The Role of the Manager: What's Really Important in Different Management Jobs

Allen I. Kraut and Patricia R. Pedigo
IBM Corporation, Inc.
and
D. Douglas McKenna and Marvin D. Dunnette
Personnel Decisions Research Institute, Inc.

Can we safely assume (to paraphrase Gertrude Stein) that "a manager is a manager is a manager"? Should we expect the jobs of all managers to be pretty much the same? And should managers expect their colleagues' jobs to be like their own? Well, "yes" and "no," according to the research described below. An analogy to team sports may help illustrate this answer, and suggest implications for organizational performance.

One of the signs of a successful athletic team is its almost uncanny ability to perform as a single unit, with the efforts of individual members blending seamlessly together. When this level of teamwork exists, unusual things happen. Quarterbacks complete blind passes, throwing the ball to spots on the field where they "know" their favorite receiver will be. The point guard playing basketball lobs a pass high above the basket, which enables a leaping teammate to catch it in midair and make a spectacular slam dunk. This level of teamwork requires a great deal of practice and natural ability, but members of the team must also have a clear understanding of their own roles, the roles of their teammates, and the way they must work together to be successful.

In addition to understanding specialized roles and assignments, players must also recognize the things that everyone, regardless of his or her position, must be ready and willing to do if the team is to win. When necessary, the quarterback must block like a lineman to allow the halfback to break free of the defense; diminutive kickers must tackle kick return specialists twice their size to stop a touchdown. The point is that the demands of a team sport call for each participant to be both a specialist and a generalist.

Management, we believe, is a team sport that makes similar demands of its players. Unfortunately, many executives (the "team captains") and managers do not recognize how managerial jobs are similar and yet different across organizational levels and functions. This lack of mutual understanding among management players can make it very difficult for them to appreciate one another's work and coordinate their work activities. It can make winning that much harder.

In addition to being able to coordinate work more effectively, executives who understand similarities and differences in managerial jobs gain other advantages. For example, they are better able to:

- Communicate performance expectations and feedback to subordinate managers.
- Prepare others and themselves for transitions to higher organizational levels or different functions.
- Forecast how different managers would perform if promoted or moved into a new function.
- Ensure that management training and development programs are targeted to fit the needs of managers as they change positions.
- Diagnose and resolve confusion regarding managerial roles, responsibilities, and priorities.

For the most part, research on managerial work has focused on the *common* denominators of management jobs. Indeed, a considerable amount of research has been published on this subject.[1] We, however, have recently completed a study designed to shed light on the *differences in management roles and activities across different levels and functions.* We started with a sample of 1,412 managers[2] and asked them to rate the relative importance of 57 managerial tasks to their jobs. Their choices included "Of utmost importance," "Of considerable importance," "Of moderate importance," "Of little importance," "Of no importance," and "I do not perform this task." Almost all tasks were rated "Of moderate importance" or higher.

Using these importance ratings, we statistically identified seven major factors or groups of management tasks:[3]

- Managing individual performance,
- Instructing subordinates,
- Planning and allocating resources,
- Coordinating interdependent groups,
- Managing group performance,
- Monitoring the business environment, and
- Representing one's staff.

We then studied how important these seven factors and their component tasks were to managers at different levels and functions.

Exhibit 1
Supervising Individuals*
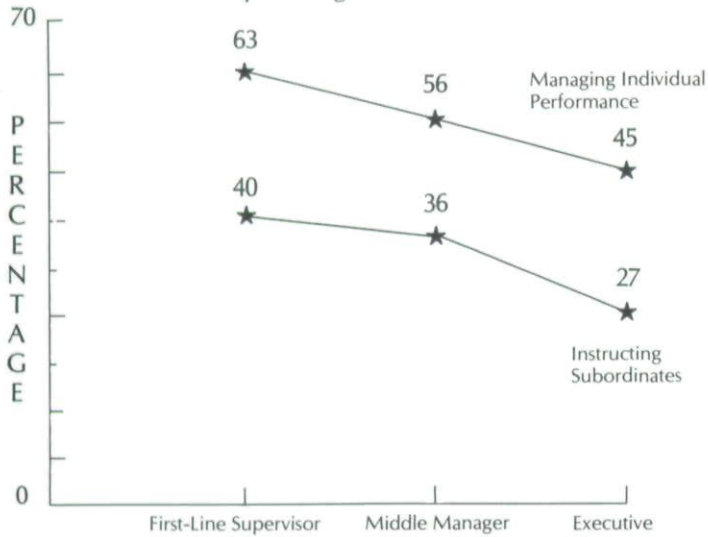
*Numbers refer to the percentage of managers who said the task was of "the utmost" or "considerable" importance.

First-Level Managers: One-to-One With Subordinates

The first two factors involve supervising others. These activities are most important to first-level managers and decline in importance as one rises in management. (See Exhibit 1.)

"Managing individual performance" was rated the single most important set of activities by first-level management. Such tasks include motivating and disciplining subordinates, keeping track of performance and providing feedback, and improving communications and individual productivity. These tasks are traditionally associated with lower-level management. Although Exhibit 1 shows that many executives continue to see these tasks as very important, it is clear that their importance drops off as one moves up the management hierarchy.

The tasks in the "managing individual performance" set are listed in order of the percentage of the total sample who rated each as of "utmost" or "considerable" importance."

76% Motivate subordinates to change or improve their performance.

76% Provide ongoing performance feedback to subordinates.

69% Take action to resolve performance problems in your work group.

69% Blend subordinates' goals (e.g., career goals, work performances) with company's work requirements.

63% Identify ways of improving communications among subordinates.

50% Keep track of subordinates' training and special skills as they relate to job assignments to aid their growth and development.

48% Resolve conflicts among subordinates.

40% Discipline and/or terminate personnel.

37% Review subordinates' work methods to identify ways to increase productivity.

The cluster *"instructing subordinates"* includes training, coaching, and instructing employees in how to do their job. Of moderate importance to most first-level managers, this cluster is considerably less important to executives.

For the "instructing subordinates" set, the items are listed below:

52% Inform subordinates about procedures and work assignments.

46% Explain work assignments to subordinates.

44% Provide technical expertise to help subordinates resolve work problems or questions.

43% Train subordinates in new techniques or procedures.

6% Schedule daily activities of subordinates.

Middle Managers: Linking Groups

The concept of linking groups seems to drive the middle manager's work. Three task factors involve linking groups. The importance of these tasks jumps sharply (an average of 19 points) from first- to middle-level management. Thus, managers going from the lowest level of supervision to middle management need to develop skills in several new areas if they are to link groups successfully. The importance of these tasks drops slightly for executives (see Exhibit 2).

The most important tasks for middle management involve *"planning and allocating resources"* among different groups. Examples include estimating group resource requirements and making decisions about how resources should be distributed. One part of this cluster includes translating general directives into specific plans and communicating their benefits. Middle managers and executives see these tasks as crucial to their jobs.

Exhibit 2
Linking Groups*
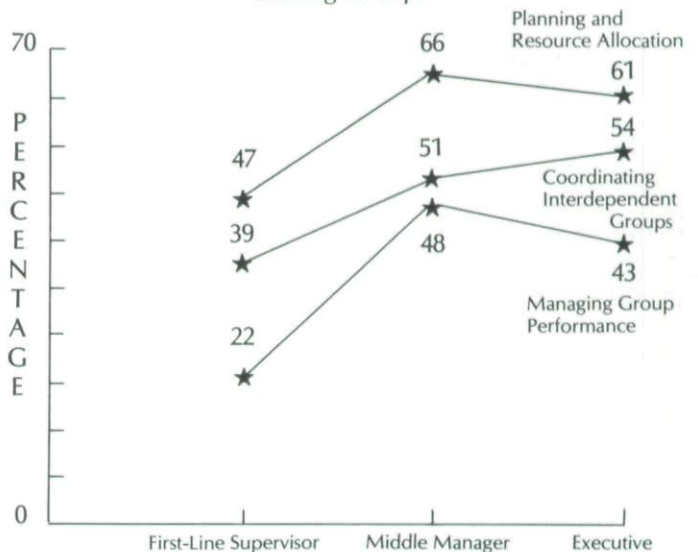
*Numbers refer to the percentage of managers who said the task was of "the utmost" or "considerable" importance.

The relative importance of the "planning and allocating resources" tasks is shown below:

72% Establish target dates for work products or services.

70% Estimate resource requirements for operational needs.

67% Develop evaluation criteria to measure progress and performance of operations.

65% Decide which programs should be provided with resources (e.g., manpower, materials, funds, etc.).

63% Translate general directives (e.g., strategic plans) from superiors into specific operational plans/schedules/procedures, etc.

58% Communicate the benefits or opportunities posed by a new idea, proposal, project, or program.

40% Distribute budgeted resources.

Both middle managers and executives also rate *"coordinating interdependent groups"* as highly important to their jobs. This cluster includes reviewing the work and plans of various groups and helping them set priorities as well as negotiating and integrating various group plans and activities. This cluster — which involves bringing several efforts together to create a final product — jumps sharply in importance when a supervisor moves into higher management.

The tasks in "coordinating interdependent groups" were rated in this way:

70% Stay informed of the goals, actions, and agendas of top management.

60% Persuade other organizational groups to provide the information/products/resources needed by your work group.

58% Monitor events, circumstances, or conditions outside your work group that may affect its goals and/or performance.

53% Persuade other managers to provide support and/or resources for a new project or program.

51% Set priorities for responding to other groups.

50% Determine the possible effects of changes in the activities or outputs of your work group on other organizational groups.

45% Maintain awareness of the goals and plans of other groups within the organization.

44% Negotiate working agreements with other groups for the exchange of information, products, and/or services.

43% Ensure coordination of the activities and outputs of interdependent groups.

42% Integrate the plans of related organizational groups.

42% Provide advice or assistance to managers of other organizational groups.

39% Disseminate information about the activities of your work group to other groups.

27% Gather information on the needs/capabilities/resources (e.g., information, services) of other groups in the company.

Of the three factors most important to middle management, the biggest shift in importance occurs for the factor *"managing group performance."* This includes managing the performance of various work groups and working with subordinate managers on this performance.

Rated low in importance by first-level managers, "managing group performance" increases sharply (by 26 percentage points) in importance for those in middle management. It is the hallmark change for those going into middle management. While the middle manager must still monitor the performance of individual supervisors, measuring and managing group-level performance indicators becomes a significantly more important part of his or her responsibilities.

The items in "managing group performance," and their level of importance are as follows:

57% Define areas of responsibility for managerial personnel.

50% Inform managers when performance in their groups does not meet established goals or standards.

48% Meet with managers to discuss the likely effects of changes on their groups.

44% Monitor your work group's performance by reading reports, information system outputs, or other documents.

25% Prepare production and productivity reports.

23% Gather or review information on the activities and progress of several different work groups.

Executives: An Eye on the Outside

The activities encompassed in *"monitoring the business environment"* are a sharp shift in emphasis for managers reaching the executive ranks (see Exhibit 3). These activities require the executive to have an increased awareness of sales, business, economic, and social trends.

Exhibit 3
*Monitoring the Business Environment**
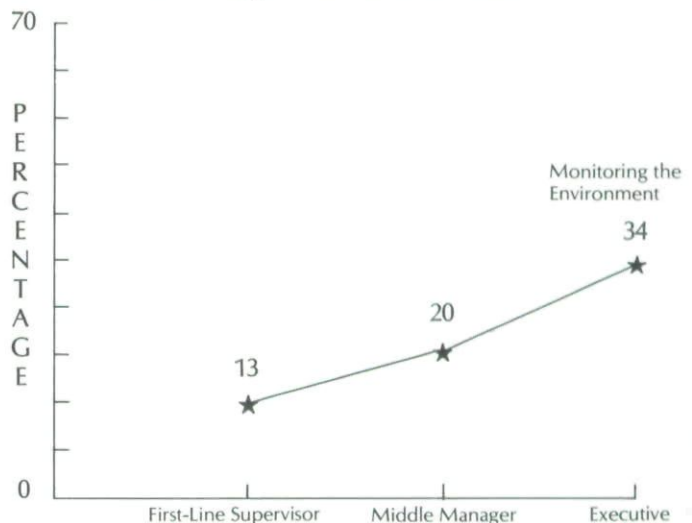
Monitoring the Environment

First-Line Supervisor: 13
Middle Manager: 20
Executive: 34

*Numbers refer to the percentage of managers who said the task was of "the utmost" or "considerable" importance.

For managers below the executive ranks, these tasks rate the lowest in importance. At what point do managers need to become aware of and proficient in adopting new viewpoints for their high-level jobs? Clearly, executives find that this expanded perspective is a key requirement of their position.

The tasks involved in "monitoring the business environment" and their importance ratings are as follows:

47% Develop/maintain relationships with management-level customers or clients from the outside business community.

38% Participate in task forces to identify new business opportunities.

37% Monitor sales performance and promotional activities.

36% Gather information about trends outside your organization.

35% Identify developing market trends.

32% Develop/maintain relationships with management-level vendors or consultants in the business community.

31% Consult on companywide problems.

26% Attend outside meetings as a company representative.

20% Monitor multinational business and economic trends.

15% Release company information to the public (e.g., the news media).

Managers at All Levels: The Ambassador

Unlike the factors discussed earlier, which rise or drop in importance as the manager moves up the corporate ladder, *"representing your staff"* is ranked equally high by all levels of management (see Exhibit 4). This is the spokesperson role, noted in earlier studies by Henry Mintzberg. It involves representing one's work group to others and includes communicating the needs of one's work group to others, helping subordinates interact with other groups, and acting as the work group's representative.

The importance ratings of tasks involved in "representing your staff" are as follows:

68% Develop relationships with managers of other organizational groups that may be able to provide your work group with information/products/services/resources.

59% Communicate the needs or requirements of your work group to managers of other organizational groups.

58% Provide information on the status of work in your work group to managers of groups that depend on you for information/products/services/resources.

57% Determine the appropriate response(s) to managers demanding information/products/services/other resources from your work group.

Exhibit 4
Representing People*
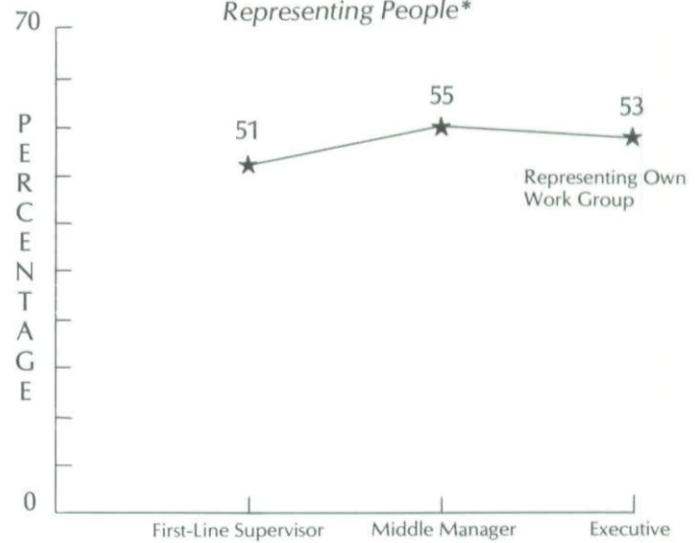
*Numbers refer to the percentage of managers who said the task was of "the utmost" or "considerable" importance.

48% Provide information or assistance to subordinates interacting with other organizational groups.

46% Communicate capabilities and resources of your work group to other managers in the organization.

39% Serve as an intermediary between your subordinates and managers of other organizational groups.

One might speculate that a big transition regarding such activities takes place when one is initially promoted into management. Until then individuals may have spoken only for themselves; thus, some adjustment is required before the manager will recognize and take on the role of group ambassador.

Differences Across Organizational Functions

Most managers would argue that different functions present significantly different management challenges. Our data permit some tests of this hypothesis.

We examined the importance of management tasks across three functions: (1) *marketing*, which includes managers in the sales and related support organization, (2) *manufacturing*, which includes managers in all phases of the manufacturing process, and (3) *administration*, which includes managers in finance, planning, and related staffs such as personnel.

As Exhibit 5 shows, the importance levels of managerial task factors are remarkably similar across functions, although some noteworthy differences exist. (The three levels of management are weighted equally in each function so that no one level has undue influence.) Marketing and administration appear to differ most in their rating of factors, with manufacturing falling in between.

Exhibit 5
The Importance of Managerial Activities*
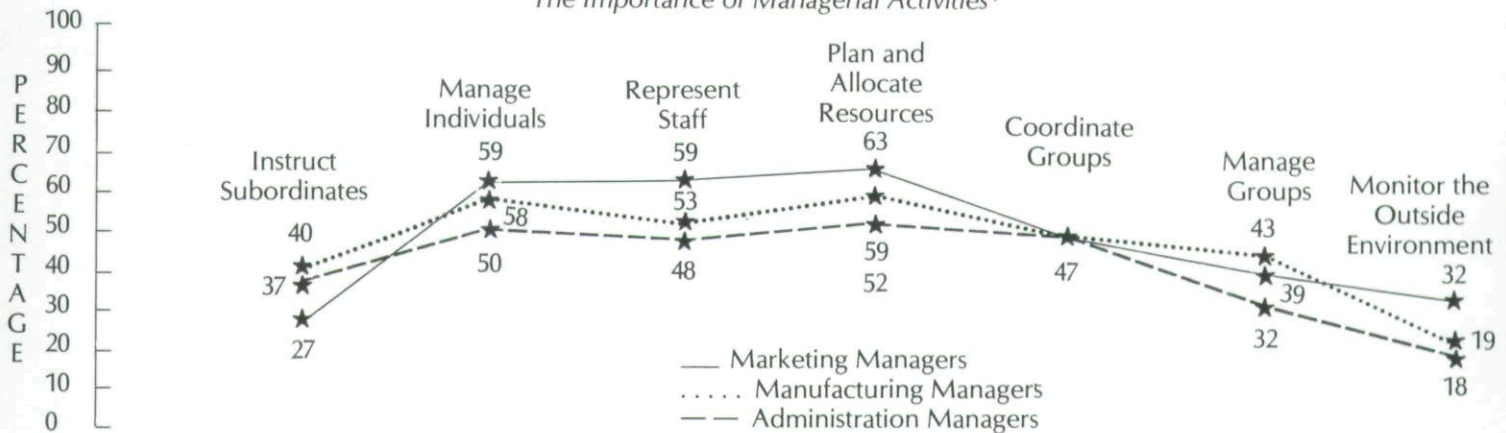
*Numbers refer to the percentage of managers in each function who said the task was of "the utmost" or "considerable" importance.

"Instructing subordinates" is least important among marketing managers (27% said it was of "the utmost" or "considerable importance"), perhaps because so much of the training of marketing employees is done in corporate-sponsored programs. In administration, however, where many highly specific staff jobs and relatively little formal corporate training exists (at least in this company), "instructing subordinates" is a relatively more important management activity.

On the other hand, we suspect that a high level of professionalism among most administrative staff reduces the emphasis that their managers place on "managing individual performance" (50%). This factor, by contrast, is considerably more important in marketing (59%).

"Representation" is rated highest in importance by managers in marketing (59%). Obviously, these managers represent the company's products to others, mainly customers. By contrast, the demand for representing one's staff is 11 points lower among managers in administration. These relative differences apply also for "planning and allocating resources," which is rated highest by marketing (63%) and manufacturing (59%), and lowest by administration (52%). The activities involved in coordinating interdependent work groups is equally important for all three functions (47%).

"Managing group performance" is of somewhat higher importance to the managers in manufacturing (43%) and somewhat lower to managers in administration (32%). Presumably the administration function is made up of more specialists and professionals who work alone.

The activities involved in "monitoring the outside business environment" take on the highest importance for managers in marketing (32%). This external orientation, which results from their interaction with customers and need to remain current on competitors' products and marketing strategies, should not be too surprising.

Overall, our data suggest there are indeed differences in the importance of various managerial tasks across functions. Nevertheless, the similarities across the entire spectrum of functions are clearly more striking. (Such conclusions are also suggested in the findings of Cynthia M. Pavett and Alan W. Lau in their extension of Mintzberg's work.[4]) This suggests that a common approach to selecting, training, and developing managers may be both feasible and desirable for many functions in an organization.

Where significant differences do exist across functions, a common management development program or cross-functional work assignments may make managers more aware of different functions' perspectives, and help them avoid seeing all managers' jobs as either the same or unique. As John Kotter has noted in his work on executive behavior, people with narrow functional backgrounds who are promoted into general management positions may face a very difficult transition.[5]

Appropriate preparation may minimize such hardships.

Theoretical Implications

While we think this study has a number of practical implications that can help organizations make more effective use of their managerial resources, it is important to consider its limitations as well. First, the data are based on managers' own perceptions of the importance of various tasks. Certainly their bosses, peers, and subordinates may have a different view of things.[6] Second, because we took a "snapshot" of managers at different levels, rather than following a group of managers over time, we cannot be certain that managers will experience the differences we describe as they move to higher-level management jobs; however, because the company whose managers we surveyed strictly follows a "promote from within" policy, it seems likely that the differences we note are indeed changes accompanying upward moves.

Despite these limitations, the study provides a carefully gathered record of the role and task perceptions of a large sample of real managers working in a diverse array of positions. As we noted at the beginning of this article, the results can be interpreted as supportive of Mintzberg's view that managerial jobs involve essentially the same managerial roles[7] as well as Katz and Kahn's argument that managers do different things at different levels.[8]

In support of Mintzberg, we found that managers at all levels rated most of the tasks on the questionnaire of some importance. The differences we observed were typically differences in the degree of importance of the tasks, not differences in whether the tasks were important at all. Yet, as Katz and Kahn would maintain, these differences are significant. Considering the costs of a manager's time, the difference between outstanding and average performance may well depend on the priority he or she assigns to each of the many tasks that are basically important.[9]

Practical Implications

How should we prepare our managers to meet the various demands that different managerial roles place on them? Who should we select to move up the management hierarchy? What training can we provide? How can we develop the skills essential for the manager's and team's success? The findings of this study provide some clues as to how a winning team can be fostered by training, development, and selection.

Training

Typically, management training has emphasized the basics of management: individually focused supervision, motivation, career planning, and performance feedback. All of these aspects should clearly be a central focus in the training of first-level managers. Given that managers continue to use these skills as they move up the hierarchy, periodic reinforcement also seems appropriate. Our study, however, indicates that training for managers above the first level must cover more than these one-to-one skills.

To help middle managers deal successfully with their responsibilities for managing and linking groups, training at this level should focus on skills needed for designing and implementing effective group and intergroup work and information systems; defining and monitoring group-level performance indicators; diagnosing and resolving problems within and among work groups; negotiating with peers and superiors; and designing and implementing reward systems that support cooperative behavior. As these topics suggest, the psychology of the individual, so important to the first-level manager, gives way to social psychology and sociology when one reaches middle management. Since the latter topics are generally less well known and more abstract than the former, it is not surprising that the transition to middle management can be very confusing and disorienting.

The executive's need to emphasize the external environment can also be partially addressed through training. The curriculum should focus on broadening the executive's understanding of the organization's competition, world economies, politics, and social trends. A number of executive training institutes and university-based programs are geared toward providing these broadening experiences; however, we think it is a serious mistake to wait until a person becomes an executive before teaching him or her to recognize the importance of attending to the relationship between the business and its environment. Consider the potential advantages of having middle and lower-level managers who understand the nature and strategic direction of their organization's business and are constantly on the lookout for opportunities and threats in the environment. We think this perspective should receive continuous attention in management training and development efforts at all levels.

Development

Planned development programs can also contribute to expanding the skill base of managers. At the first level, experiences such as filling in for the middle manager during vacation times, acting as a liaison between linked functions, or representing the entire function at important meetings can build group management and coordination skills.

For the middle manager, increased customer contact, visits to other organizations, and subscriptions to important business and trade publications can help impart the skills necessary for the executive ranks.

Selection

The results of this study also have implications for the selection of managers. Given our findings, it should not be surprising that executives are often chosen from the marketing function; these people have had their eyes on the outside environment for the majority of their careers. Yet through planned development, employees and managers from other functions can also acquire the skills required in executive management, and their contribution to overall decision making can be significant.

A Winning Team

The results of this study clearly identify the different roles that managers play and can provide organizations with the framework for building management training and development programs. By understanding the common and different roles played by managers as they move up the management hierarchy, we can develop programs that ensure that these managers have the skills needed to put together a winning team. ■

Endnotes

1. The questionnaire used in this study was based on an extensive review of research on managerial activities. A classic work in this area is *Management Behavior, Performance, and Effectiveness*, by J. P. Campbell, M. D. Dunnette, E. E. Lawler, and K. Weick, New York: McGraw-Hill, 1970. Another work that strongly influenced the questionnaire because of its depiction of the dynamic quality of managerial work, is L. Sayles's *Leadership*, New York: McGraw-Hill, 1979, aptly subtitled "What Effective Managers Really Do and How They Do It."

2. This study was conducted by the authors in a large U.S. business enterprise. A random sample, designed to overrepresent higher-strata managers, resulted in 1,412 respondents: 658 first-line managers, 553 middle managers, and 201 executives. After extensive pretesting, a list of 65 activities was used on the final survey questionnaire. Through statistical analyses, these activities were "factored," or grouped, into seven sets, which comprised 57 activities. (Eight activities fit poorly into the seven sets and were dropped.)

Despite, or perhaps because, we used a literature search as the basis for our list of activities, some activities valued in this and other organizations may not have appeared in our survey. In passing we might mention that the importance placed on various activities is not necessarily related to "good" performance. The correlation between importance and effectiveness has simply not been examined in this study. By the same token, these activities are not necessarily the "correct" or "best" ones for any particular position. It remains to be determined which activities are desirable or appropriate, especially for the future.

3. Other investigators have studied patterns of management tasks. For example, James MacDonald and his colleagues (Charles Youngblood and Kerry Glum) report their comprehensive effort to determine training needs of first- and second-level supervisors working at AT&T in their book *Performance Based Supervisory Development*, Amherst, MA: Human Resource Development Press, 1982. Since they were concerned specifically with developing training guidelines, their categories of management (listed below) are much more focused on knowledge and skill development than are the seven behavioral factors developed in our investigation. Their categories of supervision include the following:

Planning the job
Controlling the job
Providing performance feedback
Managing time
Decision making
Problem solving
Maintaining upward communications
Maintaining downward communications
Maintaining peer communications
Creating a motivating atmosphere
Developing subordinates
Self-development
Providing written communications
Involvement with meetings
Community relations

Of more direct relevance to our work is the recent work reported by Fred Luthans, Stuart Rosenkrantz, and Harry Hennessey in "What Do Successful Managers Really Do? An Observation Study of Managerial Activities," *The Journal of Applied Behavioral Science*, 21(2), 1985, 255-270. See also Fred Luthans, "Successful vs. Effective Real Managers," *The Academy of Management Executive*, May 1988, 127-132. Luthans and his colleagues observed and recorded the actual activities of managers at all management levels and in many types of organizations. Observations were recorded according to four categories: *communication*, consisting of exchanging information and processing paperwork; *traditional management*, consisting of planning, decision making, and controlling; *human resource management*, consisting of motivating, disciplining, managing conflict, staffing, and training/developing; and *networking*, consisting of socializing, politicking, and interacting with outsiders.

It should be noted that the seven factors developed from our investigation encompass all the categories studied by MacDonald and Luthans in their earlier investigations.

4. See C. M. Pavett and A. W. Lau, "Managerial Work: The influence of Hierarchical Level and Functional Speciality," *Academy of Management Journal*, 26(1), 1983, 170-177.

5. See J. P. Kotter, *The General Managers*, New York: Free Press, 1982.

6. An excellent review of the pro's and con's of various means to study managerial work is the report "Studies of Managerial Work: Results and Methods," by M. W. McCall, A. M. Morrison, and R. L. Kaplan, Greensboro, NC: Center for Creative Leadership, 1975.

7. A well-known book on this subject, Henry Mintzberg's *The Nature of Managerial Work*, New York, Harper, 1973, is based on observations of a dozen chief executive officers. His work has been replicated by others, such as L. B. Kurke and H. E. Aldrich, "Mintzberg Was Right!: A Replication and Extension of the Nature of Managerial Work," *Management Science*, 29, 8, 1983, 975-984.

8. D. Katz and R. L. Kahn's *Social Psychology of Organizations* (2nd Ed.), New York: Wiley, 1978, presents a view of very different demands, cognitive and emotional, on managers at various levels in an organization.

9. Finally, some further support for the argument that managers do some things differently at various levels was shown in one of Luthans' earlier investigations based on observations of some 53 managers (see Endnote 3). Comparisons between top executives and front-line supervisors revealed that executives engaged in much more networking, considerably more planning and decision making, and less staffing than front-line supervisors. These results are certainly compatible with ours.
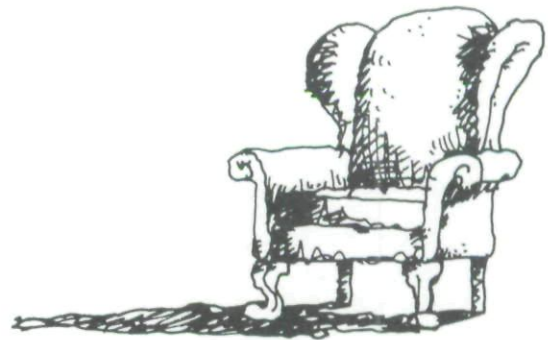
Allen I. Kraut is professor of management at Baruch College, City University of New York. For most of his professional career, he has been involved in personnel research at the IBM Corporation. Until his recent move to academia, Dr. Kraut was manager of personnel research studies in IBM's Corporate Staff, conducting strategically oriented personnel research. He also spent several years at IBM's World Trade Corporation, where he was responsible for personnel research and management development worldwide.

His interests in management have been expressed in research and consulting on executive succession planning and management development, and in several other studies on the use of peer ratings, management assessment centers, and executive selection. He has also done many employee attitude surveys, some of which have focused on executives' opinions.

Dr. Kraut is a Fellow of the American Psychological Association and a Diplomate of the American Board of Professional Psychologists. He received an M.A. from Columbia University and his Ph.D. from the University of Michigan.

Dr. Patricia R. Pedigo conducts marketplace and business partner research for the marketing and services organization of IBM. In addition to studying these topics and the management issues reported here, her research has covered attitudes toward financial planning, retirement, performance appraisal systems, benefit programs, corporate culture, management potential, succession planning, and personnel selection.

Before assuming her current position, Dr. Pedigo has held management and personnel generalist positions within IBM. She received a B.S. from the University of Washington, and an M.A. and Ph.D. in industrial/organizational psychology from the University of South Florida. She has consulted in public and private organizations, including AT&T, PepsiCo, and GTE. She has also taught personnel administration and organizational behavior at the Graduate Business School at Pace University.

D. Douglas McKenna is an associate professor and chair of the Management Department in the School of Business and Economics at Seattle Pacific University, teaching courses in human resource management, organization design, and organization development. He is currently writing a chapter (with Louis W. Fry) entitled "Organization Analysis and Design" for the upcoming second edition of Marvin Dunnette's Handbook of Industrial/Organizational Psychology.

His current research interests focus on the question of how to design and implement human resource systems in different types of organizations, particularly high-tech and knowledge-delivery firms. He has an active consulting practice and works regularly with Microsoft, Boeing, and other companies in the Pacific Northwest. During the time in which the research reported in this article was conducted, he was senior research psychologist at Personnel Decisions Research Institute, Inc. in Minneapolis.

Marvin D. Dunnette is professor of psychology at the University of Minnesota and chairman and CEO of Personnel Decisions Research Institute, Inc. of Minneapolis. He also is one of the founders and continues to serve on the board of Personnel Decisions Research Institute, Inc.

Dr. Dunnette has been influential in industrial and organizational psychology through both teaching and publication. He has served as academic advisor to 50 students who have received Ph.D. degrees in the fields of industrial/organizational psychology and counseling psychology. He is editor of the Handbook of Industrial and Organizational Psychology, *published in 1976 (Chicago: Rand McNally), and a co-author (with John Campbell, Edward E. Lawler, and Karl Weick) of* Managerial Behavior, Performance, and Effectiveness, *New York: McGraw-Hill, 1970. A second edition of the I/O Handbook is now in preparation.*

Dr. Dunnette is a Fellow of the American Psychological Association (APA) and holds the Diplomate in Industrial Psychology. He served as president of APA's Division of Industrial and Organizational Psychology during the 1966-67 year and was the 1985 recipient of that division's Award for Outstanding Scientific Contributions.