Career Orientations and Perceptions of Rewarded Activity in a Research Organization

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Career Orientations and Perceptions of Rewarded Activity in a Research Organization

Ninety-six open-ended interviews were coded to measure career orientations of scientists and engineers in a formal research organization. Responses were categorized into two career-identification dimensions (institutional-noninstitutional and technical-managerial) and three career-style dimensions (active-passive, idealistic-cynical, and task-interpersonal). The responses were also categorized with respect to perceptions of rewarded activity, or how one gets ahead, into four variables: technical performance, personality, visibility, and organizational circumstances.

The low degree of correlation among the career orientation dimensions supports the conclusion that a profile based on these five dimensions may be more accurate and useful than single dimensions. The data show no correlation between the managerial orientation and the institutional orientation, possibly a reflection of the increased professionalization of supervisory personnel. Correlations between career orientations and perceptions of rewarded activity tended to be low, suggesting that these are independent variables.

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OVER the past two decades, increasing attention has been given to issues arising from the growing employment of professional personnel by formal organizations.\(^1\) A number of variables have been proposed to describe the career attitudes, beliefs, and behavior of individuals whose background and training is technical and professional.

Marvick,\(^2\) in a study of a military research agency, distinguished three types of career orientation: (1) specialist, in which professional skill and accomplishment is given primacy; (2) institutionalist, in which the goals and gratifications are predominantly placed to the work establishment; and (3) hybrid, in which loyalty is neither to a profession nor to an institution, but where the emphasis is instead upon maneuvering among the opportunities for personal advancement and advantage. Gouldner,\(^3\) studying an academic setting, proposed two latent organizational identities: (1) cosmopolitans, people who have a high commitment to roles as specialists and are likely to use an outer reference group; and (2) locals, people who have a low commitment to roles as specialists and are likely to use an inner reference group.\(^4\) Marcson,\(^5\) in an industrial research laboratory, identified several types of career pathways: (1) continuing devotion to research and a scientific professional career; (2) becoming intrinsically interested in administration and attempting to steer one's career in this direction; (3) retaining basic loyalty to research but turning to administration, either because the future in research was limited as to

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\(^{\text{4}}\)For a summary and comparison of several career orientation typologies, see W. Kornhauser, *Scientists in Industry* (Berkeley and Los Angeles: University of California, 1962).

financial reward and status, or because of not being able to com-
pete in research performance with colleagues.

PURPOSE AND SETTING

The literature tends to reduce the variety of career orientations
to a minimum number of concepts like professional-institutional.
Informal discussion with managers in research organizations sug-
gested that more complex categories were needed, therefore an
interview study was designed, which would produce more exten-
sive career data. In coding the interviews, an attempt was made to
define independent categories or variables for describing career
orientations, with the aim of determining empirically the extent
to which they would intercorrelate and thus be reducible to a
smaller number of variables. The general approach was to think
in terms of the long-run perspective, the career rather than the
job, and the organizational rewards related to long-run perform-
ance rather than short-run productivity and satisfaction.

Specifically, the purpose of the study was to answer three ques-
tions:

1) What attitudes could be reasonably identified as career
orientations, in the sense of those perceptions, feelings, and be-
liefs pertaining to an individual's present and future career?

2) What kinds of perceptions of rewarded activity or percep-
tions of how one gets ahead, were held by the personnel of a
research organization? The purpose here was to discover variables
that could be used in future studies to measure the climate or
culture of an organization with respect to the handling of its
human resources.

3) What relationships, if any, existed among career orientations
and perceptions of rewarded activity?

The locale of the study was a research and development organi-
ization; that is, an organization whose primary goal was to produce
scientific and technical products, and to advance technical
knowledge and competence. The study was carried out in two of
the field centers of the National Aeronautics and Space Adminis-
tration (NASA).

The fact that NASA is a government organization with a very
special and high-prestige goal should be expected to influence
the variables proposed for study. For example, civil service regulations apply in the hiring, advancement, and pay scales of NASA personnel. The organization does not have a success criterion of profitability comparable to private enterprise and cannot generate its own sense of stability. If the government decides to abandon work on problems of outer space, it is likely that NASA would cease to exist in its present form. On the other hand, the NASA mission probably enjoys a high prestige among engineers and scientists because of the nature of its basic contribution to the national and over-all scientific effort. All these factors may influence career orientations and perceptions of how one gets ahead, and should make for caution in generalizing from this organization to other types of organizations.

METHOD

Because of the exploratory nature of the study, it was necessary to gather more complete data than a questionnaire would ordinarily allow—data which would more accurately reflect the thoughts of the respondents. Therefore, standardized but open-ended interviews were held with a representative sample of managers, engineers, and scientists in two NASA field centers, Langley and Lewis. Ninety-eight interviews were conducted, with ninety-six usable schedules obtained. The interviewees ranged in age from 22 to 55 with a median of 37 years; their service varied from 6 months to 30 years with a median of 10 years. The government service (GS) levels of the interviewees ranged from GS-7 through GS-15 and "Excepted." In terms of position held, the sample breakdown was approximately 60 per cent professional nonsupervisory, 20 per cent section heads, 15 per cent branch heads, and 5 per cent division chiefs. In terms of function, the proportion of research to development personnel in the sample was about 4 to 1.

Interviews ranged in length from 1 to 2½ hours and covered such topics as: why and how the person had come to work for NASA; a description of his present job; his network of work relationships, particularly in relation to obtaining information, recognition, and influence; the role stresses he experienced and

*We would like to acknowledge the assistance of Dominique Bouchard in the planning and interviewing stages of the study.
the coping patterns he used to deal with them; his perception of his future in the organization and the barriers or aids to advancement which seemed to be present; his long-run career aspirations; and his perception of how one gets ahead in the organization.

While the interviewers had general categories in mind of what sorts of variables might later be coded, there was no attempt to precode any of the answers or to limit the interview topics in any manner. It was decided to risk lower reliabilities in the later coding process in order to permit interviewees to respond using constructs that were both personally meaningful and organizationally relevant. Responses were recorded as much as possible verbatim by hand on the interview schedules.

After the interviewing had been completed, a set of variables was constructed which would categorize the various themes appearing in the responses. These covered the two basic categories of interest-career orientations and perceptions of rewarded activity. Criteria were developed for obtaining a total interview score on each variable for each respondent. An interview score was found to be necessary because no single question carried enough of the information about a particular variable to permit straight coding of questions.

All the major career variables were assessed by having the rater go through an entire interview and rate the response to each question in terms of the relevant variables. These ratings were then combined to obtain a single summary score on the interview for each variable. To insure adequate reliability and minimize bias, two raters initially assessed several entire interviews independently following their preliminary discussion of the variables and how to infer them. All instances of poor agreement were discussed until the raters felt confident that a common interpretation of the variables and accurate ratings had been achieved, following which, one person (W. McKelvey) rated all of the interviews. After all the rating had been completed, 10 per cent of the interviews were again assessed by two independent raters. The two raters were able to reproduce the ratings of the primary rater on single questions 68 per cent of the time.7

7This criterion is more stringent than reproducibility of the combined ratings for each interview since much of the error variance cancels out when a number of
Pearson product-moment correlations were obtained among the variables. The choice of a parametric statistic was based on the assumptions that the response scores on the variables approached normal distribution and that the use of one rater to code all the interviews resulted in an approximation to a metric scale.

VARIABLES ANALYZED

**Demographic and Objective Variables**

The variables analyzed in the study included a number of objective demographic ones, used to estimate the validity of the career orientation ratings.

1. NASA field center
2. Age of respondent
3. Position title
4. Type of job function (basic, applied research, development)
5. Rank (GS level) of respondent
6. Level of education
7. Type of degree obtained (science, engineering, liberal arts)
8. Years in NASA
9. Years in present position
10. Years at present rank
11. Number of other employers prior to NASA
12. Whether respondent was a Co-op student

**Career Orientation Variables**

**Career Identification.** This dimension involves the respondent's identification with a reference group or set of skills. Two dimensions were studied.

1. Institutional-noninstitutional. This pertains to the identification of the individual. The institutionalist identifies with the organization and its goals, uses the organization as the principal frame of reference for his career, and implies that he will remain in the organization. The noninstitutionalist does not identify with the organization and its goals, does not see his career in terms of the organization, and is willing to leave the organization.

2. Technical-managerial. This pertains to the work with which questions are combined into a single summated score. Hence the actual scoring reliability is somewhat greater than 68 per cent.
the individual identifies. In the technical orientation the person finds his interests, pleasures, and aspirations in technical problem solution and technical performance. In the managerial orientation the person finds his interests, pleasures, and aspirations in administrative, organizational, and interpersonal skills. Note that the definition of these orientation variables implies that they are in principle independent of each other.

There are certain similarities between the two career identification dimensions found here and concepts which have been used in previous studies. Because the two dimensions of institutional-noninstitutional and technical-managerial were defined so as to be independent of each other in principle, this made it possible to verify empirically whether the two dimensions were actually correlated highly with each other, an association which is assumed in those studies which combine these two variables into “professional” (our technical plus noninstitutional) versus “organizational” (our managerial plus institutional).

Career Styles. These involve the respondent’s general stylistic approach toward his career. This kind of variable has not been recognized in the literature thus far.

1. Movement-nonmovement. This pertains to anticipation of and desire for career change, whether this be promotion, transfer, or simply the acquisition of more responsibility or influence, either within the organization or elsewhere.

2. Active-passive. This pertains to the exertion of influence on, or manipulation of the surrounding environment. The active style involves taking initiative toward getting ahead and career movement, and making one’s own future. The passive style implies that one should not or need not engage the environment but rather let things take care of themselves, partly because one cannot influence the environment anyway.

3. Task-interpersonal. This is related to the activity an individual emphasizes as being necessary to accomplish his career goals. The task or instrumental style emphasizes doing the job, pushing the task, and keeping strictly to business. The interpersonal style emphasizes the mastery of interpersonal relations, skill in getting things done through people, concern for and interest in the social and human aspects of the job.
4. Idealistic-cynical. This is related to how the individual views his environment in terms of its ethical rightness or justness. The idealistic style perceives rewards as being commensurate with merit and that things are as they should be. The cynical style perceives absence or violation of principles of ethical rightness or justness, and feels that one must take an opportunist view of the organization in order to get ahead.

Taken together, the list of career orientation variables provides a somewhat more differentiated and complete picture of the attitudinal structure of the respondents than found in prior studies.

Rewarded Activity Variables

These variables are perceptions of what it takes to get ahead within the organization.

1. Technical competence and performance. One gets ahead by being technically competent, being knowledgeable in relevant areas of technology, by hard work, doing a good job, and so forth.

2. Personality. One gets ahead by having the right qualities or personal attributes such as tact, ability to handle people, showing initiative, being mildly aggressive and independent, and so on.

3. Visibility and gaining recognition. One gets ahead by becoming visible in the organization or the profession and by obtaining recognition. Examples here are making yourself visible to the higher officials, publishing often, building up the right image, maneuvering for influence, and other means.

4. Organizational circumstances. One gets ahead by being in the right place at the right time, being on an important project, through reorganization, expanding one's sphere of control, being sponsored by someone powerful (following in the footsteps of a rising star), by luck or fate. On the rewarded activity variables, respondents often listed several of them as being equally important and did not seem to construe them to be mutually exclusive.

RESULTS

The results are presented in terms of the major purposes of the study. The first set of results (Table 1 and Table 2) simply indicates the distribution of responses to each of the variables for both career orientation and rewarded activity to give the reader an idea
of the range of responses. It is difficult to interpret the meaning of these responses within a single organization because of the absence of a meaningful neutral point for each of the dimensions. The results therefore should be taken only as illustrative of the possibilities in using these variables for studying an organization.

The second set of results (Table 3) shows the intercorrelations among the career orientation variables. Are the dimensions for which codes were developed actually independent of each other? If not, which ones correlate with each other, and what patterns of correlation are evident?

The third set of results (Table 4) shows the intercorrelations among the rewarded activity variables. Do respondents who see visibility as important in getting ahead also tend to see personality as important, and the like?

The fourth set of results (Table 5) shows the correlation between career orientation variables and rewarded activity variables. Are there systematic relationships between a person's attitude about his own career and how he perceives one must behave to get ahead within NASA?

**Distribution of Responses on Major Variables**

As can be seen from Table 1 and Table 2, most of the variables were reasonably widely distributed, but for all the variables there was a definite tendency for most of the respondents to fall toward

<table>
<thead>
<tr>
<th>Table 1. Distribution of mean response scores for variables* indicating career orientations (N = 96).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Institutional-noninstitutional</td>
</tr>
<tr>
<td>Technical-managerial</td>
</tr>
<tr>
<td>Movement-nonmovement</td>
</tr>
<tr>
<td>Active-passive</td>
</tr>
<tr>
<td>Task-interpersonal</td>
</tr>
<tr>
<td>Idealistic-cynical</td>
</tr>
</tbody>
</table>

*Although the numbers presented in this table have been rounded off, the figures used in the correlation computations were kept to four-place accuracy.

†Scores nearer 1 show orientation toward the first half of the dimension label; scores near 9 show orientation toward the right half of the label.
one or the other end of the scale. In this population of responses and by the coding criteria used, therefore, the respondents tended to be noninstitutionally oriented, technically oriented, interested in movement, active, task-oriented and idealistic. If these findings accurately reflect the respondents' career orientations (i.e., if a scale score of 5 can be assumed to be the correct estimate of a neutral point on the scales), one can infer that the NASA employee sees himself as a dynamic, cosmopolitan, professionally oriented individual, vigorously pursuing a technical career.

In comparing the relative importance attached to the rewarded activity variables (Table 2), technical competence and performance

Table 2. Distribution of mean response scores for variables* indicating perception of rewarded activity (N = 96).

<table>
<thead>
<tr>
<th>Variables†</th>
<th>High ← Scale Categories → Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>Technical competence and performance</td>
<td>2</td>
</tr>
<tr>
<td>Personality</td>
<td>2</td>
</tr>
<tr>
<td>Visibility and recognition</td>
<td>1</td>
</tr>
<tr>
<td>Organizational circumstances</td>
<td>5</td>
</tr>
</tbody>
</table>

*Although the numbers presented in this table have been rounded off, the figures used in the correlation computations were kept to four-place accuracy.
†These variables were scored only on a scale of 1 to 5.

ranks first, organizational circumstances ranks second, personality ranks third, whereas visibility and recognition ranks fourth in importance for getting ahead. Respondents indicate, in other words, that to get ahead in NASA, it is necessary to be competent and productive, and to be fortunate or in the right place at the right time. Having the right personality and making oneself visible is considered relatively less important for advancement.

Intercorrelations among Career Orientations

Table 3 shows the product-moment intercorrelations among the six career orientation variables. It should be remembered that these variables were initially chosen to encompass the range of responses observed in the interviews. The correlations among them
Table 3. Intercorrelations among career orientation variables.*

<table>
<thead>
<tr>
<th></th>
<th>Institutional</th>
<th>Technical</th>
<th>Movement</th>
<th>Active</th>
<th>Idealistic</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional</td>
<td></td>
<td>-.04</td>
<td>-.40†</td>
<td>-.38†</td>
<td>.09</td>
<td>.07</td>
</tr>
<tr>
<td>Technical</td>
<td></td>
<td></td>
<td>-.32†</td>
<td>-.28‡</td>
<td>-.04</td>
<td>.28‡</td>
</tr>
<tr>
<td>Movement</td>
<td></td>
<td></td>
<td></td>
<td>.73†</td>
<td>-.05</td>
<td>-.23‡</td>
</tr>
<tr>
<td>Active</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.02</td>
</tr>
<tr>
<td>Idealistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Only the first half of the dimension label is given here. All significance levels reported are based on a two-tailed test.
†Significant at the .01 level.
‡Significant at the .05 level.

can now be used to determine the validity of keeping all six variables.

The results indicate that the separation of institutional-noninstitutional from technical-managerial was justified. These dimensions do not correlate with each other. The managerially oriented individual can be noninstitutionally oriented and the technical individual can be institutionally oriented.

A strong association occurs between the movement-nonmovement and the activity-passivity dimensions. The high correlation here strongly suggests that there is a single underlying dimension, which concerns both a tendency to want to move and the person’s beliefs about how one must go about moving. The individual who is movement oriented also believes one must be an active agent in making one’s own future.

The institutional orientation does correlate with the nonmovement tendency and passive style, but not with the idealism-cynicism or task-interpersonal dimensions. The technical orientation is correlated with the task dimension as might be expected, but also with nonmovement and passivity, suggesting a kind of syndrome of the man identified with technical skills being indifferent to interpersonal considerations and career movement. Rather, he is satisfied to pursue his work wherever he is permitted to do so. Inversely, the managerial orientation is correlated with movement, activity, and interpersonal styles, suggesting a syndrome of concern with active career change within an interpersonal framework.
In summary, it appears that with the exception of the movement and activity dimensions, there is no evidence in the intercorrelations to support eliminating any of the variables identified.

**Intercorrelations among Rewarded Activity Variables**

Table 4 shows the intercorrelations among the factors perceived by the respondents to be important for getting ahead in NASA. The only factor that is correlated significantly with others is organizational circumstances. The implication is that individuals who see either technical competence or personality emphasized in the organization as ways of getting ahead do not see organizational circumstances as being important, and vice versa.

*Table 4. Intercorrelations among variables indicating perception of rewarded activity.*

<table>
<thead>
<tr>
<th>Technical competence, performance</th>
<th>Personality</th>
<th>Visibility, recognition</th>
<th>Organizational circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical competence and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>performance</td>
<td></td>
<td>.09</td>
<td>-.21</td>
</tr>
<tr>
<td>Personality</td>
<td>-.09</td>
<td>.04</td>
<td>-.34*</td>
</tr>
<tr>
<td>Visibility, recognition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational circumstances</td>
<td>.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .01 level.

**Correlations Between Career Orientation Variables and Perceptions of Rewarded Activity**

Is there a tendency for respondents who have a certain orientation toward their career to show systematic trends in how they perceive the organizational reward structure and how one gets ahead? Table 5 throws light on this question.

Institutional orientation is negatively correlated with visibility, indicating that it was the noninstitutional respondents who tended to emphasize visibility and recognition as being rewarded and as the way one gets ahead.

The movement orientation style is related to both technical competence and visibility, indicating that the respondents who anticipated career movement tended to see both technical compe-
tence and visibility as relevant in getting ahead. The active orientation style shows a similar pattern, as would be expected.

Finally, the idealistic style is related to technical performance, visibility, and organizational circumstances. Respondents who were idealistic in style tended to perceive the reward structure as favoring technical performance and to a lesser extent, personality; those characterized by a cynical style saw organizational circumstances as the primary way of getting ahead, with visibility next in importance. It is likely that the idealistic-cynical correlations are influenced by a coding overlap because the idealistic-cynical score was based on all responses including how the person perceived the organizational reward structure.

**Correlations of Objective Variables with Career and Reward Variables**

The demographic and objective variables listed were also correlated with career orientation and rewarded activity variables. The main purpose was to obtain clues concerning the validity of the coded variables by seeing whether the correlations with objective variables fell into reasonable patterns. These data are not used to draw inferences about the distribution of career orientations because of the relatively small sample size in the survey. All those correlations that reached the .05 level of significance are discussed.8

8The complete intercorrelation matrix is available from the senior author upon request.
Not too surprisingly, number of years in one’s present position correlated with being institutionally oriented (.26), while level of education correlated with being noninstitutionally oriented (.33). The technical-managerial orientation correlated with type of job function (.42)—the technical orientation was found more often in a basic research job and the managerial orientation was more prevalent in development functions. This finding tends to substantiate the common belief that men in development differ from men in basic research in having attitudes (probably as a result of various processes of selection and the impact of role taking) that are more congruent with the management role. Both findings are in the direction one would predict and serve to increase the plausibility and validity of the two dimensions of career identification.

The nonmovement style or complacency was associated with increasing age (.28), length of service within NASA (.26), number of years in present position (.40), and number of years at the present GS level (.38). The passive style was also correlated with increasing number of years in present position (.36) and with present GS level (.31).

Idealism showed a positive correlation with age (.31), type of position—toward supervisory positions (.32), and present GS level (.24). The older and higher ranking the person was, the more likely he was to be idealistic.

With respect to the perceived reward structure, the emphasis on technical performance as a way to get ahead was correlated with type of job function—from basic research to developmental activities (.27), and with type of college degree—science or engineering (.30), and GS level (.28). Respondents emphasizing technical performance had an engineering rather than a science degree, development rather than basic research jobs, and higher GS levels.

The emphasis on organizational circumstances was negatively related to age (−.25), GS level (−.24), and number of years at present GS level (−.27). It is the junior member of the organization who is most likely to be pessimistic or fatalistic about his possibilities of advancement, a view probably stemming from a
feeling of having little influence or control over ways of getting ahead.

The correlations reported are generally in the direction one might expect and thus serve to substantiate the validity of the coding of the career and reward variables. This is not to say that validity has been firmly established by these data, but rather that the career and reward variables do relate meaningfully to objective variables.

CONCLUSIONS

Several conclusions and implications for further research have emerged from this study, which have significance for the developing body of knowledge about the scientific professional in a research organization. It was found that interview data on career orientations could be reliably and independently coded on both identification and stylistic dimensions. The generally low intercorrelations among five of the six orientation dimensions support the conclusion that it is important to recognize the complexity of the career orientation concept when applied to scientists, engineers, or other professional personnel. Previous research has tended to focus almost exclusively on an individual's latent identification patterns neglecting the importance of what we have termed the career style dimensions.

This conclusion implies that a research manager or consultant attempting to apply these findings about the orientations, values, and needs of professional personnel for the purpose of providing an organizational climate more compatible with their career aspirations, should recognize that a categorization such as "professional-technical" or "managerial-institutional" is a conceptualization which does not adequately incorporate differences in an individual's style of career activity. More consideration should be given to the possibility that an individual's style may reflect his perception of whatever activity is rewarded by the organization, and that his latent identification may be a reflection of the organizational reward structure.

Furthermore, it is important to recognize that the nature of these career values—identifications and styles—may change con-
siderably with time as the individual moves through an organization and encounters an increasing variety of work experiences.

Associated with the recognition of the increased complexity of the career orientation concept is the finding that the technical-managerial dimension is not correlated with institutional-noninstitutional identification. This result is substantially different from some studies which have found that a technical orientation is associated with a noninstitutional or professional orientation. Unfortunately, it was not within the scope of this study to provide an explanation for this inconsistency. By way of conclusion, however, some possible explanations can be suggested.

One possibility is related to the observation that in general the managerial role is itself becoming increasingly professionalized, which would suggest that a managerial orientation does not necessarily go with an institutional orientation. There appears to be an ever larger group of managers who do not identify with any particular organization and who are not institutionally oriented. Likewise, technical orientation and institutional identification can also be associated and may be explained, as Blau and Scott point out, by an organizational reward system which reinforces technical contribution and the values associated with commitment to professional skills. Thus an individual may simply see the technical aspect of his career as being a stepping stone to a high management position in the future, a combination of attitudes which is quite consistent with the increasing emphasis on a technical education as a prerequisite for managerial success in research organizations.

A final conclusion concerns the correlations between career orientations and objective variables such as age, rank, and length of service. The fact that the correlations which emerged fall into reasonable patterns, suggests that a study of a particular organization's utilization of its resources could be profitably pursued through a systematic sampling of career orientations in the differ-

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10 Blau and Scott, *op. cit.*
ent functional groups, for rank, age, and length of service. It would be of considerable importance to know, for example, when certain stylistic dimensions show a change—from movement to complacency, from cynicism to idealism, from task orientation to interpersonal orientation. Data such as these alongside perceptions of reward structure; evidence of actual reward structure (based on study of cases or data obtained from key managers); and ratings of productivity, effectiveness, and satisfaction should provide a more differentiated picture than is now available of the relationship between the professional and the organization.