1975). Moreover, the same self-enhancing bias appears when people compare their group with other groups (Tajfel, 1981). Thus, lower-level employees' perception of pay equity will be primarily determined by pay differentials between lower and higher organizational strata, and only to a lesser extent by input differentials (Jasso and Rossi, 1977; Alves and Rossi, 1978; Pfeffer and Langton, 1991).

Motivation

When social comparison of inputs and outcomes with upper-echelon managers leads lower-level employees to perceive that they are being treated inequitably, they are unlikely to completely alleviate this tension through cognitive reevaluation (Lawler, 1981). Research suggests that pay equity will influence three aspects of lower-level employee motivation: commitment to top-management goals, effort, and cooperation.

The degree of commitment by lower-level organization members to top-management goals is influenced by lower members' perceptions of the fairness of their rewards compared with those of upper-echelon managers. Lower-echelon employees who feel disadvantaged are less supportive of the goals of the overrewarded group (Hatfield and Sprecher, 1984). This sensitivity to interclass pay inequity is heightened when employees perceive that their organizations have a fixed pool of resources and that high executive salaries come at the expense of employee pay. In addition, individuals who believe they are treated fairly will have a stronger identification with their organizations and thus internalize the organizational goals promoted by upper-echelon managers (O'Reilly and Chatman, 1986).

Pay equity can substantially affect lower-level employees' work effort because this is a readily controlled input. People who experience inequity are more likely to attempt to change their objective situations by decreasing their inputs than by increasing their outcomes, because they typically have more control over inputs. Finally, pay equity can influence the level of cooperation between organization members by affecting their cohesiveness. Injustice creates interpersonal resentment that weakens the affiliative emotional bonds between organization members and thus reduces their willingness to cooperate (Deutsch, 1985; Levine, 1991). In addition, large wage differences between organizational levels can damage cohesiveness by increasing competition for promotions.

Product Quality

In this study, product quality is defined as customer perceptions of all nonprice attributes of an organization's goods and services (Buzzell and Gale, 1987). This definition includes both intrinsic product characteristics (e.g., features and durability) and all associated services (e.g., delivery time and after-sale service). This is a broader concept than conformance quality, which is the degree to which a product meets its technical specifications.

The level of lower-echelon employees' commitment to top-management goals, effort, and cooperation determined by their pay equity perceptions can potentially affect both the quantity and quality of organizational products. However, standard managerial control systems based on record keeping, supervision, and inspection have greater influence on production quantity than on product quality. This is because it is easier to monitor production by counting product units or through cost accounting than by assessing the many subtle facets of quality (Lawler, 1976). Moreover, the Taylorist make-and-inspect quality assurance approach adopted by many businesses tends to generate a cops-and-robbers dynamic that motivates workers to conceal quality problems from hostile inspectors. Because product quality is difficult for managers to control, quality is largely a function of the willingness of lower-level employees to contribute more than their organizations can require of them in their formal roles.

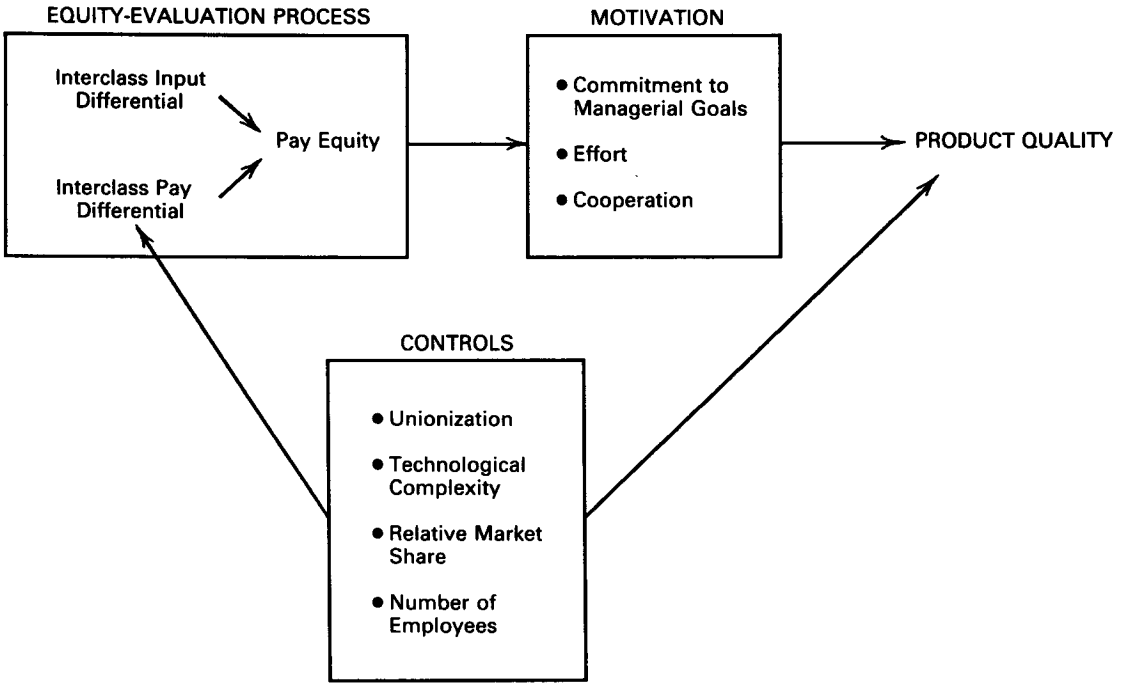
This extrarole organizational citizenship behavior can take the form of freely offering to help others, following the spirit of rules rather than only their letter, and correcting errors that would escape detection by others (Organ, 1990). However, extrarole behavior will be forthcoming only to the extent that individuals perceive that they are receiving equitable treatment in accord with their psychological contracts with their organizations (Rousseau, 1989; Organ, 1990). Thus the degree of pay equity experienced by lower-level employees can have a substantial influence on product quality by affecting extrarole behavior in the forms of goal commitment, effort, and cooperation.

Control Variables

Our theoretical model includes four controls for exogenous factors that might cause a spurious relationship between interclass pay equity and product quality. The proportion of a business unit's workforce that is unionized is included because unions promote both wage compression (Freeman and Medoff, 1984) and work rules that may affect product quality. The complexity of process technology is incorporated because this factor may increase both lower-echelon wages (Ehrenberg and Milkovich, 1987) and product quality (Porter, 1985). Business-unit relative market share is included because market power can also increase both lower-echelon wages (Freeman and Medoff, 1984) and product quality (Porter, 1985). Business-unit employment is included because organization size affects many aspects of organizational behavior.

Figure 1 graphically depicts the theoretical model of how pay and input differentials between lower and upper classes of

Figure 1. Model of the relationship between lower-level employee pay equity and product quality.



organization members can affect the product quality of organizations.

Testing the Theoretical Model

This study examines a truncated form of the interclass distributive justice model that does not include the mediating variables of perceived pay equity and motivation. These factors were excluded due to the difficulty of gaining entry to a substantial sample of businesses to ask potentially controversial questions about lower-echelon employees' perceptions of interclass pay equity. Although direct measures of these constructs would have been ideal for testing the model, the research discussed above indicates that a combination of the interclass pay and input differentials can be used to estimate the interclass pay equity perceptions of lower-level employees. The model proposes that interclass pay equity, from the perspectives of hourly workers and lower-level managers and professionals, will predict the level of business-unit product quality, after the effects of the exogenous control variables are taken into account.

METHODS

Sample and Data

This study is based on data collected from 102 business units in 41 corporations as part of the OASIS (Organization and Strategy Information Service) Research Program.[3] This sample constitutes all of the business units in the OASIS data base that provided data on compensation and product quality. Business units were selected for OASIS if they matched a business unit definition and the general managers

[3] Cowherd and Luchs (1988) provide a more extensive description of the OASIS Research Program.

were willing to authorize data collection in exchange for a report comparing their business units to others on a variety of organizational and strategic factors. Business units are autonomous organizational units, frequently called subsidiaries, divisions, or strategic business units, that constitute some corporations. A business unit has a clearly defined top-management group with primary decision-making authority in line areas such as manufacturing and sales, and substantial discretion in staff areas. Unlike most large corporations, business units sell a distinct set of products or services in competition with a well-defined set of competitors.

The 102 business units in this sample have headquarters in North America (74) and Europe (28), primarily in the United States and Great Britain. Seventy-nine percent of the business units are primarily manufacturers. They operate in a variety of industries, such as stationery, cough drops, kitchen appliances, specialty inks, truck axles, boiler maintenance, and office equipment sales and service. Business-unit employment ranges from 59 to 90,000, with a median of 849; total employment is 513,605. Business-unit sales range from $2 million to $5.8 billion, with a median of $71.3 million.

Data for each business unit were collected from the business-unit general manager and from managers from the finance, strategic planning, marketing, and human resource functions. Data collection typically began in a meeting of these key informants and OASIS researchers that dealt with such issues as identifying units that matched the business-unit definition, defining subunit boundaries, and specifying business-unit products and services, served markets, and competitors. A structured data form was used to collect information about the focal business unit's finances, environment, strategic position, organization, and reward system.

Measures

Hourly pay equity. There were three steps in the calculation of this measure of the pay of hourly employees relative to the pay of the top three levels of management, controlling for the input differential. First, the relative-pay percentiles of hourly employees and of the managers in the top three levels of the business unit were determined. A relative-pay percentile is the position of a business unit's pay level for a particular employee category compared with the pay range in the external labor market for similar positions. Relative-pay percentiles are determined through salary surveys of the relevant area or industry labor market. In a salary survey, skills, working conditions, and a job title are specified for each occupation of interest, and then the pay distribution in the relevant labor market for similar employees is determined (Milkovich and Newman, 1990). For hourly workers, the labor market comparison group is typically workers in other businesses in the same geographic area. For example, the pay of hourly employees who work on an assembly line manufacturing automobile components would be compared with the pay rates of other durables-manufacturing firms in the same area that employed

assembly line workers with similar skills. For high-level managers, salary comparisons are typically made with similar positions on the basis of hierarchical level (e.g., vice president), function (e.g., manufacturing), industry, and size of business. The detailed occupational variables found in both hourly and executive compensation surveys have substantially more explanatory power in predicting wages than do standard human capital variables such as education and experience (Leonard, 1990).

Next, the ratio of the relative-pay percentiles for hourly workers and top managers was calculated. This measure, *hourly/top-management relative-pay differential,* indicates the extent to which the two classes of employees are at the same pay percentile relative to their respective external labor markets. A score of one indicates that the two employee classes are paid at the same percentile. A high ratio indicates a more favorable situation from the perspective of hourly workers. For example, if hourly employees were paid (on average) at the 55th percentile of their labor market range and the top-management group at the 50th percentile of their labor market range, the hourly/top-management relative-pay differential score would be 1.10.

To the extent that hourly workers believe that external labor market standards are fair, hourly/top-management relative-pay differential takes hourly workers' evaluations of the relative inputs of hourly and top-management personnel into account. However, although large businesses tend to pay higher wages to hourly workers than do small businesses (e.g., Brown and Medoff, 1989), standard salary surveys for hourly employees do not include organization size as a comparison specification. At the same time, salary surveys for executives typically do standardize for organization size. To eliminate any effects of these different treatments of organizational size, the final step in the calculation of hourly pay equity was to regress hourly/top-management relative-pay differential on the *number of employees* (*log*). The number of employees was measured as the log of the number of full-time equivalent (FTE) employees. The residual from this regression captures the pay differential between hourly employees and top managers that is not accounted for by their differences in inputs, as represented in salary surveys and organization size.

Lower-level exempt pay equity. There were three steps in the calculation of this measure of the pay differential between the bottom three levels of exempt employees (typically lower-level managers and professionals) and the top three levels of management, controlling for the input differential.[4] First, the exempt employee pay grades for each business unit were combined to produce ten pay grades, and the median annual total cash compensation (including bonus) for each grade was determined. Second, the pay differential between lower-level exempt employees and top managers (*lower-level exempt/top-management pay differential*) was determined by calculating the ratio of the average pay of the three lowest exempt grades and the average pay of the three highest exempt grades. For example, a score of .30 on this measure indicates that the

4
Exempt employees are those who are not required by labor law to be paid for overtime work.

bottom exempt grades have average wage levels that are 30 percent of top management's average wage levels. A high ratio indicates a more egalitarian pay distribution. The third step in the calculation of lower-level exempt pay equity was to regress lower-level exempt/top-management pay differential on the input differential between lower-level exempt employees and top managers. Unfortunately, the most theoretically important aspects of these inputs (e.g., productivity and skills) are extremely difficult to measure directly, and inputs that can be more readily measured (e.g., education, experience) have been found to have only a modest relationship with perceived wage equity (Dornstein, 1991).

In this study, a measure of organization size, number of employees (log), was used as a proxy for the interclass input differential. Organizational size is likely to correlate with the productivity, human capital, and status dimensions that past research has shown to be perceived as inputs. Organization size predicts the number of hierarchical levels in an organization and thus the number of direct and indirect subordinates that report to top management. However, the number of subordinates for lower-level exempt employees is relatively invariant, regardless of organization size, because they are at the bottom of the managerial hierarchy. Thus the differential between the number of subordinates under top managers and those under lower-level exempt employees increases with organization size.

A manager's number of direct and indirect subordinates indicates the level of responsibility that he or she has for human, material, and financial assets. Because senior managers have more responsibility than lower-level managers and professionals, they generally have a greater impact on organizational productivity. Thus the interclass differential in productivity contribution also increases with organization size. Because the interclass productivity differential rises with organization size, both internal labor market and external selection mechanisms operate to select people with higher levels of human capital (e.g., skills and experience) into executive jobs in larger organizations. A manager's occupational status is largely determined by the number of his or her subordinates, which is a function of organization size. Thus organization size serves as a measure of the input differential, in terms of productivity, human capital, and status characteristics, between lower-level managers and top managers. This connection between organization size and the perceived interclass input differential is supported by research showing that individuals judge the appropriate wage levels for managers (i.e., their inputs) largely on the basis of the number of people in the hierarchy below them (Kuethe and Levenson, 1964; Mahoney, 1979).

The residual from the regression of lower-level exempt/top-management pay differential on number of employees (log) is the amount of the interclass pay differential that cannot be explained by the level of the interclass input differential. This residual is the measure of lower-level exempt pay equity. Higher scores on this variable

indicate greater pay equity from the perspective of lower-level exempt employees.

Product quality. The measure of a business unit's product quality was based on an executive informant's rating of the percentage of the business unit's annual sales accounted for by products that, from the perspective of customers, were assessed as superior, equivalent, or inferior to products offered by each of the three largest competitors in the market. This evaluation includes both intrinsic product characteristics (e.g., features and durability) and all associated services (e.g., delivery time and after-sale service), weighted in terms of their importance to customers. Executive informants typically based their quality ratings on previously conducted market research. Product-quality scores relative to each competitor were calculated as the percentage rated superior minus the percentage rated inferior. For example, if a business unit had ratings in comparison with Competitor A of 30 percent superior, 20 percent inferior, and 50 percent equivalent, the resulting product-quality score relative to Competitor A would be 10. A business unit's overall product-quality score was the sum of the market-share weighted scores against the three competitors. A positive score indicates that a business unit's overall level of product quality was superior to that of its primary competitors (for further details, see Buzzell and Gale, 1987).

Measuring the customer-perceived product quality of business units relative to their competitors provides a common metric across industries and is consistent with modern quality-management theory that focuses on external customer perceptions rather than internal defect rates (e.g., Juran, 1989). This measure of product quality was originally developed as part of the Strategic Planning Institute's PIMS data base. There is evidence of its reliability and validity (e.g., Phillips, Chang, and Buzzell, 1983), and it is widely used in marketing and strategy research (e.g., Hambrick, 1983; Venkatraman and Prescott, 1990).

Control variables. The unionized proportion of a business unit's workforce (*union %*) was measured as the number of FTE employees represented by unions divided by the total number of FTE employees. The *technological complexity* of a business unit's process technology was measured by determining the proportion of a business unit's assets that were in each of five categories of a scale of technological complexity derived from the ratings of a panel of engineering professors (Tannenbaum, Cook, and Lohmann, 1984). For example, category one included push carts and vacuum cleaners, and category five included optical scanners and computers. This measure is an extension of the technology scale developed by Amber and Amber (1962), which has been widely used in organizational research (e.g., Hickson, Pugh, and Pheysey, 1969; Roznowski and Hulin, 1985). A business unit's *relative market share* was measured as the market share of a focal business unit divided by the sum of the market shares of its three largest competitors. The number of employees (log) was measured as the log of the number of FTE employees in a business unit.

RESULTS

Means, standard deviations, and correlations between the variables are presented in Table 1. As previously discussed, the hourly pay equity and lower-level exempt pay equity variables are the results of removing the influence of organization size as part of controlling for the interclass input differential. As expected, the coefficient of number of employees (log) was significant both when it was regressed against hourly/top-management relative-pay differential (coefficient of .033, standard error of .019, $p < .05$) and when regressed against lower-level exempt/top-management pay differential (coefficient of −.031, standard error of .008, $p < .001$).[5]

Table 1

Means, Standard Deviations, and Intercorrelations of Measures

Variables	N†	Mean	S.D.	1	2	3	4	5	6	7	8
1. Product quality	102	35.12	30.47								
2. Hourly pay equity*	89	.00	.31	.25							
3. Hourly/top-management relative pay differential	89	1.10	.31	.23	.99						
4. Lower-level exempt pay equity*	74	.00	.10	.20	.08	.08					
5. Lower-level exempt/top-management pay differential	74	.28	.11	.16	−.02	−.08	.90				
6. Union %	90	.37	.35	.09	.15	.18	.32	.17			
7. Technological complexity	90	342.72	68.80	−.08	−.03	.03	−.06	−.25	−.22		
8. Relative market share	90	73.23	73.68	.23	.23	.24	−.09	−.19	.11	.12	
9. Number of employees (log)	102	7.01	1.63	.00	.04	.21	−.03	−.44	.15	.38	.10

* These measures are residuals after controlling for number of employees (log).
† Correlations are based on all cases used in the analyses in Table 2.

As Table 2 shows, hourly pay equity had a significant positive impact on product quality (equation 1). The coefficient of 24.77 indicates that a one standard deviation increase in hourly pay equity (about .3) adds 7.4 percentage points to the proportion of a business unit's output that is of higher quality than competitors' products. This increase in hourly pay equity is equivalent, for example, to maintaining the pay of the top three levels of managers at the 50th percentile of the labor market while raising hourly workers' pay from the 55th percentile to the 70th percentile. The quality improvement associated with this increase would be likely to reduce business unit production costs and to increase market share and profitability (Porter, 1985; Buzzell and Gale, 1987; Garvin, 1988). The cost and profitability improvements due to higher quality would be offset to the extent that increasing hourly workers' pay equity requires a net increase in labor costs. Adding the controls of union %, technological complexity, relative market share, and number of employees (log) to the regression slightly reduced the coefficient of hourly pay equity (equation 2).

Lower-level exempt pay equity also had a positive effect on product quality (equation 3). The coefficient (and standardized coefficient) was larger than that of hourly pay equity, but its statistical significance was lower. Adding the control variables slightly increased this coefficient (equation 4). When both measures of lower-echelon pay equity were

5
The results of all analyses not shown in Table 2 are available from the authors.

Table 2

Regressions of Product Quality on Hourly Pay Equity and Lower-Level Exempt Pay Equity*

	Equation				
	1	2	3	4	5
Control variables					
Union %		.09		9.32	8.81
		(10.20)		(13.06)	(13.25)
Technological complexity		−.02		−.07	−.04
		(.06)		(.07)	(.07)
Relative market share		.07		.10**	.05
		(.05)		(.05)	(.05)
Number of employees (log)		−.12		.63	−1.26
		(2.23)		(2.98)	(3.01)
Hourly pay equity	24.77**	19.01**			31.66***
	(10.36)	(10.84)			(11.82)
Lower-level exempt pay equity			59.57**	70.05**	65.40**
			(34.86)	(38.66)	(37.44)
Constant	35.81	38.40	36.72	42.94	49.09
R^2	.06	.09	.04	.16	.25
F-ratio	5.71**	1.85	2.92*	2.31**	2.83**
N	89	82	74	65	57

* $p < .10$; ** $p < .05$; *** $p < .01$.
* Unstandardized coefficients are reported, with standard errors in parentheses. Reported significance levels are one-tailed for pay-equity variables, all others are two-tailed.

entered simultaneously, the coefficient of hourly pay equity increased slightly and attained the .01 level of statistical significance (equation 5). The coefficient of lower-level exempt pay equity was stable.

Robustness Checks

The results presented in Table 2 are consistent with our model of the relationship between interclass equity and product quality. We conducted additional analyses that examined the sensitivity of these results to alternative formulations of the model and to the presence of outlying observations. The results were highly robust.

The results were unchanged when the regressions were repeated with interaction terms between the pay-equity variables and either technological complexity or union %. The results were also unchanged when the regressions were repeated with additional controls for year, industry, and country where the business unit is located. When the average wage level of hourly workers and the top three levels of managers (compared with their relevant external labor markets) was included as a control in the regressions of product quality on hourly pay equity, the coefficient of hourly pay equity and its level of statistical significance were slightly reduced, but this change did not approach statistical significance. The average wage level of hourly workers and top managers had a marginally significant effect on product quality, as suggested by efficiency wage theories (coefficient of .40, standard error of .24, $p < .10$) (for a discussion of efficiency wage theories, see Levine, 1992). Inclusion of the average wage level for exempt employees had a similarly modest effect on the coefficient and statistical significance of lower-level exempt pay equity. The average wage level of

exempt employees did not have a significant effect on product quality.

Our theory of distributive justice states that people consider both pay and input differentials in their interclass equity judgments but that pay differentials will be the most influential factor. Analyses of the model without the adjustment for the input differential represented by number of employees (log) were consistent with theory. Lower-level exempt/top-management pay differential, not adjusted for number of employees (log), had a slightly weaker correlation with product quality (.16 versus .20) than did lower-level exempt pay equity, but it was still substantively and statistically significant ($p < .10$). The relationship of hourly/top-management relative-pay differential and hourly pay equity to product quality also followed this pattern.

The results of two statistical analyses that are less sensitive to the presence of outlying observations were also robust. First, we computed the Spearman rank correlations of the two interclass pay equity variables and product quality. Rank correlations, unlike Pearson correlations and regressions, are not sensitive to outliers. The rank correlations were not substantively or significantly different from the Pearson correlations. We performed a second check of the influence of outliers by running the regressions in Table 2 with a technique that is robust to the presence of outliers (Computing Resource Center, 1990: 753). The estimated coefficients were slightly larger and attained a slightly higher level of statistical significance than did the ordinary least squares regression coefficients shown in Table 2.

DISCUSSION

This study integrates equity, relative deprivation, and quality management theories in a testable model of the relationship between interclass pay equity and product quality. There is a substantial positive relationship between product quality and interclass pay equity for both hourly workers and lower-level exempt employees. Analyses of alternative models demonstrate that these results are robust. Although cross-sectional research cannot empirically determine the causal relationship between interclass pay equity and product quality, the heterogeneous sample of business units and the inclusion of control variables greatly increase the external validity of this study and reduce the possibility that exogenous variables might cause a spurious relationship between interclass pay equity and product quality.

This study provides the first evidence that egalitarian interclass reward distributions lead not just to perceptions of fairness by lower-level employees, as has been demonstrated in many studies, but may also increase product quality. Moreover, this is the first study to establish a connection between any form of reward equity and product quality in actual organizations. Despite the growing recognition that product quality is a critical determinant of customer satisfaction and business profitability, this is also one of the few studies that provide evidence of a relationship between organizational factors and product quality.

This study also sheds light on the debate about the relationship between top-executive pay and business performance (e.g., Murphy, 1985; Gomez-Mejia, Tosi, and Hinkin, 1987; O'Reilly, Main, and Crystal, 1988; Crystal, 1991). There have been over 250 studies of the consequences of the pay of top corporate executives, but none have examined the effects of pay differentials between upper-echelon managers and lower-level employees. In addition, the relationship between executive pay and product quality has never been explored. Our findings indicate that product quality may be diminished when high wages for the upper echelon are not matched by high wages for lower-level employees. Future studies of executive pay should consider not only the effects of top managers' pay on their own motivation but also how executive pay levels affect the motivation of lower-level employees.

The sample of business organizations used in this research provides a strong basis for generalizing to business organizations in North America and Western Europe, particularly those in the United States and Great Britain. However, justice norms vary in different national and organizational cultures (Sampson, 1986). Thus, further research is needed to explore the relationship between interclass pay equity and organizational effectiveness in various cultures.

Cultural attributes other than justice norms may also moderate the impact of pay differentials on product quality (Cowherd, 1992). Organizations with high levels of worker participation and little status differentiation may require egalitarian reward patterns in order to maintain employee motivation. When managerial control is reduced in order to encourage worker participation, product quality becomes more dependent on workers' motivation and, thus, on distributive justice. The impact of distributive justice on product quality in high-involvement organizations may be additionally amplified because the egalitarian ideological premises of these cultures minimize internal status distinctions and thus legitimize reward comparisons between lower-level workers and top managers.

Other organizational characteristics may also moderate the effects of interclass pay equity by amplifying the influence of employee motivation on organizational effectiveness. Factors such as union power, the degree to which process technology permits worker control, and the existence of ad hoc teams (e.g., quality circles) can increase the decision-making role of lower-echelon employees and thus increase the effect of employee motivation on organizational effectiveness. In addition, strong organizational identification, small organization size, and demographic homogeneity may make interclass reward comparisons more salient and thereby heighten their motivational influence.

Our theoretical model states that interclass pay equity affects product quality by influencing employee commitment to managerial goals, effort, and cooperation. This study did not empirically test the role of these mediating factors. Future research should examine this process to determine if these or other factors mediate the relationship between

interclass pay equity and product quality. Furthermore, direct measures of pay equity perceptions would be useful in future studies. Our model could also be expanded to incorporate individual differences such as locus of control and political ideology, because these factors can affect people's propensity to make upward social comparisons between organizational strata (Martin, 1986; Martin et al., 1987). In addition, it would be useful to include lower-level employees' wage comparisons with referents such as coworkers, direct supervisors, and similar and dissimilar occupational groups (Kulik and Ambrose, 1992).

This study is based on a perspective from which organizational behavior is seen as determined by both economic and social factors. This perspective contrasts with the standard approach of explaining economic outcomes in terms of economic causes and social outcomes in terms of social causes. Although there are substantial theoretical and methodological barriers to integrating economic and social perspectives in organizational research, the possibility of moving beyond the findings obtained from research conducted largely within traditional disciplinary boundaries makes this a challenge worth pursuing. This study indicates that such an integrative research effort is particularly well-suited for investigating the consequences of organizational reward distributions.

REFERENCES

Abeles, Ronald D.
1976 "Relative deprivation, rising expectations and black militancy." Journal of Social Issues, 32(2): 119–137.

Adams, J. Stacy
1965 "Inequity in social exchange." In Leonard Berkowitz (ed.), Advances in Experimental Social Psychology, 2: 267–299. New York: Academic Press.

Adams, J. Stacy, and Sara Freedman
1976 "Equity theory revisited: Comments and annotated bibliography." In Leonard B. Berkowitz and Elaine Walster (eds.), Advances in Experimental Social Psychology, 9: 43–90. New York: Academic Press.

Alves, Wayne M., and Peter H. Rossi
1978 "Who should get what? Fairness judgments of the distribution of earnings." American Journal of Sociology, 84: 541–564.

Amber, George S., and Paul S. Amber
1962 Anatomy of Automation. Englewood Cliffs, NJ: Prentice-Hall.

Andrews, I. R., and Mildred M. Henry
1963 "Management attitudes toward pay." Industrial Relations, 3: 29–39.

Berger, Joseph, Morris Zelditch, Jr., Bo Anderson, and Bernard P. Cohen
1972 "Structural aspects of distributive justice: A status value formulation." In Joseph Berger, Morris Zelditch, Jr., and Bo Anderson (eds.), Sociological Theories in Progress, 2: 119–146. Boston: Houghton Mifflin.

Brown, Charles, and James Medoff
1989 "The employer size-wage effect." Journal of Political Economy, 97: 1027–1059.

Buzzell, Robert D., and Bradley T. Gale
1987 The PIMS Principles: Linking Strategy to Performance. New York: Free Press.

Computing Resource Center
1990 Stata Update Manual. Santa Monica, CA: Computing Resource Center.

Cook, Karen S., and Toshio Yamagishi
1983 "Social determinants of equity judgements: The problem of multidimensional input." In David M. Messick and Karen S. Cook (eds.), Equity Theory: Psychological and Sociological Perspectives: 95–126. New York: Praeger.

Cook, Thomas D.
1969 "Temporal mechanisms mediating attitude change after underpayment and overpayment." Journal of Personality, 37: 618–635.

Cowherd, Douglas M.
1992 "The impact of organizational culture on performance." Paper to be presented at the Academy of Management annual meeting, Las Vegas, NV.

Cowherd, Douglas M., and Robert H. Luchs
1988 "Linking organization structures and processes to business strategy." Long Range Planning, 21(5): 47–53.

Crosby, Faye
1984 "Relative deprivation in organizational settings." In Barry M. Staw and L. L. Cummings (eds.), Research in Organizational Behavior, 6: 51–93. Greenwich, CT: JAI Press.

Crystal, Graef S.
1991 In Search of Excess: The Overcompensation of American Executives. New York: Norton.

Deutsch, Morton
1985 Distributive Justice. New Haven, CT: Yale University Press.

Dittrich, John E., and Michael R. Carrell
1979 "Organizational equity perceptions, employee job satisfaction, and departmental absence and turnover rates." Organizational Behavior and Human Performance, 24: 29–40.

Dornstein, Miriam
1988 "Wage reference groups and their determinants: A study of blue-collar and white-collar employees in Israel." Journal of Occupational Psychology, 61: 221–235.
1991 Conceptions of Fair Pay: Theoretical Perspectives and Empirical Research. New York: Praeger.

Ehrenberg, R. G., and George T. Milkovich
1987 "Compensation and firm performance." In Morris Kleiner, Richard N. Block, Myron Roomkin, and Sidney W. Salsburg (eds.), Human Resources and the Performance of the Firm: 87–122. Madison, WI: Industrial Relations Research Association.

Evan, William M., and Roberta G. Simmons
1969 "Organizational effects of inequitable rewards: Two experiments in status inconsistency." Administrative Science Quarterly, 14: 224–237.

Freeman, Richard B., and James L. Medoff
1984 What Do Unions Do? New York: Basic Books.

Garvin, David A.
1988 Managing Quality. New York: Free Press.

Gomez Mejia, Luis R., Henry Tosi, and Timothy Hinkin
1987 "Managerial control, performance, and executive compensation." Academy of Management Journal, 30: 51–70.

Gordon, Michael E., L. Allen Slade, and Neal Schmitt
1986 "The 'science of the sophomore' revisited: From conjecture to empiricism." Academy of Management Review, 11: 191–207.

Granovetter, Mark
1985 "Economic action and social structure: The problem of embeddedness." American Journal of Sociology, 91: 481–510.

Hambrick, Donald C.
1983 "High profit strategies in mature capital goods industries: A contingency approach." Academy of Management Journal, 26: 687–707.

Harrison, Bennett, and Barry Bluestone
1988 The Great U-Turn: Corporate Restructuring and the Polarizing of America. New York: Basic Books.

Hatfield, Elaine, and Susan Sprecher
1984 "Equity theory and behavior in organizations." In Samuel B. Bacharach and Edward J. Lawler (eds.), Research in the Sociology of Organizations, 3: 95–124. Greenwich, CT: JAI Press.

Hickson, David J., D. S. Pugh, and Diana C. Pheysey
1969 "Operations technology and organization structure: An empirical reappraisal." Administrative Science Quarterly, 14: 378–397.

Homans, George C.
1974 Social Behavior: Its Elementary Forms, rev. ed. New York: Harcourt, Brace, Jovanovich.

Isaac, Larry, Elizabeth Mutran, and Sheldon Stryker
1980 "Political protest orientations among black and white adults." American Sociological Review, 45: 191–213.

Jasso, Guillermina, and Peter H. Rossi
1977 "Distributive justice and earned income." American Sociological Review, 42: 639–651.

Juran, Joseph M.
1989 Leadership for Quality. New York: Free Press.

Koike, Kazuo
1988 Understanding Industrial Relations in Modern Japan. Mary Saso, trans. New York: St. Martin's.

Kuethe, James L., and Bernard Levenson
1964 "Conceptions of organizational worth." American Journal of Sociology, 70: 342–348.

Kulik, Carol T., and Maureen L. Ambrose
1992 "Personal and situational determinants of referent choice." Academy of Management Review, 17: 212–237.

Landy, Frank L., and Wendy S. Becker
1987 "Motivation theory reconsidered." In L. L. Cummings and Barry M. Staw (eds.), Research in Organizational Behavior, 9: 1–38. Greenwich, CT: JAI Press.

Lawler, Edward E., III
1976 "Control systems in organizations." In Marvin D. Dunnette (ed.), Handbook of Industrial and Organizational Psychology: 1247–1291. Chicago: Rand McNally.
1981 Pay and Organizational Development. Reading, MA: Addison-Wesley.

Leonard, Jonathan S.
1990 "Executive pay and firm performance." Industrial and Labor Relations Review, 43: 13s–29s.

Levine, David I.
1991 "Cohesiveness, productivity, and wage dispersion." Journal of Economic Behavior and Organization, 15: 237–255.
1992 "What do wages buy?" Unpublished manuscript, Institute of Industrial Relations, University of California, Berkeley.

Mahoney, Thomas A.
1979 "Organizational hierarchy and position worth." Academy of Management Journal, 22: 726–737.

Martin, Joanne
1981 "Relative deprivation: A theory of distributive injustice for an era of shrinking resources." In L. L. Cummings and Barry M. Staw (eds.), Research in Organizational Behavior, 3: 53–107. Greenwich, CT: JAI Press.
1982 "The fairness of earnings differentials: An experimental study of the perceptions of blue-collar workers." Journal of Human Resources, 17: 110–122.

1986 "When expectations and justice do not coincide." In Hans W. Bierhoff, Ronald L. Cohen, and Jerald Greenberg (eds.), Justice in Social Relations: 317–335. New York: Plenum.

Martin, Joanne, and Alan Murray
1983 "Distributive injustice and unfair exchange." In David M. Messick and Karen S. Cook (eds.), Equity Theory: Psychological and Sociological Perspectives: 169–205. New York: Praeger.

Martin, Joanne, Raymond L. Price, Robert J. Bies, and Melanie E. Powers
1987 "Now that I can have it, I'm not so sure I want it: The effects of opportunity on aspirations and discontent." In Barbara A. Gutek and Laurie Larwood (eds.), Women's Career Development: 42–65. Newbury Park, CA: Sage.

Meyer, Herbert H.
1975 "The pay-for-performance dilemma." Organizational Dynamics, 3(3): 39–50.

Milkovich, George T., and Jerry M. Newman
1990 Compensation, 3d ed. Homewood, IL: BPI/Irwin.

Murphy, Kevin J.
1985 "Corporate performance and managerial remuneration." Journal of Accounting and Economics, 7: 11–42.

Oldham, Greg R., Carol T. Kulik, Maureen L. Ambrose, Lee P. Stepina, and Julianne F. Brand
1986 "Relations between job facet comparisons and employee reactions." Organizational Behavior and Human Decision Processes, 38: 28–47.

O'Reilly, Charles, and Jennifer Chatman
1986 "Organizational commitment and psychological attachment: The effects of compliance, identification and internalization on prosocial behavior." Journal of Applied Psychology, 71: 492–499.

O'Reilly, Charles A., III, Brian G. Main, and Graef S. Crystal
1988 "CEO compensation as tournament and social comparison: A tale of two theories." Administrative Science Quarterly, 33: 257–274.

Organ, Dennis W.
1990 "The motivational basis of organizational citizenship behavior." In Barry M. Staw and L. L. Cummings (eds.), Research in Organizational Behavior, 12: 43–72. Greenwich, CT: JAI Press.

Pfeffer, Jeffrey, and Nancy Langton
1991 "Wage dispersion, satisfaction, and performance: Evidence from college administrators." Unpublished manuscript, Graduate School of Business, Stanford University.

Phillips, Lynn W., Dae R. Chang, and Robert D. Buzzell
1983 "Product quality, cost position, and business performance: A test of some key hypotheses." Journal of Marketing, 47(Spring): 26–43.

Porter, Michael E.
1985 Competitive Advantage. New York: Free Press.

Pritchard, Robert D., Marvin D. Dunnette, and Dale O. Jorgenson
1972 "Effects of perceptions of equity and inequity on worker performance and satisfaction." Journal of Applied Psychology, 56: 75–94.

Rousseau, Denise M.
1989 "Psychological and implied contracts in organizations." Employee Responsibilities and Rights Journal, 2(2): 121–139.

Roznowski, Mary, and Charles L. Hulin
1985 "Influences of functional specialty and job technology on employees' perceptual and affective responses to their jobs." Organizational Behavior and Human Decision Processes, 36: 186–208.

Sampson, Edward E.
1986 "Justice ideology and social legitimation." In Hans W. Bierhoff, Ronald L. Cohen, and Jerald Greenberg (eds.), Justice in Social Relations: 87–102. New York: Plenum.

Sashkin, Marshall, and Richard L. Williams
1990 "Does fairness make a difference?" Organizational Dynamics, 19(2): 56–71.

Staw, Barry M.
1984 "Organizational behavior: A review and reformulation of the field's outcome variables." In Mark R. Rosenzweig and Lyman W. Porter (eds.), Annual Review of Psychology, 35: 627–666. Palo Alto, CA: Annual Reviews.

Summers, Timothy P., and William H. Hendrix
1991 "Modelling the role of pay equity perceptions: A field study." Journal of Occupational Psychology, 64: 145–157.

Tajfel, Henri
1981 Human Groups and Social Categories. Cambridge: Cambridge University Press.

Tannenbaum, Arnold S., Harold Cook, and Jack Lohmann
1984 The Relationship of Employee Ownership to the Technical Adaptiveness and Performance of Companies. Ann Arbor, MI: Institute for Social Research, University of Michigan.

Telly, Charles S., Wendell L. French, and William G. Scott
1971 "The relationship of inequity to turnover among hourly workers." Administrative Science Quarterly, 16: 164–172.

Valenzi, E. R., and I. R. Andrews
1971 "Effect of hourly overpay and underpay inequity when tested with a new induction procedure." Journal of Applied Psychology, 55: 22–27.

Venkatraman, N., and John E. Prescott
1990 "Environment-strategy coalignment: An empirical test of its performance implications." Strategic Management Journal, 11: 1–23.

Walster, Elaine, G. William Walster, and Ellen Berscheid
1978 Equity: Theory and Research. Boston: Allyn and Bacon.

Wolf, Ron
1990 "Apple workers send harsh 'Dear John' notes." San Jose Mercury News, 17 February: 1A, 6A.