

Designs for organizational control

External dependencies and relationships influence organizations in important ways. For example, relationships with the environment may make it impossible to improve effectiveness when control initiatives are limited to internally generated efforts (Kimberly and Nielsen, 1975). In addition, subunits that satisfy external demands may expand whereas other subunits may shrivel (Salancik and Pfeffer, 1974). Even though these external dependencies limit and influence organizations, they do not completely control them.

Many studies on organizational control have de-emphasized possible environmental effects (Gigliani and Bedeian, 1974). Instead, they have adopted an instrumental perspective that is centered within an organization and emphasizes how control processes may facilitate goal accomplishment (Georgiou, 1973; Silverman, 1970). For example, Bellman (1964) proposed that control should help organizations operate in more desirable, reliable, convenient, and economical ways. Anthony (1965) defined control as the process whereby resources are obtained and used effectively and efficiently for goal accomplishment. Arrow (1964) assumed that organizations have objective functions, and he suggested that control occurs as operating rules for organizational members are specified and enforcement rules are chosen to ensure adherence to operating rules. Lowe and McInnes (1971) stated that control should ensure that organizations survive according to stipulated criteria.

Tannenbaum (1968) and his colleagues argued that personal-influence processes and hierarchical structures may play important parts in controlling organizations. He suggested that control is exercised whenever people intentionally attempt to influence behavior. He proposed that opportunities to exercise control vary according to hierarchical level. His initial studies in the United States demonstrate that those higher in organizational hierarchies perceive that they have more influence. Subsequent international comparisons emphasize that the influence which people perceive varies not only across hierarchical levels but also across countries (Tannenbaum *et al.*, 1974). These international comparisons suggest that the way influence is distributed may reflect local political ideologies outside the organization rather than internally determined needs (Meyer and Rowan, 1977).

In contrast to Tannenbaum's interest in the influence

of people, Lawler (1976) focused on how an artificial control system produces behavioral results. He suggested that the elements of a thermostatic system define the mechanistic functions that are necessarily present in a control system (Eilon, 1966). Lawler (1976) then explored how these various functions may encourage undesirable behavior, such as rigidity, data falsification, and resistance to control. He also discussed the many problems that result when rewards are tied directly to performance measures (Argyris, 1952).

Control is effective when desired behavioral sequences are certain to occur and organizations are certain to achieve desired states (Katz and Kahn, 1966). March and Simon (1958) provided a starting point for synthesizing how this might be achieved. They argued that organizational control depends partly on internal procedures and practices and partly on ongoing external events. People choose to notice and respond to some cues and to ignore others. When appropriate standardized-response routines are available, people may respond automatically. Alternatively, when standardized-response routines are not available, responses may be more discretionary. Control occurs to the extent that consistent responses are evoked by the same cues.

Organizations are made up from subunits; what occurs within subunits is controlled by subunits' members (Barnard, 1938). Control over subunits depends on the interrelationships between subunits. These connections may be tight or loose, flexible or fixed, open or closed, or nonexistent; they may be determined by subunit members or by developments in the external environment. Control both within and over subunits maybe by design. Designs for control are never complete. Partial designs for control over subunits include rules for channeling work, information, and resource flows.

People within subunits determine how standardized procedures and solution-generating routines are brought together to form an ongoing process of organizational control. Ongoing control within subunits depends primarily on people's capacities to respond to short-term changes. Ongoing control over subunits is a longer-term problem which depends primarily on people's capacities (a) to reflect on and understand relations between subunits and with environments and (b) to make appropriate adjustments to ensure that the organization develops in desirable directions.

The general viewpoint presented in the chapter is that

designs for control involve establishing fixed rules, routines, and procedures for defining a control domain. The rules determine what can occur; the routines and procedures determine how things get done (Simon, 1957). The rules dominate other influential sources; as they relate to one another and are changed, they guide organizational evolution over time. People influence control by setting and changing rules and by constructing sequences of previously programmed routines and standardized procedures in ways which are appropriate to ongoing experience. Organizations then achieve the goals implicit in their rules, their routines, and their procedures (Katz and Kahn, 1966; Maruyama, 1963).

When implementing control designs, controllers should respond to external events, but they should not be overwhelmed by them. To achieve this balance, they should immerse themselves in any ongoing experience during the implementation phase. They should not reflect on whether the existing rules are appropriate or their available repertoire of procedures and routines is adequate (Mintzberg, 1973). Rather, they should simply select from their available repertoire according to current reality demands and then act accordingly (March and Simon, 1958). The implementation phase characterized by a lack of reflection is complemented by the reflective design phase, in which the appropriateness of existing rules and the adequacy of procedures and routines should be assessed. Together, these two complementary processes of design and implementation define a cycle which generates and regenerates designs for controlled organizational action.

Control designing for organizations is analogous to being conscious as a person. Without consciousness, people's actions are as likely to be determined by others as by themselves. They do not control their own actions, and they do not know that they are not controlling them (Torbert, 1972). Similarly, when organizations cannot respond selectively to ongoing events, and when they lack pre-designed rules, routines, and procedures with which to respond, they can have no control. Instead, organizations are buffeted this way and that by many randomly encountered environmental forces (Cohen *et al.*, 1972).

The following section examines the control games played in organizations. Later sections explore the roles that human cognition, information, and feedback play in control processes and describe control within and over subunits in more detail. A concluding section examines the implications for designing organizational control systems.

Control games

The game of budget control

Hofstede (1967) stated that a game spirit is the crucial element distinguishing successful from unsuccessful applications of budget-control techniques. He believed that superiors' attitudes are decisive in determining whether control in organizations actually develops as a game. He suggested that if superiors can establish a trusting relationship with subordinates and provide protection from undue pressures, then the free scope needed for game development will have been created. Whether a control game actually occurs depends on whether the rules are understood and accepted, and on whether individual managers are interested in playing.

Seeking to assess what behaviors are involved in a budget-control game in practice, Swieringa and Moncur (1972) administered a questionnaire to international-bank managers. Using a factor analysis, they identified four distinct budget-oriented behaviors. Table 1 classifies the four factors by distinguishing between participants' situational interpretations as opposed to where they focus attention within situations, and between an unrestricted time perspective and one where attention is restricted to a single stream of ongoing events.

Factor A includes high weightings on variables concerned with the extent to which budgets are used to evaluate performance and the extent to which managers participate in determining these budgets. Budgeting goals are usually only temporarily fixed. Periodically, they are declared indeterminate. At these times, new goal levels and possibly new rules for budgeting must be established in a renegotiation process. Until these new

Table 1 Alternative budget-oriented control behaviors

	Time perspective	
	Restricted to ongoing events	Unrestricted
Attention within control situation	Factor B: Managers are unconcerned about budgets and concentrate on ongoing events.	Factor D: Managers' attention is distracted away from ongoing events by budget-related requirements.
Interpretation of control situation	Factor A: Having participated in the budget-setting process, managers understand budget controls and performance evaluations based on budgets.	Factor C: Managers analyze causes of budget variances.

goals are fixed and also accepted, there will be uncertainty about the budget situation. People will focus attention on this uncertainty and its possible meaning rather than attending to ongoing events.

Uncertainty may be reduced by allowing people to participate in—and hence have more influence over—the rule-making and goal-setting processes (Tannenbaum, 1968). Indeed, in Hofstede's (1967: 10) budgeting study, more influence meant participating in determining (a) the general rules and policies, (b) the specific rules which defined personal roles, or (c) the formal sanctions used to ensure rule conformity. As managers participate more in the budget-setting process, they regard budget constraints and goals as more relevant; indeed, Hofstede found no manager who regarded budgets as irrelevant. Searfoss and Monczka (1973) found that more participation by subordinates is positively associated with more goal-directed and evaluative efforts by superiors. They also found that more budget evaluation and participation are associated with less job ambiguity and with more confidence in, and satisfaction with, the organization.

Management-by-objectives programs (MBO), though broader than budget controls, also aim to formulate clear, concise goals for organizational subunits by allowing subunit members to participate in the goal-setting process and by providing feedback on goal accomplishment (Drucker, 1954). Managers report that MBO programs succeed in clarifying what is expected and in increasing their awareness of overall corporate goals. This awareness increases with more frequent feedback (Carroll and Tosi, 1973).

As MBO programs aim simply to clarify organizational rules and expectations, permanent performance improvements would not be expected. But because, on balance, goal levels tend to be increased rather than decreased (Raia, 1965), short-term performance improvements have been documented. These have usually been temporary and have usually tapered off relatively quickly (Ivancevich, 1974, 1977; Milani, 1975; Raia, 1966). Often, MBO programs result in no performance improvement even in the short term (Carroll and Tosi, 1973; Ivancevich, 1972). On the other hand, if the new goals that are set are more difficult than previous ones, and if they are also accepted, then higher performance may be expected (Latham and Yukl, 1975; Locke, 1968).

Tosi *et al.* (1976) compared various possibilities for explaining how MBO programs may impact organizations. They concluded that, in general, MBO programs function to bring about more uniformity concerning situational interpretations. In particular, they suggested that over time, shared perceptions increase with regard to superior-subordinate relations, goal relevance and clarity, performance-reward associations, and job satisfaction.

Factor B in Table 1 has high weighting on variables indicating that managers are essentially unconcerned about budgets. In commenting on this factor, Birnberg (1972) thought it could indicate people who do not care. However, managers in Hofstede's (1967) study, who also did not think budgets were particularly relevant, pointed out that they were much more concerned about their ongoing work. Budget unconcern and its consequences have not been extensively investigated; Swieringa and Moncur (1972) found that it is positively associated with job satisfaction.

Factor C includes high weightings on variables indicating managers' attempts to understand the reasons for budget variances. The weightings suggest that superiors do not play a very active role in this analysis. Rather, it is subordinate managers who are required to explain budget variances; superiors take these variances into account when allocating rewards. Less experienced managers and those spending more time with home-office personnel are most concerned with this type of analysis (Swieringa and Moncur, 1972). Hofstede (1967) found that budget variances are most often explained by standards that are perceived to be too tight or too loose. This suggests that analyses are often not very sophisticated, focusing on a few simple relationships as understood by subordinates within the situation, rather than on multiple relationships characterizing the wider environment that could be brought into consideration by supervisors with broader understandings of organizational operations.

Factor D has high weightings on variables indicating that managers may be required to reflect on budget matters even as they believe it is more important to be focusing on ongoing events. These disturbance variables include meetings to discuss the meaning and importance of budgets, excessive paperwork, stoppages in ongoing activity because funds are exhausted, budget changes which ignore ongoing activity, superiors expressing satisfaction when operations come out as budgeted, superiors providing positional support during meetings on budget matters, and superiors bringing managers together to deliver pep talks about budget requirements. Swieringa and Moncur found that such disturbances arise most often for managers who spend less time with home-office personnel.

Swieringa and Moncur concluded their study with a canonical correlation analysis which showed that managerial experience and satisfaction are generally positively associated with budget-oriented behaviors and interpretations characterized by a restricted focus on ongoing events (Mintzberg, 1973); experience and satisfaction are unrelated to behaviors and interpretations characterized by an unrestricted time perspective—factors C and D in Figure 1. Yet design activity would be expected to be most effective when the time perspective

is unrestricted. Swieringa and Moncur's study suggests that, in practice, the behaviors and interpretations reflecting an unrestricted time perspective may differ markedly from those that are ideally suitable for effective control. For example, the factor analysis suggests that designs for control prepared and understood by both superiors and subordinates may not occur; instead, superiors see it as subordinates' responsibility to explain budget variances and to take what corrective action is necessary. In addition, superiors intervene in disturbing ways that are aimed at making adjustments and corrections, but which in fact take subordinate managers' attention away from ongoing events. Such behaviors by superiors reduce organizational control (Todd, 1977, 1978).

Games of budget control include all the interpretations and behavior listed in Figure 1. If, in practice, budget-related interpretations and behaviors are something less than ideal for control purposes, it is important to find out the extent people within organizations discriminate between their behaviors. One indication would be whether people prefer to be involved with budget-related behaviors and interpretations that facilitate control but prefer not to be involved with those that are ineffective for control. Hofstede (1967) found that a positive attitude toward budget control is associated with participation in budget setting and also with moderately tight budgets which provide a challenge—with associated expectations of performance improvement (Collins, 1978; Dunbar, 1971; Stedry, 1960). He found that this positive attitude is also positively associated with perceptions of frequent and useful budget meetings, and with frequent discussions with superiors about budget figures. This suggests that a positive preference for working with budgets may generalize indiscriminately to a positive attitude towards all budget-oriented behaviors. Managers with a positive attitude may prefer to be involved in distractions which take attention away from ongoing events, as well as in other behaviors which contribute positively to the control process. Therefore, a positive preference for working with budgets may not necessarily be associated with more control.

In order to exercise control effectively, people need some free scope to respond to ongoing events (Hofstede, 1967; Marrow *et al.*, 1967). Frequent evaluations (Hopwood, 1972, 1973), uncertainties about rules and goals, and repeated interventions from superiors—even well intentioned ones—all distract and disturb. For example, De Coster and Fertakis (1968) found that both initiatives and supportive behaviors by superiors are associated with budget-induced pressure. When people do not have enough free scope, they embark on subversive games designed to confound and nullify control.

Subversive control games

As even supportive and considerate superior behavior may encroach upon the free scope that subordinates need to concentrate and deal with ongoing events, it is easy for control difficulties to develop in hierarchical authority relationships. On the one hand, superiors wish to believe that their hierarchical statuses based on formalized knowledge are being honored. On the other hand subordinates know that this knowledge is often irrelevant for solving problems arising from ongoing events. At the same time, interventions from authority figures should be obeyed. Subordinates are in a double bind and find that a behavioral cycle encouraging deception has been set in motion (Bateson, 1972; Wagner, 1978). The more superiors issue commands based on formal rationalizations, the more ritualistic and less relevant are these interventions to ongoing events. There is less real reason to accept their authority, and there is also less free scope for the subordinates to concentrate on ongoing events if these commands are accepted. Instead, and to maintain their freedom of action, subordinates may decide to behave ritualistically and to feign deference just as the superiors have feigned knowledge about ongoing events (Laurent, 1978). A new game has been defined. Superiors and subordinates are playing against each other, and each can score as each is better able to deceive the other (Vandivier, 1972; Whetten, 1978).

Subversive control games occur at all hierarchical levels. They are time-consuming, energy-absorbing, stressful, and exciting. At lower levels, there are few illusions among superiors or subordinates as to what is going on, because task performance and evaluation are relatively simple and objective. At higher levels, task performance and evaluation are more complex and subjective. Maintaining appearances becomes more important as the scope of subversive playing increases (Kanter, 1977).

Analogous to bribing, hierarchical controls generally involve financial incentives. These tend to clarify the scoring process for the antagonists. Superiors may act as though their subordinates care only about financial incentives. But in a plant where piece-rate incentives were used extensively, Roy (1952) found that although workers constantly talked about money, this was not because they were greatly interested in earnings. Most chose not to maximize their incomes. Rather, for workers, the piece-rate incentive system symbolized their superiors' ultimate incompetence. Workers constantly sought methods to counteract their superiors' persistent attempts to control tightly through manipulating the piece rates. Most often they succeeded. The result was loose control which allowed workers wide discretion to organize their work as situations demanded and also to

earn money if they wished. Roy noted that as workers were able to increase their discretion, they became more interested in their work and more productive. This increased productivity was associated with increased hostility towards superiors and a growing antagonism towards the company. On the other hand, when superiors overtly allow workers more discretion, job interest and productivity can increase without evoking hostility, because superiors are no longer putting subordinates in the double-bind position that encourages them to play a subversive game (Starbuck *et al.*, 1978; Whyte, 1955).

Similar subversive games occur within middle management. Superiors prepare work schedules, plans, and budgets, and demand that their subordinates conform to them; subordinates manipulate their superiors' expectations to obtain discretion. For example, Clegg (1975) described the tactics employed in dealing with superiors by a project director on a construction site. Building plans and other contractual documents are supposed to be unequivocal, tight controls which set out exactly what must be done, what materials must be used, and what everything must cost. They are binding on both the builder and the future owners, and their efficient realization is supposed to be a primary goal towards which a project director works. In fact, although there is little room for negotiation over material and equipment costs, a Bill of Works setting out what must be done can be made quite equivocal. A project director seeks to manipulate this equivocality by obtaining clarifications in ways that increase discretion. Legal definitions are shown to be approximate designs at best, and the project director gains the ability to respond appropriately to the project's particular conditions.

How is this done? Clegg reported that top managers believe that a building project develops steadily and consistently. Rationalizing from this belief, top managers define a situation as being controlled when profit is accumulating steadily over time. To assure themselves that all is developing as it should, top managers require project directors to prepare weekly progress reports, setting out the work that has been done and what it has cost. As they know the selling price, top managers reason that they can calculate whether a profit is being achieved.

When preparing reports, a project director takes top managers' naive beliefs and control definitions into account; they fill out the forms in a way that indicates all is progressing according to expectations and an appropriate profit is being made. What is actually happening on a construction site may have little to do with what is stated in the reports. The real events cannot be reported if they contradict top managers' rationalized definitions for project control. A project manager believes that it is necessary to conform ritualistically to top managers'

definitional control in order to be judged competent to direct future building projects.

During a project, matters arise or are made to arise, which require clarifications or new construction methods, and hence new understandings between the owners and the builders. A project manager utilizes these clarifications either to increase the price to the owners or to change the completion dates, depending on the adjustments needed to make real progress match reported progress. The builders generally achieve profits.

At top hierarchical levels, maintaining control appearance becomes very important. Presidents and boards of directors are often treated as demigods, and flattering evidence confirming past successes is deemed to be an extremely acceptable communication from obedient subordinates. Pahl and Winkler (1974) examined the relationships between managers and directors in nineteen British industrial corporations varying widely in size. They emphasized that although directors allocate resources, it is the managers who not only control operations but also control the information on which allocation decisions are based. By manipulating this information, the managers can prevent the theoretically more powerful directors from controlling resource allocations (Pettigrew, 1973; Wilensky, 1967).

Pahl and Winkler (1974) identified numerous operating rules which managers use to assure directors that everything is in order and flowing smoothly. For example, they never surprise directors with new information or plans in public. Nor do they put an item on directors' agendas unless a decision has already been reached. Particularly in large companies, the directors themselves report that they are so busy dealing with crises and attending ceremonies that they have little time to think; this makes them easy pickings. Managers measure their successes by their ability to maintain only the loosest contact with the directors while obtaining the resources they want when they want them. Managers give only generalized cost estimates, and they promise only barely acceptable results when they apply for resources. They seek discretion to operate without additional constraints or performance targets. They make intensive preparations for the directors' allocation meetings: the aim is to make sure that information supporting their proposals is abundant and that any discordant information has been eliminated. Such preparations foster a sense that order is being maintained, and so satisfy the directors' needs to confirm both their high statuses and their belief that they exercise control.

It is remarkable that hierarchical superiors—who possess experience in organizations, who are smart, and who value realism—are so easily deceived by illusions of control and that they encourage control games. Such games are expensive in time, in energy, and in hostility,

but it may be that competitive people either enjoy playing them or do not know how not to play them (Argyris, 1974). Furthermore, managerial tendencies to reject information which questions their rationalized definitions suggest they would rather have the illusion of total control than strong influence on the reality of an ongoing shared-control process (Janis, 1972). Hofstede (1978) concluded that as superiors emphasize static form, and ignore the active content in communications from subordinates (Cyert *et al.*, 1961), the best they can achieve is a control illusion (Boulding, 1968).

Cognition, information, and feedback

People create, implement, and modify the rules and relations that ultimately control organizations. This section discusses how people learn and think about their roles within organizations, and how their thinking may be modified in response to new information and feedback.

Cognitive norms and appropriate behavior

Dreeben (1968) suggested that formal schooling processes teach people to detach themselves from ongoing events and to develop their capacity to reflect on their experience. People learn to distinguish between particular situations and their places and functions within them. They learn that there are norms that should govern their conduct within particular situations. Further, within these situations, they learn that it is possible to mediate the relationship between their feelings, their thoughts, and their actions. Such learning helps people to understand, and to participate effectively in, organizations.

Dreeben identified some norms that relate to specific situations and which determine appropriate behavior. For example, people are taught that in some situations it is legitimate to require that tasks should be done alone. They learn that in such cases they should accept personal responsibility for interpreting the situation and that they are accountable for how they perform. People are also taught that it is legitimate to use standards of excellence to evaluate performance. They learn that they should perform as best they can and actively demonstrate their ability to achieve. People are taught further that it is legitimate to categorize people who are in the same situations and who face the same ongoing problems as members of a single class. Within this class, people learn that fairness is based on universalistic criteria rather than special privilege. Finally, people are taught that in task-oriented contexts, it is legitimate to limit evaluations to discrete actions that contribute to performance. They learn that rewards are given for performance contributions rather than for developing a more balanced individual identity.

People use those norms to guide their behavior in organizations. Specifically, given contextual cues, they assess which norms may be relevant and how the variables that they could manipulate might relate to one another and to organizational performance. For example, Yates and Kulick (1977) found that naive people generally believe there should be strong, positive relationships between more effort and more performance success. Practical experience modifies this naive view. As task complexity increases, the need for additional knowledge is recognized. One possibility is that more complex understanding may develop as new experiences and information are sequentially evaluated (Schum, 1977). More experience may also lead to improved performance (Barclay *et al.*, 1971), as may information about how environmental variables relate to one another (Cammalleri *et al.*, 1973; Nystedt and Magnusson, 1973).

On the other hand, more experience may have just the opposite effects. People may become convinced that reflective understanding is just not relevant for their organizational roles. For example, Van Maanen (1973) described how police recruits expect that hard work on their part will lead to desirable performance and success. But the training provided by the police academy is dull and routinized, emphasizing obedience to departmental rules, rigorous physical training, and ritualistic details. Because teachers at the academy believe that little specialized knowledge is available to help police officers exercise control, they do not encourage recruits to look for such knowledge. During their probationary period, recruits' expectations that hard work leads to success decline consistently. Instead, new values are learned which require no reflective thought. These include commitment, loyalty, and dedication to the police organization, unquestioned obedience to authority figures, strict adherence to rules, and a general desire to stay low and to avoid trouble.

Following classroom training, recruits are introduced to real police work in the field. They are assigned to an experienced officer who demonstrates and explains police routines along with what is appropriate and expected patrol behavior. Out in the field, all officers face the same problems and the emphasis is always on learning the same established routines for responding to ongoing events. Recruits are evaluated on whether they respond to ongoing events with a willingness to take risks in order to protect their partners. Van Maanen (1975) found that after field training, those recruits who were still motivated according to reflective rationalizations received the lowest job-performance ratings.

More generally, it seems that some organizational contexts provide cues which suggest that the ability to respond appropriately to ongoing events is most important whereas others provide cues that emphasize the

need for reflective thought. Organizational control systems require both behaviors. People expect to find interpretable cues from which they can determine what their roles in their particular situations should be and what roles others should play (Simon; 1957). People may choose continually to reinterpret ongoing events in order to confirm the context and in order to make any needed adjustments in their behavior. As the roles they are to play are more exactly defined, so they may be played more effectively, but they may also be more difficult to change.

Interpreting information

People actively interpret information and infer different meanings depending on which situational contexts, relations, and processes they believe are implied. Perceptions are never objective, and meanings that are attributed are always potentially uncertain even though ongoing events may be definite, and information about them may be specific and detailed (Hammond and Brehmer, 1973). This is because meaning is actively attributed based on critical processes that match patterns in incoming information with stored patterns that people have memorized from earlier experiences (Deutsch, 1963). For example, this critical process may be directed towards interpreting and classifying the situational context. People compare incoming cues with possible contextual keys which they have been taught are important for defining situations and appropriate behaviors. The information available may be either precise or inexact, but the judgments made are invariably simple and unequivocal. People identify not only a context and a set of contextually compatible behaviors but also, implicitly, a set of excluded behaviors which are contextually incompatible.

For example, Milgram (1974) described cues which convince people that they are in an authoritarian context which requires obedient behavior. People have learned that authority relationships are common within organizations. When, in addition, they notice official notices, uniformed personnel, and organizational members who behave calmly as though they expect obedience, and there are no additional anomalous factors, people may decide they are indeed in an authoritarian context (Metz, 1978). Then, automatically from previous learning, they may believe that to behave appropriately, they should repress their independent assessments and judgments, and respond to any ongoing events as they are told by the person in authority. Similarly, superiors need say little but can still give subtle cues to subordinates that are clearly understood to mean that deferential behavior confirming superiors' actions is appropriate and expected (Halberstam, 1972).

In a similar way, equally innocuous cues may be inter-

preted as indicating that people can control a particular situation. For example, Langer (1975) found that as a context involving task performance is interpreted as being familiar, or as requiring skill, or as involving competition, people believe that they can control it. When people wish to achieve specific and specified goals, and when they spend longer thinking about these goals, they perceive they can control their success. As more successes have been registered in the past, people come to believe that they control the processes which produce those successes (Harvey and Harris, 1975; Jenkins and Ward, 1965; Langer and Roth, 1975; Miller, 1976).

In deciding whether or not situations are controllable, people are generally insensitive to real causal relations. They do not distinguish between events where success depends on controllable relations and skill, as opposed to those where success depends on uncontrollable relations that are chance-determined (Jenkins and Ward, 1965; Schwed, 1955; Skinner, 1971). Langer (1975) concluded that if contextual cues are interpreted as indicating that control is possible, people prefer to believe they are indeed able to exercise control (Perlmutter and Monty, 1977), irrespective of what the objective situation may be. This leads to illusions of control.

Illusions of control do have advantages. When people feel confident, they are more active and find it easier to approach, to interact, and to explore (White, 1959). People with high confidence in their control abilities may be highly motivated to take initiatives and to invest the time, efforts and resources which ensure successes (McClelland and Winter, 1969).

Illusions of control also have disadvantages. Instead of exploring what new information may mean, cognitive activities may become increasingly rigid and retrospectively focused. People attribute failure to exogenous factors or chance (Wortman and Brehm, 1975; Wortman *et al.*, 1973), whereas success is attributed to their own skills and efforts (Frieze and Weiner, 1971; Luginbuhl *et al.*, 1975) and to supposedly positive aspects of their own work groups and organizations (Staw, 1975). Such interpretations indicate how easily people can discount information when they believe they are in control (Fischhoff and Beyth, 1975). They allow people to argue that although previous efforts may have failed, these efforts were nevertheless justified.

Information about ongoing events may also be interpreted concerning its implications for the relations between people within the same situation, for relations between organizational subunits, and for relations between an organization as a whole and its environment. Such interpretations presuppose knowledge about how people, subunits, organizations, and environments should be related to one another.

When evaluating relations with others in the same situation, relative rewards may be closely evaluated. If

an existing reward structure is regarded as inequitable according to universalistic criteria, people may adjust both their efforts and the basis for their evaluations in order to achieve perceived equity (Adams, 1976; Weick, 1966). Such adjustments take place independently of organizational control processes. In addition, people have theories as to which relationships are most critical for performance (Staw, 1975).

How subunit relations are evaluated is conditional on specific situational characteristics (Dornbusch *et al.*, 1975). For example, Mahoney and Frost (1974) suggested that evaluation criteria depend on the discretion allowed the particular subunit (Hickson, 1966), and may include the subunits' flexibility, the mutual support between subunits, whether people are participating in training and development programs, whether production is flowing smoothly, and whether especially talented personnel are used efficiently. Formal organizational structures, supervisors, co-workers, the task itself, and peoples' own interpretations are all information sources that determine the criteria used for making evaluations (Hanser and Muchinsky, 1978). As tasks require more complex skills and autonomy, workers may rely more on their own direct experience and assessments to decide how information should be interpreted (Greller and Herold, 1975).

Relations between an organization and its environment may be evaluated based on abilities to acquire and maintain resources, on prestige, or on abilities to cope effectively with critical contingencies (Hickson *et al.*, 1971; Hinings *et al.*, 1974; Pfeffer and Salancik, 1978; Thompson, 1967). In response to information interpretations that there may have been changes in these abilities, attempts may be made to make adjustments. But because there are many information sources and many possible evaluation criteria, what any relational change may mean or imply is likely to be unclear. As a result, any adjustments that are made are likely to be small and to reflect short time horizons (Braybrooke and Lindblom, 1963). The intent is to alter existing relations in a way that reduces currently perceived problems. Typically, only a restricted number of alternatives and their consequences are examined. Such incremental developments are open and responsive to new information. They also have the advantage that people feel relatively secure and in control because any changes are so small that it is not necessary to be correct. When errors are made, the error costs are low.

There are also problems with this incremental adjustment process. Such adjustments are not directed towards any stable goal, and new information may be severely discounted. For example, Dudycha *et al.* (1973) found that experimental subjects are reluctant to give up successful strategies even though the relations on which these strategies are based have changed. Herman (1977)

showed that unless people are actually dissatisfied, they simply listen to, but do not respond to, persuasive communications. Janis (1972) described how people may ignore or distort information about real relations, and remain emotionally committed to their rationalizations about how these relations should be. Information about ongoing events occurs at unpredictable intervals; and the meanings that should be attributed with respect to the particular context and appropriate behavior, and with respect to desirable relations between people, subunits, and an organization and its environment, are always problematic (Campbell, 1969). Although people's interpretations may promote motivation and may facilitate sensitivity and adaptability, they do not directly help control. They may actually detract from control if they lead to control illusions or to random adjustments in relations. In order to have organizational control, it is necessary actively to determine the information-generation process itself, as well as its interpretation.

Feedback generation

People believe organizations should be controlled to achieve goals. They believe control can be achieved through comparing and evaluating actual and expected performances. Indeed, providing people with outcome feedbacks is a cue indicating that controlled performances are desired. Organizational information systems are usually designed to generate outcome feedbacks. Such information systems are separate from reality, formalized, artificial, and contrived (Simon, 1969).

Most organizations rely on accounting statements or similar counting systems to generate outcome feedback. The methods for generating such feedback are standardized and well understood; what such feedback means is unequivocal, at least according to formal accounting logic. Hence, the interpretation problems associated with information about ongoing events are avoided. On the other hand, it is completely unclear what may be implied about ongoing reality by outcome feedbacks that indicate unfavorable differences between actual results and goals.

Hopwood (1972) observed that great emphasis on accounting feedbacks impedes understanding. Studying budget use in a corporation, he noted that budgets are single-dimensional and so do not reflect all dimensions relevant to organizational performance (Inn *et al.*, 1972). Hopwood found that where great emphasis is placed on meeting budgets, general job-related tension is high, trust for superiors is low, relationships with co-workers are poor, and reported costs are manipulated to make them look right so that the available accounting data become meaningless. Managers are sometimes sensitive to these negative consequences and choose not to use output records (Ouchi, 1978).

People respond to outcome feedback indicating unfavorable differences between actual results and goals by subjecting them to comprehensive and critical analyses in order to determine their credibility and possible meaning (Taylor, 1975). When analyses rely only on artificially generated data, there are defensive biases in interpreting outcome feedbacks. Such biases are particularly likely when (a) people can only reflect on, and have no direct contact with, the situations they are supposed to control but (b) believe they have had opportunities to choose freely the means that were supposedly used to exercise control. They become more defensively biased when they receive feedback indicating negative outcomes, which feedback is partly incomprehensible but could be interpreted as indicating that their chosen means are failing (Calder *et al.*, 1973; Collins and Hoyt, 1972; Wortman, 1975).

For example, in experiments by Staw (1976) and Staw and Fox (1977), the experimental subjects playing executive roles received accounting feedback describing the results achieved by the organization which they were supposedly controlling. These historical data showed declining profits for two product divisions over a ten-year period. Subjects were required to allocate new research-and-development funds to these two divisions. In both experimental treatments, all funds were initially invested in a single product line. In one experimental treatment, another executive had chosen which product division should receive this investment; in the other treatment, the experimental subjects chose this product division. After additional outcome feedback indicated that profits for both divisions had continued to decline, the experimental subjects then made second decisions about the research-and-development funds. This time, it was not necessary to allocate all funds to one division. Those who had made no initial decisions allocated, on average, less than half of the newly available funds to the initially chosen product division. Those who made the initial decisions themselves increased their commitments on average, and invested approximately 60 percent of the new funds in the previously chosen product division.

Accounting feedback is more likely to be acted upon when it is accompanied by additional information which indicates there are causal relations that can be expected to continue to exert influence in the future. Staw and Ross (1978), for example, found that when failure is supposedly caused by foreseeable events that are likely to persist, decision makers make adjustments to include this recognized reality. When feedback about negative outcomes is believed to be caused by temporary, unstable events, no adjustments are made.

Inasmuch as outcome feedback revealing differences between actual results and goals provides no information about the causal relations determining ongoing

events, it is not clear how it may be used to improve control. To have any effect at all, it must be labeled in ways that correspond to previous understandings (Miller, 1971; Muchinsky and Dudycha, 1975). It must also be relevant for the task at hand: for example, feedback to individuals may help individual performance, and feedback to groups may help achievement where group members have differentiated roles and are performing interdependent tasks (Nadler, 1979). But except in conjunction with increased goals (Locke *et al.*, 1968), there is little evidence that outcome feedback improves either performance or control (Goldberg, 1968). There is evidence that outcome feedback may confuse people because they do not know what it implies about underlying causal relations. As a result, they respond to it inconsistently (Schmitt *et al.*, 1976; Staw and Fox, 1977).

After reviewing the literature on outcome feedback, Nadler (1979) concluded that a more comprehensive approach to feedback in organizations is needed. Numerous variables may determine a particular output measure and unless these are all taken into account, control may not be effective. For example, Nelson and Machin (1976) described the control problem associated with reducing absenteeism among hospital personnel. They argued that absenteeism is not just a resource-control problem, but also involves relations among hospital subunits and relations between the hospital and other organizations. Only when the absenteeism-control problem was considered from this broader perspective was it possible to introduce control measures successfully.

A basic problem with outcome feedback in general, and accounting feedback in particular, is that it can only be used to evaluate the past formally. Such retrospective and formal evaluative behavior may be interesting and satisfying for those who do it, but in itself it provides no insights at all about control structures. To be useful for control, feedback should describe the relations which determine the values of the variables to be controlled (Weick, 1969). Instead of outcome feedback, a completely different type of feedback is needed for control purposes. Unfortunately, few field studies have explored how types of feedback other than outcome feedback may affect organizational control. On the other hand, numerous experimental studies have explored the impacts of alternative feedback types. These results are highly suggestive as to what may happen in organizations if other forms of feedback are generated.

One series of experiments has generally assumed that linear relationships exist between a variable to be controlled and the variables which influence this control variable. Todd and Hammond (1965) argued that feedback providing information about these linear relations may improve performance and control in comparison to

the case where only feedback on outcomes is provided. They found that experimental subjects receiving feedbacks about the relations between variables performed better and improved rapidly over time, whereas those receiving only output feedback achieved little improvement. Castellan (1974) suggested that such relational feedback might be particularly useful when it indicates that a possible causal variable has little relevance and hence can be ignored. Hammond and Summers (1972) reanalyzed Todd and Hammond's data and showed that when outcome feedback is given in addition to feedback on the relations between variables, the result is poorer performance. They argued that after receiving feedback, subjects in both conditions understood the control relations, but those who also received outcome feedback apparently then became distracted and inconsistent in their responses (Hammond *et al.*, 1973).

Hammond and Summers (1972) suggested that in addition to feedback that describes the relations between variables, feedback that describes how these relations are being perceived may also be helpful (Brunswik, 1956; Hirsch *et al.*, 1964), particularly when more than one person wishes to utilize the feedback (Balke *et al.*, 1973; Hammond and Brehmer, 1973). Schmitt *et al.* (1976) found that, indeed, feedback on perceptions interacts with feedback on relations to enhance performance, but that feedback on perceptions without feedback on relations results in poorer performance. Hammond and Brehmer (1973) found that without feedback on perceptions and simply through discussions, people can resolve differences in opinion with respect to the relative importance that should be accorded particular relations. On the other hand, without feedback on their perceptual processes, people cannot resolve differences about the relations that they perceive to exist between variables. This becomes increasingly difficult as the alternative relations they perceive are nonlinear (Brehmer, 1974; Brehmer and Qvarnström, 1976).

As relations are more predictable, people base their decisions more consistently on the relational rules they have been able to identify (Brehmer, 1976). Unless some exogenous information or disturbance intervenes, people use these relational rules consistently to make decisions. For example, Libby (1975) found that over time, and although confidence in their own judgments varies, bankers consistently rely on the same relational rules defining relations between accounting ratios and financial solvency to reach conclusions about whether or not a firm is bankrupt.

Exogenous information or other disturbances easily shatters this consistent and controlled behavior. For example, Balke *et al.* (1973) found that negotiators involved in intensive discussions with each other continue to believe in the same relational rules but behave quite inconsistently with them. As they understand both

their own rules about relations and those of their partners only poorly, they do not know that they are behaving inconsistently. Apparently, inconsistency increases and then dominates behaviors as relations are thought to be probabilistic. In such circumstances, people continually make changes and test new rules. Consistent behavior and control become impossible (Brehmer and Kuylensstierna, 1978; Dudycha and Naylor, 1966).

If people give priority to responding adaptively to change rather than exercising control, then it makes sense that although they may have rules describing the underlying relations influencing the variables to be controlled, they should question them when they encounter any challenging information. At the same time, if everybody does this, there is likely to be little organizational control. From a control standpoint, the problem is not to prevent rule changes when they are needed. Rather, the problem is to generate feedback that can prevent inconsistent behavior in response to probabilistic interpretations of information when, in fact, underlying relations that are well understood—and from which appropriate rules have been derived—are unchanged.

Apparently, with too much information, people find it difficult to visualize what is going on. Hammond (1971) suggested that graphical presentations of feedback, possibly using computer terminals with an interactive capacity, may provide an answer to this problem. Graphical feedback is easily comprehended because the relation between a possible causal variable and a variable to be controlled cannot only be described, it can also be seen (Balke *et al.*, 1973; Hammond and Brehmer, 1973). Similarly, a visual presentation can easily summarize a history of probabilistic relations in such a way that people can see if any underlying regularities continue to exist. With such feedback, they are less likely to be erroneously distracted.

Although this excellent experimental work has important implications for the types of feedback needed in organizations, a broader view must be taken if such a feedback-generation system is to be relevant for control purposes. This is because the variables which organizations may wish to control are usually influenced not by single, direct, causal relations, but rather by chains of relations which have cyclic, reflexive properties (Maruyama, 1963). Control over subunits, in particular, is usually exercised through these loops of causal relations (Weick, 1969).

Maruyama (1963) discussed the deviation-counteracting and deviation-amplifying properties that may characterize cyclic loops of causal relations between variables. Given a small deviation, a deviation-counteracting loop ensures that an initial state is reestablished. On the other hand, if a loop is deviation-amplifying, the same initial deviation triggers even greater changes so that a process is set in motion towards

a new state that may be quite different from any initial state. More generally, deviation-amplifying loops control the goals towards which organizations strive.

Organizations' information systems typically do not generate feedback describing loops of causal relations. Nevertheless, Axelrod (1976) and his colleagues have attempted to describe the extent to which people in organizations perceive these control processes based on causal relations. Through analyzing various documents and protocols, they found that people do perceive chains of causal relations, but that retrospective reports typically omit relational links that would complete cyclical loops. On the other hand, when asked to identify the separate links which would form loops of cyclical relations, people do so readily (Hart, 1976). Axelrod speculated that in talking about control, people may have more relational beliefs than they can handle and that they choose structurally simple decision-making descriptions that emphasize causally prior relations. This emphasis effectively hides the important role played by cyclical relations in a control process.

Bougon *et al.* (1977) asked organizational members to specify the separate influences that a subset of organizational variables have on one another. They then constructed the relational loops that these separate influence relations implied. They found that conventional goal variables are subject to many influences, conventional constraint variables are subject to few influences, and conventional means variables are subject to intermediate influence. They found that the implied loops surrounding goal variables are deviation-amplifying. This means that goal variables are typically unstable, generally being influenced—and turn influencing other variables—to move in consistent deviation-amplifying directions.

Bougon *et al.* found that as people perceive more relations are influencing a particular variable, they come to believe they can control that variable. This means, for instance, that people believe that they are most able to control goals, then means, and believe that they have least control over constraints. At the same time, organizational members report they are uncertain about many influence relations. When these are eliminated so that analysis is based exclusively on those influence relations that are perceived to be certain, the correlation between more influence relations and members' beliefs in their ability to exercise control is no longer significant. This suggests that at least unconsciously, organizational members know performance is controlled by the influence relations between variable pairs which together make up implicit reflexive loops. People believe they can intervene and exercise control only to the extent that they can perceive additional uncertainty and inconsistency in these influence relations. In general, the control process is determined by the cyclic relations, not the

people. People exercise control to the extent that they can break or change influence relations, or establish new relations between variables.

Controlling behavior

People continually direct ongoing control efforts within organizational subunits. Such control may require that particular behaviors be executed correctly and at appropriate times. Techniques of behavior modification apply here. On the other hand, control over subunits is a rather different process. Consistently applied rules, and the interrelationships they establish between subunits, play the most critical role at this level in the control process; resource-allocation processes are an example.

Control of organizational members via behavior modification

Behavior modification is a technique for teaching people to respond automatically and appropriately to particular situational cues. It probably represents the most developed technique for using rewards and punishments to control behavior (Nord, 1969). Stated briefly, the theory is that behaviors have consequences in people's environments, and depending on whether people judge these consequences as positive or negative, the likelihoods that their behaviors will recur increase or decrease. Skinner (1953) argued that by appropriately manipulating observable consequences of behavior, controllers can encourage more desirable behavior and discourage less desirable behavior.

The relevant sequence includes a stimulus, which sets the appropriate occasion for the particular behavioral sequence, the behavioral sequence itself, and the consequences for the actors that depend on whether the desired behavioral sequence is executed. Behavior modifiers should manipulate consequences in such a way that any rewards are contingent on executing the desired behavioral sequence correctly on appropriate occasions (Kerr, 1975). Luthans and Kreitner (1975) described how behavior modification might be applied to organizational control, particularly control in business organizations. Performance-related occasions are identified where particular behaviors are desired or where undesirable behaviors are occurring. These behaviors are then precisely defined, and counts are made to determine whether they are occurring on desired occasions. If the counts indicate that the desired behaviors are not always occurring on appropriate occasions, some behavior modification may be needed. In this case, possible consequences that could encourage desirable behavior, or existing consequences that are encouraging undesir-

able behavior, must be identified. These are then manipulated to modify behavioral likelihoods in desired directions. To assess success, desirable-behavior frequencies are counted before and after a modification.

If the modification is to introduce a connection between a particular occasion and a desirable behavior, either rewards should be made clearly contingent on appropriate behavior or, alternatively, punishing circumstances may be removed when appropriate behavior occurs (Hamner and Organ, 1978). If the modification is to break existing connections between a particular occasion and an undesirable behavior, any reward should be removed and no rewards should be given so that the inappropriate behavior is slowly extinguished—or possibly the undesirable behavior should be directly punished. Skinner (1953) argued that, where possible, it is preferable to use rewards rather than punishments, because rewards unequivocally add something to the situation. Punishments are usually more expensive to administer. In addition, they not only detract from a situation directly but also indirectly—by creating conflicts between the preferred, desirable behavior and the existing, undesirable behavior which may be only temporarily suppressed. The undesirable behavior together with any conflict, resentment, and hostility associated with the punishment may be remembered, and later make it difficult for a person to learn or perform this behavior in a new situation where it is appropriate.

Rewards may be scheduled at various intervals. If appropriate behavior is consistently rewarded, connections between appropriate occasions and desirable behaviors are learned quickly; they are also quickly forgotten when rewarding stops. If quick learning is desired, people may be encouraged to generate feedback rewards for themselves that also indicate the extent they are behaving appropriately (Lamal and Benfield, 1978; Runnion *et al.*, 1978a, 1978b). On the other hand, if appropriate behavior is only occasionally rewarded, preferable connections are both learned and forgotten more slowly. These different scheduling properties should be taken into account, and schedules should be designed and altered depending upon the rate of environmental change. The main aim is to make people's desirable responses automatic (Skinner, 1953). Secondly, this automatic response should be temporary or permanent depending on the particular situation.

Luthans and Kreitner (1975) gave numerous examples of successful behavior modifications in industrial settings. For example, disruptive, complaining behavior by a machine operator was eliminated, and scrap from a stamping mill and rejects on an assembly line were reduced. Wide success has also been reported in reducing absenteeism and encouraging on-time

attendance (Kempen and Hall, 1977; Kent *et al.*, 1977; Orpen, 1977; Pedalino and Gamboa, 1974).

There is little doubt that behavior modification can change behavior. What is not clear are when rewards and punishments are necessary and which are useful. Some behavioral changes occur because people develop clearer understandings of what is possible and what is needed (Gray, 1979; Komaki, 1977; Locke, 1977, 1979). Behavior modification has been widely reported to have been applied successfully in the Emery Air Freight Corporation (Business Week, 1971, 1972; Training and Development Journal, 1972). Edward J. Feeney introduced the program, but the modifications were often carried out in areas where he did not have direct responsibility. He reported that he always started out by investigating exactly what was going on. He found, for example, that the responsible superiors believed that containers were being filled to 90 percent of capacity but measurement showed only 45 percent. Through investigation and measurement, Feeney discovered cost-saving opportunities. Rewards linked to feedback are alleged to have helped ensure that these previously unrecognized opportunities were exploited.

Hamner and Hamner (1976) reported cases where managers said the achievable success from behavior modification has reached a plateau and additional contingent rewards such as praise have become irritants. Similar to many discussions of behavior modifications, these managers' reports are unclear as to whether their organizations' successes have been due to new understandings, to more frequent feedback, to more challenging and specific goal setting, to praise and recognition, or to financial rewards. Although contingent rewards and punishments have had important effects in laboratory studies (Skinner, 1969), and they may help reprogram people who have learned undesirable behaviors (Geiser, 1976), dramatic changes can be produced without extrinsic rewards and punishments. In complex settings such as generally exist in organizations, simply clarifying what is going on may be enough to improve performance and ensure appropriate behavior. Providing relevant and immediate feedback may help people learn to select appropriate behaviors automatically and, in turn, this may lead to better control and to performance improvements (Adam, 1975). However, if the links between performance-related occasions and appropriate behaviors are not problematic, behavior modification as discussed by Skinner (1953, 1969) is unlikely to help control.

Control within organizational subunits

Coordination and control problems in organizations are often nearly decomposable: they can be broken down into subproblems which are assigned to subunits where

they can be worked on in a semi-independent manner (Simon, 1962). Thompson (1967) proposed that if the control goal is to reduce coordination costs, interdependencies should determine which tasks are grouped together within a subproblem. Within a subunit, the same principles may be applied. A subproblem may be divided into tasks which are performed in semi-independent ways. Interdependent tasks may be allowed to proceed for short periods as if they were independent. After short times, interdependency problems develop and have to be solved; but after this has been done, tasks can be reallocated and a semi-independent phase starts again.

Where a subunit's members perform similar and relatively simple tasks, there are few interdependencies, and most problems can be solved through standardized routines. The main goal of control involves maintaining a one-to-one relationship over time between, on the one hand, the work and energy capacities available within the subunit and, on the other, the demands being made upon it. For example, in the clerical agency described by Crozier (1964), the goal of control was to ensure that all work was processed on the same day as it was received. In normal times, the established work routines usually satisfied work demands. When the work demands suddenly increased, a crisis atmosphere developed, and control by superiors became critical. The superiors insisted that rules and standardized routines should be adhered to and this insistence increased response rigidity and made overtime necessary to satisfy work demands. Alternatively, the superiors might have broken the standardized routines and added flexibility, allowing a one-to-one relationship between capacities and demands to be established more quickly (Drabek and Haas, 1969).

Where tasks vary and interdependencies change, it may not always be possible to maintain a one-to-one relationship between demands and capacities. In this case, the control goal may be to reestablish this relationship within an acceptable time period. Changes in work demands should be monitored and, where possible, anticipated; response capacities should sometimes be supplemented.

Preparing forecasts and actively searching their environments may enable people to anticipate work demands but there is evidence that, in fact, they do not rely much on these devices. Forecasts are typically inaccurate (Donaldson, 1969), and most information comes from informal contacts and discussions (Aguilar, 1967; Kanter, 1977) rather than from formally organized searches (March and Simon, 1958). Instead, people usually rely on the human ability to visualize the multiple values which variables may take during different time periods (Weick, 1974). They simultaneously evaluate current work demands and conjecture how they might develop in the future; this allows both lagged

effects and lead-time effects to be taken into account (Deutsch, 1963). The flexibility which characterizes human monitoring and the possibility of immediate actions to deal with unusual changes and errors make human response capabilities far superior to those of mechanical techniques (Haberstroh, 1960). However, Simon (1957) has argued that cognitive limits on human understanding may impede control efforts. At least over short time periods, one human mind can handle and comprehend only so much information. That this limitation constrains organizational activities over long periods seems doubtful. But at least in the short term, their cognitive limits may confront people with informational overloads. Weick (1970) suggested that, when facing overloads, people seek to maintain one-to-one relationships between the information-processing demands they perceive being made on them and their own information-processing capabilities as they perceive them. People maintain these one-to-one relationships by using disengaging strategies. One strategy is to focus more or less exclusively on current information-processing demands and essentially to ignore any demands remaining from the past or potential demands in the future. A second strategy is to focus on past information-processing demands: ongoing projects are carried to completion irrespective of current or future information-processing demands, (Schutz, 1967; Weick, 1970).

Weick also argued that rather than change their standardized routines, people often respond to overloads by redefining and simplifying their environments so that some previously considered information becomes irrelevant and can be ignored. Hall (1972) observed that negotiations may have to be undertaken to accomplish this. Managers usually respond to overloads by focusing on the present (Carlson, 1951; Mintzberg, 1973; Sayles, 1964). But because current information-processing loads can be very high for managers, and because they lack long-term perspectives, rapid attention shifts are common and many decisions are made by oversight and flight (Cohen *et al.*, 1972).

Redefining environments can erode control. In particular, some events and relationships having influence on the situation are simply not perceived. The situation's complexity is not registered, and events are perceived so that they fit in with images that are already stored (Bruner *et al.*, 1956). Rather than seeking to learn how environmental and organizational variables relate to one another, people may only be interested in output feedbacks which ignore means-ends relations (Ouchi and Maguire, 1975).

Only if they understand the tasks performed within their subunit and understand how these tasks interrelate, can people consistently control a subunit's performance. This capability may be most evident when

normal functioning breaks down. Those who know the switches to push, but not the behavioral sequences needed for task accomplishment, are likely to be helpless when faced with a breakdown. Those with understanding may quickly carry out appropriate behavioral sequences to reestablish normal functioning (Thibaut and Kelley, 1959).

When the subproblems in subunits involve many interdependent tasks which are performed in semi-independent ways, breakdowns are inevitable, frequent, and recurring (Perrow, 1967). There is a need for experts in the subunits who understand the problem-solving process completely. Other people learn to rely on these experts, and the experts learn the similarities among recurrent breakdowns. Cues may be identified and constant relationships noticed which allow needed solutions to be formulated quickly. Thus, problem-solving processes may develop into solution-generating routines, so that new solutions no longer have to be invented from scratch (Simon, 1962).

For example, Dutton and Starbuck (1971) described a production scheduler who had developed a solution-generating routine to handle critical work-flow interdependencies and to ensure that work flowed smoothly and efficiently. The scheduler distinguished subsystems where interdependencies were most critical from those where they were not. Specifically he concentrated on generating schedules for the two most complex and expensive machines; these schedules largely determined the work done on the less complicated machines downstream in the factory.

The scheduler had memorized his experience over several years. Given particular orders, the materials to be used, and the fabrication operations to be performed, he referred to his memory and estimated the speed at which the orders would be processed. These speed estimates enabled the scheduler to forecast when a new schedule would be required.

By observing the scheduler, Dutton and Starbuck determined the variables that he considered when estimating speeds. They were able to formulate simple equations which specified relations among these variables, and which could have made the same speed estimates. However, they were convinced that the scheduler did not use equations, but had memorized the associations between orders' characteristics and speeds. He apparently obtained the speed estimates by a table look-up procedure. This would mean that over a four-year period, he had memorized a table with approximately 5,000 entries. Thus, for some people, cognitive capacities may not be so small in the long term (March and Simon, 1958; Williamson, 1964, 1975).

The scheduler exerted strong influence on his factory's profits, and he was probably the best scheduler of 25 in his company. But his exceptional cognitive capacities

were not appreciated by his superiors. They did not value the differentials between his schedules and those of other schedulers. They also criticized him for optimizing globally rather than locally; essentially, his superiors asserted that the scheduler should exhibit bureaucratic myopia and not look outside the prescribed boundaries of his role. When another company offered him a more responsible job with better promotion opportunities, he moved.

In general, there are no constraints which force control to be intelligent in the short run, and people have different ideas about what constitutes intelligent control. For example, Powell and Schlacter (1971) hypothesized that more participation in schedule generation by members of road crews might improve their productivity. In fact, more participation was associated with lower productivity but higher morale. Apparently, the schedules that had been generated by the operations department without workers' participation had taken more task interdependencies into account but had de-emphasized job satisfaction, whereas the schedules generated by the work crews placed less emphasis on task interdependencies and gave more attention to matters that affected their job satisfaction. It is probable that the operations department and the work crews disagreed about the goals of control.

Susman (1970) found clear goal differences between skillmen and their helpers in an oil refinery. The skillmen work in a control room and are responsible for setting control boards so that optimal operating conditions are achieved. Two helpers work with each skillman to form a work crew; the helpers are supposed to support the skillman by handling and responding to ongoing matters.

Skillmen and their helpers differ in their orientations to work. Skillmen are highly interested in applying their cognitive skills to control problems, and they have opportunities to do this. Helpers do not have such opportunities, and those helpers who are more competent actually prefer to do tasks which are less demanding cognitively—such as reading meters, organizing truck loadings and tank transfers, and delivering laboratory samples. Such errands provide opportunities to tour the refinery and to establish social contacts with other workers. The helpers reported that a pressure-free atmosphere and opportunities to converse are the aspects they like most about their jobs. While the helpers are enjoying conversation, the skillmen are enjoying control.

The norms and situationally appropriate behaviors that people have learned in school (Dreeben, 1968) are congruent with both these alternative perspectives and may be used to justify alternative ways for perceiving and allocating status within subunits. Those people who enjoy control might argue that performance would be

most effective if all organizational statuses are congruent with opportunities to use cognitive capacities. Such people may see status primarily as an input that complements their technical knowledge and which helps them implement control. At the other extreme, those people who enjoy interpersonal relations, and who are responsible for ongoing control actions that require little reflective thought, might argue that organizational statuses should be allocated more justly and that opportunities to utilize cognitive capacities are unjustly distributed. These people may see status primarily as a reward that should be distributed fairly in order to raise morale (Dreeben, 1968; Weick, 1966).

Some experimental evidence suggests that, depending on how status is allocated, different control goals may be achieved. Sampson (1969) ran experiments with congruent groups in which controllers had higher statuses than other people, and incongruent groups in which controllers had lower statuses than other people. The congruent groups performed consistently better than the incongruent groups. Sampson also found that when statuses within a group are assigned according to a justice principle rather than a competence principle, interpersonal relations are much more friendly.

Professionals in organizations derive high status from their specialized understanding and they may use this status in an authoritarian way. Depending on whether their knowledge is in fact relevant to solve problems, they may help or hinder control. For example, in an experimental study, Cammalleri *et al.* (1973) found that when an authoritarian superior understands how to solve a problem, group performance is better than that achieved with democratic leadership, but when an authoritarian superior gives incorrect instructions, group performance is far worse than with democratic leadership. High status and an authoritarian style can also be used to resist changes which would also dilute the personal control of high-status people. Hage (1974), for example, described how surgeons successfully resisted attempts to improve a hospital's services.

The key control positions, such as skillman and surgeon, are not generally open to other members of their organizations. When access to such positions opens up, drastic changes may occur. Whyte (1961), for instance, described how glassworks used to be controlled by the most skilled glassblowers, the gaffers, who had both high technical skill and high status, and who exercised authoritarian control over their work teams. Unionizations and other changes drastically altered the gaffers' status. Younger, less experienced workers received rapid promotions and authoritarian control was replaced by more socially sensitive leadership. The goals of control changed.

Although people within subunits may perform specialized control functions, top managers within sub-

units may have to be involved in a complete role range including cognitive-control activities and the implementing of control routines (Mintzberg, 1973). Nevertheless, like other subunit members, top managers may choose to emphasize either cognitive activities or the implementing of routines. For example, Shapira and Dunbar (1980) found that in an in-basket simulation, managers utilized all ten managerial roles identified by Mintzberg (1973), but their responses clustered into two clear groupings—informational-exchange activities that are relevant for cognitive-control activities and the implementing of control routines.

Control over organizational subunits

People are aware of their subunits' dependency on organizational resource pools, and they are aware that other subunits are competing for these resources. Such competitions can lead to much uncertainty, bargaining, and conflict. To escape conflict, people do not require that resource allocations should be contingent on shared interests and common goals (White, 1974). Rather, people loosen the couplings they perceive should exist between one subunit and another, so that each subunit may have some freedom to concentrate on its own affairs and to develop somewhat independently (Glassman, 1973). To avoid bargaining, people may accept resource allocations made by standardized routines (Gunsteren, 1976). To reduce uncertainty, they may argue that previous commitments to themselves—and other subunits—should continue (Wildavsky, 1975).

Standardized allocation routines usually start from past allocations (Coward *et al.*, 1975; Crecine, 1969; Davis *et al.*, 1966, 1971; Fenno, 1966; Gerwin, 1969; Nystrom, 1975). Then subunits state claims for more resources, and resource guardians check whether it is possible to meet such requests (Wildavsky, 1975). Typically, only the simplest rules are used to adjust allocations (Davis *et al.*, 1966, 1971; Wanat, 1974). Changes from the past are generally small and they are designed to avoid problems rather than to achieve specific goals (Braybrooke and Lindblom, 1963). More generally, the control goals of allocation routines are to ensure that resources are not exhausted, and that activities are not disrupted. As a result, understandings that have been guiding behavior in the past can usually continue to do so in the future.

Weber and Peters (1969) edited studies detailing routines whereby financial resources are allocated and controlled in a department store. Allocations are made at regular intervals. First, the top managers adjust the previous years' figures for any anticipated growth or decline, and come up with a sales forecast for the total store over the next season (Brown, 1963). This sales forecast serves as an overall constraint on the allocations

of open-to-buy funds made to departments. Moore and Weber (1969) described how funds are allocated to departments. The departmental managers make plans six months in advance, starting from their departments' monthly sales one year previously. These departmental-sales forecasts are then compared with the total sales anticipated by the top managers. If the departmental forecasts are higher than the sales needed to meet top managers' expectations, the departmental forecasts are reduced. If the departmental forecasts are less than needed, then no changes are made.

Myers and Weber (1969) described how departmental managers control open-to-buy funds. At the beginning of each selling season, the departmental managers use some of their open-to-buy funds to purchase merchandise. As a season progresses, it becomes clearer whether sales expectations will be met. Based on this additional knowledge, decisions are made about further purchases. If sales are lower and inventories higher than expected, some planned purchases are not made in order to avoid excessive markdowns late in the season. Thus, actual purchase decisions are made by those managers who know the various markets, but these managers cannot recommit funds until their original purchases produce sales. Purchasing mistakes have to be corrected before a season's end, when financial resources must be liquid for reallocation.

These allocation routines are predictable and logical. They emphasize that funds are limited, they correct mistakes, and they encourage efficient uses of funds (Wildavsky, 1975). The store's financial resources are continuously being recommitted. Through this routine, the store maintains financial mobility and can change relations with its environment (Donaldson, 1969).

If environmental conditions are relatively stable and resources are generally adequate, such allocation routines allow subunits to be only loosely coupled together even though all share the same resource pools (Simon, 1962). Individual subunits can concentrate on their own internal control goals and problems (Baumler, 1971; March and Simon, 1958). But an organization's resource pools are periodically checked and protected by both the constraints and the error-correcting properties that are built into the allocation routines.

Resource pools are affected by changes in an organization's environmental opportunities (Aldrich and Mindlin, 1978; Yuchtman and Seashore, 1967). This may induce changes in internal resource allocations. Based on whether their current allocations and expectations match, subunits may decide that they should grow or retrench (Beer, 1972). They may also decide that they should change their control goals.

Consistently applied rules then determine both how much and in what directions subunits should either grow or retrench (Sahal, 1978). Wanat (1974), for example,

described resource-allocation rules that ensure that governmental departments grow. Specifically, the previous appropriation should be accepted as a base point; all current departmental requests should be more than or equal to previous appropriations; all current appropriations should be less than or equal to current requests; all current appropriations should include the previous base and an additional allocation for mandatory expenditures needed to meet increased costs for maintaining the same level of service; all cuts should be made on new-program requests. These rules establish a deviation-amplifying loop in a growth direction. All current appropriations must be equal to or greater than previous appropriations, and departments are likely not only to expand but to grow faster as they are more acquisitive and make larger requests (Coward *et al.*, 1975). A similar set of rules could be formulated that would ensure that deviations are amplified in a way that guarantees a departmental retrenchment.

Consistently applied rules may also be used to assemble and eliminate change possibilities. By relying heavily on their current understanding, people can specify more restrictive rules and, generally speaking, this specification excludes possibilities for change and ensures more of the same (Braybrooke and Lindblom, 1963). Conversely, when fewer restrictive rules are specified, less reliance is being put on current understanding, and more possibilities for change exist, so that a major reorientation may take place. For example, a rule forbidding new technologies substantially reduces the possibilities for change. A second rule forbidding variations in products or services would eliminate more possibilities. The rules listed by Weick (1969: 72-73) illustrate how possibilities for change can be reduced; for example, that any changes should minimize effort and should give priority to doing those things which have been done most often in the past, those things which can be done most quickly, and those things which should cause the least disruption.

Hage (1977) identified rules for combining change with either growth or retrenchment. Subunits may be required to expand by introducing new technologies, or they may be required to retrench by utilizing more specialized technologies suitable for meeting particular reduced, but more secure, demands. Subunits may be required to expand by differentiating products and services, or they may be required to retrench by restricting variations to a smaller range (Marrow *et al.*, 1967).

Generally speaking, people in organizations give little attention to the rule sequences used in organizations or the control consequences for behavior that follow from the resulting deviation-counteracting or deviation-amplifying loops. This may be because people have little awareness of these consistent relations (Balke *et al.*, 1973) and because they prefer to believe that they,

personally, rather than impersonal rules, are in control (Fox, 1977). This preferred perception may be achieved by focusing on the short term (Mintzberg, 1973) so that long-term decision-making consistencies are overlooked. In addition, a short-term focus is likely to concentrate on those decisions where there is at least short-term discretion so that there is a possibility to exercise personal control (Bougon *et al.*, 1977). Within this framework, power to get things done may be perceived to be an important variable (Kanter, 1977) and subunits that are perceived to have power may be in a better position to direct that discretionary decisions are made in ways that favor them.

For example, Salancik and Pfeffer (1974) described the budget-allocation process at the University of Illinois, where department heads apparently do not understand the power relations underlying the allocation process very well. Although they believe that graduate students and national prestige are the most important contributions that their departments make to their university, statistical analyses suggest that power is, in fact, primarily dependent on the outside funds that departments attract. Salancik and Pfeffer also found that department heads are biased, believing that budget allocations should be based on those resources that their own departments can supply. They found further that departments use their power—derived from outside funding—to ensure that graduate fellowships—the most critical and scarce resources subject to discretionary decision making—are allocated disproportionately to themselves. That is, powerful departments use their power to establish deviation-amplifying loops within the organization to control those discretionary allocations that are most important and critical. By doing so, powerful subunits acquire more power and weak subunits lose power.

Not every university allows its departments the decision-making discretion to allocate pooled resources consistently. Some universities require departments currently bringing in funds—for example, departments of business administration or adult education—to provide subsidies for currently less affluent departments (Baldrige, 1971; Clark, 1956). They do this by eliminating decision-making discretion and establishing allocation rules to ensure, for example, that the university as a whole develops in a more balanced way.

On the other hand, if departments do have decision-making discretion to allocate pooled resources, it is likely that powerful departments will consistently allocate more critical resources to themselves, making themselves still stronger. Salancik and Pfeffer also found evidence that when a resource is considered less critical—in the Illinois case, funds for summer faculty fellowships—, powerful departments do not use their power to initiate deviation-amplifying loops favoring themselves; instead, weaker departments become benefi-

ciaries of deviation-amplifying loops, but only with respect to resources that are not critical, and only to the extent that powerful departments are prepared to be generous (Thibaut and Kelley, 1959).

Salancik and Pfeffer (1974) asked whether these continued accumulations of internal power and resources to particular subunits correspond to criteria which are important to those external organizations on which all subunits ultimately depend. If powerful subunits become increasingly affluent by consistently manipulating decision-making discretion in their favor, competence and power may be attributed to them internally (Pondy and Birnberg, 1969), but they may become insensitive to external developments—with adverse consequences for the total organization (Hedberg *et al.*, 1976). When predicted accomplishments do not match actual outcomes, powerful subunits may readily discount these discrepancies as reflecting inadequate forecasting, or as temporary aberrations, or as being the responsibilities of other subunits. With internal power but an inadequate understanding of relations between the organization and its environment, powerful subunits may fail to interpret realistically certain information and feedback that should be disturbing.

Beer (1972) distinguished two operating modes that might describe organizations that are insensitive to developments in relations with the environment. In the moribund mode, subunits continue to act as if everything is normal even though changes in relations with other subunits or with external organizations are creating serious incompatibilities. Powerful subunits may be particularly susceptible to the second, self-destructive mode, in which subunits interpret their own affluence as indicating that their total organization not only possesses adequate resources, but also is confronted with extensive growth opportunities. Members of powerful subunits substitute their dreams of success—such as high profits, abundant resources, and promotions (Chenoweth, 1974)—or their social ideals—such as saving cities, reducing unemployment, and resolving racial unrest (Pressman and Wildavsky, 1973)—for realistic understanding (Weick, 1974). It is only a matter of time before such fantasies lead to self-destruction (McClelland and Winter, 1969: 361–364). They push their organization into expansion projects even though no external opportunities justify them. When resources are exhausted, the organization is in serious trouble (Dunbar and Goldberg, 1978).

Consistently applied rules effectively control organizational subunits, and depending on whether the loops the rules create are deviation-counteracting or deviation-amplifying, the subunits may either remain the same, grow, retrench, or change. At the same time, these internal adjustments alter the organization itself in ways which may change the equilibria between the

organization and its environment. How far such changes can proceed is likely to have limits (Starbuck, 1965). It is important that organizational members should be aware of the deviation-amplifying loops formed by the rules they use, and aware of their consequences not only for relations between subunits but also for relations between their organization and its environment. Without such awareness, the cognitive basis for control may be lost (Miller *et al.*, 1960), but the rules may nevertheless continue to exert an amplified influence so that goals considered undesirable are, in fact, achieved.

For example, Hall (1976) described rules and consequent relations that eventually destroyed a weekly magazine, the *Saturday Evening Post*. The *Post* held constant its advertising price per page, so that the advertising price per reader decreased as circulation increased. A lower advertising price per reader stimulated advertising sales, and more advertising allowed the editors to enlarge the magazine. It was editorial policy to maintain a more or less constant ratio of advertising pages to magazine size. A larger magazine attracted more subscribers. However, the costs of producing a larger magazine increased faster than the revenues obtained from additional advertising and subscriptions. The *Post* lost financial resources even as its circulation increased. Hall suggested that this destructive loop would have been broken if the *Post* had kept its advertising price per reader constant. In a simulation, he demonstrated that, with such a pricing rule, the negative relationship between circulation and advertising price would have disappeared and profitable publication could have continued.

The successes and failures achieved by organizations are often attributable to rules that have been consistently applied. The *Post* example illustrates how people have difficulty interpreting the meaning of outcome feedback reflecting the operation of such rules. Hall's discussion shows how consistently applied rules have manifest consequences which are achieved automatically if people do not intervene to change them. Indeed, established rules must channel activity in consistent ways towards specific ends no matter what people think. Rules can lead to highly desirable achievements, accumulations, expansions, and growth; they can also result in wealth being dispersed, time being wasted, isolation, and bankruptcy.

Control rules are means to ends, and organizations should be designed so that these ends are what people in organizations desire. Rules are always neutral factors that are separate from people; people can choose to manipulate rules if they are aware of them. People do not always perceive that they are choosing to apply rules or that they could apply different rules.

People learn in school to make distinctions between the ends which rules are designed to achieve. Based on

this distinction, people decide whether they should question or change rules. Specifically, they distinguish between rules for social conduct (Collett, 1977) and rules which summarize the knowledge needed for performing tasks. Rules for social conduct may sometimes be challenged, but rules for task performance are more often considered objective and factual, and somehow beyond challenge.

Generally, in school, people are encouraged to accept all rules as imperatives provided by more knowledgeable authorities. People learn that they should accept the rules, the authorities, and their knowledge without further question. Metz (1978) described the disciplining problems and associated fears that result when students in school do not accept rules as imperatives. Questioning a rule may be regarded by subordinates as a challenge to authority or as a challenge to knowledge; from a superior's standpoint, this distinction may not be that important and the questioning may be seen simply as a challenge (Dreeben, 1968). People remember this insensitivity and the imagined consequences that they feared would result from challenging a superior (Metz, 1978). In later life, they may challenge rules which are immoral or unfair, but rules that may possibly be factually false do not generate the same emotional reaction and may be simply accepted even though they are known to be situationally inappropriate.

The experiments by Milgram (1974) describing obedience to authority illustrate this problem. People volunteer to be subjects in a scientific study of memory. On arriving at the experimental site, it is explained that the study is concerned with how punishment affects learning. Subjects are led to believe that they must teach the experimenter's confederate to learn by administering electric shocks every time the confederate apparently makes a mistake. The experimenter requires that during the experiment, the subject should increase the shock voltage by fifteen-volt increments from fifteen volts to 450 volts. Milgram was, in fact, interested in finding out how long subjects would obey the experimenter and the rule for incrementally increasing shocks, and how subjects would go about challenging and eventually disobeying this rule and the experimenter.

Although many people challenged the experimenter and his rule about shocking, they still continued to administer increasingly stronger shocks—which would certainly have killed the confederate had the shock machine really been connected. But the subjects did not know this deception and most were convinced that through the shocks administered by themselves, the confederate was indeed dead. Apparently within such a situation, many people see themselves simply as agents, mechanically executing impersonal rules which have been rationally designed by knowledgeable authorities. They no longer see themselves as autonomous agents

with a capacity to intervene, to change rules, and to exercise control personally. In these circumstances, people tune out information that could raise doubts about their actions, and concentrate on executing the assigned rules and routines in a way that they believe is satisfactory to their superiors.

Apparently, subjects did not question the experiment's scientific validity. But the confederate's screams for help did raise doubts about the social and moral justification for adhering to the supposedly scientific rules for shocking. Some people responded by at first denying that the confederate was really being hurt and by arguing to themselves that he was just being difficult. As the screams continued, subjects developed subterfuges and made false reports to the experimenter in efforts to avoid administering shocks. They showed increasingly agitated symptoms of physical stress, and requested the experimenter to alter the rule. They threatened not to adhere to the rule if the experimenter did not change it. But despite these protests, many people continued to adhere to the rule and they delivered lethal shocks.

To justify continuing the experiment, the experimenter always mentioned scientific necessity as the prime reason. Subjects did not challenge this knowledge base. Instead, they resisted implementing the rule strictly on moral grounds, and many did this with great trepidation. When there is no reason to question task performance on moral grounds, questioning at all may simply not occur. For example, Rokeach *et al.* (1960) reported that some days after assigning subjects a logical problem with rules that made it impossible to solve, subjects became highly tense and started to avoid the experimenter, but they did not admit to questioning either the rules or whether a solution was possible. As most organizational rules are not perceived by most people to have immoral consequences, most are not questioned or challenged.

Yet, when outcomes are not corresponding to expectations, people in organizations should question the rules based on previous knowledge and being consistently applied to achieve control over subunits (Holstrum, 1971). Control rules are insensitive and mechanical and ignore so much ongoing experience that they should only be considered appropriate in the short term. In addition, purposely established deviation-amplifying loops inevitably change the equilibria between an organization and its environment. In this new situation, previous knowledge about equilibria is no longer relevant. Continued reliance on the same rules means that people in the organization have wedded themselves to past success and have also committed themselves to the means used for achieving past successes.

Although standardized allocation routines and other

consistently applied rules keep coordination costs down, they usually do not include any provisions to accommodate overall, comprehensive views of both subunits' relations and external relations, not even when outcome feedback indicates that these are getting out of line with one another (Weick, 1976). This is a fundamental problem with those conventional methods for control over organizational subunits which seek to reduce bargaining, uncertainty, and conflict.

On the other hand, zero-based budgeting and program budgeting are two unconventional, comprehensive routines for allocating resources among subunits (Novick, 1969). Their basic principle is that budgets should be organized in terms of desired goals, and that resources should be allocated to subunits according to the contributions the subunits are expected to make to these goals. However, these comprehensive routines have probably never been successfully applied (Gunsteren, 1976). New goal categories inevitably create new conflicts and uncertainties for subunits, all of which then attempt to show that they contribute to all organizational goals and, therefore, have legitimate claims on all resource pools (Wildavsky, 1975). Compromises and adjustments become more difficult as interdependencies become more apparent (White, 1974). But perhaps most important, although these routines ask controllers to reconsider what effects existing allocation routines and rules may be having, they do not generate any meaningful alternative routines and rules. Most people within organizations are not prepared to work through the uncertainties, adjustments, and reorganizations which new, comprehensive routines and rules would require. In contrast, the marginal routines which start from past allocations implicitly accept existing procedures and allow meaningful comparisons. In addition, accepting the status quo does not challenge the existing political coalitions, which people may have struggled to achieve.

Although conventional methods for control over organizational subunits may make needed changes and adjustments to control processes very difficult, such adjustments do sometimes occur. Such change usually requires both a clearly perceived crisis in organizations and external relations coupled with insightful top managers who can formulate new ideologies and articulate new sets of organizational rules (Starbuck *et al.*, 1978). Sometimes an organization notices that the external environment is changing and that the organization must also change if it is to survive. For example, Baldrige (1971) described how, for over a century, New York University had provided educational opportunities for all types of people in New York. During the 1950s, as the public educational sector expanded, the university realized that its traditional student base would be threatened. In the early 1960s, enrollments dropped off,

and the university prepared to change its image and to become a highly selective, uniquely urban center for full-time learning. Appropriate rules and procedures were implemented to make sure that these changes occurred, so that by the 1970s, New York University was a very different institution than the one that had existed in the 1950s. This needed transformation was achieved only at the cost of very high internal conflict.

The self-initiated reorganization achieved by New York University is an unusual organizational saga. More often, organizations can only achieve such changes by replacing their leadership with new people from outside the organization, because the existing membership cannot conceive, or will not perceive, how they might use rules and procedures that are different from those that they have used in the past (Mitroff *et al.*, 1977; Starbuck and Hedberg, 1977). For example, Marrow *et al.* (1967) described the changes that became possible only after a plant was taken over by another company. Instead of responding to all variations in customers' demands, the new marketing policy required some model standardization and fewer models produced to customers' specifications. These changes allowed a smoother work flow. Within subunits, there were also changes. For example, instead of highly specialized production, with workers sequentially dependent on one another, workers were reorganized into small, flexible groups and the product range that each worker encountered was reduced. These needed changes were perceived as potentially very disruptive (Coch and French, 1948); without the new leadership, they would not have occurred.

Designing control

People in organizations understand rules best in terms of the ways they define, constrain, and restrict behavior within subunits. Although people may often view existing rules as stable structures (Schon, 1971), in fact, rules should only be held and viewed constant in the short term. In the long term, they should be reexamined, adjusted, and changed. This is because rules play their most critical role in the control process through the ways they combine together to channel information, behavior, and resource flows into deviation-counteracting and deviation-amplifying loops that then affect and change the relations between subunits and, in the process, the relations between organizations and their environments. As people reflect on the control process, they may not see this total picture (Axelrod, 1976). Yet, the flow interrelationships and loops which rules establish continue to exercise their controlling effects, pushing organizations in particular directions, irrespective of whether or not they are understood. In this sense, interrelated control rules that combine into

flow loops are self-organizing (Sahal, 1978, 1979), and people cannot be sure that organizational directions that result are automatically desirable.

People may wish to have an impact on this self-organizing system. In order to do this, they should first recognize the self-organizing properties which characterize rule systems exercising control over subunits. After such recognition, people realize that their personal motives and individual efforts can be very secondary factors in the overall control process (Stinchcombe, 1960). Any consistent associations between variables are, alone, enough to establish deviation-counteracting or deviation-amplifying flow loops which ensure that organizations develop in definite directions (Thorp, 1966). But by identifying the overall directions towards which existing rule systems are pushing organizations (Bateson, 1972), and by intervening to establish new rules or to change old ones, people can complement rule systems in critical ways by steering the ongoing control process so that organizations develop in desirable directions.

Within subunits, rules set short-term constraints (Simon, 1962, 1964). The bases for control are established solution-generating routines and standardized procedures which should be combined together by subunit members in ways that establish and maintain one-to-one relations between subunits' capacities and demands. In other words, within subunits, people play a coordinating role—rather than a steering role—in the control process. Nevertheless, also within subunits, people should periodically assess the effects and efficiencies of solution-generating routines and assess whether standardized procedures are being triggered on appropriate occasions. Where necessary, expert knowledge may be used to improve solution-generating routines; behavior modification may be used to establish links between appropriate cues and needed standardized procedures.

Figure 1 sets out some broad outlines for people's role in designs for organizational control. The control process relies initially on outcome feedbacks. If outcomes are as expected, the existing control system of rules, routines, and procedures is allowed to continue. If outcome feedbacks are not acceptable, people should intervene. First, they should focus on control over subunits and reexamine the existing information, behavior, and resource flows between subunits and between the organization and its environment (Powers, 1978). This requires that additional feedback must be generated to identify needed rule changes and to allow appropriate interventions to be made. If outcome feedback is still unacceptable, it may then be necessary to focus on control within subunits and to investigate how budget-control games are being played. Before making any changes, additional feedback should be generated which

either describes the effects and efficiencies of solution-generating routines, or which indicates whether standardized procedures are being triggered on appropriate occasions, and so allow adjustments to be made.

Figure 1 shows how people should complement the control functions performed by the rules that constrain subunits, and the solution-generating routines and standardized procedures used within subunits. People should see themselves as harmonizers and molders who are prepared to be minimally content with current rules, routines, and procedures, and who wish to improve them (Hedberg *et al.*, 1976). At the same time, until negative outcome feedback is received and its implications understood, people should continue to rely on current rules, routines, and procedures. People within subunits should concentrate on establishing and maintaining one-to-one relations between their capacities and the demands made on their subunits, by bringing together existing solution-generating routines and known stan-

dardized procedures in ways that are appropriate to ongoing events.

People do not usually think that their role in exercising control over subunits should be simply complementary to the more basic control functions being automatically exercised either by relations between variables or by established rules. Similarly, within subunits, they do not think their role should be restricted to bringing together already established solution-generating routines and standardized procedures in ways that are appropriate to ongoing events. Rather, at both levels, because of prescriptions that people have learned in school and because of their own personal motives, many people think human controllers should be the central causal agents that give control processes their force and character, and determine their efficiency and effectiveness. Such people perceive control over subunits to be exercised by leaders who have authority to specify procedures and to request information (Becker and

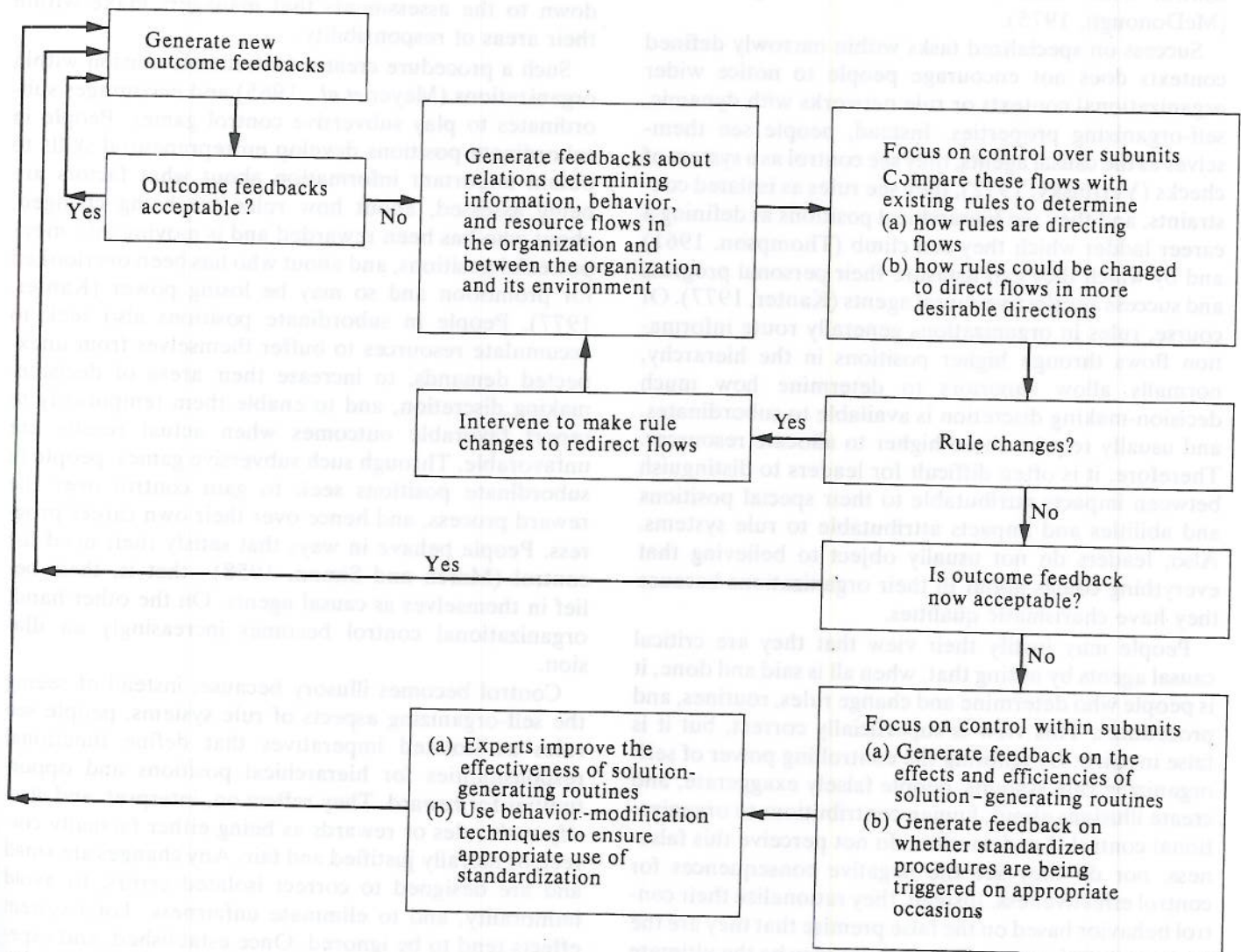


Figure 1 Outline for people's role in designs for controlled organizational achievement

Neuhauser, 1975). They perceive control within subunits to be exercised by managers who are always actively seeking new information and who are continually responding to ongoing events in brief, fragmented, and varied ways (Mintzberg, 1973).

People learn in school that if tasks are assigned to them, they should take personal responsibility for performing them (Dreeben, 1968). They also learn that it is legitimate to use standards to evaluate the work for which they are responsible, and that rewards should be based on their performances. As a result, people learn to see themselves in such control situations as prime causal agents. They learn to focus attention on their own individual progress within the particular situations and to ignore wider organizational contexts. Through their successes in specialized tasks within clearly restricted areas, people learn that they can maintain one-to-one relations between their own capacities and the demands made on them. In this sense, they can exercise effective control over their own lives within organizations (McDonough, 1975).

Success on specialized tasks within narrowly defined contexts does not encourage people to notice wider organizational contexts or rule networks with dynamic, self-organizing properties. Instead, people see themselves as the causal agents, they see control as a system of checks (Vertinsky, 1972), they see rules as isolated constraints, and they see hierarchical positions as defining a career ladder which they can climb (Thompson, 1961) and by which they can measure their personal progress and success as effective causal agents (Kanter, 1977). Of course, rules in organizations generally route information flows through higher positions in the hierarchy, normally allow superiors to determine how much decision-making discretion is available to subordinates, and usually require those higher to allocate resources. Therefore, it is often difficult for leaders to distinguish between impacts attributable to their special positions and abilities and impacts attributable to rule systems. Also, leaders do not usually object to believing that everything comes about in their organizations because they have charismatic qualities.

People may justify their view that they are critical causal agents by noting that, when all is said and done, it is people who determine and change rules, routines, and procedures. This view is superficially correct, but it is false in spirit. By ignoring the controlling power of self-organizing rule systems, people falsely exaggerate, and create illusions about, human contributions to organizational control. Leaders often do not perceive this falseness, nor do they see the negative consequences for control effectiveness. Instead, they rationalize their control behavior based on the false premise that they are the central control agents. This premise may be the ultimate control illusion (Bakan, 1966).

Figure 2 sets out some broad outlines for people's role in designs for organizational control, given the premise that people are the central causal agents in the control process. Again, the control process is initiated by outcome feedbacks and unacceptable outcomes are investigated. Given the premise that people are the critical control agents, this investigation concentrates on evaluating whether people, who hold various positions with various task assignments within the organizational hierarchy, have fulfilled their performance responsibilities. Many organizations base these assessments on budget performance (Lawler and Rhode, 1976). Managers who meet expectations are rewarded, possibly financially, possibly with promotions, and possibly with increased decision-making discretion. On the other hand, those who fail to meet expectations may be punished by receiving no financial rewards, no promotions, and possibly by having their decision-making discretion reduced. This emphasis on personal responsibility supported by rewards and punishments then filters down to the assessments that managers make within their areas of responsibility.

Such a procedure creates tremendous tension within organizations (Meyer *et al.*, 1965) and encourages subordinates to play subversive control games. People in subordinate positions develop entrepreneurial skills to obtain important information about what factors are being assessed, about how rules are being changed, about who has been rewarded and is moving into more powerful positions, and about who has been overlooked for promotion and so may be losing power (Kanter, 1977). People in subordinate positions also seek to accumulate resources to buffer themselves from unexpected demands, to increase their areas of decision-making discretion, and to enable them temporarily to report favorable outcomes when actual results are unfavorable. Through such subversive games, people in subordinate positions seek to gain control over the reward process, and hence over their own career progress. People behave in ways that satisfy their need for control (March and Simon, 1958)—that is, their belief in themselves as causal agents. On the other hand, organizational control becomes increasingly an illusion.

Control becomes illusory because, instead of seeing the self-organizing aspects of rule systems, people see rules as isolated imperatives that define functional responsibilities for hierarchical positions and opportunities for reward. They reflect on, interpret, and classify such rules or rewards as being either factually correct, or morally justified and fair. Any changes are small and are designed to correct isolated errors, to avoid immorality, and to eliminate unfairness. Total system effects tend to be ignored. Once established, and especially in an authoritarian context, people hesitate to

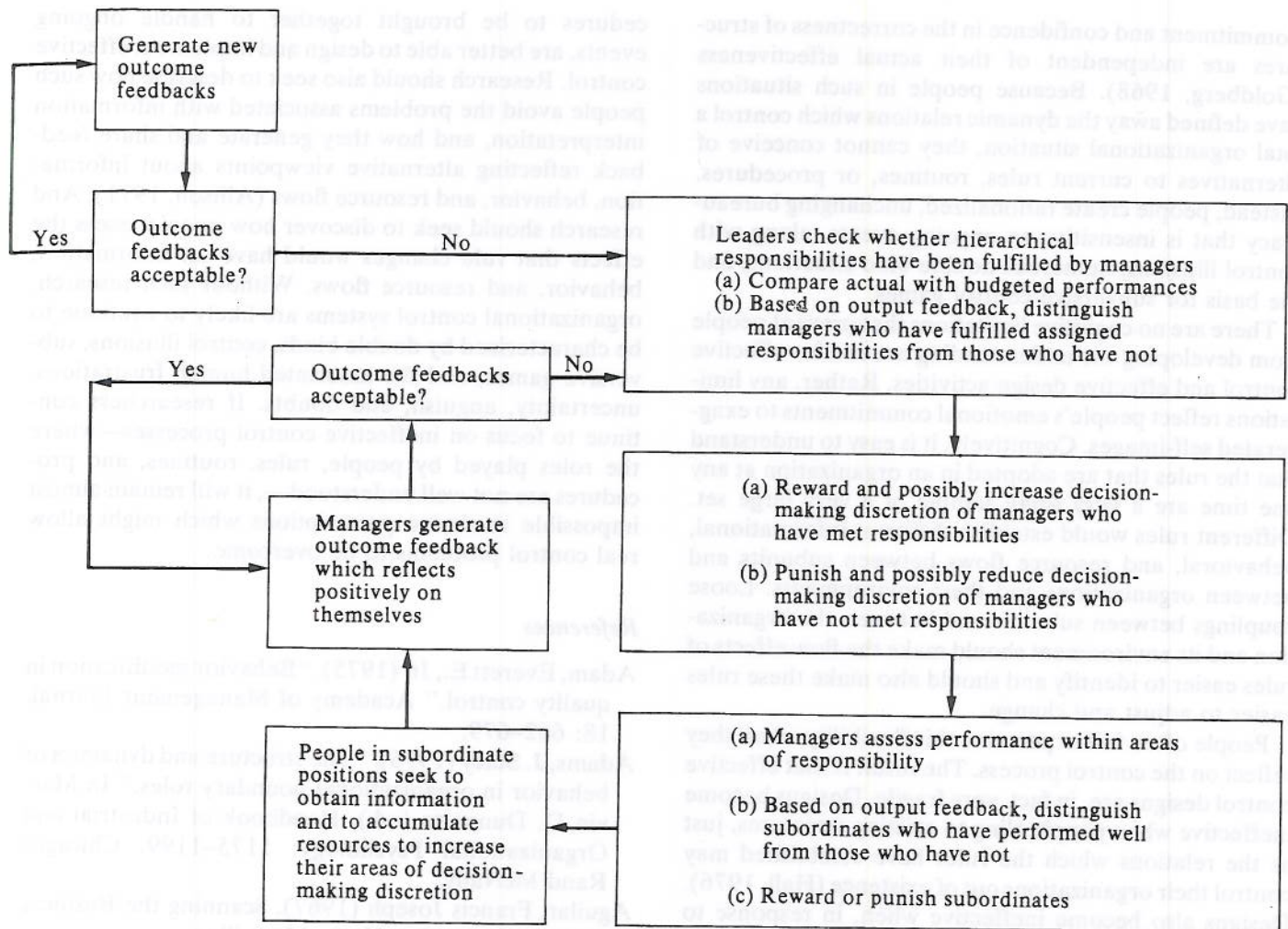


Figure 2 Outline for people's role in designs to promote organizational control illusions

change or challenge rules, responsibility assignments, or rewards. Rather, the existing situations are simply accepted, and people rely on outcome feedback to decide whether behavior within the situations is being effective. Should outcomes be negative, the fault is usually attributed to those isolated units that apparently did not fulfil their budgets or some other expectations. How these particular defects may really relate to the ongoing control process is usually not understood. In such a system, design activity is past-oriented and justified by past learning and personal ambitions rather than being future-oriented and being directed towards accomplishing organizational control goals. Admittedly, some outstanding individuals may develop procedures or solution-generating routines that are particularly effective control devices within subunits, but such contributions are easily dominated by the relational processes exercising control over subunits. Such control efforts within subunits often go unrecognized, and may be criticized in situations which emphasize authoritarian relationships.

People who see themselves as primary causal agents in the control process probably do not perceive the dynamic self-organizing properties that characterize ongoing structures. This blindness enables them to regard the existing structures as frameworks which reduce dynamic relational fields into manageable sets of static objects and categories, and which they then believe they should use to interpret ongoing events. Indeed, without such supposedly static frameworks, people could not be so sure that they are in control. As people in organizations want to maintain the belief that they are exercising control, they become increasingly committed to existing structures. They regard possible changes as disruptive and threatening because the stable frameworks might become unstable (Schon, 1971). This defensiveness increases as people are committed to seeing themselves as causal agents but at the same time are anxious that this belief may be an illusion (Curle, 1972; Torbert, 1972). Commitment to existing rules, routines, and procedures seems to increase as they have been used more often to interpret more information.

Commitment and confidence in the correctness of structures are independent of their actual effectiveness (Goldberg, 1968). Because people in such situations have defined away the dynamic relations which control a total organizational situation, they cannot conceive of alternatives to current rules, routines, or procedures. Instead, people create rationalized, unchanging bureaucracy that is insensitive to ongoing events, along with control illusions, numerous double-bind situations, and the basis for subversive control games.

There are no cognitive limitations that prevent people from developing the understanding needed for effective control and effective design activities. Rather, any limitations reflect people's emotional commitments to exaggerated self-images. Cognitively, it is easy to understand that the rules that are adopted in an organization at any one time are a very small sample of a very large set. Different rules would establish different informational, behavioral, and resource flows between subunits and between organizations and their environments. Loose couplings between subunits and between the organization and its environment should make the flow effects of rules easier to identify and should also make these rules easier to adjust and change.

People often fail to perceive this flexibility when they reflect on the control process. The result is that effective control designs are, in fact, very fragile. Designs become ineffective when people cling to existing structures, just as the relations which the rules have established may control their organizations out of existence (Hall, 1976). Designs also become ineffective when, in response to new and uncertain information, people decide to abandon adherence to established rules, routines, and procedures, even though underlying relations on which the rules are based are unchanged (Balke *et al.*, 1973). These defensive and ineffective control practices become more likely as people are more embedded in a control system that promotes the illusion that people, and their individual efforts, are the critical agents in the control process (Holloman and Hendrick, 1972). Attempts to introduce rule changes automatically make couplings between subunits tighter, and conflict, bargaining, and uncertainty increase as each subunit manager propounds a narrow perspective which ignores the total picture and possibilities for flexibility.

Much research on organizational control in fact describes the difficulties associated with exaggerating the roles played by people and not understanding the functions performed by rules, routines, and procedures in the control process. The more moderate and balanced approach advocated here needs to be explored. Research should seek to determine whether people who are aware of the self-organizing properties of rules, and who understand the necessity for preprogrammed solution-generating routines and standardized pro-

cedures to be brought together to handle ongoing events, are better able to design and implement effective control. Research should also seek to describe how such people avoid the problems associated with information interpretation, and how they generate and share feedback reflecting alternative viewpoints about information, behavior, and resource flows (Allison, 1971). And research should seek to discover how people assess the effects that rule changes would have on information, behavior, and resource flows. Without such research, organizational control systems are likely to continue to be characterized by double binds, control illusions, subversive games, and the associated human frustrations, uncertainty, anguish, and doubts. If researchers continue to focus on ineffective control processes—where the roles played by people, rules, routines, and procedures are not well understood—it will remain almost impossible to derive prescriptions which might allow real control problems to be overcome.

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