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# CONTROL: ORGANIZATIONAL AND ECONOMIC APPROACHES*

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Organizational design often focuses on structural alternatives such as matrix, decentralization, and divisionalization. However, control variables (e.g., reward structures, task characteristics, and information systems) offer a more flexible approach. The purpose of this paper is to explore these control variables for organizational design. This is accomplished by integration and testing of two perspectives, organization theory and economics, notably agency theory. The resulting hypotheses link task characteristics, information systems, and business uncertainty to behavior vs. outcome based control strategy. These hypothesized linkages are examined empirically in a field study of the compensation practices for retail salespeople in 54 stores. The findings are that task programmability is strongly related to the choice of compensation package. The amount of behavioral measurement, the cost of measuring outcomes, and the uncertainty of the business also affect compensation. The findings have management implications for the design of compensation and reward packages, performance evaluation systems, and control systems, in general. Such systems should explicitly consider the task, the information system in place to measure performance, and the riskiness of the business. More programmed tasks require behavior based controls while less programmed tasks require more elaborate information systems or outcome based controls.
(ORGANIZATIONAL DESIGN; INCENTIVES; CONTROL SYSTEMS)

## 1. Introduction

Consider the following vignettes. A minicomputer manufacturer sees increased competition, volatile technology, and high interest rates. In this environment, plant managers play a crucial role in balancing customer service, quality and inventory considerations with traditional manufacturing concern with costs. How does the manufacturing vice-president encourage the balancing of these often conflicting objectives by the plant managers?

A fast food chain has purchased its franchises. The chain management now must hire and manage the managers of the newly acquired stores. How should these managers be evaluated and rewarded given the geographic dispersion of stores and the long hours and attention to detail demanded of retail store managers?

A large metals fabricator has a mature salesforce, experienced in selling to small and medium sized firms. However, recent market analyses demonstrate that the organization should shift its emphasis to larger, more profitable customers. Many salesmen disagree. What should management do?

These and similar cases concern questions of organizational design. However, while the thinking on organizational design often focuses on structural solutions such as matrix, decentralization and divisionalization (e.g., Galbraith 1977), these cases illustrate the importance to organizational design of control tools such as reward structures and information systems. Control is an important, if sometimes neglected, facet of organizational design.

The focus of this paper is on organizational control as a design mechanism in organizations. The paper is both a theoretical integration and an empirical test. The

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first portion of the paper describes, compares, and integrates organizational and agency perspectives on control. The result is a general model which relates task characteristics, information systems, rewards, and uncertainty. The second portion of the paper describes an empirical examination of the model in retailing from which the relative importance of the model variables and the extent to which the model mirrors reality can be considered. The third portion of the paper discusses a broader framework for designing organizations using control mechanisms.

## 2. Organizational Theory and Control

Recent organizational approaches to control (e.g., Ouchi 1979) suggest two underlying control strategies. On the one hand, control can be accomplished through performance evaluation. Performance evaluation refers to the cybernetic process of monitoring and rewarding performance. This strategy emphasizes the information aspects of control. Namely, to what degree can the various aspects of performance be assessed? Alternatively, control can be achieved by minimizing the divergence of preferences among organizational members. That is, members cooperate in the achievement of organizational goals because the members understand and have internalized these goals. This strategy emphasizes people policies such as selection, training, and socialization.

The two control strategies are interrelated. An organization can tolerate a work force with highly diverse goals if a precise evaluation system exists. In contrast, a lack of precision in performance evaluation can be tolerated when goal incompatibility is minor (Ouchi 1979). The choice between the two is driven by the ease of performance evaluation.

The performance evaluation control strategy suggests that something is measured. In the organizational literature, this view is seen in the classic work of Thompson (1967), and later that of Ouchi (1979). Thompson and Ouchi argue that the something which is measured is either the behavior of employees or the outcomes of those behaviors. Therefore, the performance evaluation strategy for control can be either behavior or outcome based. Thompson and Ouchi further argue that which of these is used for control depends upon the information characteristics of the given task. In Ouchi's terms, these characteristics are: (1) knowledge of the transformation process, or task programmability, and (2) the ability to measure outcomes.

Figure 1 is Ouchi's (1979) formulation of Thompson's (1967) linkage of task characteristics and control strategies. There are three control strategies, two of which are performance evaluation strategies (behavior and outcome based) and one which is a social or "people" based strategy. The underlying linkage between task characteristics and control strategy is simple. If the task can be programmed, then behaviors are explicitly defined and readily measured. Therefore, control is accomplished by perfor-

Control strategy = $F$ (task characteristics)

| | | Task Programmability | |
|---|---|---|---|
| | | Perfect | Imperfect |
| Outcome Measurability | High | Behavior or outcome control | Outcome control |
| | Low | Behavior control | Socialization "Clan" control |

*Adapted from Ouchi (1979).

FIGURE 1. Organizational Theory.

mance evaluation of behaviors. However, as task programmability decreases, behaviors are more difficult to use as the basis of the control strategy because they are less clearly specified. Now consider outcomes. If the goals can be clearly stated, then outcomes can be measured and performance evaluations of outcomes is the appropriate control strategy. If both behaviors and outcomes can be measured, then either can be used (Ouchi 1979). Finally, if the task is neither programmed nor has a measurable outcome, then the alternative control strategy of minimizing divergence of preferences (i.e., people side of control) becomes appropriate.

In summary, the task characteristics determine which control strategy is appropriate. The key insights of the organizational approach to control are: (1) the role of task characteristics, especially task programmability, in the choice of control strategy through impact on measurement costs and (2) social control as an alternative to control based upon performance evaluation.

## 3. Agency Theory and Control

Control is also considered in the theoretical economics/accounting literature on agency theory. There the traditional interest is in contracting. Agency theory considers the optimal contract form for that ubiquitous control relationship in which one person, the principal, delegates work to another, the agent. As Ross (1973) notes: "The relationship of agency is one of the oldest and commonest codified codes of social interaction. We will say that an agency relationship has arisen between two (or more) parties when one, designated as the agent, acts for the other, designated the principal, in a particular domain of decision problems. Examples of agency are universal." Jensen and Meckling (1976) add: "It (agency relationship) exists in all organizations and in all cooperative efforts—at every level of management in firms."

The agency problem is to determine the optimal contract for the agent's service. For example, in our earlier vignette of the minicomputer manufacturer, the manufacturing vice-president is the principal and the plant managers are the agents in an agency model of the vignette. Again, in the case of the vignette, the agency problem is to determine the measurement and reward structures for the plant managers such that they appropriately balance concerns for inventory, service, quality, and cost in a context of uncertain demand.

The theory is simply stated in terms of two cases. When the behavior of the agent is observed, a behavior based contract is optimal because the agent's behaviors are the purchased commodity. This is the simple case of complete information. Both parties, principal and agent, know what the agent has done. The second case is incomplete information. The agent is aware of his/her behaviors, but the principal is not. A dilemma arises because the principal cannot determine if the agent has behaved appropriately. If the principal rewards the agent based upon the agreed job behaviors, but without confirmation of those behaviors by the principal, the agent may shirk. The agent cannot be relied upon to perform as agreed.

In the case of incomplete information, the principal has two options. The principal can purchase information about the agent's behaviors and reward those behaviors. This requires the purchase of surveillance mechanisms such as cost accounting measures, budgeting systems, or additional layers of management. Alternatively, the principal can reward the agent based on outcomes (e.g., profitability). Such outcomes are surrogate measures for behaviors. However, in this option, the agent is penalized or rewarded for outcomes partially outside his/her control. In other words, good outcomes can occur despite poor efforts and poor outcomes can occur despite good efforts. While this scheme encourages effort on the part of the agent, it does so at the price of shifting some of the risk of the firm to the agent. The optimal choice between

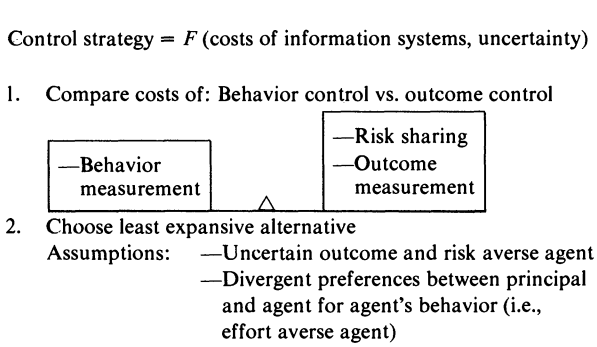


FIGURE 2. Agency Theory.

the two options rests upon the trade-off between the cost of measuring behavior, and the costs of measuring outcomes and transferring risk to the agent (Figure 2).

Agency models explicitly recognize two key features of organizations. One is the divergence of preferences among organizational members (often termed "effort aversion" in the formal agency literature). People are assumed to have preferences for their own actions which do not necessarily coalign with those of other organization members. In this political view of organizations, the role of control is to provide measures and rewards such that individuals pursuing their own self-interest will also pursue the collective interest. Notice that if there is no divergence of preferences, then the measurement of either behaviors or outcomes is unnecessary for control. In effect, relaxation of the divergent preferences assumption is analogous to social control in the organizational literature.

The second key feature of organizations modelled in agency theory is the outcome uncertainty of organizations. Organizations are assumed to have uncertain futures. The future may bring prosperity, bankruptcy, or a myriad of intermediate outcomes. The risk of the uncertain future is partially borne by the owners. However, employees (agents) also bear risk and they bear increasing risk as control becomes more outcome based. In this view, control system measures and rewards, not only motivate behavior, but also alter risk sharing patterns. Organizations are seen as risk sharing as well as work sharing collectives. Notice also that if there is no outcome uncertainty or agents are not risk averse, then the choice between behavior and outcome control reduces to simply their comparative measurement costs in the organizational literature.

In summary, agency theory suggests two underlying strategies of control: behavior based and outcome based. Both strategies rely upon performance evaluation. The key insights of agency theory are: (1) the role of uncertainty in the choice of control strategy through its impact on risk sharing costs, and (2) the role of information systems in maintaining behavior control as an alternative to outcome control when information about the agent's behavior is otherwise incomplete.

## 4. Comparison of Organizational and Agency Approaches

Comparison of agency theory with the organizational approach reveals obvious similarities (Figure 3). Indeed, Ouchi's (1979) work stems, in part, from the economic theory of markets and hierarchies (Williamson 1975). Both agency and organizational

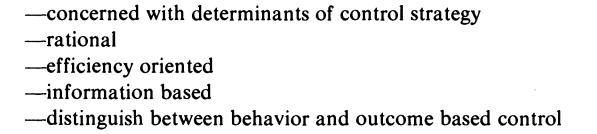


FIGURE 3. Similarities Between Organizational and Agency Approaches to Control.

—Cost
compare ability to measures behaviors and outcomes (0)
vs.
compare *costs* of behavior control and outcome control (A)
—Reward
control is a measurement and evaluation process (0)
vs.
control is a measurement, evaluation, *and* reward process (A)
—Social or "People" control
assume divergent performances for effort of workforce (A)
vs.
possible to reduce divergent preferences through social control (0)
—Role of Information
task characteristics determine the information available (0)
vs.
information is a purchasable commodity (A)
—Uncertainty
control determined by measurement issues (0)
vs.
control determined by measurement *and* risk bearing issues (A)

FIGURE 4. Differences Between Organizational and Agency Approaches to Control.

approaches are rational, efficiency approaches which are concerned with the determinants of control strategy. Both are information based. Both distinguish between two types of performance evaluation control: behavior based and outcome based control. However, there are differences in emphasis such that the two approaches are complementary in important ways. These differences are summarized in Figure 4.

One difference is agency's emphasis on rewards. In the organizational literature, control is a process of measurement and evaluation. Reward is implicit. In agency theory, the contracting emphasis makes rewards explicit. Therefore, agency theory captures the reward linkage of control arrangements such as salary plus bonus (reward) if ROI exceeds target (measure) as well as more subtle rewards such as promotion to partner (reward) if legal work meets the expectation of partners and clients (measure). This is a subtle distinction, but agency theory captures reality in a more precise way.

A second difference is agency's emphasis on costs. The organizational approach looks at the ease of performance evaluation given the nature of the task. Clearly, ability to measure is related to cost. However, cost is a more comprehensive term which captures the practical impact of cost considerations of choice of control mechanism. For example, size effects on administrative costs of information systems, and more subtle costs such as increased turnover resulting from some aspect of the control system may be very relevant, but are not necessarily related to ability to measure. It is a subtle difference, but the language of agency theory is more precise on this point.

A third difference concerns the assumption that there exists a divergence of preferences between the principal and agent for the agent's effort. This assumption (usually termed "effort aversion") is made in most agency formulations. In contrast, in the organizational literature, the important realization is made that organizations vary in the degree to which this assumption actually holds. That is, selection policies, training policies, and socialization practices can affect the homogeneity of values among organizational members. For example, in *Z* or clan type organizations, the assumption of divergent preferences is unlikely to hold. In summary, the organizational literature explicitly recognizes the "people" or social strategy for control, and its particular relevance when performance evaluation is prohibitively costly.

A fourth difference is the role of information. In the organizational approach,

information about behaviors and outcomes depends upon static characteristics of the task. Implicitly, task characteristics affect the costs of gathering information. For example, if task behaviors are programmed, then information about behaviors is readily, and presumably cheaply, available. In contrast, information is a commodity in agency theory. Varying amounts of information about behaviors and outcomes are available at varying prices through the purchase of information systems such as budgeting systems, monthly reporting, and layers of management.

A final difference is uncertainty. In agency theory, outcome is assumed to be a function of employee behaviors and random effects. Such effects include competitor actions, government policies, weather and the like. Such effects introduce uncertainty such that appropriate behaviors can lead to good or bad outcomes. Therefore, when outcome control is used, the employee bears risk for which he/she typically is paid a premium (except when the employee is not risk averse or when there are no unknown exogenous factors). This is an important contribution of agency theory because it explicitly recognizes the risk bearing implication of control strategies. In contrast, the Thompson/Ouchi framework ignores uncertainty.

In summary, the organizational and agency approaches are complementary. The organizational approach emphasizes (1) the importance of task characteristics, especially task programmability, to the choice of control strategy, and (2) the existence of "people" or social control as an alternative to control through performance evaluation. Agency theory adds to the organizational approach more explicit emphases on (1) information systems, (2) uncertainty, (3) costs, and (4) rewards.

In order to clarify these arguments, consider the vignette of the minicomputer manufacturer which begins this paper. The problem of the manufacturing vice-president is to design a control system for plant managers. From the organizational perspective, the choice of control system depends upon the plant manager's task. If that task is relatively programmed (e.g., a single, simple, and mature product is produced), behavior based control is appropriate. If the task is less programmed (e.g., a new product or production process is used, a complex production process is used, multiple products are manufactured) and plant output is readily measured by units shipped or some other simple measure, outcome based control is appropriate. Finally, if the task is less programmed and plant outputs are costly to measure (e.g., plant morale and product quality are important outputs in addition to units produced), then social control is appropriate. This is the organizational theory approach. Agency adds two ideals to it. One is information systems. Organizations can compensate for decreased task programmability and outcome measurability by increasing information systems (e.g., additional layers of management, improved accounting procedures, more frequent formal reports). The second idea is uncertainty. Uncertainty in technology (e.g., silicon chip manufacture, cancer medicine), or environment (e.g., muliple competitors, government policies) raises the costs of outcome control because of the risks to the plant managers posed by highly uncertain outcomes. Organizations can compensate for high outcome uncertainty by the improvement of information systems or by social control.

In summary, the integration of the organizational and agency approaches yields task programmability, information systems, and uncertainty as determinants of control strategy.

## 5. Hypotheses

In the prior portion of the paper, organizational and agency approaches to control are described, compared and integrated. In the next portion of the paper, we empirically examine our model in order to determine to what extent the model mirrors reality and which are the important variables.

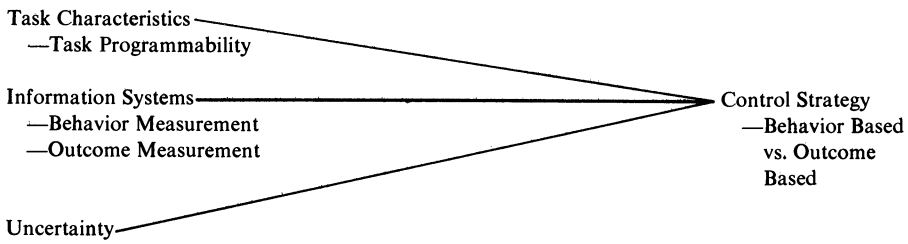


FIGURE 5. The Hypothesized Model for Relationships Between Control Variables for Design.

For simplicity, we focus on four principal hypotheses, which relate to the use of behavior vs. outcome control strategy. The major simplification is that we ignore the social control strategy by assuming that there are divergent preferences for the efforts of the workforce. The hypotheses are:

*H*1: *As task programmability increases, behavior based control is more likely.*

This hypothesis follows from the organizational arguments that task performance affects the costs of behavior measurement, and, thus, those of behavior based control. More programmability implies more complete information about the agent's behaviors. Less programmability implies incomplete information about the agent's behavior and results in higher behavior measurement cost.

*H*2: *As behavior measurement increases, behavior based control is more likely.*

This hypothesis is based on the agency argument that behavior measures (e.g., budgeting systems, quantitative measures) improve information about behaviors, and are an alternative to outcome control.

*H*3: *As the cost of outcome measurement increases, behavior based control is more likely.*

This hypothesis follows from the agency arguments that outcome measurement is a cost component of outcome based control.

*H*4: *As outcome uncertainty increases, behavior based control is more likely.*

This is based on the agency argument that additional reward for risk bearing is a cost component of outcome based control. The assumption that the employee is more risk averse than the organization underlies the direction of the hypothesis. Figure 5 summarizes the overall model which is examined in the empirical setting.

## 6. Organizational Sampling

The research sample consists of all 95 specialty stores in a suburban Bay Area shopping center. Speciality stores are operationally defined as those stores with less than 8,000 square feet of selling space. This restriction eliminates large, multi-department stores. The control practices for store salespersons are the specific focus. All stores in the sample were contacted via direct contact with the store manager. After two follow-up letters, usable responses were obtained from 54 stores.

The sample is attractive for several reasons. One is that it provides a relatively large number of comparable organizations which are conveniently located. Second, and more importantly, retailing closely resembles a competitive market and, therefore, provides a setting in which a normative, efficiency model such as ours should be descriptively accurate. Finally, since retail salespeople typically exhibit high turnover, have few promotions, and are not rigorously selected, social or "people" control is not very relevant.

The stores are small both in terms of physical size (mean selling space square footage = 2014), and number of employees (mean = 8.1). The typical store has one

store manager, and possibly one, two or three assistant managers. Twenty-five percent (25%) are private/family owned firms. The size of the store chain ranges from 1 local store to 948 nationwide stores. The salespeople are young (mean age = 25.3), and both male and female (mean % women = 40). Turnover is high. Part-time employment is common, and promotion is not. A range of merchandise is present, including women's and men's wear, cameras, toys, shoes, cheeses, and sporting goods.

## 7. Methods

The principal instrument is a questionnaire, The Survey of Retail Store Managers. It was completed by each store manager. The questionnaire was developed from interviews with store managers and salespeople at a neighboring shopping center, retail union business agents, and personnel managers from several Bay Area department stores. The questionnaire was pre-tested at a third shopping center for clarity and relevance.

The store manager was selected as the principal informant because that individual is both knowledgeable and accessible. Although store managers are generally knowledgeable, multiple methods and informants are used to provide more robust measures as appropriate. Secondary informant sampling was accomplished by a snowballing procedure in which the store manager designated two salespeople to be informants. There are 21 three-informant stores, 22 two-informant stores, and 11 single-informant stores.

## 8. Measures

The measures were developed from the preliminary interviews mentioned above. The measures are relatively objective and somewhat specific to retailing. Such a design strategy emphasizes measurement accuracy. The internal consistency of the measures for each construct is assessed by (1) a test for unidimensionality using a common factors model with oblique rotation and an eigenvalue $> 1$ cutoff, and (2) a standardized Cronbach reliability statistic (Bagozzi 1980). A multitrait-multimethod (MM) correlation matrix (Campbell and Fiske 1959, Bagozzi 1980) is used to determine convergent and discriminant validity. Convergent validity is judged by whether the correlations between measures of the same construct are significant, greater than zero, and "sufficiently large" (Campbell Fiske criterion 1) (Bagozzi 1980). Discriminant validity is judged by the number of correlations between measures of the same construct that are smaller than the correlations of those measures with the measures of other constructs. Finally, single measures for each construct were computed from the first factor score of a common factor model.

### 8.1. *Task Programmability*

The preliminary interviews were particularly important for the design of the programmability measures because they provided a good description of the sales job. The interviews revealed that the selling task was consistently the most time-consuming and important part of the sales job.

The measures of programmability focus on the amount of service in the selling process. Here service implies a less programmable job because service is a highly abstract and variable commodity which is difficult to monitor (e.g., Sasser, Olson and Wyckoff 1978). It may vary with the customer, product, salesperson, time of day, etc. The store manager and two salespeople were the informants.

The first measure is a set of commonly used categories of service offered to customers (Redinbaugh 1976). The categories differ in the amount of service usually provided by the store. Service increases with each category.

1. How would you describe the service which you offer to customers? Check *one*.
   _____Customer fills out warehouse requisition, check out only
   _____Check out only
   _____Check out only with limited sales assistance
   _____Check out only, but sales assistance readily available
   _____Customer is assisted continuously

Cronbach Alpha = 0.86 (21 3 informant stores)
= 0.88 (23 2 informant stores)
= 0.80 (44 2 or 3 informant stores)

The second measure is a set of commonly used categories of customer effort (Redinbaugh 1976). The categories are based upon the effort which the average customer spends in purchasing the product, and are reflective of the service demanded by store patrons. Service increases with each category.

2. How would you describe your merchandise? Check *one*.
   _____Customer buys product often and expends minimal effort
   _____Customer buys the product occasionally, has some brand and price sensitivity, may shop many stores
   _____Customer buys the product infrequently, and/or expends much effort to understand the features of the product and brand differences

Cronbach Alpha = 0.92 (21 3 informant stores)
= 0.90 (23 2 informant stores)
= 0.94 (44 2 or 3 informant stores)

The third measure is an estimate of the time which the salesperson spends with the typical customer who makes a purchase.

3. Approximately how much time is spent with the average customer who makes a purchase (minutes)?

Cronbach Alpha = 0.95 (21 3 informant stores)
= 0.89 (23 2 informant stores)
= 0.91 (44 2 or 3 informant stores)

The fourth measure is an estimate of the length of the training period. Less programmable jobs usually require more product knowledge, and more selling technique. Therefore, such jobs should have longer training periods.

4. How long would it take an average full-time salesperson to learn the basic duties of the sales job in your store? Circle *one*.

< 1 week  2 weeks  4 weeks  < 6 months  > 6 months

Cronbach Alpha = 0.88 (21 3 informant stores)
= 0.88 (23 2 informant stores)
= 0.94 (44 2 or 3 informant stores)

In order to overcome the problem of different numbers of informants per store, the informants' answers to the same question were averaged to produce four measures of programmability (i.e., service, product, selling time, training time) for each store. This is an acceptable procedure since the interrater reliabilities of each measure are well above the 0.6 rule of thumb (Nunnally 1967). The various empirical construct validity statistics for the four resulting programmability measures are:

—Internal consistency: Standardized Cronbach Alpha = 0.72,
—Convergent validity: Range of correlations = 0.33 – 0.54, significant at 0.05,
—Discriminant validity: # cross construct correlations > within construct correlations = 4 of 96.

### 8.2. *Behavior Measurement*

The preliminary interviews mentioned above were used to define the important measures of behavior. The interviews revealed that store managers evaluate salespeople by personal observation of their work. This is consistent with prior empirical research on the relationship between size and formalization of measures (e.g., Child 1972). It is not surprising since the stores are small, and personnel administration is a major part of the store manager's job. The interviews also revealed virtually no use of formal, quantitative behavior measures such as comparison to budgeted performance.

The behavior measurement construct is measured by the physical limitations on the observation of salespeople by management. The measures are (1) selling space square footage of the store, (2) total number of store employees, and (3) number of salespeople per store supervisor (i.e., managers and assistant managers).

—Internal consistency: Standardized Cronbach Alpha = 0.82,
—Convergent validity: Range of correlations = 0.49 − 0.65, significant at 0.01,
—Discriminant validity: # cross construct correlations > within construct correlations = 0 of 54.

### 8.3. *Outcome Uncertainty*

The preliminary interviews mentioned above revealed that store managers do not have a clear sense of the outcome uncertainty of their store. It was quickly apparent that store managers were not able to answer these questions in other than vague terms. Therefore, secondary source measures were sought.

There are three measures of outcome uncertainty. One is the number of competitors in the San Francisco SMSA by merchandise category. The second and third are the failure rates in 1975 and 1979 respectively by merchandise category. The competition measure captures a major source of uncertainty in industries like retailing with low barriers to entry (Porter 1980), and high flexibility in product/service niche (Thomas 1978). The two failure rate measures are more directly tied to the variance in the outcome distribution, and to the perceptions of risk within the industry (Redinbaugh 1976). In general, merchandise, which is not subject to rapid fashion changes (e.g., hardware) or which requires an expensive inventory (e.g., jewelry), is less uncertain. Women's apparel has the greatest uncertainty.

—Internal consistency: Standardized Cronbach Alpha = 0.82,
—Convergent validity: Range of correlation = 0.52 − 0.76, significant at 0.05,
—Discriminant validity: # cross construct correlations > within construct correlations = 0 of 54.

### 8.4. *Cost of Outcome Measurement*

As mentioned above, the preliminary interviews suggest that selling is the prime task, and that sales are the principal outcome of the efforts of the salespeople. Therefore, differences in the cost of outcome observation because of differences in the inherent measurability of the outcome are minimal in this setting. Rather, the cost of outcome observation depends upon the cost of the outcome measurement system. This cost is measured by (1) the number of stores in the store chain, and (2) a dichotomous ownership variable, private/family owned vs. public corporation. Both are size measures because, in this setting, outcome based control is commissions, which require extra administration, a particularly burdensome cost in small organizations. This reasoning was supported by our preliminary interviews at other shopping centers.

—Internal consistency: Standardized Cronbach Alpha = 0.75,
—Convergent validity: Range of correlations = 0.60, significant at 0.05,
—Discriminant validity: # cross construct correlations > within construct correlations = 0 of 20.

### 8.5. *Control*

Control is operationalized in terms of behavior based vs. outcome based reward structures. Short-term, monetary compensation is the key reward in this setting.

Promotion, perquisites, stock options and the like are not relevant. Therefore, reward categories are from the literature on monetary compensation (Sibson 1974). A dichotomous measure is used. Outcome based rewards are those pay plans in which at least a portion of the compensation is based upon outcomes, generally sales, for which the employee is personally responsible. Commission, commission against draw and salary plus commission are considered to be outcome based. In this sample, most of the outcome based plans are salary plus commission. The commission contribution is at least 30% of the total pay in all cases. Behavior based rewards are those pay plans in which pay is salary or hourly rate.

### 8.6. *Alternative Explanations*

The Talbert and Bose study (1978) of the compensation of retail salespeople is a good source of alternative explanations to our hypotheses. Talbert and Bose studied the determinants of pay level. They found that pay level is related to type of store (specialty vs. department), store location (city vs. suburbs), sex (men are paid more), and price of the merchandise ("big ticket" salespeople are paid more). Since both type and location are controlled by site selection in our research, only sex and price are considered.

The sex composition of each store's sales staff was measured by the fraction of all salespeople who are men. The price of the merchandise sold was obtained from the store manager's response to a survey question which asked the store manager to estimate the dollar sales amount of the typical purchase in the store.

## 9. Results

In review, task programmability, behavior measures, cost of outcome measurement, and outcome uncertainty are hypothesized to predict control strategy for retail salespeople. Salaried compensation indicates behavior control and commission compensation indicates outcome control. The major conclusion is that the theoretical model and especially task programmability accurately capture control practices in the research setting. Means, standard deviations, and correlations for the constructs are shown in Figure 6. In general, the correlations between independent variables are not significant. The exception is the positive correlation between cost of outcome measurement, and the use of behavior measures. That is, store chains, which are too small for commissions to be feasible from a cost standpoint, substitute greater management supervision of behavior. Thus, behavior measures and outcome based rewards substitute for one another as predicted by agency theorists. This is contrary to the argument that behavior and outcome controls are not substitutes (e.g., Ouchi and Maguire 1975).

The results for the alternative explanations of sex composition of the salesforce and merchandise price are shown in model 1 of Figure 7. Neither sex nor price of merchandise is a significant predictor of control ($F = 0.4$, not significant at 0.10 and $F = 1.8$ not significant at 0.10 respectively). Model 2, the hypothesized variables alone, is statistically significant ($R^2 = 0.49$, $F = 11.8$ significant at 0.01, $N = 54$). Model 3, which includes the alternative explanation and the hypothesized varibles, suggests that the alternative explanations add virtually no explanatory power ($R^2 = 0.49$, $F = 7.6$ significant at 0.01, $N = 54$). The $R^2$ result suggests that the theoretical model is relatively accurate. Another measure of the operational significance of the model is its ability to separate the commission stores from salary ones. The discriminant function resulting from the hypothesized variables classifies 83% of the stores correctly. This compares favorably with the baseline case of 61% for random assignment proportional to group size, and 57% for assignment of all stores to the larger group, behavior based reward (Figure 8).

| | Mean | Standard Deviation | Sex | Task Programmability | Behavior Measurement | Cost of Outcome Measurement | Outcome Uncertainty | Reward Form |
|---|---|---|---|---|---|---|---|---|
| Selling price ($) | 100.1 | 42.4 | 0.17 | − 0.41 | 0.08 | 0.09 | − 0.07 | − 0.20 |
| Sex (proportion male) | 0.6 | 0.3 | | − 0.21 | − 0.11 | 0.06 | − 0.15 | − 0.12 |
| Task programmability | 0.0 | 0.9 | | | − 0.23 | − 0.13 | 0.18 | 0.55 |
| Behavior measurment | 0.0 | 1.4 | | | | 0.33 | − 0.15 | 0.18 |
| Cost of outcome measurement | 0.0 | 0.9 | | | | | − 0.16 | 0.23 |
| Outcome uncertainty | 0.0 | 1.2 | | | | | | 0.23 |

FIGURE 6. Correlation Matrix ($N = 54$).

Regression Equations and Betas Predicting Reward Form

| | $R^2$ | $F$ | Selling Price | Sex | Job Programmability ($H1$) | Behavior Measurement ($H2$) | Cost of Outcome Measurement ($H3$) | Outcome Uncertainty ($H4$) |
|---|---|---|---|---|---|---|---|---|
| 1. Alternative explanations | 0.05 | 1.3 | −0.19 | − 0.09 | | | | |
| 2. Hypotheses | 0.49 | 11.8*** | | | 0.61*** | 0.27** | 0.25** | 0.20* |
| 3. Hypotheses & alternative explanations | 0.49 | 7.6*** | 0.02 | 0.06 | 0.63*** | 0.28** | 0.24** | 0.20* |

Reward Form = 0 if outcome based (commission)
= 1 if behavior based (salary)

*Significant at 0.10.
**Significant at 0.05.
***Significant at 0.01.

FIGURE 7. Discriminant Analysis ($N = 54$).

1. Hypothesized model

| | Actual | |
|---|---|---|
| Predicted | Behavior based | Outcome based |
| Behavior based | 27 | 3 |
| Outcome based | 6 | 18 |

Percentage correctly classified = 45/54 = 83%

2. Naive model 1—All cases assigned to larger group

| | Actual | |
|---|---|---|
| Predicted | Behavior based | Outcome based |
| Behavior based | 33 | 21 |
| Outcome based | 0 | 0 |

Percentage correctly classified = 33/54 = 61%

3. Naive model 2—Random assignment of cases to groups in proportion to group size

| | Actual | |
|---|---|---|
| Predicted | Behavior based | Outcome based |
| Behavior based | 20 | 10 |
| Outcome based | 13 | 11 |

Percentage correctly classified = 31/54 = 57%

FIGURE 8. Discriminant Analysis Classification Tables ($N = 54$).

All hypotheses are supported. Programmability ($H1$) is the single most important predictor ($F = 27.8$, significant at 0.01). That is, the nature of the selling task is the principal determinant of whether commissions or salaries are used. When more customer sales service is provided, outcome based control through commissions is more likely.

Behavior measures ($H2$) and cost of outcome measures ($H3$) are also significant predictors ($F = 6.1$, significant at 0.05, and $F = 4.7$, significant at 0.05 respectively). That is, stores in which employees are supervised more, and smaller stores, for which administration of commissions is expensive, are more likely to use salaries. Outcome uncertainty ($H4$) is the least important predictor ($F = 3.6$, significant at 0.10). Thus, the risk bearing problems associated with commission compensation in more competitive and failure prone types of retailing are modest.

## 10. Discussion

The results suggest that the combined organizational and economic perspective yields a more complete view of control than either alone in the specialty retail setting. The results are particularly strong with regard to explained variance (49%) and percentage of the stores correctly classified into commission or salary (83%). The results are particularly convincing because of the use of multiple methods, multiple informants, and tests for internal consistency, convergent validity and discriminant validity, all of which point to a more rigorous study than is typical. The results also imply that task characteristics, as suggested by organizational researchers, contribute relatively more explanatory power than do measurement system characteristics, as suggested by agency theorists. However, other settings, in which a broader range of measures (e.g., formal, quantitative measures such as budgeting) are respresented, might exhibit more powerful measurement system characteristics. Finally, the results imply that the information economics of performance measurement, as measured by

task and measurement system characteristics, are relatively more important than the economics of risk bearing as measured by outcome uncertainty. In summary, the results support the hypothesized linkages among the concrete control variables of task characteristics, information systems, and reward structures in the context of uncertainty. We turn now to some implications of the research.

Despite the obvious problems of generalizing from a single study in a narrow setting, several tentative implications emerge. One implication is that the humanist/attributionist argument that salient extrinsic reward diminishes intrinsic motivation (e.g., Deci 1972) should be used cautiously outside of the experimental laboratory.

Our research results are that specialty retailers use policies which are contrary to humanist-attributionist prescriptions. That is, sales jobs, which are more intrinsically interesting because they are less programmed, are precisely those jobs for which commissions, a salient extrinsic reward, are used. Such over-justification appears to be a viable policy in specialty retailing.

The key point is that humanists/attributionists see motivation as a problem of boredom in simple jobs. However, when a dull job is made more interesting, motivation problems do not disappear. Rather, they change to problems of performance evaluation under uncertainty as suggested by control theorists. Thus, the motivation of salesmen, engineers, and university professors is not a problem of job boredom, but rather one of direction and evaluation under uncertainty as suggested by control theories. In these contexts, organizational managers use over-justification, despite some possible loss of intrinsic motivation, in order to achieve more overall effort.

A second implication of the research results is that responsibility need not match controllability. Such a mismatch violates the popular notion that responsibility and controllability should be matched (e.g., Gulick and Urwick 1937, Lawler and Rhode 1976, Koontz and O'Donnell 1968).

Our research results suggest that some viable specialty retailers violate this adage. Their salespeople are evaluated and rewarded through sales commissions even though they typically do not select store merchandise, do not price that merchandise, do not select advertising, and certainly cannot alter the overall economy which affects consumer buying. Thus, some viable specialty retailers mismatch controllability and responsibility, despite the probable drawbacks of dissatisfaction and turnover, as suggested by organizational research (e.g., Dornbusch and Scott 1974), for greater motivation.

## 11. Conclusion: Towards a Broader Framework of Control Strategies

A major underlying argument of this paper is that control is an important aspect of organizational design. The approach has been to combine the organizational approach to control with that of agency theory, a major theoretical statement on control in the economics/accounting literature, and to examine the integrated theory in a field setting. A more comprehensive framework for understanding organizational design from a control perspective emerges from the research.

One strategy is to design a very simple, routine job such that behaviors are easily observed, and to reward based upon behaviors. Behavior based control is accomplished through job design. A second strategy is to design a more complex, interesting job. Then the organization can invest in information systems (e.g., budgeting systems or layers of management) in order to gain knowledge about behaviors, and to reward based upon these behaviors. Behavior based control is accomplished through information systems. In the limit, this strategy encourages the generation of a huge quantity of measures. However, behavior could be evaluated in even the most difficult jobs to observe. A third alternative is to design the more complex, interesting job, but use a much simpler evaluation scheme (e.g., profitability, revenues), and to reward based

upon the results of the evaluation. This relies on a much simpler evaluation scheme, and a flexible job content. Higher, but riskier rewards are substituted for measures, and precise job design. The disadvantage is that now the employee bears more risk than in the other alternatives. The third option, outcome based control, is used because of its motivation effects when behaviors are difficult to observe, and in spite of its risk sharing problems. Finally, a fourth option is available to organizations. That alternative is to employ people whose preferences coincide with those of management. In contrast to the first three options which emphasize the performance evaluation side of control, this option emphasizes people policies such as selection, training and socialization. It is particularly attractive when any kind of measurement is costly (e.g., R&D, professional services). However, its disadvantage is lengthy implementation time. Finally, the choice among these options depends upon task programmability, information systems, and uncertainty. These are the basic building blocks for organizational design through control.[1]

## References


ANTHONY, ROBERT AND JOHN DEARDEN, *Management Control Systems*, Richard D. Irwin, Homewood, Ill., 1980.

BAGOZZI, RICHARD, *Causal Models*, Wiley, New York, 1980.

CAMPBELL, D. AND D. FISKE, "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix," *Psychological Bull.*, 56 (1959), 81–105.

CHILD, JOHN, "Organizational Structure, Environment, and Performance: The Role of Strategic Choice," *Sociology*, 6 (1972), 2–22.

DECI, EDWARD, "The Effects of Contingent and Non-Contingent Rewards on Intrinsic Motivation," *Organizational Behavior and Human Performance*, 8 (1972), 217–229.

DEMSKI, JOEL, "Class Notes on Managerial Incentives," Graduate School of Business, Stanford University, Stanford, Cal., 1978.

——— AND GERALD FELTHAM, "Economic Incentives in Budgetary Control Systems," *Accounting Rev.*, 53 (1978), 336–359.

DORNBUSCH, SANFORD AND W. RICHARD SCOTT, *Evaluation and the Exercise of Authority*, Jossey-Boss, San Francisco, 1974.

EDSTROM, ANDERS AND JAY GALBRAITH, "Transfer of Managers as a Coordination and Control Strategy in Multinational Organizations," *Admin. Sci. Quart.*, 22 (June 1977), 248–263.

GALBRAITH, JAY, *Designing Complex Organizations*, McGraw-Hill, New York, 1977.

GULICK, L. AND L. URWICK, (EDS.), *Papers on the Science of Administration*, Institute of Public Administration, New York, 1937.

HARRIS, MICHAEL AND ARTHUR RAVIV, "Some Results on Incentive Contracts with Applications to Education and Employment, Health Insurance, and Law Enforcement," *Amer. Econom. Rev.*, 68 (1978), 20–30.

HOLMSTROM, BENGT, "Moral Hazard and Observability," *Bell J. Econom.*, 10 (1979), 74–91.

———, "Moral Hazard in Teams," *Bell J. Econom.*, 13 (1982), 324–340.

JENNERGREN, L. PETER, "On the Design of Incentives in Business Firms—A Survey of Some Research," *Management Sci.*, 26 (February 1980), 180–201.

JENSEN, M. C. AND W. H. MECKLING, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *J. Financial Econom.*, 3 (1976), 305–360.

KAHNEMAN, DANIEL AND AMOS TVERSKY, "Prospect Theory: An Analysis of Decisions Under Risk," *Econometrica*, 47 (March 1979), 263–291.

KOONTZ, HAROLD AND CYRIL O'DONNELL, *Principles of Management*, McGraw-Hill, New York, 1968.

LAMBERT, RICHARD, "Managerial Incentives in Multiperiod Agency Relationships," Ph.D. Thesis, Stanford University, Stanford, Cal., 1981.

LANGER, ELLEN J., "The Illusion of Control." *J Personality and Social Psychology*, 32 (1975), 311–328.


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LAWLER, EDWARD AND JOHN RHODE, *Information and Control in Organizations*, Goodyear, Pacific Palisades, Cal., 1976.

MASLOW, ABRAHAM, "A Theory of Human Motivation," *Psychological Rev.*, (1943).

NUNNALLY, J., *Psychometric Theory*, McGraw-Hill, New York, 1967.

OUCHI, WILLIAM, "A Conceptual Framework for the Design of Organization Control Mechanisms," *Management Sci.*, 25 (September 1979), 833–848.

——— AND MARYANN MAGUIRE, "Organizational Control: Two Functions," *Admin. Sci. Quart.*, 20 (December 1975), 559–569.

PORTER, MICHAEL, *Competitive Strategy Techniques for Analyzing Industries and Competitors*, Free Press, New York, 1980.

REDINBAUGH, LAWRENCE, *Retailing Management*, McGraw-Hill, New York, 1976.

ROSS, S., "The Economic Theory of Agency: The Principal's Problem," *Amer. Econom. Rev.*, 63 (1973), 134–139.

SASSER, EARL, R. PAUL OLSON AND D. DARYL WYCKOFF, *Management of Service Operations*, Allyn and Bacon, Boston, 1978.

SIBSON, RICHARD, *Compensation*, McGraw-Hill, New York, 1974.

TALBERT, J. AND C. BOSE, "Wage Attainment Processes: The Retail Clerk Case," *Amer. J. Sociology*, 83 (1978), 403–421.

THOMAS, DANIEL, "Strategy is Different in Service Businesses," *Harvard Business Rev.*, 56 (July-August 1978), 158–165.

THOMPSON, J. D., *Organizations in Action*, McGraw-Hill, New York, 1967.

WILLIAMSON, OLIVER E., *Markets and Hierarchies*, Free Press, New York, 1975.

WILSON, ROBERT, "On the Theory of Syndicates," *Econometrica*, 36 (March 1968), 119–132.