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# ON THE DEFINITION OF FEEDBACK

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The paper discusses the lack of a commonly accepted definition of the concept of feedback in management theory, dealing with communications networks and decision processes in living systems at the organization level. It proposes a general definition. It deals with living systems at the organization level, including the total system and all subsystems. Implications of the proposed definition to current conceptualizations of feedback processes in management are explored.

KEY WORDS: organization, decision making, feedback, management theory.

## INTRODUCTION

**F**EEDBACK is a widely used concept in management theory. It is used in management decision making (Bogart, 1980; Brehm & Bryant, 1976; Cantley, 1981; Connolly & Miklausch, 1978; Welford, 1972), planned organizational change (Cartwright, 1951; Chin, 1976; Katz & Kahn, 1966; Leavitt, 1965; Mann, 1963), management control (Ashton, 1976; Hackman, 1976; Hofstede, 1968; Lawler, 1976; Miner, 1975), organization design (Haberstroh, 1965), and training, performance appraisal, motivation (Herold & Greller, 1977; Hinrichs, 1976; Kim & Schuler, 1979; Nemeroff & Consentino, 1979; Sorensen & Franks, 1972).

Despite wide usage of the concept of feedback, there is little consensus among management theorists on the definition of the concept. Furthermore, some of the definitions used by management theorists vary considerably from the definitions used in related fields like general systems theory, cybernetics, control theory, etc.

The lack of an agreed upon definition of the concept of feedback does not bode well for the development of the concept in management theory. Theoretically, each person and each discipline can independently define a concept as long as they adhere to the respective definitions consistently. But such diversity of definitions hinders communication and, more importantly, the transfer of knowledge across individuals and disciplines. Thus, as long as the definition of the concept of feedback used by management theorists is at variance with

the definitions used in cybernetics, general systems theory, control theory, etc., knowledge from these disciplines cannot be translated into the context of management. This would be unfortunate given the interdisciplinary nature of management theory.

On the other hand, there is no universally accepted definition of feedback outside management theory either. Ashby (1956), for example, delineates the theorists' position on feedback as well as the experimenters' and practitioners' position. Buckley (1967) draws a distinction between feedback and pseudo-feedback; Wilden (1972) draws a distinction between feedback and weak feedback. Buckley's definition of pseudo-feedback and Wilden's definition of weak feedback would still be called feedback in Ashby's framework. In the following, based on implicit and explicit definitions used in management theory and outside, we propose a definition of feedback. In explaining the definition we show the links to other definitions, and we also explain why the proposed definition would clarify some of the confusion.

## DEFINITION OF FEEDBACK

Feedback is information about the gap between the actual level and the reference level of a system parameter which is used to alter the gap in some way. For example, information on overspending on travel by a salesman used to cut his spending in the future is feedback. The system parameter is the salesman's travel expenditure. The reference level of the system parameter is the budgeted expenditure; the actual level

is the actual expenditure. The gap between the reference level and the actual level is the amount of overspending. Information on the gap when used to alter the gap (most probably to decrease the gap) becomes feedback. If the information on the gap is merely stored without being utilized to alter the gap, it is not feedback.

The above definition of feedback emphasizes three crucial points:

1. The focus of feedback may be any system parameter: input, process, or output.
2. The necessary conditions for feedback are the existence of data on the reference level of the parameter, data on the actual level of the parameter, and a mechanism for comparing the two to generate information about the gap between the two levels. There cannot be any feedback if any one of the three (data on the reference level, data on the actual level, mechanism for comparing) is absent.
3. The information on the gap between the actual level and the reference level is feedback only when it is used to alter the gap. If the information is stored in memory it is not feedback.

In the following we will discuss the three points in detail.

### Focus of feedback

The first point, i.e., that the focus of feedback can be any system parameter, indicates the generality of the suggested definition. Most definitions of feedback focus only on the output parameters (Bogart, 1980; Cantley, 1981; Chin, 1976; DeGreene, 1970; DiStefano, Stubberud, & Williams, 1967; Lawler, 1976; Miller, 1976; Van Gigch, 1978). There is no reason to restrict the focus of feedback to output parameters only. Thus feedback may be focused on the output of an employee, the amount of effort (s)he is putting on the job (input), work procedures (process), etc. (In Bogart's, 1980, terminology, feedback focused on process would be called feedwithin.) Similarly the focus may be the number of units produced by a department, raw materials supply, or the conversion process. Focus on

output parameters alone unnecessarily restricts the generalizability and usefulness of the concept. In this sense our definition is in line with the definitions used by Miller (1972, 1978), Miner (1976), and Ashby (1956).

The system parameter which is the focus of feedback may itself be a function of other system parameters. The various financial ratios like current ratio, quick ratio, etc., are examples of parameters which are functions of more elementary parameters like current assets, total assets, inventory, etc. In such cases the process of feedback could be much more complex, because the alternatives available for altering the gap between the reference level and actual level will be many more than would be available with simple, direct system parameters. Such and related implications are discussed in detail in the section on altering the gap between reference and actual levels.

The parameter may or may not be amenable to quantitative measurement. Attempts could be made to quantify the qualitative parameters, although it is often difficult to do so without trivializing the parameter. (For example, how can one quantify the elegance of a well written computer program?) Consequently, with qualitative parameters, subjective judgment needs to be exercised in measurement. Hence, there is scope for wide individual differences in the assessment of qualitative parameters. Techniques like group discussion, Delphi (Martino, 1972), establishing specific criteria (which in a sense is like breaking down the parameter into its components), etc., may be used to generate a consensus. But even then the scope for individual differences complicates the feedback process.

The measurement of the parameter may be on a rudimentary categorical scale (yes-no, present-absent), on an ordinal scale (better-worse, more-less), on an interval scale (temperature), or on a well developed ratio scale (length, time). Categorical and ordinal scales would tend to be used with more qualitative parameters, and interval and ratio scales with more quantitative parameters. Measurement using any of the above types of scales would be sufficient for feedback.

## Necessary conditions for feedback

The second point explains the necessary conditions for feedback. There are three conditions:

1. Availability of data on the reference level of the system parameter.
2. Availability of data on the actual level of the system parameter.

3. Availability of a mechanism for comparing the data on the reference level with that on the actual level to generate information about the gap between the two levels.

In the following we will discuss the above three conditions in detail.

**Reference level.** Budgets, PERT charts, production schedules, sales targets, etc., summarize reference levels of various parameters of an organization. Rarely do organizations have separate, independent reference levels for each activity. Reference levels are interrelated in the form of a network. The examples cited earlier in the paragraph are all examples of reference level networks. Budgets summarize the reference levels for the various interrelated revenues and expenditures.

The concept of a network of reference levels is very important in the context of complex systems, particularly organizations. The importance of the network concept stems from the fact that in a network changes cannot be made in one component without affecting the other components of the network. As a matter of fact, the so-called unintended consequences of organizational change can be traced to the change agent's ignorance of the existence of such a network of relationships between the reference levels. We will return to the notion of a network of reference levels when we discuss the role of feedback in changing organizations.

Reference levels may be set in a number of ways: (a) based on historical data, (b) based on an over-all plan, (c) based on competitor's actions, and (d) arbitrarily (Pounds, 1969). Presently we are concerned with the existence of the reference levels and not the origin. Hence, we shall not discuss this aspect any further.

Reference levels may be explicit or im-

TABLE 1  
CATEGORIZATION OF REFERENCE LEVELS.

	Quantitative	Qualitative
Explicit	Budgets PERT	Code of Conduct
Implicit	Norms on Output	Dress Codes

PLICIT, qualitative or quantitative. Table 1 gives examples of each of the four types of reference levels: (a) explicit-quantitative, (b) explicit-qualitative, (c) implicit-quantitative, and (d) implicit-qualitative. It is not necessary, as Hofstede (1968) seems to imply, that reference levels be quantifiable for feedback mechanisms to operate.

When reference levels are implicit and/or qualitative, comparison and consequent feedback is rendered difficult. Despite the above fact, implicit and qualitative reference levels are extremely important in management and cannot be ignored. The importance of group norms (Lewin, 1947; Hackman, 1976) and appropriate "ritual" behavior (Kuhn, 1974; Kuhn, 1975) testify to the importance of these types of reference levels. Of course, implicit reference levels can be explicated to make comparison and consequent feedback easier. In fact, this is the main thrust of Mann's (1963) technique for organizational change. The purpose of management by objectives (MBO) (Drucker, 1954) is also a similar one. On the other hand, only some qualitative reference levels can be quantified. Most cannot be, except by trivializing the meaning of the parameters. For example, it is very difficult to quantify the reference levels for interpersonal skills. In fact, qualitative parameters prove to be the most difficult for performance appraisal.

Reference levels may be static, dynamic, or static over short periods of time and dynamic over longer periods (a step function of time). In dynamic organizations it would be difficult to find static reference levels. However, the starting and closing times of an organization are good examples (although the introduction of flexible hours would change this). The dynamism of reference levels may be due to a number of factors. First, the natural process of growth

or decline of an organization may constantly change the reference levels. Second, the reference levels may be influenced by environmental factors. In other words, since reference levels are interdependent, the alteration in reference level of any one parameter will affect the reference levels of other parameters. Given the dynamic environment in which most organizations exist, and the dynamic character of the elements of the organization itself, one would expect a constant change in the reference levels. Third, and last, the propensity of aspiration levels to shift upwards or downwards, depending on their fulfillment or nonfulfillment, would also lead to a constant change in reference levels (Eilon, 1971; Rao & Russell, 1960; Simon, 1961).

**Actual level.** The data on the actual level of the system parameter is obtained by measurement. The measurement may be qualitative or quantitative depending on the parameter. The measurement may use a rudimentary categorical scale, an ordinal scale, an interval scale, or a well developed ratio scale. Unless there is some way of measuring the actual level, feedback is impossible. Usually organizations measure and record the actual levels of a number of parameters almost constantly. Time clocks are used to record the time employees come in and leave, the accounting department keeps track of the actual receipts and expenditures, the store clerk keeps track of the inventory levels of the various items, etc. Since it is costly to collect and store the data continuously, some parameters are measured only periodically. Thus a salesman may be asked to report the travel expenditure only on a weekly basis.

In addition to the cost of collecting and storing data, a number of other factors influence the periodicity of data collection. The first factor is the definition of the reference level. If the travel budget for the salesman, for example, is allocated on a monthly basis, there is no point in collecting data on actual expenditure on a daily or weekly basis. The second factor is the frequency of feedback desired. As explained later, too frequent or too infrequent feedback is dysfunctional. Therefore, the optimal frequency of feedback will determine

the periodicity of collection of data on actual levels.

### **Comparison of reference and actual levels**

A mechanism for comparing the reference level with the actual level of the system parameter to generate information about the gap between the two levels is the third requirement for feedback. Organizations usually have a variety of mechanisms for performing the comparison. The system which is the target of feedback may itself perform the comparison. For example, an employee studying the Gantt chart can compare his own performance with the reference level. The supervisor or manager of the target system may do the comparison. A separate department, for example, the budget control department, or the management control department, or the quality control department, may do the comparison. Lastly, the process of comparison may be automated as in the case of automated inventory control systems.

Irrespective of the unit performing the comparison, a basic and obvious requirement is that the unit should have data on the reference level and the actual level of the system parameter it is comparing. In the absence of either comparison it is impossible.

When the reference and actual levels are quantified, comparison is easy. When the levels are qualitatively defined, there is scope for wide individual differences as explained earlier. The same methods suggested earlier for generating consensus (group discussion, Delphi, establishing criteria, etc.) may be used in this case also. However, it must be noted that in assessing the gap, differences may be related to nature of the gap (the qualitative aspect) and/or the magnitude of the gap (even if roughly expressed as large or small). Thus, in assessing the reading skills of a child, assessments may differ in terms of: (a) the number of mistakes made (the quantitative aspect), and (b) the nature of mistakes—whether the errors are “large” because inappropriate words were substituted, or whether the errors were “small” because

synonyms or meaningful words were substituted.

### Using information about the gap to alter the gap

The information about the gap, by itself, is not feedback. The information can be called feedback only if, and when, the information is used to alter the gap.

The distinction between information about the gap and feedback is important. To ensure the essential circularity inherent in the concept of feedback (Ashby, 1956; DiStefano, 1967), the information about the gap must be used to alter the gap; only then is the loop complete. Thus, the manager's awareness of the shortfall in an employee's performance is not feedback. Only when the awareness is translated into action (encouragement, reprimand, punishment) does the information about the shortfall become feedback. Even if the accounting department has information on a salesman's overexpenditure, it is not feedback unless it is utilized to alter the salesman's expenditure in some way.

Sometimes a decision may be made not to alter the gap. In such a situation too the information about the gap would be called feedback because a conscious decision is made to take no action. The information about the gap would not be considered feedback if the decision to take no action is by default, because the information about the gap is archived without conscious consideration.

Some may question the necessity of distinguishing information about the gap from feedback. It may be argued that the information about the gap, by itself, is feedback—that there is a gap. And when action is taken based on this information, it is control. Proponents of this view are certainly entitled to their own definition. But we beg to differ, with reason.

Feedback serves a purpose in organization; it may be stabilization, control, growth, or change (Ramaprasad, 1979). To serve any purpose, a conscious decision has to be made about the gap between the actual level and reference level of a parameter. The decision may not be made immediately, it may be delayed, and during

the delay the information may be archived. However, if no decision is ever made about the gap and the information about the gap is merely archived *ad infinitum*, the information is redundant. No systemic purpose will have been served by obtaining information about the gap. An unnecessary expense (of collecting data on actual level and reference level and converting them into information about the gap) will have been incurred. Thus, the distinction between feedback and information about the gap highlights the purposive character of feedback.

The distinction has practical significance too. Management information systems, especially after widespread use of computers, generate volumes of report on variance (the gap between the actual and reference levels) of many parameters at considerable expense. Often the reports are merely stored, without specific decisions. Part of the reason for this misplaced effort and expenditure is the false belief that determination of the gap or variance by itself is sufficient, when in fact it is not. It is important to stress the necessity of making a decision about the gap to make the cost and effort for obtaining information about the gap worthwhile. Hence, the emphasis on using the criterion of conscious decision about the gap, or lack of such a decision to distinguish feedback and information about the gap.

Depending on the parameter (which is the focus of feedback), and the system configuration, there may be one or more ways of altering the gap. Usually (but not always), with increasing complexity of the parameter and the system, more alternatives will be available. Thus, the room temperature, given a simple heating system, can only be increased by turning on the heater. On the other hand, inventory turnover can be altered by altering the inventory or the sales—and each of these components, in turn, can be altered in a number of ways. The fact that in complex systems there may be more than one way of altering the gap between the reference level and the actual level of the system parameter, is one source of equifinality and multifinality in such systems. Equifinality results because there are a number of alternative actions,

when a gap is observed, which can drive the system to the same end state. At the same time, because when a gap is observed in a system parameter, a number of alternative actions can be taken, each of which could drive the system in a different direction, we have multifinality.

Just as important as the distinction between information about the gap and feedback, is the distinction between feedback and the action taken to alter the gap. The same feedback may trigger a variety of actions depending upon the system. Some actions may widen the gap, others may narrow the gap. It is not important, insofar as labeling the information about the gap as feedback, what the consequences of the action (triggered by the feedback) are. However, the consequences of the action are important to categorize the feedback as positive feedback or negative feedback. In the following we will discuss the above distinction.

#### POSITIVE FEEDBACK AND NEGATIVE FEEDBACK

If the action triggered by feedback widens the gap between the reference and actual levels of the system parameter, the feedback is called positive feedback. On the other hand, if the action reduces the gap between the two levels, the feedback is called negative feedback (Kuhn, 1975; Laszlo, 1972; Miller, 1976; Rose, 1974; Watzlawick, Beavin, & Jackson, 1967; Wilden, 1972).

For example, if information about a salesman exceeding his quota is used to affect his future sales (and consequently alter the quota-sales gap), then the information is feedback. The information may be used to curtail future sales (because of lack of supplies), in which case the feedback would be negative. The information may be used to increase the sales even more, in which case the feedback would be positive. In the former case the feedback may be delivered with a rebuke, in the latter with encouragement. It must be noted that rebuke and encouragement are not, by themselves, feedback; they are actions triggered by feedback. It must also be noted that in some cases the action-consequence rela-

tionship is not entirely predictable. Thus, with a reactive salesman, rebuke may result in increased sales, hence, magnification of the gap, as a consequence of which the feedback would be deemed to be positive. Unpredictability of the action-consequence relationship not only makes the study of feedback difficult, but also emphasizes the need to distinguish between positive and negative feedback based on the consequence, and not the action.

For another example, let us consider the obverse of the above. Information about a salesman lagging in sales may trigger rebuke or encouragement. The rebuke, in turn, may demoralize the salesman, resulting in even lower sales. In this case the feedback is positive. If rebuke through fear increases sales, the feedback would be negative. If encouragement increases sales, then, too, the feedback would be negative.

The above distinction is contrary to some commonly held beliefs about positive and negative feedback. In common parlance, and some scientific literature (Herold & Greller, 1977; Ilgen, Fisher & Taylor, 1979), the distinction is based on the emotional connotation, to the recipient, of the action triggered by feedback. If the action has positive emotional connotation (makes the recipient happy, etc.), it is called positive feedback. If the action has negative emotional connotation (makes the recipient unhappy, etc.), it is called negative feedback (Herold & Greller, 1977; Kuhn, 1975; Watzlawick, Bevin, & Jackson, 1967).

It must be noted that negative feedback as per the latter definition could be positive or negative feedback under the former definition. For example: Herold and Greller (1977), using the latter definition, term receiving a formal report of poor performance as negative feedback. (Presumably the purpose of delivering the report is to alter the employee's performance—otherwise the report, by itself, cannot be called feedback.) Using the former definition, if the report of poor performance improves the performance, thus reducing the performance gap, only then can it be called negative feedback. On the other hand, with a reactive employee, the report may, in fact, result in poorer performance, thus enhancing the gap, in which case the report of poor per-

formance would be positive feedback. Similarly, positive feedback in the latter framework may be positive or negative feedback in the former framework.

There are two reasons for our recommending the adoption of the former definition in management theory. First, it is more in tune with the definition of positive and negative feedback in disciplines related to management theory like general systems theory, cybernetics, control theory, etc. Second, it distinguishes between the two types of feedback based on the effect on the system parameter which is the focus of feedback, and not based on the effect on an element of the loop (for example: the worker). In terms of the thermostat (a commonly used analogy to explain the concept of feedback), feedback cannot be categorized as positive or negative based on whether it turns on or turns off the heater (although Berrien (1968, 1976) defines it as such). The categorization has to be based on whether departures from the desired temperatures are magnified (positive feedback) or dampened (negative feedback).

There is often another source of confusion about the distinction between positive and negative feedback. The terms are confused with positive and negative reinforcement (Skinner, 1969). We will not discuss this in detail; suffice it to say that both positive and negative reinforcements are negative feedback mechanisms, because they try to minimize deviations from the reference level (desired behavior).

### CONCLUSION

Given the existing profusion of definitions of feedback, is another definition such as the one proposed in this paper needed? It has been stated at the beginning of the paper that many prevailing definitions and the attendant confusion hinder communication and transfer of knowledge between subdisciplines in management theory, as well as between management theory and other related disciplines. Adoption of the proposed definition will be justified if it will enhance the intra- and interdisciplinary communication and transfer of knowledge, and consequently will help develop unifying principles regarding feedback in manage-

ment theory. The argument for adoption will be further strengthened if it can be shown that the unifying principles, in turn, will provide novel, useful insights for the management theorist.

In the following we derive some general systemic propositions from the proposed definition of feedback. We then relate the general propositions to specific propositions in management theory. We thus hope to illustrate how the proposed definition could facilitate intra- and interdisciplinary communication, help develop unifying principles on feedback, and generate further insights in management theory.

For example, consider the three necessary conditions for feedback described earlier. Briefly, the conditions are:

- (a) There should be data on the reference level of the focal system parameter,
- (b) There should be data on the actual level of the same parameter, and
- (c) There should be a mechanism for comparing the two data.

By definition, absence of any one or more of the above three conditions will render the feedback process ineffective. If the role of the (negative) feedback process is to maintain the focal parameter at the reference level, the process would be ineffective if the reference level is unavailable or if data on the actual level is unavailable.

The above discussion can be translated into the managerial context as follows. Let an employee's performance be the focal parameter. The role of the feedback process would be to maintain the performance of the employee at a desired value called the goal. This may be done by providing the employee data on the goal as well as on his actual performance. The employee can then correct for any discrepancy between the goal and actual performance. Clearly, if the employee lacks data on the goal or on his actual performance, the feedback process would be ineffective. This is in essence the basis of Ivancevich and McMahon's (1982, p. 361) proposition: "... goal setting when combined with feedback would enhance performance, job satisfaction, and organizational commitment more than would providing feedback alone." Note that



in their terminology feedback connotes data on actual performance, data on the gap between the goal and actual performance, or both.

Even if data are available on the reference level and the actual level of the focal parameter, feedback would be ineffective if either or both data are inaccurate. Four possible contingencies based on whether data on the two levels are accurate or inaccurate are shown in Table 2. Ideally both data should be accurate. When both data are inaccurate the feedback process would be meaningless. The other two contingencies, wherein one of the two data are inaccurate, are managerially significant. For example, a firm may have a specific market share as its goal (reference level), but may not be able to measure its market share (actual level) accurately. Or a firm may have an accurate count of each employee's production (actual level), but may not have clear performance goals (reference level).

In both situations when data on only one of the two levels are inaccurate:

- (a) the effectiveness of the feedback process will be reduced, and
- (b) the biases of the comparator will affect the measurement of the gap between the actual and reference levels.

The above propositions are similar to propositions formulated by Ilgen, Fisher, and Taylor (1979) regarding individual behavior in organizations. Their propositions are summarized in Table 3. Note that

TABLE 3  
INTERACTION OF GOAL AND FEEDBACK SPECIFICITY.

Feedback	Goals	
	Specific	General
Specific	Feedback is easily understood and applied to future performance	Performance evaluation is difficult
General	Feedback is interpreted in terms of the performer's frame of reference	Feedback is difficult to interpret and apply

Source: Ilgen, Fisher, and Taylor, 1979, p. 365.

"goals" in their terminology is synonymous with "reference levels" in ours, and similarly "feedback" is synonymous with "actual level." Also their dichotomy of "specific-general" is synonymous with our dichotomy of "accurate-inaccurate." It must also be noted that Ilgen, Fisher, and Taylor assume that the performer is the comparator.

Interestingly, we can also see that Ilgen and his co-workers' summary of propositions is incomplete. Performance evaluation is difficult, and the performer's frame of reference is introduced *both* when "goals" are general and "feedback" is specific and vice-versa.

The general propositions on the effects of inaccurate reference and actual levels on the feedback process are also applicable to an individual learning clinical diagnosis. In diagnosis the true state of the focal parameter has to be inferred from data on other related parameters. One way learning occurs is when the inference is confirmed or rejected by subsequent direct measurement (as in an autopsy) of the focal parameter. The diagnostician's inference is what (s)he believes to be the actual level of the focal parameter. The subsequent direct measurement is the reference level of the same parameter. The diagnostician compares the inference with the direct measurement and determines the gap between the two. (S)he tries to minimize the gap in future diagnoses.

Learning will be maximum when the inference is clearly stated and the subsequent measurement of the true state is accurate. Learning will not be possible when both the statement of inference and subsequent

TABLE 2  
INTERACTION OF ACCURACY OF REFERENCE LEVEL AND OF ACTUAL LEVEL.

Actual Level	Reference Level	
	Accurate	Inaccurate
Accurate	* Effective feedback process	Ineffective feedback process  Determination of the gap influenced by biases of the comparator
Inaccurate	Ineffective feedback process Determination of the gap influenced by biases of the comparator	Feedback is meaningless

measurement of the true state are fuzzy. If one of the two—inference or measurement of the true state—is fuzzy, learning will be less than maximally effective, and it will also be a function of the diagnostician.

In the above framework it is easy to understand Connolly and Miklausich's (1978) findings. In their terminology "feedback error" refers to error in measuring the true state (reference level). From an experiment they arrive at the following conclusions:

(a) "... feedback error has an important impact on performance in diagnostic inference tasks."

(b) "... increasing feedback error appears to depress performance in such tasks."

(c) "Subjects whose initial learning was under zero-error feedback appear less sensitive to high-error feedback than are subjects whose initial learning was under high-error feedback conditions."

The last finding can simply be attributed to the fact that learning under zero-error "feedback" would be higher than under high-error "feedback."

Extending the above discussion on learning clinical diagnosis, the following question may be of interest: Will the learning be facilitated by the diagnostician himself generating data on the reference level (performing the autopsy?) and acting as the comparator? Or will it be facilitated by another person generating data on the reference level and acting as the comparator? Ivancevich and McMahon (1982) (using a somewhat different terminology) in the context of individual performance in organizations suggest "the superiority of self-generated over internally generated performance oriented feedback." In our terminology the implication is that the feedback process will be more effective when the performer himself generates data on the actual level and acts as the comparator. This finding could perhaps be generalized to clinical diagnosis too. It may be argued that learning clinical diagnosis will be more effective when the diagnostician himself measures the reference level (the actual

level is inferred by the diagnostician) and acts as the comparator.

The above are only a few examples of the utility of the proposed definition of feedback. Adopting separate definitions of feedback in each discipline and subdiscipline may be philosophically justified. But, a single definition would probably be better justified for advancing knowledge in the disciplines. Management theory is interdisciplinary and in its infancy. It can ill afford a babel of definitions of an important concept such as feedback.

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