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Educational Organizations as Loosely Coupled Systems

Karl E. Weick

In contrast to the prevailing image that elements in organizations are coupled through dense, tight linkages, it is proposed that elements are often tied together frequently and loosely. Using educational organizations as a case in point, it is argued that the concept of loose coupling incorporates a surprising number of disparate observations about organizations, suggests novel functions, creates stubborn problems for methodologists, and generates intriguing questions for scholars. Sample studies of loose coupling are suggested and research priorities are posed to foster cumulative work with this concept.[1]

Imagine that you're either the referee, coach, player or spectator at an unconventional soccer match: the field for the game is round; there are several goals scattered haphazardly around the circular field; people can enter and leave the game whenever they want to; they can throw balls in whenever they want; they can say "that's my goal" whenever they want to, as many times as they want to, and for as many goals as they want to; the entire game takes place on a sloped field; and the game is played as if it makes sense (March, personal communication).

If you now substitute in that example principals for referees, teachers for coaches, students for players, parents for spectators and schooling for soccer, you have an equally unconventional depiction of school organizations. The beauty of this depiction is that it captures a different set of realities within educational organizations than are caught when these same organizations are viewed through the tenets of bureaucratic theory.

Consider the contrast in images. For some time people who manage organizations and people who study this managing have asked, "How does an organization go about doing what it does and with what consequences for its people, processes, products, and persistence?" And for some time they've heard the same answers. In paraphrase the answers say essentially that an organization does what it does because of plans, intentional selection of means that get the organization to agree upon goals, and all of this is accomplished by such rationalized procedures as cost-benefit analyses, division of labor, specified areas of discretion, authority invested in the office, job descriptions, and a consistent evaluation and reward system. The only problem with that portrait is that it is rare in nature. People in organizations, including educational organizations, find themselves hard pressed either to find actual instances of those rational practices or to find rationalized practices whose outcomes have been as beneficent as predicted, or to feel that those rational occasions explain much of what goes on within the organization. Parts of some organizations are heavily rationalized but many parts also prove intractable to analysis through rational assumptions.

It is this substantial unexplained remainder that is the focus of this paper. Several people in education have expressed dissatisfaction with the prevailing ideas about organizations supplied by organizational theorists. Fortunately, they have

1
This paper is the result of a conference held at La Jolla, California, February 2–4, 1975 with support from the National Institute of Education (NIE). Participants in the conference were, in addition to the author, W.W. Charters, Center for Educational Policy and Management, University of Oregon; Craig Lundberg, School of Business, Oregon State University; John Meyer, Dept. of Sociology, Stanford University; Miles Meyers, Dept. of English, Oakland (Calif.) High School; Karlene Roberts, School of Business, University of California, Berkeley; Gerald Salancik, Dept. of Business Administration, University of Illinois; and Robert Wentz, Superintendent of Schools, Pomona (Calif.) Unified School District. James G. March, School of Education, Stanford University, a member of the National Council on Educational Research, and members of the NIE staff were present as observers. This conference was one of several on organizational processes in education which will lead to a report that will be available from the National Institute of Education, Washington, D.C. 20208. The opinions expressed in this paper do not necessarily reflect the position or policy of the National Institute of Education or the Department of Health, Education, and Welfare.

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also made some provocative suggestions about newer, more unconventional ideas about organizations that should be given serious thought. A good example of this is the following observation by John M. Stephens (1967: 9–11):

> [There is a] remarkable constancy of educational results in the face of widely differing deliberate approaches. Every so often we adopt new approaches or new methodologies and place our reliance on new panaceas. At the very least we seem to chorus new slogans. Yet the academic growth within the classroom continues at about the same rate, stubbornly refusing to cooperate with the bright new dicta emanating from the conference room . . . [These observations suggest that] we would be making a great mistake in regarding the management of schools as similar to the process of constructing a building or operating a factory. In these latter processes deliberate decisions play a crucial part, and the enterprise advances or stands still in proportion to the amount of deliberate effort exerted. If we must use a metaphor or model in seeking to understand the process of schooling, we should look to agriculture rather than to the factory. In agriculture we do not start from scratch, and we do not direct our efforts to inert and passive materials. We start, on the contrary, with a complex and ancient process, and we organize our efforts around what seeds, plants, and insects are likely to do anyway . . . . The crop, once planted, may undergo some development even while the farmer sleeps or loafs. No matter what he does, *some* aspects of the outcome will remain constant. When teachers and pupils foregather, some education may proceed even while the Superintendent disports himself in Atlantic City.

It is crucial to highlight what is important in the examples of soccer and schooling viewed as agriculture. To view these examples negatively and dismiss them by observing that "the referee should tighten up those rules," "superintendents don't do that," "schools are more sensible than that," or "these are terribly sloppy organizations" is to miss the point. The point is although researchers don't know what these kinds of structures are like but researchers do know they exist and that each of the negative judgments expressed above makes sense only if the observer assumes that organizations are constructed and managed according to rational assumptions and therefore are scrutable only when rational analyses are applied to them. This paper attempts to expand and enrich the set of ideas available to people when they try to make sense out of their organizational life. From this standpoint, it is unproductive to observe that fluid participation in schools and soccer is absurd. But it can be more interesting and productive to ask, how can it be that even though the activities in both situtations are only modestly connected, the situations are still recognizable and nameable? The goals, player movements, and trajectory of the ball are still recognizable and can be labeled "soccer." And despite variations in class size, format, locations, and architecture, the results are still recognized and can be labeled "schools." How can such loose assemblages retain sufficient similarity and permanence across time that they can be recognized, labeled, and dealt with? The prevailing ideas in organization theory do not shed much light on how such "soft" structures develop, persist, and impose crude orderliness among their elements.

The basic premise here is that concepts such as loose coupling serve as sensitizing devices. They sensitize the observer to notice and question things that had previously been taken for granted. It is the intent of the program described here to develop a language for use in analyzing complex organizations, a language that may highlight features that have previously gone unnoticed. The guiding principle is a reversal of the common assertion, "I'll believe it when I see it" and

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presumes an epistemology that asserts, ''I'll see it when I believe it.'' Organizations as loosely coupled systems may not have been seen before because nobody believed in them or could afford to believe in them. It is conceivable that preoccupation with rationalized, tidy, efficient, coordinated structures has blinded many practitioners as well as researchers to some of the attractive and unexpected properties of less rationalized and less tightly related clusters of events. This paper intends to eliminate such blindspots.

THE CONCEPT OF COUPLING

The phrase ''loose coupling'' has appeared in the literature (Glassman, 1973; March and Olsen, 1975) and it is important to highlight the connotation that is captured by this phrase and by no other. It might seem that the word coupling is synonymous with words like connection, link, or interdependence, yet each of these latter terms misses a crucial nuance.

By loose coupling, the author intends to convey the image that coupled events are responsive, *but* that each event also preserves its own identity and some evidence of its physical or logical separateness. Thus, in the case of an educational organization, it may be the case that the counselor's office is loosely coupled to the principal's office. The image is that the principal and the counselor are somehow attached, but that each retains some identity and separateness and that their attachment may be circumscribed, infrequent, weak in its mutual affects, unimportant, and/or slow to respond. Each of those connotations would be conveyed if the qualifier loosely were attached to the word coupled. Loose coupling also carries connotations of impermanence, dissolvability, and tacitness all of which are potentially crucial properties of the ''glue'' that holds organizations together.

Glassman (1973) categorizes the degree of coupling between two systems on the basis of the activity of the variables which the two systems share. To the extent that two systems either have few variables in common or share weak variables, they are independent of each other. Applied to the educational situation, if the principal-vice-principal-superintendent is regarded as one system and the teacher-classroom-pupil-parent-curriculum as another system, then by Glassman's argument if we did not find many variables in the teacher's world to be shared in the world of a principal and/or if the variables held in common were unimportant relative to the other variables, then the principal can be regarded as being loosely coupled with the teacher.

A final advantage of coupling imagery is that it suggests the idea of building blocks that can be grafted onto an organization or severed with relatively little disturbance to either the blocks or the organization. Simon (1969) has argued for the attractiveness of this feature in that most complex systems can be decomposed into stable subassemblies and that these are the crucial elements in any organization or system. Thus, the coupling imagery gives researchers access to one of the more powerful ways of talking about complexity now available.

But if the concept of loose coupling highlights novel images heretofore unseen in organizational theory, what is it about these images that is worth seeing?

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COUPLED ELEMENTS

There is no shortage of potential coupling elements, but neither is the population infinite.

At the outset the two most commonly discussed coupling mechanisms are the technical core of the organization and the authority of office. The relevance of those two mechanisms for the issue of identifying elements is that in the case of technical couplings, each element is some kind of technology, task, subtask, role, territory and person, and the couplings are task-induced. In the case of authority as the coupling mechanism, the elements include positions, offices, responsibilities, opportunities, rewards, and sanctions and it is the couplings among these elements that presumably hold the organization together. A compelling argument can be made that *neither* of these coupling mechanisms is prominent in educational organizations found in the United States. This leaves one with the question what *does* hold an educational organization together?

A short list of potential elements in educational organizations will provide background for subsequent propositions. March and Olsen (1975) utilize the elements of intention and action. There is a developing position in psychology which argues that intentions are a poor guide for action, intentions often follow rather than precede action, and that intentions and action are loosely coupled. Unfortunately, organizations continue to think that planning is a good thing, they spend much time on planning, and actions are assessed in terms of their fit with plans. Given a potential loose coupling between the intentions and actions of organizational members, it should come as no surprise that administrators are baffled and angered when things never happen the way they were supposed to.

Additional elements may consist of events like yesterday and tomorrow (what happened yesterday may be tightly or loosely coupled with what happens tomorrow) or hierarchial positions, like, top and bottom, line and staff, or administrators and teachers. An interesting set of elements that lends itself to the loose coupling imagery is means and ends. Frequently, several different means lead to the same outcome. When this happens, it can be argued that any one means is loosely coupled to the end in the sense that there are alternative pathways to achieve that same end. Other elements that might be found in loosely coupled educational systems are teachers-materials, voters-schoolboard, administrators-classroom, process-outcome, teacher-teacher, parent-teacher, and teacher-pupil.

While all of these elements are obvious, it is not a trivial matter to specify which elements are coupled. As the concept of coupling is crucial because of its ability to highlight the identity and separateness of elements that are momentarily attached, that conceptual asset puts pressure on the investigator to specify clearly the identity, separateness, and boundaries of the elements coupled. While there is some danger of reification when that kind of pressure is exerted, there is the even greater danger of portraying organizations in inappropriate terms which suggest an excess of unity, integration, coordination, and consensus. If one is nonspecific about

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boundaries in defining elements then it is easy—and careless—to assemble these ill-defined elements and talk about integrated organizations. It is not a trivial issue explaining how elements persevere over time. Weick, for example, has argued (1974: 363–364) that elements may appear or disappear and may merge or become separated in response to need-deprivations within the individual, group, and/or organization. This means that specification of elements is not a one-shot activity. Given the context of most organizations, elements both appear and disappear over time. For this reason a theory of how elements become loosely or tightly coupled may also have to take account of the fact that the nature and intensity of the coupling may itself serve to create or dissolve elements.

The question of what is available for coupling and decoupling within an organization is an eminently practical question for anyone wishing to have some leverage on a system.

STRENGTH OF COUPLING

Obviously there is no shortage of meanings for the phrase loose coupling. Researchers need to be clear in their own thinking about whether the phenomenon they are studying is described by two words or three. A researcher can study ''loose coupling'' in educational organizations or ''loosely coupled systems.'' The shorter phrase, ''loose coupling,'' simply connotes things, ''anythings,'' that may be tied together either weakly or infrequently or slowly or with minimal interdependence. Whether those things that are loosely coupled exist in a system is of minor importance. Most discussions in this paper concern loosely coupled systems rather than loose coupling since it wishes to clarify the concepts involved in the perseverance of sets of elements across time.

The idea of loose coupling is evoked when people have a variety of situations in mind. For example, when people describe loosely coupled systems they are often referring to (1) slack times—times when there is an excessive amount of resources relative to demands; (2) occasions when any one of several means will produce the same end; (3) richly connected networks in which influence is slow to spread and/or is weak while spreading; (4) a relative lack of coordination, slow coordination or coordination that is dampened as it moves through a system; (5) a relative absence of regulations; (6) planned unresponsiveness; (7) actual causal independence; (8) poor observational capabilities on the part of a viewer; (9) infrequent inspection of activities within the system; (10) decentralization; (11) delegation of discretion; (12) the absence of linkages that should be present based on some theory—for example, in educational organizations the expected feedback linkage from outcome back to inputs is often nonexistent; (13) the observation that an organization's structure is not coterminus with its activity; (14) those occasions when no matter what you do things always come out the same—for instance, despite all kinds of changes in curriculum, materials, groupings, and so forth the outcomes in an educational situation remain the same; and (15) curricula or courses in educational organizations for which there are few prerequistes—the longer the string of prerequisties, the tighter the coupling.

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POTENTIAL FUNCTIONS AND DYSFUNCTIONS OF LOOSE COUPLING

It is important to note that the concept of loose coupling need not be used normatively. People who are steeped in the conventional literature of organizations may regard loose coupling as a sin or something to be apologized for. This paper takes a neutral, if not mildly affectionate, stance toward the concept. Apart from whatever affect one might feel toward the idea of loose coupling, it does appear a priori that certain functions can be served by having a system in which the elements are loosely coupled. Below are listed seven potential functions that could be associated with loose coupling plus additional reasons why each advantage might also be a liability. The dialectic generated by each of these oppositions begins to suggest dependent variables that should be sensitive to variations in the tightness of coupling.

The basic argument of Glassman (1973) is that loose coupling allows some portions of an organization to persist. Loose coupling lowers the probability that the organization will have to—or be able to—respond to each little change in the environment that occurs. The mechanism of voting, for example, allows elected officials to remain in office for a full term even though their constituency at any moment may disapprove of particular actions. Some identity and separateness of the element "elected official" is preserved relative to a second element, "constituency," by the fact of loosely coupled accountability which is measured in two, four, or six year terms. While loose coupling may foster perseverance, it is not selective in what is perpetuated. Thus archaic traditions as well as innovative improvisations may be perpetuated.

A second advantage of loose coupling is that it may provide a sensitive sensing mechanism. This possibility is suggested by Fritz Heider's perceptual theory of things and medium. Heider (1959) argues that perception is most accurate when a medium senses a thing and the medium contains many independent elements that can be externally constrained. When elements in a medium become either fewer in number and/or more internally constrained and/or more interdependent, their ability to represent some remote thing is decreased. Thus sand is a better medium to display wind currents than are rocks, the reason being that sand has more elements, more independence among the elements, and the elements are subject to a greater amount of external constraint than is the case for rocks. Using Heider's formulation metaphorically, it could be argued that loosely coupled systems preserve many independent sensing elements and therefore "know" their environments better than is true for more tightly coupled systems which have fewer externally constrained, independent elements. Balanced against this improvement in sensing is the possibility that the system would become increasingly vulnerable to producing faddish responses and interpretations. If the environment is known better, then this could induce more frequent changes in activities done in response to this "superior intelligence."

A third function is that a loosely coupled system may be a good system for localized adaptation. If all of the elements in a large system are loosely coupled to one another, then any

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one element can adjust to and modify a local unique contingency without affecting the whole system. These local adaptations can be swift, relatively economical, and substantial. By definition, the antithesis of localized adaptation is standardization and to the extent that standardization can be shown to be desirable, a loosely coupled system might exhibit fewer of these presumed benefits. For example, the localized adaptation characteristic of loosely coupled systems may result in a lessening of educational democracy.

Fourth, in loosely coupled systems where the identity, uniqueness, and separateness of elements is preserved, the system potentially can retain a greater number of mutations and novel solutions than would be the case with a tightly coupled system. A loosely coupled system could preserve more "cultural insurance" to be drawn upon in times of radical change than in the case for more tightly coupled systems. Loosely coupled systems may be elegant solutions to the problem that adaptation can preclude adaptability. When a specific system fits into an ecological niche and does so with great success, this adaptation can be costly. It can be costly because resouces which are useless in a current environment might deteriorate or disappear even though they could be crucial in a modified environment. It is conceivable that loosely coupled systems preserve more diversity in responding than do tightly coupled systems, and therefore can adapt to a considerably wider range of changes in the environment than would be true for tightly coupled systems. To appreciate the possible problems associated with this abundance of mutations, reconsider the dynamic outlined in the preceding discussion of localized adaptation. If a local set of elements can adapt to local idiosyncracies without involving the whole system, then this same loose coupling could also forestall the spread of advantageous mutations that exist somewhere in the system. While the system may contain novel solutions for new problems of adaptation, the very structure that allows these mutations to flourish may prevent their diffusion.

Fifth, if there is a breakdown in one portion of a loosely coupled system then this breakdown is sealed off and does not affect other portions of the organization. Previously we had noted that loosely coupled systems are an exquisite mechanism to adapt swiftly to local novelties and unique problems. Now we are carrying the analysis one step further, and arguing that when any element misfires or decays or deteriorates, the spread of this deterioration is checked in a loosely coupled system. While this point is reminiscent of earlier functions, the emphasis here is on the localization of trouble rather than the localization of adaptation. But even this potential benefit may be problematic. A loosely coupled system can isolate its trouble spots and prevent the trouble from spreading, but it should be difficult for the loosely coupled system to repair the defective element. If weak influences pass from the defective portions to the functioning portions, then the influence back from these functioning portions will also be weak and probably too little, too late.

Sixth, since some of the most important elements in educational organizations are teachers, classrooms, principals, and so forth, it may be consequential that in a loosely coupled system there is more room available for self-determination by

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the actors. If it is argued that a sense of efficacy is crucial for human beings, then a sense of efficacy might be greater in a loosely coupled system with autonomous units than it would be in a tightly coupled system where discretion is limited. A futher comment can be made about self-determination to provide an example of the kind of imagery that is invoked by the concept of loose coupling.

It is possible that much of the teacher's sense of—and actual—control comes from the fact that diverse interested parties expect the teacher to link their intentions with teaching actions. Such linking of diverse intentions with actual work probably involves considerable negotiation. A parent complains about a teacher's action and the teacher merely points out to the parent how the actions are really correspondent with the parent's desires for the education of his or her children. Since most actions have ambiguous consequences, it should always be possible to justify the action as fitting the intentions of those who complain. Salancik (1975) goes even farther and suggests the intriguing possibility that when the consequences of an action are ambiguous, the stated *intentions* of the action serve as surrogates for the consequences. Since it is not known whether reading a certain book is good or bad for a child, the fact that it is intended to be good for the child itself becomes justification for having the child read it. The potential trade-off implicit in this function of loose coupling is fascinating. There is an increase in autonomy in the sense that resistance is heightened, but this heightened resistance occurs at the price of shortening the chain of consequences that will flow from each autonomous actor's efforts. Each teacher will have to negotiate separately with the same complaining parent.

Seventh, a loosely coupled system should be relatively inexpensive to run because it takes time and money to coordinate people. As much of what happens and should happen inside educational organizations seems to be defined and validated outside the organization, schools are in the business of building and maintaining categories, a business that requires coordination only on a few specific issues—for instance, assignment of teachers. This reduction in the necessity for coordination results in fewer conflicts, fewer inconsistencies among activities, fewer discrepancies between categories and activity. Thus, loosely coupled systems seem to hold the costs of coordination to a minimum. Despite this being an inexpensive system, loose coupling is also a nonrational system of fund allocation and therefore, unspecifiable, unmodifiable, and incapable of being used as means of change.

When these several sets of functions and dysfunctions are examined, they begin to throw several research issues into relief. For example, oppositions proposed in each of the preceding seven points suggest the importance of contextual theories. A predicted outcome or its opposite should emerge depending on how and in what the loosely coupled system is embedded. The preceding oppositions also suggest a fairly self-contained research program. Suppose a researcher starts with the first point made, as loose coupling increases the system should contain a greater number of anachronistic practices. Loosely coupled systems should be conspicuous for their cultural lags. Initially, one would like to know whether

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that is plausible or not. But then one would want to examine in more fine-grained detail whether those anachronistic practices that are retained hinder the system or impose structure and absorb uncertainty thereby producing certain economies in responding. Similar embellishment and elaboration is possible for each function with the result that rich networks of propositions become visible. What is especially attractive about these networks is that there is little precedent for them in the organizational literature. Despite this, these propositions contain a great deal of face validity when they are used as filters to look at educational organizations. When compared, for example, with the bureaucratic template mentioned in the introduction, the template associated with loosely coupled systems seems to take the observer into more interesting territory and prods him or her to ask more interesting questions.

METHODOLOGY AND LOOSE COUPLING

An initial warning to researchers: the empirical observation of unpredictability is insufficient evidence for concluding that the elements in a system are loosely coupled. Buried in that caveat are a host of methodological intricacies. While there is ample reason to believe that loosely coupled systems can be seen and examined, it is also possible that the appearance of loose coupling will be nothing more than a testimonial to bad methodology. In psychology, for example, it has been argued that the chronic failure to predict behavior from attitudes is due to measurement error and not to the unrelatedness of these two events. Attitudes are said to be loosely coupled with behavior but it may be that this conclusion is an artifact produced because attitudes assessed by time-independent and context-independent measures are being used to predict behaviors that are time and context dependent. If both attitudes and behaviors were assessed with equivalent measures, then tight coupling might be the rule.

Any research agenda must be concerned with fleshing out the imagery of loose coupling—a task requiring a considerable amount of conceptual work to solve a few specific and rather tricky methodological problems before one can investigate loose compling.

By definition, if one goes into an organization and watches which parts affect which other parts, he or she will see the tightly coupled parts and the parts that vary the most. Those parts which vary slightly, infrequently, and aperiodically will be less visible. Notice, for example, that interaction data—who speaks to whom about what—are unlikely to reveal loose couplings. These are the most visible and obvious couplings and by the arguments developed in this paper perhaps some of the least crucial to understand what is going on in the organization.

An implied theme in this paper is that people tend to overrationalize their activities and to attribute greater meaning, predictability, and coupling among them than in fact they have. If members tend to overrationalize their activity then their descriptions will not suggest which portions of that activity are loosely and tightly coupled. One might, in fact, even use the presence of apparent overrationalization as a

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potential clue that myth making, uncertainty, and loose coupling have been spotted.

J.G. March has argued that loose coupling can be spotted and examined only if one uses methodology that highlights and preserves rich detail about context. The necessity for a contextual methodology seems to arise, interestingly enough, from inside organization theory. The implied model involves cognitive limits on rationality and man as a single channel information processor. The basic methodological point is that if one wishes to observe loose coupling, then he has to see both what is and is not being done. The general idea is that time spent on one activity is time spent away from a second activity. A contextually sensitive methodology would record both the fact that some people are in one place generating events and the fact that these same people are thereby absent from some other place. The rule of thumb would be that a tight coupling in one part of the system can occur only if there is loose coupling in another part of the system. The problem that finite attention creates for a researcher is that if some outcome is observed for the organization, then it will not be obvious whether the outcome is due to activity in the tightly coupled sector or to inactivity in the loosely coupled sector. That is a provocative problem of interpretation. But the researcher should be forewarned that there are probably a finite number of tight couplings that can occur at any moment, that tight couplings in one place imply loose couplings elsewhere, and that it may be the *pattern* of couplings that produces the observed outcomes. Untangling such intricate issues may well require that new tools be developed for contextual understanding and that investigators be willing to substitute nonteleological thinking for teleological thinking (Steinbeck, 1941: chapt. 14).

Another contextually sensitive method is the use of comparative studies. It is the presumption of this methodology that taken-for-granted understandings—one possible "invisible" source of coupling in an otherwise loosely coupled system—are embedded in and contribute to a context. Thus, to see the effects of variations in these understandings one compares contexts that differ in conspicuous and meaningful ways.

Another methodological trap may await the person who tries to study loose coupling. Suppose one provides evidence that a particular goal is loosely coupled to a particular action. He or she says in effect, the person wanted to do this but in fact actually did that, thus, the action and the intention are loosely coupled. Now the problem for the researcher is that he or she may simply have focused on the wrong goal. There may be other goals which fit that particular action better. Perhaps if the researcher were aware of them, then the action and intention would appear to be tightly coupled. Any kind of intention-action, plan-behavior, or means-end depiction of loose coupling may be vulnerable to this sort of problem and an exhaustive listing of goals rather than parsimony should be the rule.

Two other methodological points should be noted. First, there are no good descriptions of the kinds of couplings that can occur among the several elements in educational organizations. Thus, a major initial research question is simply, what

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does a map of the couplings and elements within an educational organization look like? Second, there appear to be some fairly rich probes that might be used to uncover the nature of coupling within educational organizations. Conceivably, crucial couplings within schools involve the handling of disciplinary issues and social control, the question of how a teacher gets a book for the classroom, and the question of what kinds of innovations need to get clearance by whom. These relatively innocuous questions may be powerful means to learn which portions of a system are tightly and loosely coupled. Obviously these probes would be sampled if there was a full description of possible elements that can be coupled and possible kinds and strengths of couplings. These specific probes suggest, however, in addition that what holds an educational organization together may be a small number of tight couplings in out-of-the-way places.

ILLUSTRATIVE QUESTIONS FOR A RESEARCH AGENDA

Patterns of Loose and Tight Coupling: Certification versus Inspection

Suppose one assumes that education is an intrinsically uninspected and unevaluated activity. If education is intrinsically uninspected and unevaluated then how can one establish that it is occurring? One answer is to define clearly who can and who cannot do it and to whom. In an educational organization this is the activity of certification. It is around the issues of certification and of specifying who the pupils are that tight coupling would be predicted to occur when technology and outcome are unclear.

If one argues that ''certification'' is the question ''who does the work'' and ''inspection'' is the question ''how well is the work done,'' then there can be either loose or tight control over either certification or inspection. Notice that setting the problem up this way suggests the importance of discovering the distribution of tight and loosely coupled systems within any organization. Up to now the phrase loosely coupled systems has been used to capture the fact that events in an organization seem to be temporally related rather than logically related (Cohen and March, 1974). Now that view is being enriched by arguing that any organization must deal with issues of certification (who does the work) and inspection (how well is the work done). It is further being suggested that in the case of educational organizations there is loose control on the work—the work is intrinsically uninspected and unevaluated or if it is evaluated it is done so infrequently and in a perfunctory manner—but that under these conditions it becomes crucial for the organization to have tight control over who does the work and on whom. This immediately suggests the importance of comparative research in which the other three combinations are examined, the question being, how do these alternative forms grow, adapt, manage their rhetoric and handle their clientele. Thus it would be important to find organizations in which the controls over certification and inspection are both loose, organizations where there is loose control over certification but tight control over inspection, and organizations in which there is tight control both over inspection and over certification. Such comparative research might be conducted among different kinds of educational organiza-

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tions within a single country (military, private, religious schooling in the United States), between educational and noneducational organizations within the same country (for example, schools versus hospitals versus military versus business organizations) or between countries looking at solutions to the problem of education given different degrees of centralization. As suggested earlier, it may not be the existence or nonexistence of loose coupling that is a crucial determinant of organizational functioning over time but rather the patterning of loose and tight couplings. Comparative studies should answer the question of distribution.

If, as noted earlier, members within an organization (and researchers) will see and talk clearly about only those regions that are tightly coupled, then this suggests that members of educational organizations should be most explicit and certain when they are discussing issues related to certification for definition and regulation of teachers, pupils, topics, space, and resources. These are presumed to be the crucial issues that are tightly controlled. Increasing vagueness of description should occur when issues of substantive instruction—inspection—are discussed. Thus, those people who primarily manage the instructional business will be most vague in describing what they do, those people who primarily manage the certification rituals will be most explicit. This pattern is predicted *not* on the basis of the activities themselves—certification is easier to describe than inspection—but rather on the basis of the expectation that tightly coupled subsystems are more crucial to the survival of the system and therefore have received more linguistic work in the past and more agreement than is true for loosely coupled elements.

Core Technology and Organizational Form

A common tactic to understand complex organizations is to explore the possibility that the nature of the task being performed determines the shape of the organizational structure. This straightforward tactic raises some interesting puzzles about educational organizations. There are suggestions in the literature that education is a diffuse task, the technology is uncertain.

This first question suggests two alternatives: if the task is diffuse then would not any organizational form whatsoever be equally appropriate *or* should this directly compel a diffuse form of organizational structure? These two alternatives are not identical. The first suggests that if the task is diffuse then any one of a variety of quite specific organizational forms could be imposed on the organization and no differences would be observed. The thrust of the second argument is that there is one and only one organizational form that would fit well when there is a diffuse task, namely, a diffuse organizational form (for instance, an organized anarchy).

The second question asks if the task in an educational organization is diffuse then why do all educational organizations look the way they do, and why do they all look the same? If there is no clear task around which the shape of the organization can be formed then why is it that most educational organizations do have a form and why is it that most of these forms look indentical? One possibile answer is that the tasks of educational organizations does not constrain the form of the

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organization but rather this constraint is imposed by the ritual of certification and/or the agreements that are made in and by the environment. If any of these nontask possibilities are genuine alternative explanations, then the general literature on organizations has been insensitive to them.

One is therefore forced to ask the question, is it the case within educational organizations that the technology is unclear? So far it has been argued that loose coupling in educational organizations is partly the result of uncertain technology. If uncertain technology does not generate loose coupling then researchers must look elsewhere for the origin of these bonds.

Making Sense in/of Loosely Coupled Worlds

What kinds of information do loosely coupled systems provide members around which they can organize meanings, that is, what can one use in order to make sense of such fleeting structures? (By definition loosely coupled events are modestly predictable at best.) There is a rather barren structure that can be observed, reported on, and retrospected in order to make any sense. Given the ambiguity of loosely coupled structures, this suggests that there may be increased pressure on members to construct or negotiate some kind of social reality they can live with. Therefore, under conditions of loose coupling one should see considerable effort devoted to constructing social reality, a great amount of face work and linguistic work, numerous myths (Mitroff and Kilmann, 1975) and in general one should find a considerable amount of effort being devoted to punctuating this loosely coupled world and connecting it in some way in which it can be made sensible. Loosely coupled worlds do not look as if they would provide an individual many resources for sense making—with such little assistance in this task, a predominant activity should involve constructing social realities. Tightly coupled portions of a system should not exhibit nearly this preoccupation with linguistic work and the social construction of reality.

Coupling as a Dependent Variable

As a general rule, any research agenda on loose coupling should devote equal attention to loose coupling as a dependent and independent variable. Most suggestions have treated loose coupling as an independent variable. Less attention has been directed toward loose coupling as a dependent variable with the one exception of the earlier argument that one can afford loose coupling in either certification or inspection but not in both and, therefore, if one can locate a tight coupling for one of these two activities then he can predict as a dependent variable loose coupling for the other one.

Some investigators, however, should view loose coupling consistently as a dependent variable. The prototypic question would be, given prior conditions such as competition for scarce resources, logic built into a task, team teaching, conflict, striving for professionalism, presence of a central ministry of education, tenure, and so forth, what kind of coupling (loose or tight) among what kinds of elements occurs? If an organization faces a scarcity of resources its pattern of couplings should differ from when it faces an expansion of re-

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sources (for instance, scarcity leads to stockpiling leads to decoupling). Part of the question here is, what kinds of changes in the environment are the variables of tight and loose coupling sensitive to? In response to what kinds of activities or what kinds of contexts is coupling seen to change and what kinds of environments or situations, when they change, seem to have no effect whatsoever on couplings within an organization? Answers to these questions, which are of vital importance in predicting the outcomes of any intervention, are most likely to occur if coupling is treated as a dependent variable and the question is, under what conditions will the couplings that emerge be tight or loose?

Assembling Loosely Connected Events

Suppose one assumes that there is nothing in the world except loosely coupled events. This assumption is close to Simon's stable subassemblies and empty world hypothesis and to the idea of cognitive limits on rationality. The imagery is that of numerous clusters of events that are tightly coupled within and loosely coupled between. These larger loosely coupled units would be what researchers usually call organizations. Notice that organizations formed this way are rather unusual kinds of organizations because they are neither tightly connected, nor explicitly bounded, but they are stable. The research question then becomes, how does it happen that loosely coupled events which remain loosely coupled are institutionally held together in one organization which retains few controls over central activities? Stated differently, how does it happen that someone can take a series of loosely coupled events, assemble them into an organization of loosely coupled systems, and the events remain both loosely coupled but the organization itself survives? It is common to observe that large organizations have loosely connected sectors. The questions are, what makes this possible, how does it happen? What the structure in school systems seems to consist of is categories (for example, teacher, pupil, reading) which are linked by understanding and legitimated exogenously (that is, by the world outside the organization). As John Meyer (1975) puts it, "the system works because everyone knows everyone else knows roughly what is to go on . . . . Educational organizations are holding companies containing shares of stock in uninspected activities and subunits which are largely given their meaning, reality, and value in the wider social market." Note the potential fragility of this fabric of legitimacy.

It remains to be seen under what conditions loosely coupled systems are fragile structures because they are shored up by consensual anticipations, retrospections, and understanding that can dissolve and under what conditions they are resilient structures because they contain mutations, localized adaptation, and fewer costs of coordination.

Separate Intending and Acting Components

Intention and action are often loosely coupled within a single individual. Salancik (1975) has suggested some conditions under which dispositions within a single individual may be loosely coupled. These include such suggestions as follows.

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(1) If intentions are not clear and unambiguous, then the use of them to select actions which will fulfill the intentions will be imperfect. (2) If the consequences of action are not known, then the use of intention to select action will be imperfect. (3) If the means by which an intention is transformed into an action are not known or in conflict, then the coupling of action to intention will be imperfect. (4) If intentions are not known to a person at the time of selecting an action, then the relationships between action and intention will be imperfect. This may be more common than expected because this possibility is not allowed by so-called rational models of man. People often have to recall their intentions after they act or reconstruct these intentions, or invent them. (5) If there exists a set of multiple intentions which can determine a set of similar multiple actions, then the ability to detect a relationship between any one intention and any one action is likely to be imperfect. To illustrate, if there is an intention A which implies selecting actions X and Y, and there is also an intention B which implies selecting actions X and Y, then it is possible that under both presence and absence of intention A, action X will be selected. Given these circumstances, an observer will falsely conclude that this relationship is indeterminant.

The preceding list has the potential limitation for organizational inquiry in that it consists of events within a single person. This limitation is not serious *if* the ideas are used as metaphors or if each event is lodged in a different person. For example, one could lodge intention with one person and action with some other person. With this separation, then all of the above conditions may produce loose coupling between these actors but additional conditions also come into play given this geographical separation of intention from action. For example, the simple additional requirement that the intentions must be communicated to the second actor and in such a way that they control his actions, will increase the potential for error and loose coupling. Thus any discussion of separate locations for intention and action within an organization virtually requires that the investigator specify the additional conditions under which the intending component can control the acting component. Aside from the problems of communication and control when intention and action are separated there are at least two additional conditions that could produce loose coupling.

1. If there are several diverse intending components all of whom are dependent on the same actor for implementing action, then the relationship between any one intention and any one action will be imperfect. The teacher in the classroom may well be the prototype of this condition.

2. The process outlined in the preceding item can become even more complicated, and the linkages between intention and action even looser, if the single acting component has intentions of its own.

Intention and action are often split within organizations. This paper suggests that if one were to map the pattern of intention and action components within the organization these would coincide with loosely coupled systems identified by other means. Furthermore, the preceding propositions begin to suggest conditions under which the same components might be at one moment tightly coupled and at the next moment loosely coupled.

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CONCLUSION: A STATEMENT OF PRIORITIES

More time should be spent examining the possibility that educational organizations are most usefully viewed as loosely coupled systems. The concept of organizations as loosely coupled systems can have a substantial effect on existing perspectives about organizations. To probe further into the plausibility of that assertion, it is suggested that the following research priorities constitute a reasonable approach to the examination of loosely coupled systems.

1. Develop Conceptual Tools Capable of Preserving Loosely Coupled Systems

It is clear that more conceptual work has to be done before other lines of inquiry on this topic are launched. Much of the blandness in organizational theory these days can be traced to investigators applying impoverished images to organizational settings. If researchers immediately start stalking the elusive loosely coupled system with imperfect language and concepts, they will perpetuate the blandness of organizational theory. To see the importance of and necessity for this conceptual activity the reader should reexamine the 15 different connotations of the phrase "loose coupling" that are uncovered in this paper. They provide 15 alternative explanations for any researcher who claims that some outcome is due to loose coupling.

2. Explicate What Elements Are Available in Educational Organizations for Coupling

This activity has high priority because it is essential to know the practical domain within which the coupling phenomena occur. Since there is the further complication that elements may appear or disappear as a function of context and time, this type of inventory is essential at an early stage of inquiry. An indirect benefit of making this a high priority activity is that it will stem the counterproductive suspicion that "the number of elements in educational organizations is infinite." The reasonable reply to that comment is that if one is precise in defining and drawing boundaries around elements, then the number of elements will be less than imagined. Furthermore, the researcher can reduce the number of relevant elements if he has some theoretical ideas in mind. These theoretical ideas should be one of the outcomes of initial activity devoted to language and concept development (Priority 1).

3. Develop Contextual Methodology

Given favorable outcomes from the preceding two steps, researchers should then be eager to look at complex issues such as patterns of tight and loose coupling keeping in mind that loose coupling creates major problems for the researcher because he is trained and equipped to decipher predictable, tightly coupled worlds. To "see" loosely coupled worlds unconventional methodologies need to be developed and conventional methodologies that are underexploited need to be given more attention. Among the existing tools that should be refined to study loose coupling are comparative studies and longitudinal studies. Among the new tools that should be "invented" because of their potential relevance to loosely

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coupled systems are nonteleological thinking (Steinbeck, 1941), concurrence methodology (Bateson, 1972: 180–201), and Hegelian, Kantian, and Singerian inquiring systems (Mitroff, 1974). While these latter methodologies are unconconventional within social science, so too is it unconventional to urge that we treat unpredictability (loose coupling) as our topic of interest rather than a nuisance.

4. Promote the Collection of Thorough, Concrete Descriptions of the Coupling Patterns in Actual Educational Organizations

No descriptive studies have been available to show what couplings in what patterns and with what strengths existed in current educational organizations. This oversight should be remedied as soon as possible.

Adequate descriptions should be of great interest to the practitioner who wants to know how his influence attempts will spread and with what intensity. Adequate description should also show practitioners how their organizations may be more sensible and adaptive than they suspect. Thorough descriptions of coupling should show checks and balances, localized controls, stabilizing mechanisms, and subtle feedback loops that keep the organization stable and that would promote its decay if they were tampered with.

The benefits for the researcher of full descriptions are that they would suggest which locations and which questions about loose coupling are most likely to explain sizeable portions of the variance in organizational outcomes. For example, on the basis of good descriptive work, it might be found that both tightly and loosely coupled systems ''know'' their environments with equal accuracy in which case, the earlier line of theorizing about ''thing and medium'' would be given a lower priority.

5. Specify the Nature of Core Technology in Educational Organizations

A suprisingly large number of the ideas presented in this paper assume that the typical coupling mechanisms of authority of office and logic of the task do not operate in educational organizations. Inquiry into loosely coupled systems was triggered partly by efforts to discover what *does* accomplish the coupling in school systems. Before the investigation of loose coupling goes too far, it should be established that authority and task are not prominent coupling mechanisms in schools. The assertions that they are not prominent seem to issue from a combination of informal observation, implausibility, wishful thinking, looking at the wrong things, and rather vague definitions of core technology and reward structures within education. If these two coupling mechanisms were defined clearly, studied carefully, and found to be weak and/or nonexistent in schools, *then* there would be a powerful justification for proceeding vigorously to study loosely coupled systems. Given the absence of work that definitively discounts these coupling mechanisms in education and given the fact that these two mechanisms have accounted for much of the observed couplings in other kinds of organizations, it seems crucial to look for them in educational organizations in the interest of parsimony.

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It should be emphasized that if it *is* found that substantial coupling within educational organizations is due to authority of office and logic of the task, this does not negate the agenda that is sketched out in this paper. Instead, such discoveries would (1) make it even more crucial to look for patterns of coupling to explain outcomes, (2) focus attention on tight and loose couplings within task and authority induced couplings, (3) alert researchers to keep close watch for any coupling mechanisms other than these two, and (4) would direct comparative research toward settings in which these two coupling mechanisms vary in strength and form.

6. Probe Empirically the Ratio of Functions to Dysfunctions Associated with Loose Coupling

Although the word ''function'' has had a checkered history, it is used here without apology—and without the surplus meanings and ideology that have become attached to it. Earlier several potential benefits of loose coupling were described and these descriptions were balanced by additional suggestions of potential liabilities. If one adopts an evolutionary epistemology, then over time one expects that entities develop a more exquisite fit with their ecological niches. Given that assumption, one then argues that if loosely coupled systems exist and if they have existed for sometime, then they bestow some net advantage to their inhabitants and/or their constituencies. It is not obvious, however, what these advantages are. A set of studies showing how schools benefit and suffer given their structure as loosely coupled systems should do much to improve the quality of thinking devoted to organizational analysis.

7. Discover How Inhabitants Make Sense Out of Loosely Coupled Worlds

Scientists are going to have some big problems when their topic of inquiry becomes low probability couplings, but just as scientists have special problems comprehending loosely coupled worlds so too must the inhabitants of these worlds. It would seem that quite early in a research program on loose coupling, examination of this question should be started since it has direct relevance to those practitioners who must thread their way through such ''invisible'' worlds and must concern their sense-making and stories in such a way that they don't bump into each other while doing so.

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