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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A conceptual model of management development has been drawn in an attempt to interpret and integrate the effects of individual characteristics, situ- ational factors, and career paths and stages. The purposes of the model are (1) to provide a framework for understanding the results of the Stanford longitudinal managerial studies while integrating the results of studies from Brigham Young University, Carnegie-Mellon, M.I.T., and other studies;		

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and (2) to generate hypotheses that can be tested with the Stanford data set. Personality traits, most prominently Ascendancy or Social Boldness, maturely directed Energy, and Social Extroversion, have some significance for managerial progress. Two overlapping scales, a High Earners' Scale and a General Managers' Scale, were developed by Thomas and Margaret Harrell that predicted earnings and achieving a General Manager Position in five to ten years out of school. Situational factors that appear to be salient are size of organization; technological sophistication of the organization; and growth mode. Career stages include the paths to general management, and the rotation of functional fields. The interaction of these and other variables throughout one's career can permit predictions of outcome that are expected to exceed chance and to improve on previous models.

Manager Development: A Conceptual Model

During the past three years an effort has been made to develop an instrument that could offer some validity for selecting potential business general managers. Ten year longitudinal data were collected on members of seven Stanford Graduate School of Business MBA classes--graduates of 1961-1967. The more than 1,000 men in these classes were given a psychological test battery consisting of nine instruments. Career progress was followed up by questionnaires five years later; the rate of return being 87 per cent. Six of the classes have completed a ten year follow-up questionnaire.

Previous technical reports have reviewed the analysis of the test battery and questionnaire data and have indicated the complexity of a managerial career. From the findings of this research project along with those of other researchers we hope to provide a conceptual framework that will prove useful in understanding the current status of manager development and in specifying an area for future research.

Three General Approaches

In the realm of predicting a future event within the organizational context, particularly something as uncertain and multivaried as becoming a general manager, one will, undoubtedly, be confronted with distinctive approaches and conflicting results. We will now briefly review three major approaches to the study of careers, or how people move through organizations: (1) structural determination, (2) random selection, and (3) purposive selection based on individual characteristics.

Structural Determination

An organization is basically a system set up to reduce the variability of individual behavior within that system (Thompson, 1967). With limited individual variability a bureaucratic organization, based on the division of labor, is organized to facilitate the movement and replacement of specific individuals (Gouldner, 1950). With the organizational structure thus set up to facilitate the movement of managers and to provide an arena or "sphere of action" for the individual to seek solutions to his career problems (Thompson, 1967), it is often seen as a possible determinant of career patterns.

An interesting perspective on organizational structure and vacancies is provided by Vroom and MacCrimmon (1968) and by White (1970). Careers are herein viewed as the movement of managers among positions by a stochastic process which "shows the likelihood of movement from one state (position) of the system (organization) to any other state over some specific time period" (Vroom and MacCrimmon, 1968). Expanded by White (1970), this approach deems careers not as the result of individual characteristics and motives, but as "a chaotic by-product of the path of a large system." He goes on to define more explicitly the relevant dimensions of a career: "...Instead of careers of men, the natural subject of prediction at an individual level is careers of vacancies, since vacancies, not men or jobs, move freely within the system". In addition to the unit of analysis, another contribution of White is concepts "interdependence" and "interconnectedness"; that is, if one vacancy is created, its filling causes another vacancy and so on down the line.

Factors such as size, rate of growth, and complexity of the organization have been found to be positively related with the rate of succession (Grusky, 1964; Warner and Abegglen, 1955). A proposed qualification of the size

variable suggests that the visibility of the individual in the organization and the number of organizations visible to him are important qualifiers to organizational size, mobility and succession (March and Simon, 1958). An individual may be prominent in a small organization, but in turn, have a low visibility of additional career alternatives while the reverse may be true in a large organization.

Finally, Gusfield (1957), while studying the Women's Christian Temperance Union, identified four ways in which the organization's structure prolonged the control of an older generation. First, through the organized oligarchy, the official positions are able to maintain and exercise power through the day to day operations. These current officers at headquarters have communications with local leaders and members. The second and perhaps most important way which the incumbent remains in power is through an apparent ability to be reelected to office. Many of the decisions as to who will be nominated and elected to office are made by committees that are influenced by the incumbent; by the time the election arrives most convention delegates have received some prior "guidance". Third, as in most organizations, people move up the ladder of offices in some regular order, hence insuring orderly succession. As a result, the choice of future officers are made by the incumbents long before the situation arrives when they actually function in the office. Finally, rules are maintained by the sentiments which may be violated by their having been broken, i.e. people's expectations and interests are bound by the system of orderly progression, thus it is often seen as a hostile act to remove an incumbent from office. The results are predictable - the rule and the office are maintained by the incumbent's interests and the non-office-holder's sentiments.

Although Gusfield's findings are from an organization somewhat different from most business organizations, our experience and research tends to support and add to the generality of his findings. Many of the informal and seemingly irrational aspects of organizational succession are mentioned which lead us into the next general area of study, random selection.

Random Selection

The lack of confidence in the validity of criteria for management selection is the basic assumption or hypothesis for this area of study. Few people, if any, know what makes a good manager, least of all the people who are doing the actual selection. The process may be random. Even if some criteria are systematically used, they are likely not related to actual job performance. It is conceivable, therefore, that researchers may be able to find some variables that could be related to managerial succession - but, most likely they will be the result of superstitious behavior, not relevant to job performance criteria.

Roth (1963) describes a career as the sequence and timing of events through which many people pass. Those passing through such events attempt to structure them no matter how uncertain they may be. Thus, the structures often result in timetables of expectations. For a timetable to exist, however, there must be some pattern of related, definable, frequently experienced stages and an interacting group of people who have access to clues for constructing the timetable norms. All is well as long as the stages and the clues are clear, but problems arise if they are ambiguous or unstable.

The more unclear the reference points are, the harder it is for members of a career group to know where they stand in relation to others and the more likely it is that they will attend to inappropriate clues and thus make grossly inaccurate predictions concerning future progress..... The meanings of such reference points are learned by members of the group through observation of the experience of other members and through the communication of experiences,

ideals, myths, and hopes among the members of the group. During a time of rapid change in the timetable when the changes are not made explicit, such information will contain many contradictions and thus make the construction of a stable and reliable timetable norms more difficult.... Not that members of the group will not keep trying, but that their judgements will so often be so far wrong that they lose confidence in their ability to make predictions of the future. (Roth, 1963)

This aforementioned condition described above may describe the attitude of many career researchers rather than that of managers in various organizations.

If the candidates for a particular position all possess the essential characteristics prescribed for the job, or if the formal criteria are not easily identifiable, informal subjective criteria will be the essence of the decision (Collins, 1946; Dalton, 1951). C. Wright Mills (1956) discussed some of the politics and actual criteria that managers use in moving people into top positions:

The standards that prevail are not clear-cut and objective; they seem quite intangible, they are often quite subjective, and they are often perceived by those below as ambiguous.

He went on to describe the survival of the fit, which does not mean "formal competence - there probably is no such thing for top executive positions - but conformity with the criteria of those who have already succeeded." From many examples he comes to the conclusion the best definition of ability for upward movement is: "usefulness to those above, those in control of one's advancement."

Personality

The assumption of personality influences maintains that there are specific characteristics of individuals that significantly affect or, in the purest sense, cause the qualifications for and assignment to a managerial position. Numerous studies have been done to find the trait or set of traits that provides a link between the individual personality and becoming a

manager. For instance, background characteristics, such as the presence of a dominant father, was related to orientation or conflict in managers (Zaleznik, Dalton, and Barnes, 1970). Although our finding failed to confirm the relationship, need-for-achievement, as presented by Atkinson (1958) and McClelland (1961), is often related to people in general management positions.

In the closely related field of leadership, Stogdill (1974) reviewed over 300 studies that attempted to relate individual traits or personality characteristics to leadership in such diverse groups as business managers and volunteer service organizations. He concluded, and most personality theorists would agree, that "the characteristics considered singly, hold little diagnostic or prescriptive significance. In combination, it would appear that they interact to generate personality dynamics advantageous to the person seeking the responsibility of leadership." (pp. 81-82).

Central to the issue of personality characteristics is the stability of the personality itself and the related question of development of managers verses their initial selection. If personality is stable, and, if personality characteristics are related to becoming a manager, managers could be selected rather than developed. A comprehensive set of data has come from AT&T wherein managers showed only small personality changes and much stability over a seven year period (Bray, Campbell and Grant, 1974). Two studies, Schein (1967) and Pendse (1973), have shown modest changes in attitudes that could be considered part of the socialization process when potential managers tend to have "career anchors" that stabilize their careers over time. With this perspective it comes as no surprise that studies on the effects of more short term training programs have either shown no effect or a short term gain that tended to level off after the individual returned to his usual

environment (Fleishman, et al., 1955; Hariton, 1951; Harrell, 1962; Campbell and Dunnette, 1968; Campbell, et al., 1970). Only programs that changed the work environment seemed to have a long term affect on behavior (Zenger, 1970), and much of the organization development literature lacks the rigor to establish that point with certainty.

Within personality theory, situational factors have been shown to interact with personality to determine individual behavior (Mischel, 1968). Further research is being directed at understanding the specific environmental factors and the personality dimensions they affect. Similar research would be useful in the study of careers.

Our look at managers considers the impact of personalities, organizational variables, and some random circumstance on the careers of a sample of MBA's over a ten year period. It does not attempt a controlled experiment of training verses no training; nor is it a broad comparative study. Instead, our sample of highly select individuals, all of whom have received two years of MBA training and all of whom work in business organizations, would tend to limit the wide differences of background, ability, education, etc. that are fairly useful global predictors on the population as a whole. This restriction of range in the selected sample increases the saliency of personality differences that have been found. This provides a population in which certain individual and post-training situational differences can be studied in a revealing way.

Previous Stanford Findings

Analysis of the Stanford longitudinal data indicated three primary areas of information that seem to have positive relationship with becoming a General Manager (GM): (1) characteristics of the individual, i.e. background, personality factors, vocational interests and some indicators of

ability; (2) situational factors such as size of company, growth of company and industry; (3) career paths and informal factors. All of these areas have been discussed in previous reports but will be reviewed briefly at this point.

Characteristic of the Individual

Our research has shown that GMs want to be GMs; therefore, they are willing to work long hours to attain the position and keep it. They are above the MBA average, which in turn, is above the general population average in Ascendance or Social Boldness; they like to take the lead and persuade others. Their General Activity or Energy, which when naturely directed, appears to be highly important. Positively correlated with Energy is the Manic component of the MMPI. Such a manic elevation at the effective level was not so high as to indicate neurotic or psychotic tendencies of dashing from one task to another before finishing the first. GMs are notably men-of-action, not scholarly-staff types as indicated by low academic orientation on the SVIB, generally true for MBAs. Unexpectedly, there was also a slight elevation of the MMPI Paranoid component, which at that level is said to mean "sincerety" by the clinical specialists of the MMPI. GMs were high in Personnel Interests and Managerial Orientation on ATGSB scores, both verbal and quantitative aptitudes, they were just average for Stanford MBAs.

GMs were also above average in Social Extroversion; they liked to interact with people in the organization and at parties which may or may not be work related. In the sense of being interested and able to interact, to communicate, especially orally, with fellow members of the organization, they are particularly suited for contemporary organizational life. They

They were not the "organizational man" of Whyte (1957), but were more willing to express an opinion contrary to that of the group than are non GMs. Overall, GMs scored well in areas indicating they are emotionally secure and well adjusted.

The personality pattern seems to fit the demands of the job for top organizational executives as described by Mintzberg (1973). Two of the key roles for managers, interpersonal and informational, contain many aspects that would be facilitated by social boldness, extroversion, and oral communications skills. Mintzberg found that top executives jump around rapidly from one task to another, averaging only seven minutes per task. GMs do not perform in-depth studies characteristic of staff members. In addition their interactions were often reacting to the demands of the people, not proacting or initiating; a pattern similar to what was found with college presidents (Cohen and March, 1974). Thus do our personality findings indicate that GMs as a whole and on the average have personality profiles that are congruent with the active demands of long hours, with many brief contacts that characterize top executive positions.

The Assessment Center has come to be regarded by some as the most valid procedure for determining managerial potential (Bray, et al, 1974). It has also been regarded as a major device for development of managers. It includes psychometric measures of personality and ability and also simulations of realistic managerial situations. The most notable simulation is an In-Basket Exercise. Also included are assigned role plays with non-participation observers plus sociometric ratings of participants whose managerial potential is being assessed. The final product is a written report by the professional staff based on the results of several days of assessment. This report evaluates the managerial potential of the individual, one's strengths and weaknesses.

The Assessment Center was initially intended only to aid in decisions regarding promotion to manager positions, but later it was found that it can also serve for development. For the latter purpose the report is presented orally and in writing to the assessee as a guide for training and other development steps. These suggestions can facilitate the growth of the individual to become a more effective manager.

Situational Factors

We have been able to predict 25% of the variance in those who have reached the GM level: therefore, 75% of "success" is due to variables other than personal characteristics - to situational variables and to chance. Of the situational factors, the biggest determinant of whether the MBA will get to GM early was the size of the company. Those in small companies of under 1,000 employees, had 30% in GM versus 15% for those in large companies at five years out of school. Hence the chances of becoming a GM are twice as great in small companies.

Other variables which surfaced in the interview but were not measured, are the type of industry and the growth of the company. Industries with higher risks seemed to provide more openings than other industries. Growth companies also provided many opportunities for GM. Mere possession of an MBA degree is a situational variable aside from the actual training, ability and motivation it usually implies.

Career Paths and Informal Factors

It was found that the "challenge" presented by the first job was commonly associated with reaching GM which concurs with results found by Berlew and Hall (1966) at AT&T. In that study, however, the possible effect of individual differences was not ruled out; that is, the more challenging jobs may have been given to the most promising candidates. The presence of

a sponsor or "Godfather" is also related to becoming a GM. It appears that a sponsor serves two purposes - one is real power, to get a man promoted or to be an important ally; the second, to be a non-directive counselor.

To become a GM in a large company, it appeared advantageous to start as an Assistant to As stated earlier, chances for becoming a GM were twice as high in a small company as in a large company although approximately half of the small company GMs started their careers in large companies. Finally, MBAs who rotated functional fields, to-or-from-what field made little difference, between entry job and the job at five years out were twice as likely to be GMs at ten years out of school.

While each of the three general areas of study discussed earlier and our additional research findings are significantly related to becoming a GM, no one relationship is sufficiently strong to be completely comfortable in making predictions. However, if the findings could be combined in a meaningful manner, it should greatly improve the accuracy of our predictions. Insights borrowed from the studies and conceptual work done in other areas including personality, leadership, and additional career models will assist us in integrating our research.

Integrating the Individual and the Situation

Our research indicates the need for an integration of the aforementioned approaches if a more complete understanding of careers is to be achieved. Schein (1971) attempted a description of the organizational impacts on the individual career, primarily using such notions as centrality to the organization, job boundaries and the case of penetration into a new job. Successful job performance, and thus career movement, is viewed by Lopez (1970) as the dynamic outcome of the transactions that occur among three major variables: (1) personality, (2) roles, and (3) organization milieu.

Although the need to combine the different perspectives into a unified view of careers has been discussed, little has actually been done to accomplish the task. Neither will our contribution accomplish the task completely but we hope to show a framework for understanding the system of business general manager development and indicate a clear direction for future research. Advances in integrating the individual-situational variables in areas only marginally related to careers provides us some useful guidance.

The field of leadership has also moved away from a one dimensional view of leadership either in terms of the individual characteristics or the situational factors. It has been proposed that leadership is a function of the interaction of three sets of variables: forces in the leader, forces in the subordinates, and forces in the situation (Tannenbaum and Schmidt, 1958). DuBrin (1963) found that a composite of both trait and situational items correlated significantly with a leadership criterion, whereas neither set alone was significantly related, Stogdill (1974) in his massive review of the leadership literature, reinforced the interaction ideas when he stated:

It is believed that characteristics of the individual and demands of the situation interact in such a manner as to permit one, or perhaps a few, persons to rise to leadership status.

(p. 23)

Based upon a study of the congruence between the environmental press and the individual's personality, the prediction of performance and behavior has been previously studied by Stern, Stein and Bloom (1956), Stern (1970), and Moos (1974). These studies have proceeded to analyze and understand the environment primarily through the individual participants' perceptions, obtaining personality measures, consideration of the interaction between the environment and the individual, and finally formulating specific behavior

predictions.

A Proposed View

Having laid a fairly extensive foundation that (a) explained three major approaches to studying careers, (b) how our past research has contributed to those approaches, and (c) a general trend in related fields to integrate the different ideas, we will now build on that foundation a conceptual view of managerial careers.

As did Schein (1971), we feel there is an important distinction between the organizational and individual level of analysis. This distinction is important because for the most part of an individual's career, the organization's structure and climate are more or less fixed situation factors. White (1970), Thompson (1967), and others suggested that for this reason the organization structure drives the system of careers. The size of the company, its organization, its growth, and the industry it is in, bound the career system and determine important career variables such as the number of positions available, how often changes occur and vacancies are created, and the skills that are most needed and most central to the organization. All of these are central to the opportunities of becoming a GM.

In addition to the structural variables, many variables within groups or encountered in relationships between people interact with the individual's characteristics to affect his career. While often seen as random, which they sometimes are, interactions with the individual's personality are difficult to rule out. For example, much of the succession literature indicates that managers tend to promote those who are similar to themselves in attitude and values and who can be most useful to them (Mills, 1956). This definitely contributes to the idea of randomness across situations or at the extreme

completely superstitious behavior. But, the interaction between an individual and his supervisor is full of personality factors. For example, in a somewhat related situation, it has been demonstrated that the clients in psychotherapy elicit more consistent behavior from different therapists, than therapists show with different clients (Moos, 1967). We would suspect a similar pattern with individuals and their managers. The interaction between the individuals and their personal characteristics and those of the supervisor definitely affects the likelihood of developing a sponsor or mentor relationship, an important influence in managerial careers (Martin and Strauss, 1956; Harrell, 1974; Thompson, Dalton and Price, 1976). At any rate, the influence that comes from interacting with and perhaps modeling one's behavior after that of a supervisor will have an effect on the individual's career.

Another important relationship factor affecting a career is that between the manager and his subordinates. Just as the manager's relationship with his superior affects him, so does his relationship with his subordinates. Subordinate characteristics such as needs for independence, tolerance for ambiguity, interests, and past experiences were among those proposed by Tannenbaum and Schmidt (1958) as affecting the leadership relationship. Barnland (1962) also identified a relationship between leaders and group member characteristics. In addition, the affirmation of leadership positions often depends on the acceptance of the individual leader by his subordinates (Mechanic, 1962; Zaleznik, 1971).

In addition to the interaction between individual and subordinate characteristics, the interactions between individual characteristics and task demands is related to the output success of a given assignment. Factors like the type of problem faced and the time pressures (Tannenbaum and Schmidt, 1958) along with the favorableness of the situation (Fiedler, 1967) all

interact with the individual manager's personality and background characteristics. Also related here is the functional area an individual may chose, and the 'challenge' of his first job and subsequent job assignments.

As shown in Figure 1, within the context of the organizational setting, supervisor characteristics, subordinate characteristics and task demands all interact with the individual's own personal characteristics to affect his success in assignments, new opportunities and finally his career paths or pattern. As indicated in the figure, the success on a given assignment is determined by the interaction of individual characteristics, subordinates characteristics and task demands. Assignment success then affects the supervisor's perceptions which are mediated by his relationship with the individual - all of which affect the likelihood of future opportunities. Opportunities and past successes then determine to a great extent the career path or pattern an individual may follow. Schein (1975) found that the previously mentioned statement was mediated by the individuals long range interests and aptitudes as demonstrated by Schein's idea of career anchors. Furthermore, each new assignment may bring new tasks, subordinates and supervisors into the frame of reference.

If patterns in dealing with each of these above mentioned variables did not develop, a minor crisis would emerge with each job change. Crises do not seem to occur regularly, but there do seem to be major changing points in a career when normal patterns are broken and new ones are formed.

Four such patterns or changes have recently been identified and described, (Thompson, Dalton and Price, 1976). These career stages appear to have application to our current formulation although the stages in general management development are probably more distinct in some organizations than in others. They are:

Stage I: Apprentice. When an individual first enters his career there are three main concepts he needs to learn: (1) how to make the transition from theoretical learning to applied technical work; (2) how to be an effective subordinate; and (3) how the informal social system and the political system work. This learning can occur most effectively under the tutelage of a more senior mentor. The junior person learns by helping the mentor with his work; quite often he is assigned the detailed tasks. To be effective in the first stage an individual must understand the goals of the mentor and help him achieve those goals, perform detailed work promptly and efficiently, be observant and willing to learn, and finally be aggressive and take some initiative. This is an important developmental stage because the junior person learns many important concepts, gains confidence in his ability, but most of all has the power of an established mentor to help and guide him.

Stage II: Independent Specialist. The individual then begins to move out on his own, to have his own ideas and the ability to pursue them. The primary goal of this stage is to establish oneself as a competent individual and to be able to work independently without constant supervision. To develop credibility and a reputation it is almost mandatory to specialize either in a content area or a specialized set of skills. Finally he needs to begin dealing with people outside his own little work group in order to gain what Jennings terms visiposure. That is, visibility to see what the organization or system around is like and how it operates; and exposure so people with power both above and lateral to the individual will recognize

his work and ability.

The basis of power at this stage is the individual's specialty. To exercise that power he must be able to ask questions intelligently, bring something original to the problem or project, develop a reputation, and understand how his technical problem will interface with the entire system.

Stage III: Mentor. The overriding characteristics of the mentor stage is the broadening into new areas of technical application and involvement in other aspects of the organization. As he generates new ideas and projects, he recognizes the need to involve other people in the development of those ideas. Now instead of doing all the detailed work himself, he can delegate much of it to other people, while still maintaining control. Thus his power is increased because of new, more encompassing ideas but probably more through the relationships he begins to cultivate.

The individual's power and influence are additionally increased if he performs all of the functions of this stage in a competent manner. Some of those functions are: (1) being the driving force in the system, (2) taking the initiative for his own work and that of other people, (3) setting objectives and dividing the work effectively, (4) seeing how the talents of others can best be directed toward a particular problem or goal, and (5) focusing on communications both written and oral.

Stage IV: Developer. As the individual begins to assess the outside environment and assists the organization in adapting to it, his credibility and influence are strengthened even further. People

both above and below him have greater confidence in his judgement both in terms of the direction the organization should go and guidance for their own careers. His power is based on an increase in his perspective, scope, and responsibility, in general his conceptual skills. In this manner his influence is extended beyond just a small group.

The other major task of this stage, in addition to developing a direction for the organization, is the development of future key people. To perform this task well, he must be able to assess people accurately in the organizational environment.

Our findings indicate many similarities in the careers of the GM. Yet we also note a few important differences may emerge. The apprenticeship stage, with a sponsor and a challenging job assignment, is very similar for the GM, but the specialist stage may fail to conform to the majority of MBA cases. An excellent example of the apprenticeship stage is being an Assistant to a President or to a Vice-President which has indeed been followed by achieving unusually high positions. Though the learning and content of the stage are similar, the concept of specialization runs into difficulty since most MBAs tend to be general in applicability. Changing functional fields has been a highly significant way of avoiding a too narrow specialization that diminishes the likelihood of achieving a position as a GM. Becoming a sponsor for other managers and moving to a more responsible position characterize the Mentor stage. By this time the human relations skills, so frequently discussed, are vital to the performance of the manager's duties. As one gains conceptual and administrative skills, common to the developer stage, and moves toward the boundaries of the organization, one is in a position, such as a GM, where he

has an impact on the direction of the organization.

These career stages, of course, are pursued at different rates by different people. Some MBAs are by no means confident that upon graduation they could become a manager, while others want such a job immediately, and occasionally get it. In fact, Schleh (1975) suggested that one of the biggest flaws in MBA careers is the high starting salaries that cause the MBA to start at such a high level that they do not have a chance to learn the common, but important, details of work at the lower levels. Granted, a professional manager does not have to know all the details of his subordinate's job, but to know the fundamental process is a necessity for managing. There is some advantage to starting at the bottom, even though one moves up more quickly. In terms of the stages, the MBA attempts or is encouraged to skip the first or second stage and miss out on some of the intrinsic learnings that would optimize professional managerial development.

From a discussion of the ideas described in Figure 1, we hope to have a more clear idea of the components of a manager's career and how they interact. The question of how these components could be systematically studied still remains. Our previously collected data, which have provided a large part of the basis of our view, could also be of use in still more integrative studies.

A Possible Analysis

Although it would only be a rough approximation of the opportunities or vacancies that occur in an organization, we could divide the organizations into four major groups:

	Large	Small
High Growth		
Low Growth		

Of course, the results would show more accuracy if better measures such as turnover rate, average age of management population, etc., could be collected, as well as greater distinctions in the variables mentioned.

Within each group of organizations we could examine the relationship of personal characteristics to early career factors, e.g. presence of a sponsor, challenge of the first job and beginning functional area. Ideally we would like to know the congruence of the individual's personality and values with his manager's, the characteristics of the subordinates (if any), and a more distinctive breakdown on the task dimensions, e.g. uncertainty, favorability, time pressures, etc.

Theoretically, from these relationships we could predict each next step in the MBA career and maybe a general prediction of becoming a GM. Then given the next situation we could update the probability of our prediction on the bases of present circumstances and past data. This process would continue each year or each job change for ten years. While a limited version of this process would be feasible given our data, a much more feasible process would be to use the five and ten year questionnaire and check data at these points. For example, at five years out we could check for progress and status in such areas as having changed functional fields and to what field, moving from a large to a small organization, and managing a significant group in the organization. Other areas would be desirable but even these may considerably increase our predictive power. All of these areas are then analyzed with respect to individual characteristics and the

data from step one. The third step would be to analyze variables similar to those in the second step only collected at ten years out (See Figure 2).

We would expect that there is no "one path" to GM, but rather several paths with a significantly higher probability of becoming a GM.. In addition, the personality characteristics associated with each path will be different, that is, different paths require different characteristics. If this is the case, individuals and organizations could make career decisions somewhat earlier and with a better understanding of the influences.

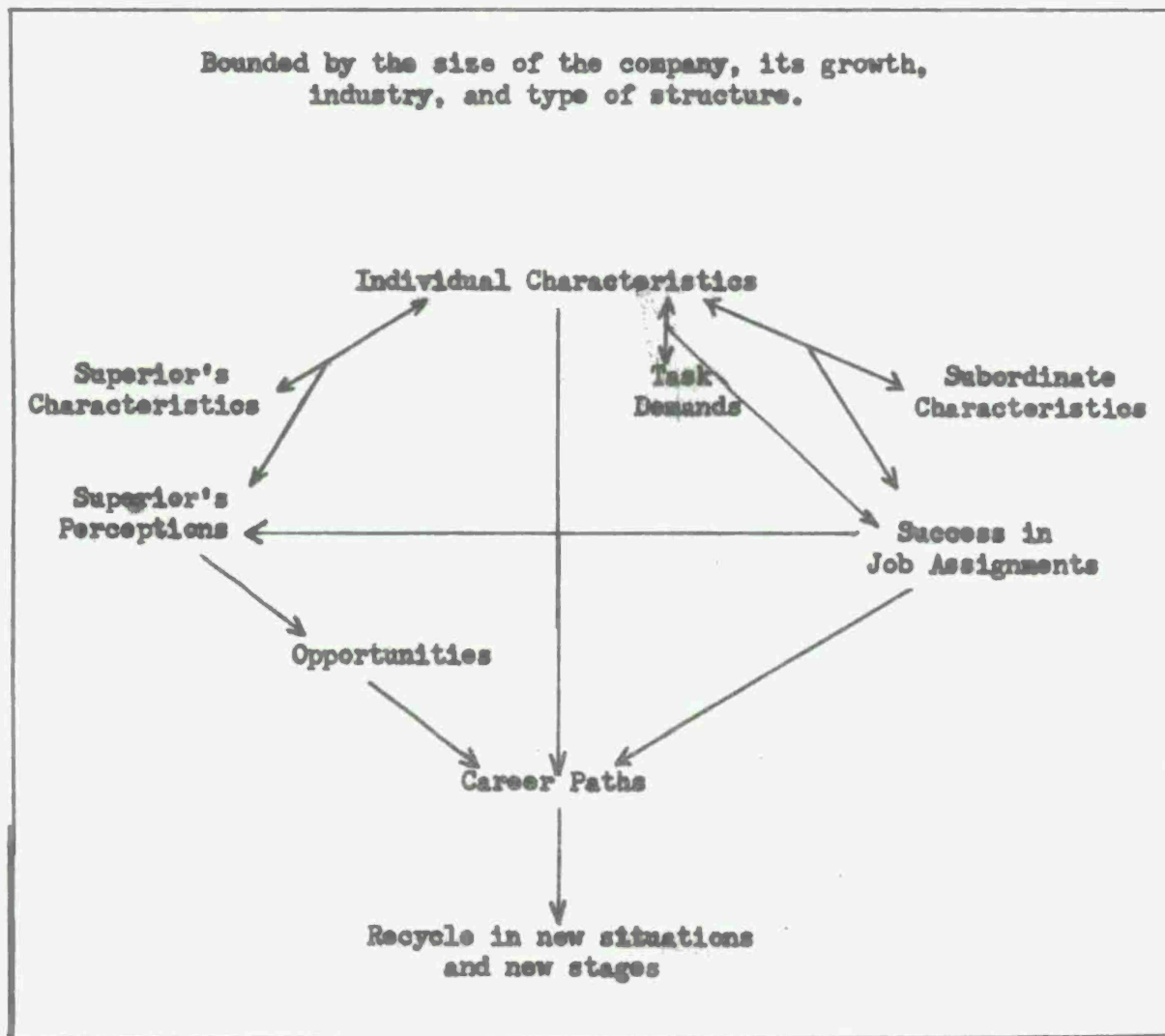


Figure 1: Factors Interacting to Affect the GM Career.

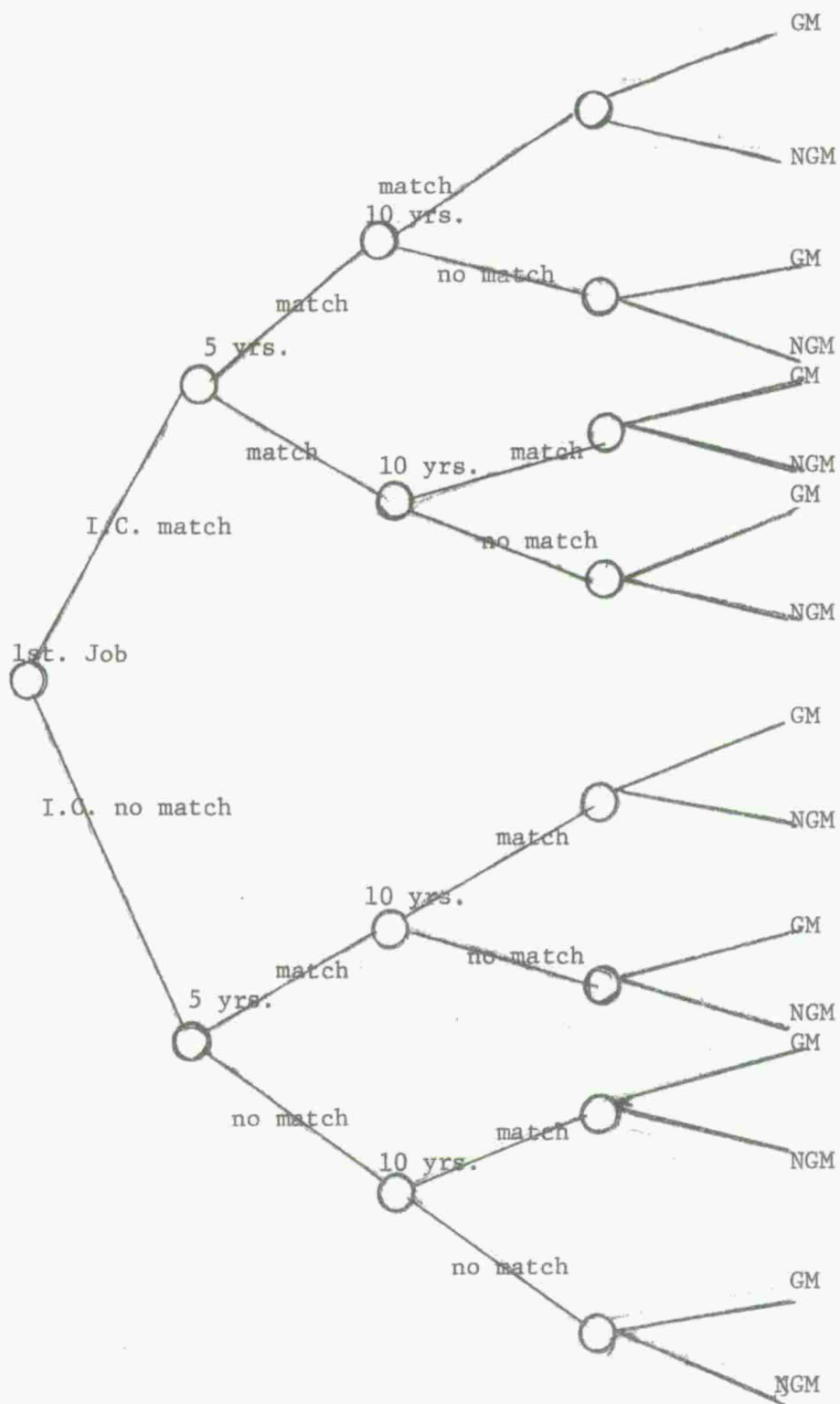


Figure 2. A Tree to Achieve a Position as a General Manager.

REFERENCES

- Allen, L.A. Associates, Inc. Summary Report of Research: Performance Appraisal and Counseling Systems. Palo Alto, California, 1975.
- Atkinson, J. W. (Ed.) Motives in Fantasy, Action, and Society. Princeton, N. J.: Van Nostrand, 1958.
- Bales, R. F. Interaction Process Analysis. Reading, Mass.: Addison-Wesley, 1950.
- Barnlund, D. C. "Consistency of emergent leadership in groups with changing tasks and members", Speech Monographs, 1962, 29, 45-52.
- Beckett, J. A. "What do graduating business school students know about the realities of the outside world?", Collegiate News and Views, Vol. XXIX, No. 2, Winter, 1975-76, 1-3.
- Berlew, D. W., & D. T. Hall. "The socialization of managers: effects of expectations on performance", Administrative Science Quarterly, 1966, 11, 207-223.
- Blake, R. R., et al. "Breakthrough in organization development", Harvard Business Review, 1964, 42, 133-155.
- Bray, D. W., et al. Formative Years: A Long-Term AT & T Study of Managerial Lives. New York: Wiley, 1974.
- Business Council, The. List of Members. Washington, D.C., 1976.
- Campbell, J. P., & M. D. Dunnette. "Effectiveness of T-group experiences in managerial training and development", Psychological Bulletin, 1968, 70, 73-104.
- Campbell, J. P., et al. Managerial Behavior, Performance, and Effectiveness. New York: McGraw-Hill, 1970.
- Chandler, A. D., Jr., & S. Salsbury. Pierre S. De Pont and the Making of the Modern Corporation. New York: Harper, 1971.
- Cohen, M. D., & J. G. March. Leadership and Ambiguity: the American College President. New York: McGraw-Hill, 1974.
- Collins, O. "Ethnic behavior in industry: sponsorship and rejection in a New England factory", American Journal of Sociology, 1946, 51, 293-298.
- Coombs, D. H., N. Allyn., & T. W. Harrell. "Attitudes of Stanford undergraduate men toward business", Stanford Graduate School of Business Bulletin, Winter, 1967, pp. 10; 12-13; 48-50.

2 - References

- Crooks, L. A., & J. T. Campbell. Career Progress of MBAs: An Exploratory Study Six Years After Graduation. Princeton: Educational Testing Service, 1974.
- Dalton, M. Men Who Manage: Fusions of Feeling and Theory in Administration. New York: John Wiley, 1959.
- Dill, W. R., et al. The New Managers: Patterns of Behavior and Development. Englewood Cliffs, N. J.: Prentice-Hall, 1962.
- Domhoff, G. W. The Bohemian Grove and Other Retreats. New York: Harper, 1974.
- Du Brin, A. J. "Trait and situational approaches in the development of a leadership inventory", Journal of Industrial Psychology, 1963, 1, (1), 28-37.
- Fiedler, F. E. A Theory of Leadership Effectiveness. New York: McGraw-Hill, 1967.
- Fiedler, F. E. "The trouble with leadership training is that it doesn't train leaders", Psychology Today,
- Finkle, R. B., & W. S. Jones. Assessing Corporate Talent: A Key to Managerial Manpower Planning. New York: Wiley-Interscience, 1970.
- Fleishman, E. A., et al. Leadership and Supervision in Industry. Monograph No. 33, Bureau of Educational Research, Columbus: The Ohio State University, 1972.
- Frederiksen, M., et al. Prediction of Organizational Behavior. New York: Pergamon, 1972.
- Ghiselli, E. E. Explorations in Managerial Talent. Pacific Palisades, California: Goodyear Publishing Company, 1971.
- Gibb, C. A. "Leadership" in G. Lindzey and E. Aronson (eds.), The Handbook of Social Psychology, 2nd Edition, Volume 4. Reading, Mass.: Addison-Wesley Publishing Company.
- Glaser, B. G. (Ed.) Organizational Careers: A Source Book for Theory. Chicago: Aldine, 1968.
- Gouldner, A. W. (Ed.) Studies in Leadership: Leadership and Democratic Action. New York: Harper, 1950.
- Grusky, O. The New Military. New York: Russell Sage Foundation, 1964.
- Gusfield, J. R. "The problem of generations in an organizational structure", Social Forces, 1957, 35, 323-330.
- Haas, J. E. Middle Managers' Expectations of the Future World of Work: Implications for Management Development. (Technical Report No. 26 on ONR Contract). Rochester, New York: Management Research Center of the College of Business Administration, the University of Rochester, 1969.

- Hariton, T. "Conditions Influencing the Effects of Training Foremen in New Human Relations Principles", Ph.D Dissertation, University of Michigan, in N. R. F. Maier, Principles of Human Relations, New York: John Wiley, 1952, 184-195.
- Harrell, Margaret S., et al. Predicting Compensation and the Attainment of a General Management Position Among MBA Graduates (Tech. Rep. No. 9 on Contract N00014-76-C-0009). Stanford: Graduate School of Business, 1976.
- Harrell, T. W. Managers' Performance and Personality. Cincinnati: South-Western, 1961.
- Harrell, T. W. "Innovation of Participation in a Management", in W. Schramm (ed.), Studies in the Utilization of the Behavioral Sciences, Stanford: Institute for Communication Research, 1962, 143-171.
- Harrell, T. W. & M. S. Harrell. Background, Personality and Vocational Interests of General Managers (Technical Report No. 2 on ONR Contract). Stanford: Graduate School of Business, 1973.
- Harrell, T. W. & M. S. Harrell. Predictors of Management Success (Technical Report No. 3 on ONR Contract). Stanford: Graduate School of Business, 1974.
- Harrell, T. W. & M. S. Harrell. "Relation of second year MBA grades to business earnings", Personnel Psychology, 1974, 27, 487-491.
- Harrell, T. W. & M. S. Harrell. A Scale for High Earners (Technical Report No. 7 on ONR Contract). Stanford: Graduate School of Business, 1975.
- Harrell, T. W. & M. S. Harrell. Career Paths to General Management (Technical Report No. 8 on ONR Contract). Stanford: Graduate School of Business, 1975.
- Harrell, T. W. & M. S. Harrell. "Stanford MBAs ten years out", Stanford Business School Alumni Bulletin, Fall, 1975, 13-15.
- Hastorf, A. H. "The Reinforcement of Individual Actions in a Group Situation", in L. Krasner & L. P. Ullmann (eds.), Research in Behavior Modification, Holt, Rinehart & Winston, 1964.
- Hemphill, J. K. "Relations between the size of the group and the behavior of 'superior' leaders", Journal of Social Psychology, 1950, 32, 11-22.
- Hilton, T. W., et al. "Performance Criteria in Graduate Business Study", Parts 1 & 2: Development of rating scales, background data form and the pilot study. Preliminary Draft. Submitted to R & D Committee of the Policy Committee for the Admissions Test for Graduate Study in Business, 1969, ETS, Princeton, New Jersey.
- Jay, M. "The OK Boss in all of us", Psychology Today, February, 1976, 31-36; 80.
- Kay, E. The Crisis in Middle Management. New York : AMACON, 1974.
- Lopez, F. M. The Making of a Manager. American Management Association, 1970.
- Maccoby, M. "'Winning' and 'losing' at work: goals differ for the craftsman, the company man, the gamesman, and the jungle fighter; what turns you on?" IEE Spectrum, July, 1973, 39-48.

- March, J. G. & H. A. Simon. Organizations. New York: Wiley & Sons, 1958.
- Marshall, G. L. "Predicting Executive Achievement". Unpublished doctoral dissertation, Boston, Mass.: Harvard Business School, 1964.
- Martin, N. H. & A. L. Strauss. "Patterns of mobility within industrial organizations", Journal of Business, 1956, 29, 101-110.
- MBA. "The Black MBA: The Vanguard Generation Moves Up", MBA, January, 1976, 21-24; 42.
- McClelland, D. C. The Achieving Society. Princeton, New Jersey: Van Nostrand, 1961.
- Mechanic, D. "Sources of power of lower participants in complex organizations", Administrative Sciences Quarterly, 1962, 7, 349-364.
- Mills, C. W. The Power Elite. Oxford University Press, 1956.
- Mintzberg, H. The Nature of Managerial Work. New York: Harper, 1973.
- Mischel, W. Personality and Assessment. New York: Wiley, 1968.
- Mischel, W. "Continuity and change in personality", American Psychologist, 1969, 24, 1012-1018.
- Moos, R. H. Evaluating Correctional and Community Settings. New York: Wiley, 1975.
- Moos, R. H. & S. Clemes. "Multivariate study of the patient-therapist system: a replication and extension", Journal of Consulting Psychology, 1967, 31, 119-130.
- Morris, C. G. "Effects of task characteristics on group process", Dissertation Abstracts, 1966, 26 (12, pt. 1), 7477.
- Newcomb, T. M. Personality and Social Change. New York: Dryden, 1943.
- Newcomer, M. The Big Business Executive: The Factors that Made Him, 1900-1950. New York: Columbia University Press, 1955.
- Norton, S. D. The Empirical and Contentent Validity of Assessment Centers vs. Traditional Methods for Predicting Managerial Success. University of Missouri, St. Louis.
- Pendse, S. G. "A study of attitude change during management education". Unpublished Ph.D. dissertation. Stanford: Graduate School of Business, 1973.
- Powell, R. M. Race, Religion, and the Promotion of the American Executive. Columbus, Ohio: College of Administrative Science, the Ohio State University, 1969.
- Rhode, J. G., et al. "An analysis of personal characteristics related to professional staff turnover in public accounting firms", University of Washington, 1976.
- Roberts, B. B. "The leader, group, and task variable of leader selection in college", Dissertation Abstracts, 1969, 29, 2360-2361.

- Roth, J. A. Timetables. Bobbs-Merrill, 1963.
- Sayles, L. Managerial Behavior: Administration in Complex Organizations. New York: McGraw-Hill, 1964.
- Schein, E. H. "Attitude change during management education", Administrative Science Quarterly, 1967, 11, 601-628.
- Schein, E. H. "The individual, the organization, and the career: a conceptual scheme", The Journal of Applied Behavioral Science, 1971, 7, 401-426.
- Schein, E. H. Occupational Socialization in the Professions: The Case of Role Innovation. Cambridge, Mass.: MIT, 1970.
- Schein, E. G. Career Anchors and Career Paths: A Panel Study of Management School Graduates (Technical Report No. 1 to ONR). MIT, 1974.
- Schleh, E. Private Communication, 1975.
- Sharkey, J. "Understanding the subjective criteria", MBA, January, 1976, 23-4; 42.
- Stern, G. G. People in Contact. New York: Wiley, 1970.
- Stern, G. G., M. I. Stein, & B. S. Bloom. Methods in Personality Assessment. Glencoe, Illinois: The Free Press.
- Stogdill, R. M. Handbook of Leadership. New York: Macmillan, 1974.
- Stogdill, R. M., et al. A Prediction Study of Administration Work Patterns. Columbus, Ohio: Ohio State University, 1956.
- Tagiuri, R. (Ed.) Research Needs in Executive Selection. Boston: Division of Research, GSBA, Harvard University, 1961.
- Thomas, E. J. & C. F. Fink. "Effects of group size", Psychological Bulletin, 1963, 60, 371-384.
- Thompson, J. D. Organizations in Action. New York: McGraw-Hill, 1967.
- Thompson, P., G. Dalton., & R. Price. Career Stages: A Model of Professional Careers in Organizations. Brigham Young University, 1976.
- Valenzi, E. R., et al. Individual Differences, Structure, Task, and External Environment and Leader Behavior: A Summary. (Technical Report No. 40 on ONR Contract). Rochester, New York, 1972.
- Vroom, V. H. & E. L. Deci. "The stability of postdecision dissonance: a follow-up study of the job attitudes of business school graduates", Organizational Behavior and Human Performance, 1971, 6, 36-49.
- Vroom, V. H. & K. R. MacCrimmon "Toward a stochastic model of managerial careers", Administrative Science Quarterly, June, 1968, 26-46.

- Ward, L. B. & A. G. Athos. Student Expectations of Corporate Life: Implications for Management Recruiting. Boston: Harvard University, Graduate School of Business Administration, Division of Research, 1972.
- Warner, W. L. & J. C. Abegglen. Occupational Mobility in American Business and Industry. University of Minnesota, 1955.
- Weinstein, A. G. and V. Srinivasan. "Predicting managerial success of Master of Business Administration (MBA) graduates", Journal of Applied Psychology, 1974, 59, 207-212.
- White, H. Chains of Opportunity. Cambridge, Mass.: Harvard University Press, 1970.
- Whyte, W. H., Jr. The Organization Man. Garden City, New York: Doubleday, 1957.
- Williams, F. J. & T. W. Harrell. "Predicting success in business", Journal of Applied Psychology, 1964, 48, 164-167.
- Zaleznik, A., G. W. Dalton & L. B. Barnes (Eds.) Orientation and Conflict in Career. Boston: Harvard University, Graduate School of Business Administration, Division of Research, 1970.
- Zenger, J. H. "A comparison of human development with psychological development in T-groups", Training and Development Journal, July, 1970.

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