ABSTRACT

MAN-MACHINE RELATIONSHIPS, ATTITUDES TOWARD WORK AND MEANINGS IN THE WORK ROLE

by Jon M. Shepard

Underlying this study was this basic question: does a man's relationship to technology at work influence his integration into or separation (alienation) from the work role? In the development of industrial technology three man-machine relationships may be singled out: craft production, mechanized production and automated production. The phases in the man-machine relationship were linked to variations in the division of labor at work. Workers were skilled artisans in craft production systems and the division of labor was not highly differentiated. In mechanized production systems workers become special-purpose machine operators laboring under a higher degree of differentiation. The latest technological advancement, automated production, engages workers as machine monitors. Again, the degree of differentiation is lower as monitors are responsible for a larger share of the production process. To represent these man-machine relationships samples of craftsmen in the automobile industry, assembly line workers in the automobile industry and monitors in the oil refining industry were selected.

Six dependent variables were derived from the alienation literature and self-theory. Powerlessness referred to the lack of freedom and control in work. Meaninglessness had reference to the failure to perceive the relationship of one's job to the jobs of others in the work organization. The degree to which promotion in the company was based on non-merit criteria was embodied in the concept normlessness. Powerlessness, meaninglessness and normlessness were viewed as predisposing factors in the development of alienation from work.

Three aspects of alienation were developed. Self-evaluative involvement referred to the degree to which self was evaluated with respect to the work role. Social isolation was conceived as the degree to which workers were committed to certain values and goals of the work organization. Instrumental work orientation meant the treatment of work as a means to ends outside the work situation rather than as an end in itself.

The following theoretical framework was developed. The self arises from interaction with the social environment. Maintenance of self-image requires support from the social environment. Persons strive to maintain positive self-evaluation. An actor tends to evaluate himself with regard to a social referent to the extent that he can maintain positive evaluations of himself and his actions in the system. In industrial societies where status structures are

multidimensional self-esteem maintenance can be a selective process. Therefore, if an actor's actions in a social system with a multidimensional status structure do not produce social support for the maintenance of positive evaluations of himself and his actions, he will tend to change the criteria by which he evaluates himself. There is a curvilinear relationship between the phase in the man-machine relationship (proceeding from non-mechanization to mechanization to automation) and the degree of differentiation in the division of labor (lower, higher and lower differentiation). Status recognition constitutes support from the social environment for positive self-evaluation and therefore tends to prevent alienation. Status recognition is more likely where a person has some control over the activity in which he is engaged (powerlessness dimension), can achieve given goals by socially approved behaviors (normlessness dimension) and can predict the outcomes of his behavior (meaninglessness dimension). The degree of powerlessness, meaninglessness and normlessness vary directly with the degree of differentiation in the division of labor at work. Alienation from work is more likely to occur where the division of labor at work is highly differentiated. That is, self-evaluative involvement is more likely to occur in activities where status recognition can be maintained; social isolation is less likely to occur when there is self-evaluation in terms of the activity in which the person is

involved with others; and activities are more likely to be perceived as instrumental when there is little self-evaluation in terms of the activity and when social isolation is high.

Viewing the independent variable, technology, in the historical sense described above, it was hypothesized that a curvilinear relationship would appear between the phase in the man-machine relationship and the six independent variables (e.g., alienation would be lower among craft production workers, higher among mechanized production workers and lower among automated production workers). It was also predicted that perceived powerlessness, meaninglessness and normlessness would contribute to variation in the degree of self-evaluative involvement in the work role, social isolation from the work organization and instrumental work orientation. The theory was supported by confirmation of these hypotheses.

Controlling for age, education and income separately did not alter the findings.

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CHAPTER I

THE PROBLEM AREA

Introduction

Job attributes and worker responses has been a neglected area of study in industrial sociology. If scientific management emphasized engineering aspects in the search for the "one best way," the human relations in industry school also ignored the impact of technology on workers in favor of a concern for social factors. This is not to say that social, organizational, economic and other factors do not influence worker responses to their jobs. What it does say is that worker responses to particular kinds of technological systems need exploration.

Intrinsic job aspects do predictably influence attitudes toward work. Herzberg, in a review of job satisfaction studies, concludes that intrinsic job aspects as a whole ranked fifth in relation to nine other job factors.[1]

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[1]The other job factors presented here in order of importance are security, opportunity for advancement, company and management, wages, intrinsic aspects of the job, supervision, social aspects of the job, communication and working conditions. The ranking of these job aspects is derived from reviewing the studies in the area, and the rank order should be considered as characteristic of the findings in most of the studies that were reviewed. See Frederick

It should be noted that, as a single aspect, "interest" ranked second only to security as a source of job satisfaction.

It was a young Marx who saw meaning in work as the "first necessity in life." Loss of intrinsic involvement in work followed the "objectification" of labor brought about by capitalistic economic institutions. Though in different ideological cloaks, many others have shared Marx's early concern for the quality of the workingman's experience while earning his bread (or, as the case may be, trying to keep up with monthly payments on his color television, his wife's electric dishwasher, and his son's college education).

Recognition of this need for research can be seen in a relatively recent interest in job design with its concern for meshing organizational, technical and human considerations in the design of jobs. Job enlargement and job rotation have been suggested as means for introducing meaning to mass production jobs. Also, concern with intrinsic job aspects is manifested in the work of industrial sociologists. A representation of their work is contained in Walker's collection of articles.[1] It is to the effects of technological

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Herzberg et al., Job Attitudes: Review of Research and Opinion (Pittsburgh: Psychological Service of Pittsburgh, 1957), pp. 72-79.

[1]Charles R. Walker, Modern Technology and Civilization (New York: McGraw-Hill Book Co., Inc., 1962).

systems (automated, mechanized and craft) upon job content, attachment to work roles and meanings in work that this dissertation is addressed.

Research Objectives and Conceptual Dimensions

This dissertation is concerned with the study of variations in technology, man-machine relationships and division of labor as related to selected social psychological experiences of workers in the plant. These relationships have changed as technology has advanced from hand tools used by the craftsman to power machinery guided by machine operators. Further alterations are forecast by the introduction of continuous-process and computer technology into the workplace.

An important factor hypothesized as contributing to varying attitudes toward work is the extent of the job specialization at work. Division of labor refers "to the systematic way in which the technical operations of men and machines are assigned to individual employees as work tasks--a bundle of work tasks constituting a 'Job.'"[1] There is an association between a characteristic form of division of labor and stage in technological development. This association is due to the presence of a unique man-machine

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[1]Robert Blauner, Alienation and Freedom (Chicago: University of Chicago Press, 1964), p. 9.

relationship attending each type of production technology. In the handicraft stage of production artisans equipped with hand tools fashioned products from raw materials to finished goods. The skill rested with the worker's ability to manipulate hand tools. Mechanization resulted in the proliferation of many special-purpose machines, each of which was designed to perform limited operations on the total product. This produced the need for special-purpose machine operators who were semiskilled operators performing an occupational specialty. All of these specialties contributed to the final product, but each specialty performed only a small part of the total operation. In sum, the division of labor tended toward increasing differentiation or increasing functional specialization. The advent of highly developed automatic materials handling and automatic controls creates jobs in which the worker becomes the monitor of an integrated production system. A reversal of the trend toward job specialization is predicted by some with the advent of automated technology. Job enlargement in the sense of responsibility for a larger share of the production process appears to be the key element in this change.

The aims of this dissertation are: (1) to relate attitudes toward work and self to levels of technological development (craft technology, mechanization, and automation) within the framework of self and alienation theory; (2) to specify some conditions under which the variants of alienation

isolated by Seeman[1] are empirically related; (3) to ascertain the relative importance of work activity compared to non-work activity among industrial workers; (4) to assess the extent of alienation in different contexts involving distinctive man-machine relationships; (5) to contribute to the theoretical, empirical and operational clarification of the concept of alienation, which was born in social argument and nutured in polemics; (6) to study attitudes toward work in an automated industry--oil refining.

For the present study, technology, as an important independent variable affecting the immediate work situation, is singled out. Three sets of attitudes toward intrinsic aspects of the job hypothesized to be conditioned by the nature of the man-machine relationships are: (1) perceived degree of control and freedom of work (powerlessness dimension); (2) perceived degree of knowledge of the relationships among jobs in the industrial plant (meaninglessness dimension); (3) perceived possibilities for promotion based on ability (normlessness dimension). These job aspects are clearly not exhaustive. Any number of elements could have been chosen.[2] However, the job aspects selected for study

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[1]Melvin Seeman, "On the Meaning of Alienation," American Sociological Review, XXIV (December, 1959), 783-791.

[2]For example, Walker and Guest were concerned with seven areas: (1) the worker's immediate job, (2) his relations to fellow workers, (3) pay and security, (4) his relation to supervision, (5) general working conditions in the plant, (6) promotion and transfer, (7) his relation to the

were dictated by the alienation frame of reference. The hypotheses for this set of variables are that powerlessness, normlessness and meaninglessness will be higher among workers in mechanized production systems, and lower among workers in craft and automated production systems.[1] A similar curvilinear pattern is expected between the phase in the man-machine relationship and three aspects of alienation: self-evaluative involvement (degree to which a person judges himself in terms of the status criteria of a particular social system), social isolation from the work organization (degree of reward value assigned to goals or beliefs that are typically valued in a given social system) and instrumental work orientation (degree to which work is valued primarily as a means to non-work ends rather than valued for its intrinsic rewards).

Dimensions of powerlessness, meaninglessness and normlessness will also be used as independent variables affecting various aspects of involvement in or alienation from work-related activity. Alienation and self theory suggest three dependent variables: social isolation, instrumental work orientation and self-evaluative involvement.

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union. See Charles R. Walker and Robert H. Guest, The Man on the Assembly Line (Cambridge, Massachusetts: Harvard University Press, 1952).

[1]This is the thesis developed by Blauner, Alienation and Freedom, op. cit.

The expectation is that where powerlessness, meaninglessness and normlessness are high, there will be greater social isolation from the work organization, less self-evaluative involvement in the work role and a greater incidence of instrumental orientation toward work.

It will also be contended that persons will tend to choose for self-evaluation those social contexts within which they can maintain favorable self-images. Work roles which provide little social support for the maintenance of positive self-evaluation (where powerlessness, meaninglessness and normlessness are high) will promote a tendency toward low self-evaluative involvement on the part of incumbents. Concomitantly, the reward value placed on goals and values of the work organization decreases. In addition, work will tend to take on an instrumental character. Using some aspects of self theory, the powerlessness, meaninglessness and normlessness variants of alienation will be viewed as predisposing factors in the development of isolation from the goals and values of the work organization, low self-evaluative involvement in the work role and instrumental orientation toward the work role[1] (see Figure 1).

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[1]See William A. Faunce, Social Problems of Industrial Society (New York: McGraw-Hill, forthcoming) for a fuller discussion along these lines.

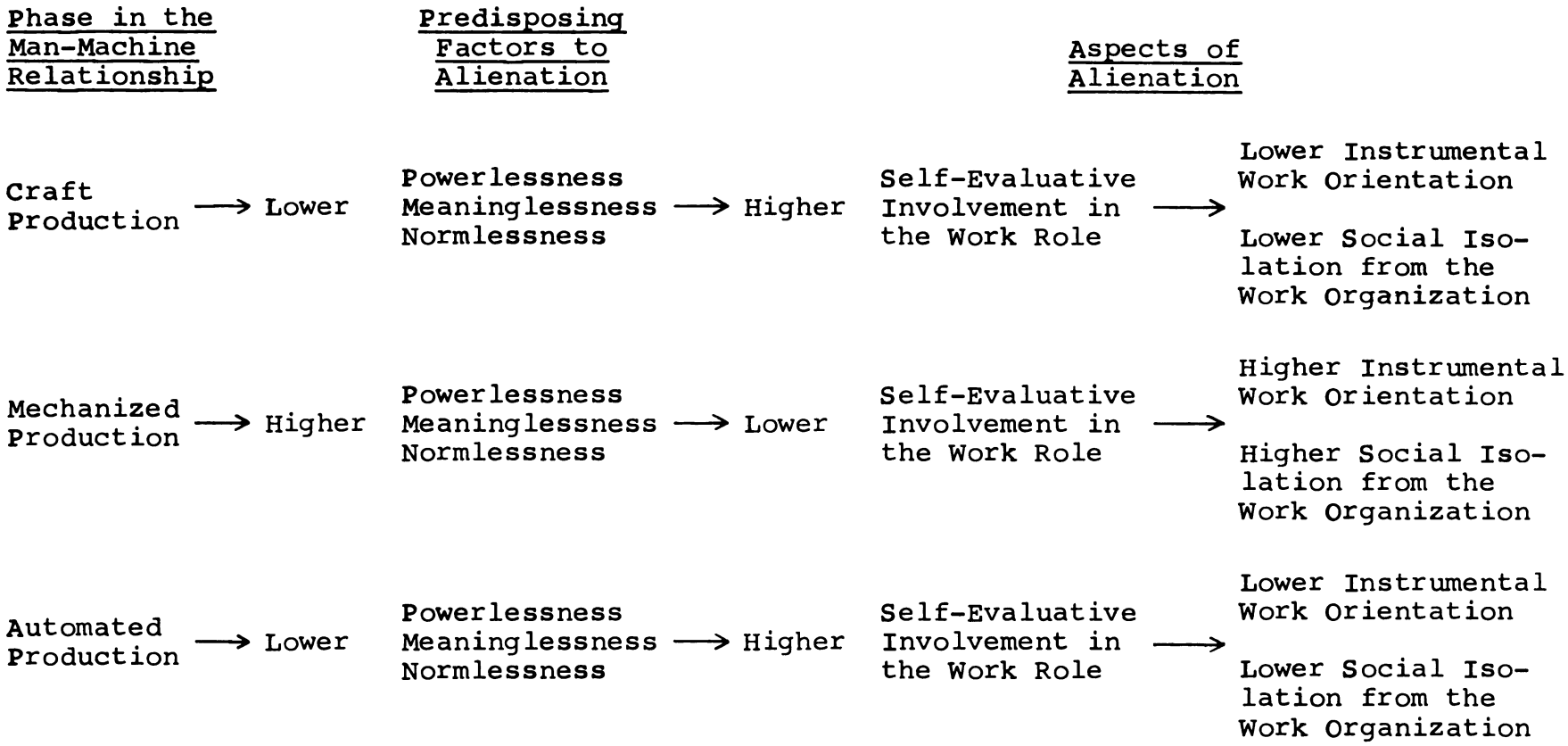

Figure 1. Schema relating predisposing factors to and aspects of alienation to phases in the man-machine relationship and to each other.

If fractionalized jobs, like those found on the assembly line, do not permit the attainment of social support for self-evaluation, encourage loyalty to the employing organization or provide consummatory rewards, other factory jobs may. It will be argued that the man-machine relationships represented by the skilled crafts in industrial manufacturing and monitoring of automated production systems do engender the positive side of these dichotomies.

Automation is often discussed as a new technology, restoring to the factory worker the meaning that mechanization has thus far denied him. Speculative and scholarly works prompted by the concern for automated technology have focused primarily upon employment, unemployment, retraining and leisure. Much less has been said about the impact of automated technology on attitudes toward work.

Research Settings

Research indicates that in various samples of the labor force more than 80 percent indicate general job satisfaction. Blauner contends that there are difficulties in assessing the absolute level of job satisfaction. He argues for the study of relative levels of satisfaction found among workers from different industries and occupations:

> It is difficult to interpret a finding that 70 percent of factory workers report satisfaction with their jobs because we do not know how valid and reliable our measuring instrument is. But when 90 percent of printers compared to only 40

> percent of automobile workers report satisfaction, the relative difference remains meaningful.[1]

In line with this argument, attitudes toward work in the present study will be assessed by studying blue-collar workers in different technological environments. Analysis will involve comparisons among blue-collar workers in non-mechanized jobs (craftsmen in the automobile industry), mechanized jobs (assembly line workers in the automobile industry) and automated jobs (monitors in the oil refinery industry).

Work and Non-Work Roles

It is well known that the Hawthorne studies brought to the fore effects of social variables upon attitudes toward work which had previously been ignored. Blauner[2] argues that the human-relations-in-industry approach with its focus on the social relations among workers, tended to ignore the nature of work itself. Studies by Chinoy,[3]

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[1]Robert Blauner, "Work Satisfaction and Industrial Trends in Modern Society," Labor and Trade Unionism, ed. by Walter Galenson and S. M. Lipset (New York: John Wiley and Sons, Inc., 1960), p. 365.

[2]Ibid., p. 350.

[3]Ely Chinoy, Automobile Workers and the American Dream (Garden City, New York: Doubleday and Co., Inc., 1955).

Walker and Guest,[1] Zaleznic[2] and many others[3] have aided in filling this gap, since they looked at the relationship between intrinsic job aspects and attitudes toward work. This study continues in the same tradition.

An often leveled criticism of the human-relations-in-industry school is the failure to consider extra-plant variables.[4] Their research is often interpreted by critics to mean that attitudes toward work are conditioned entirely within the social system of the factory.[5] As Morse and

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[1]Walker and Guest, op. cit.

[2]A. Zaleznic, C. R. Christensen and F. J. Roethlisberger, The Motivation, Productivity, and Satisfaction of Workers: A Prediction Study (Cambridge: Harvard Business School, 1958).

[3]Arthur N. Turner and Paul R. Lawrence, Industrial Jobs and the Worker (Cambridge: Harvard Business School, 1965); William A. Faunce, "Automation in the Automobile Industry: Some Consequences for In-Plant Social Structure," American Sociological Review, XXIII (August, 1958), 401-407; Floyd C. Mann and Richard L. Hoffman, Automation and the Worker (New York: Henry Holt, 1960); Charles R. Walker, Toward the Automatic Factory (New Haven: Yale University Press, 1957); and Blauner, Alienation and Freedom, op. cit.

[4]See Arthur Kornhauser, "Psychological Studies of Employee Attitudes," Journal of Consulting Psychology, VIII (August, 1944), 1; Henry A. Landsberger, Hawthorne Revisited (Ithaca, New York: Cornell University, 1958); and Delbert Miller and William H. Form, Industrial Sociology (2nd ed.; New York: Harper and Row, Publishers, 1964).

[5]In part, this criticism is dated. Whyte makes this statement, "It should be the particular function of the sociologist to point out that the industrial organization does not exist in a vacuum but is part of the social network of the larger society. In our eagerness to explore the internal structure of the plant, we have sometimes neglected

Weiss suggest, workers may be attached to work for a number of reasons not thought to be intrinsic job aspects.[1] Dubin[2] presents evidence that work is not a central life interest for factory workers in terms of intimate human relations and personal satisfactions. However, the work place does promote attachment with regard to organizational and technological experiences. Workers, then, may be "satisfied" with or integrated into the work role for a variety of reasons, unrelated to the intrinsic meaning of work. Attitudes toward work in this dissertation will be cast in the light of both work and non-work dimensions. This dissertation will not explore the relative importance of extra-work activities by specific questions about the family, community, etc. Social isolation, instrumental work orientation and self-evaluative involvement, however, each contain a

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to note its interconnections with the larger society or have given only lip service to the mutually dependent relations of industry and society. Nevertheless, there now exists a rather substantial body of research which places industry in its social setting. . . ." See "Industrial Sociology," Review of Sociology, ed. by Joseph B. Gittler (New York: John Wiley and Sons, Inc., 1957), p. 294.

[1]Some examples are associating with people, keeping occupied, justifying existence, habit and keeping out of trouble. Nancy C. Morse and R. S. Weiss, "The Function and Meaning of Work and the Job," American Sociological Review, XX (April, 1955), 191-198.

[2]Robert Dubin, "Industrial Workers Worlds: A Study of the 'Central Life Interests' of Industrial Workers," Social Problems, III (January, 1956), 131-142.

work-non-work dichotomy.[1] For example, self-evaluative involvement in work is concerned with the degree to which one evaluates himself with regard to the work role. Workers who are characterized by low self-evaluative involvement at work evaluate themselves primarily in terms of extra-work status criteria. There is, however, in this study no specification of what these values or goals might be, except that they are related to non-work roles.

A criticism of the concept alienation is that it has a negative bias. It is apparent that powerlessness, meaninglessness, normlessness, instrumental work orientation and social isolation emphasize lack of integration. If, however, alienation is examined with respect to social referents less inclusive than "society," alienation from one social role may indicate integration into one or more others. The ideologically loaded Marxian interpretation of alienation views the capitalist worker as separated from himself and

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[1] In addition to Dubin, several writers emphasize the gap between work and non-work activity among many American workers: C. W. Mills, White Collar (New York: Oxford University Press, 1951), pp. 235-238; Frederick Herzberg et al., The Motivation to Work (New York: John Wiley and Sons, Inc., 1959); David Riesman and Warner Bloomberg, Jr., "Work and Leisure: Fusion or Polarity," Man, Work, and Society, ed. by Sigmund Nosow and William H. Form (New York: Basic Books, Inc., 1962), pp. 35-41; and Daniel Bell, The End of Ideology (Rev. ed.; New York: Collier Books, 1961), p. 225. On the other hand, some argue that work is still a central life interest, providing integration between man and society. See Nosow and Form, op. cit., p. 11.

his products due to pernicious economic institutions balanced against him. The resultant self-estrangement from work is presented as an all-pervasive social psychological experience. This study assumes that workers may be integrated into non-work social roles as alternatives to work-related roles without suffering a lowering of self-esteem.

Coming out of the classical sociological tradition, alienation was conceived as a societal phenomenon. Many current conceptualizations still use this global frame of reference. Other researchers argue that it is difficult to make alienation amenable to sharp empirical test using culture or society as the referent from which people are "alienated." Clark points out that man anchors himself to society differentially. Various social situations will be participated in with different degrees of intensity or involvement. Clark proposes the study of alienation in a well-defined social unit because,

> When viewed from the standpoint of a single organization, the concept of alienation can be examined in an environment about which we are more adequately informed than with the whole of society.[1]

This dissertation will study alienation with regard to work as the social referent.

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[1]John P. Clark, "Measuring Alienation Within a Social System," American Sociological Review, XXIV (December, 1959), 851.

Practical Significance of the Study

In view of the prediction that automation is the technological wave of the future, it is important to study its impact upon workers. This represents a continuation of industrial sociology's concern with men at work. Little scientific investigation has been conducted in automated work places,[1] though the literature is replete with sometimes scholarly and sometimes purely speculative books and articles.

The historical trend in industrial organizations has been toward an increasingly differentiated division of labor. Specialization of function was seized as the most economical, efficient and productive way to run the production end of an organization. Some recent literature argues that continued specialization of function may have adverse effects and research in job design has been undertaken.[2]

That alterations in job design may be beneficial to workers is evident in several studies. Walker and Guest,

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[1] William A. Faunce, op. cit.; Mann and Hoffman, op. cit.; Blauner, Alienation and Freedom, op. cit.; Walker, Toward the Automatic Factory, op. cit.

[2] Louis E. Davis, "Job Design and Productivity: A New Approach," Personnel, XXIII (March, 1957), 418-430; Louis E. Davis and Richard Werling, "Job Design Factors," Occupational Psychology, XXXIV (1960), 109-132; Louis E. Davis, "The Effects of Automation on Job Design," Industrial Relations, XI (October, 1962), 53-71; and Louis E. Davis, "The Design of Jobs," Industrial Relations, III (October, 1966), 21-45.

for example, found that utility men, repairmen and inspectors in the automobile industry had more positive attitudes toward their jobs than assembly line workers who rated repetitiveness and machine pacing very high as sources of job dissatisfaction. Walker and Guest, in other words, found an association between the number of operations a worker performed on his job and his level of job interest. Similarly, they found more favorable expressions among off the line workers:

> I move a few cars around. I perform quite a few things actually. That's enough variety to satisfy me. It's not like turning a screw all day on the production line.

Comparing means in two departments, Kennedy and O'Neill[1] found no support for the hypothesis that workers with highly simplified jobs have less favorable attitudes than utility men. However, comparisons in two other departments showed that utility men held more favorable attitudes toward work than assembly line workers performing fractionalized jobs. Walker and Marriott[2] tested the effects of mechanically exacting type of work by dividing workers in factories A and B into two groups: "mechanized" (work rate controlled by conveyor) and "non-mechanized" (work pace controlled by

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[1]James E. Kennedy and Harry E. O'Neill, "Job Content and Workers' Opinions," Journal of Applied Psychology, XLII (1958), 372-275.

[2]J. Walker and R. Marriott, "A Study of Some Attitudes to Factory Work," Occupational Psychology, XXV (1951) 181-191.

worker) jobs. For both factories the "mechanized" groups reported 54 percent "satisfied" with the operation and about 15 percent in the dissatisfied categories. In the "non-mechanized" group factory A showed 72 percent satisfied and factory B showed 77 percent. Only 2 percent and 8 percent were dissatisfied. Boredom was a complaint for only 8 percent of the rolling mills employees, while more than one-third of the men in the mass-production factories made a similar complaint. Similarly the degree of job interest was more intense in the rolling mills than in the automobile factories. These studies suggest that some form of job rotation and/or job enlargement may improve attitudes toward work.

While job specialization has increased productivity, it produces some unsalutory effects on worker attitudes toward their job. Suggestions of job rotation and job enlargement may be seen as recognition of this argument and perhaps represents a trend away from job specialization.[1] Technology does set limits on the division of labor, but it is possible to organize work in different ways under the

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[1]Turner and Lawrence present opposing references on the relationship between the level of worker motivation, task-involvement and job enlargement: "in spite of the considerable publicity given to successful examples of enlarging the scope of the task, experiments in this direction have not been widely imitated; apparently the evidence has not been entirely convincing, perhaps because the problem is somewhat more complex than it first appeared," Turner and Lawrence, op. cit., p. 7.

same technological system. Consequently, it may be important to discover if worker attitudes do vary with their relationship to technology. Dissatisfactions resulting from man-machine relationships, characterized by a highly differentiated division of labor, may be ameliorated by application of this knowledge in the direction of job rotation and/or job enlargement, without altering the technology.

CHAPTER II

THEORY AND RESEARCH: ALIENATION AND SELF THEORY

Alienation as a Scientific Concept

Introduction

Marx's heritage to social critics has proved bountiful. To social scientists interested in the concept of alienation, his ideas must be considered a mixed blessing. The major question is the separation of ideology from Marx's ideas on alienation in order to turn them to scientific usefulness. Fueur[1] discusses the ideological origins of alienation as formulated by the young Marx. It is quite undeniable that the concept alienation has a "negativistic" or non-integrative bias, which can be accounted for by its ideological genesis. However, to abandon these designations seems less desirable, in the pursuit of cumulative scientific research, than to use the concepts with their implied

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[1]Lewis Fueur, "What is Alienation? The Career of a Concept," ed. by Maurice Stein and Arthur Vidich, Sociology on Trial (Englewood Cliffs, New Jersey: Prentice-Hall, 1963), pp. 127-147.

opposites, i.e., powerlessness-control, etc.[1] In recent years, social scientists have shown increasing interest in alienation as an empirically measurable concept. Seeman's[2] contribution was to distinguish the five uses of the concept alienation from a mass of sociological literature and to state them in a more empirically useful form.[3]

This study follows some recent trends in the scientific study of alienation dimensions: the study of alienation in a delimited social system, concern with the multidimensionality issue and a comparative approach to alienation.

Much of the research in this area assumes the larger society as the social referent from which alienation is measured.[4] Clark was the first to relate alienation

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[1]Blauner uses this approach: powerlessness-freedom and control, meaninglessness-purpose and function, social-isolation-integration, self-estrangement-self-involvement. See Blauner, Alienation and Freedom, op. cit.

[2]Seeman, op. cit.

[3]Seeman was not the first to see alienation as a multidimensional concept. See Anthony Davids, "Generality and Consistency of Relations Between the Alienation Syndrome and Cognitive Processes," Journal of Abnormal and Social Psychology, LI (July, 1955), 61-67.

[4]Gwynn Nettler, "A Measure of Alienation," American Sociological Review, XXII (December, 1957), 670-677; Seeman, op. cit.; Dean, op. cit.; Russell Middleton, "Alienation, Race and Education," American Sociological Review, XXVIII (December, 1963), 973-977; Elmer L. Struening and Arthur H. Richardson, "A Factor Analytic Exploration of the Alienation, Anomia, and Authoritarianism Domain," American Sociological Review, XXX (October, 1965), 768-776; and J. L.

(powerlessness) to a specific organizational setting. It is his argument that alienation should not be measured in terms of a societal referent. Rather, he opts for a single unit approach--"selecting for study only those whom we can establish to be involved in a single, well-defined unit, for instance, a social system."[1] Clark argues that alienation from a global social referent is less meaningful than measuring alienation from a specifiable social system or subsystem. Important for the present study is the point that integration into social life is not an all or nothing proposition. Man is anchored to different segments of his social environment with varying degrees of intensity.

Since the present study approaches alienation from work, a less than global referent, research focusing on more specified social systems is more to the point. There is a growing number of studies relating various dimensions of

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Simmons, "Some Intercorrelations Among 'Alienation Measures,'" Social Forces, XLIV (March, 1966), 370-372. Alienation from or lack of integration into, the larger society is a theme running through the "mass society" literature. Organizational society breeds powerlessness for individuals. See Robert A. Nisbet, The Quest for Community (New York: Oxford University Press, 1953), and William Kornhauser, The Politics of Mass Society (Glencoe, Illinois: The Free Press, 1959). Some suggest participation in organizations to mediate between the powerless and the state. See A. G. Neal and Melvin Seeman "Organizations and Powerlessness--A Test of the Mediation Hypothesis," American Sociological Review, XXIX (April, 1964), 216-226.

[1]Clark, op. cit., p. 850. See also Leonard I. Pearlin, "Alienation from Work: A Study of Nursing Personnel," American Sociological Review, XXVII (June, 1962), 314-326.

alienation to delimited social systems.[1] However, as Neal and Rettig[2] underline, scant empirical effort has been dispensed toward the theoretical question of the unidimensional versus the multidimensional conception of alienation.

Seeman extracts five ways in which alienation has been conceived in the literature. He argues for the independence of these five variants with the recognition that they may be related under certain conditions. His argument for independence rests on the assumption that, for example, a person may feel powerless in a given role but still assign high reward value to the goals of the system of which he is a part. It was possible, to use an extreme example, for a Calvinist to believe in predestination (where his fate was

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[1]Jan Hajda, "Alienation and Integration of Student Intellectuals," American Sociological Review, XXVI (October, 1961), 758-777; Pearlin, op. cit.; Arnold Rose, "Alienation and Participation: A Comparison of Group Leaders and the Mass," American Sociological Review, XXVII (December, 1962), 834-838; Melvin Seeman, "Alienation and Learning in a Hospital Setting," American Sociological Review, XXVII (December, 1962), 772-782; Melvin Seeman, "Alienation and Social Learning in a Reformatory," American Journal of Sociology, LXIX (November, 1963), 270-284; Arthur Neal and Salomon Rettig, "Dimensions of Alienation Among Manual and Non-Manual Workers," American Sociological Review, XXVIII (August, 1963), 599-608; Michael Aiken and Jerald Hage, "Organizational Alienation: A Comparative Analysis," American Sociological Review, XXXI (August, 1966), 497-507; and Melvin Seeman, "On the Personal Consequences of Alienation in Work," American Sociological Review, XXXII (April, 1967), 273-285.

[2]Arthur G. Neal and Salomon Rettig, "On the Multidimensionality of Alienation," American Sociological Review, XXXII (February, 1967), 55.

predetermined and not subject to his alteration) and still value the tenets of his religion.[1]

One purpose of this dissertation is to specify some conditions under which certain so-called variants of alienation may be related. There is little research directly indicating the relationships among powerlessness, meaninglessness, normlessness, social isolation, instrumental work involvement and self-evaluative involvement as proposed in this study. Operationalizing the powerlessness, normlessness and social isolation variants of alienation outlined by Seeman, Dean[2] concluded that the three sub-scales conformed to criteria of unidimensionality. The three sub-scales with a total of 24 items were composited into an alienation index (reliability .78). Correlation coefficients among the three sub-scales ranged from .41 to .67. Again, following Seeman, Middleton[3] found that the five items used to measure powerlessness, meaninglessness, normlessness, social estrangement and estrangement from work constituted a Guttman scale with a coefficient of reproducibility of .90. The interrelations (chi-squares) of the

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[1]For brief discussions of the dependence and independence of the usages of alienation see Seeman, op. cit., 786, 788, 789.

[2]Dean, op. cit.

[3]Middleton, op. cit.

five types of alienation ranged from .48 to .81 (Yule's Q). Simmons,[1] using Dean's measures, found moderate correlations among powerlessness, normlessness and social isolation. The correlation coefficients were .43, .33, .53, all considerably above the .01 level. Neal and Rettig,[2] on the other hand, concluded that Seeman's dimensions of powerlessness and normlessness were empirically independent. However, in a more recent article,[3] Neal and Rettig argue that dimensions of alienation may be related or separate depending on the technique used in testing.

Other studies have focused on the relationship of some alienation variant with other social psychological variables but are not directly relevant here.[4] There has been little effort to relate Seeman's five dimensions of alienation to each other causally and at the same time to

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[1] Simmons, op. cit.

[2] Neal and Rettig, "Dimensions of Alienation . . . ," op. cit.

[3] Neal and Rettig, "On the Multidimensionality of Alienation," op. cit.

[4] W. H. Jarrett and A. O. Haller, "Situational and Personal Antecedents of Incipient Alienation: An Exploratory Study," Genetic Psychology Monographs, LXIX (1964), 151-191; and Struening and Richardson, op. cit.

relate them using a delimited social system as the referent for measuring alienation.[1]

Browning faults Seeman for failing to interrelate the five variants of alienation into a single concept:

> Having assumed certain theoretical approaches as coming under a common rubric, i.e., alienation, it is incumbent on the theoretician to discern their relationships and points of articulation. Without having done so, it is surely impermissible to assert that the phenomena under consideration are part of one theoretical dimension, i.e., alienation.[2]

Browning makes the suggestion that alienation is best viewed as a process of three stages. The "predisposing stage" involves three successive phases in the person's experience: in order of occurrence they are powerlessness, meaninglessness and normlessness. Passing out of this first stage involves the rejection of relevant cultural norms and this rejection marks the opening of the "stage of cultural disaffection." At this point comes the third stage in the alienation process, "social isolation." This stage includes

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[1]An important exception is Blauner's contention that self-estrangement (when an activity is a means rather than a fulfilling end) is a result of being used as a means for the ends of others. It is conditions of powerlessness, normlessness and social isolation that produce feelings of being an instrument for the goals of others. See Blauner, Alienation and Freedom, op. cit., p. 33.

[2]Charles Browning et al., "On the Meaning of Alienation," American Sociological Review, XXVI (October, 1961), 780.

several modes of adaptation, one of which is "self-estrangement." Browning conceives of Seeman's dimension "self-estrangement" as "a means of adaptation involving the actor's rejection of cultural goals while he adheres to the institutionalized means."[1] A marginal man is created who is involved only partially in two social systems. The schema of relationships among the dimensions of alienation and self-evaluative involvement to be presented later takes its inspiration, if not content, from Browning's suggestions.[2]

A major difficulty with Browning's model is that a longitudinal design is best suited to test it. Repeated measures on subjects over a period of years would provide evidence for the idea that a person feels normlessness after experiencing first powerlessness and then meaninglessness. The cross-sectional nature of the present study is not designed for testing the particular "processual" hypotheses proposed by Browning. However, powerlessness, meaninglessness and normlessness can be used as "predisposing" factors in the development of "alienation" within a cross-sectional design by introducing age as a control variable in the analysis as a measure of time. It is consistent with the theory to be developed that the longer the exposure to

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[1] Ibid.

[2] See page 8 for the schematic relationships among the variants of alienation developed for this study.

objective conditions promoting powerlessness, meaninglessness and normlessness the greater the alienation from work. Since income and education also affect attitudes toward work they too will be included as controls in the analysis.

Age, income and education are expected to affect the hypothesized relationships between the phase in the man-machine relationship, powerlessness, meaninglessness, normlessness, social isolation, self-evaluative involvement and instrumental work orientation. With advancing age, workers exposed to work which denies status recognition or social support for positive self-evaluation will tend toward higher alienation from work. It is expected, then, that alienation will increase among assemblers with age. No major affect of age is expected among craftsmen or monitors since it is hypothesized that their relationship to technology will not produce high alienation.

Workers with higher income and more education are presumably better equipped (financially and culturally) to turn to non-work roles when their work tends to promote alienation. Consequently, it is expected that higher income and more highly educated assemblers will be more alienated than lower income and less educated assemblers. Income and education are expected to exhibit little affect upon craftsmen or monitors.

Part of the theoretical framework to be developed later will predict that experienced powerlessness,

meaninglessness and normlessness lead to "alienation." Alienation will be defined as "separation" in three senses: (1) withdrawal of self-evaluation from the work role (lack of self-evaluative involvement); (2) lack of commitment to the goals and values of the work organization (social isolation); and (3) inability to experience consummatory meaning in work (instrumental work orientation).

Predisposing Factors in the Development of Alienation

Powerlessness-control in work.[1]--The first predisposing factor, and the most frequently employed, derives from Marx's concern with the expropriation of the means of production by the entrepreneurs. Marx's view of the worker in capitalist society was one of man separated from himself and other men in the work place, subjected to an economic system balanced against him.

A more general expression of this idea is found in Gerth and Mills' remark on Weber:

> Marx's emphasis upon the wage worker as being "separated" from the means of production becomes, in Weber's perspective, merely one special case of a universal trend. The modern soldier is equally "separated" from the means of violence;

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[1]The cumbersomeness of this dual designation makes it desirable to refer to the first half of this and other factors in subsequent discussion.

> the scientist from the means of inquiry; and the civil servant from the means of administration.[1]

According to Blauner powerlessness occurs when the worker is treated as an object and is dominated and controlled by other people or a technological system of production such that as subject he cannot alter the condition.[2] Seeman defines the powerlessness variant of alienation "as the expectancy or probability held by the individual that his own behavior cannot determine the occurrence of the outcomes, or reinforcements, he seeks."[3]

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[1] H. H. Gerth and C. W. Mills, From Max Weber: Essays in Sociology (New York: Oxford University Press, 1946), p. 50. Taken from Seeman, op. cit., p. 784.

[2] Blauner, Alienation and Freedom, op. cit., p. 32.

[3] Seeman, op. cit., p. 784. Seeman makes it clear that a person's expectancy for control of events is not to be equated with an observer's judgment of objective powerlessness, comparison of the situation against some ethical standard by an observer, or the person's sense of discrepancy between his expectations for control and the amount of control he wishes. This is in contrast to Clark who contends that a measure of alienation must be the degree to which man feels powerless to achieve the role he judges to be rightfully his. Clark attaches, then, a sense of discrepancy prior to the development of powerlessness. Alienation, for Clark, involves separation from something which is valued. (Clark, op. cit., p. 849.) One hypothesis which might be explored is the relationship between alienation in its discrepant sense and the development of pathological responses such as despair, etc. In this chapter it is argued that alienation, in the nondiscrepant sense, is not necessarily related to personality maladjustments.

Of the four modes of industrial powerlessness discussed by Blauner,[1] lack of control over the immediate work process is used here in operationalizing powerlessness. This choice is based on the nature of the independent variable, technology. Concern, then, is with control over such things as pace of work, freedom from close supervision, freedom of physical movement, control over the quantity of production and choice of work techniques.

Meaninglessness-purpose in work.--The meaninglessness variant refers to the inability to understand the events in which one is engaged. Mannheim's distinction between "functional rationality" and "substantial rationality" points up this usage. Mannheim argues that as functional rationality increases in the process of industrialization and society organizes with an eye to the most efficient attainment of ends, there is a concomitant recession in a person's ability to act in a situation on the basis of his own understanding of the events in which he is engaged.[2] This usage is defined by Seeman as "a low expectancy that

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[1]The other three are the separation from ownership of the products of work and the means of producing them, inability to affect managerial policies and absence of control over the conditions of employment. Blauner, Alienation and Freedom, op. cit., p. 16.

[2]Karl Mannheim, Man and Society in an Age of Reconstruction (New York: Harcourt, Brace & Co., 1940), p. 59. Discussed in Seeman, op. cit., p. 786.

satisfactory predictions about future outcomes of behavior can be made."[1]

For Blauner meaninglessness sets in when individual roles are perceived as lacking integration into the total system of goals of an organization. When workers know only their own specialized tasks and do not, in the course of their work, come to know the tasks of their co-workers, other departments, or how their work contributes to the larger company product(s), they feel a loss of purpose and function--they experience meaninglessness.

Normlessness-normative integration in work.--Durkheim's concern with the breakdown of the moral order, a condition of normlessness, is the classical source of this predisposing factor. In this conception social norms have lost their regulative effect on individuals.

Seeman's usage of normlessness relates to the psychological state of persons exposed to social conditions in which norms have lost their regulative force. In The Division of Labor in Society[2] Durkheim was concerned with integration or the lack of it on the societal level. To a point, division of labor based upon organic solidarity (mutual interdependence) was regulative. Lack of frequent, easy

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[1]Seeman, op. cit., p. 786.

[2]Emile Durkheim, The Division of Labor in Society, trans. by George Simpson (Glencoe, Illinois: The Free Press, 1947).

and regular communication and articulation among integrative institutions might produce an abnormal form of division of labor. In Suicide[1] Durkheim argues that anomie produces a form of suicide resulting from the lack of a set of regulative norms equilibrating man's desires with his realistic means for attaining social goals. Still, anomie was a structural explanation of variation in suicide rates in industrial society. Merton[2] extended Durkheim's theory of anomie from suicide to deviant behavior in general. Merton's emphasis upon individual modes of adaptation to perceived disjunction between cultural goals and institutionalized means rendered his treatment of anomie somewhat more social psychological than Durkheim's. Equating anomie with alienation, Srole tends to psychologize Durkheim's theory of anomie. His eunomia-anomia continuum "is conceived as referring to the individual's generalized, pervasive sense of 'self-to-others belongingness' at one extreme compared with 'self-to-others distance' and 'self-to-others alienation' at the other pole. . . ."[3] One aspect of normlessness for

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[1]Emile Durkheim, Suicide, trans. by John A. Spaulding and George Simpson (Glencoe, Illinois: The Free Press, 1951).

[2]Robert K. Merton, Social Theory and Social Structure (Glencoe, Illinois: The Free Press, 1957). See Seeman, op. cit., p. 787.

[3]Leo Srole, "Social Integration and Certain Corollaries: An Exploratory Study," American Sociological Review, XXI (December, 1956), 711.

Dean[1] is purposelessness. By this he means the absence of values that might give purpose of direction to life. Loss of intrinsic and socialized values results in the insecurity of the hopelessly disoriented.

Nettler argues for the theoretical independence of anomie, alienation and personal disorganization. Though not identical, he contends, there is a correlation between anomie (Durkheim's social condition of normlessness) and alienation (estrangement from society and the culture it carries--a psychological condition of the individual). It is likely that a high degree of anomie will produce alienation. Still, suggests Nettler, the two should not be confused. Nor should they be equated with personal disorganization (intrapersonal conflict, personal goallessness, or lack of internal coherence). Behavior which seems indicative of anomie (e.g., white-collar crime, delinquency, etc.) may be performed by well-integrated individuals (non-alienated from social anchorages). Also one may "be alienated with or without personal disorganization and with or without participating in behaviors that are ordinarily used as indexes of anomie."[2]

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[1]Dean, op. cit.

[2]Nettler, op. cit., p. 672.

Seeman contends that alienation should not be taken for an equivalent to personality adjustment or maladjustment. He follows Nettler's position that alienation and anomie often are, but should not be "equated . . . with personal disorganization defined as intrapersonal goallessness, or lack of 'internal coherence' . . . [their] bearing on emotional sickness must be independently investigated."[1] The study by Neal and Rettig[2] is supportive of this contention. They found normlessness and powerlessness as conceptualized by Seeman to be empirically separated from Srole's anomie scale which measures despair and personal maladjustment. However, powerlessness may be painful if there is an important discrepancy between, for example, the perception of power and desire for power.

In discussing "adaptations" (the kinds of conformity and deviance) that may occur when social norms are no longer effective in guiding behavior, Merton takes up the contradiction of subscription to success goals and the existence of unequal opportunity in American society. Anomie or normlessness results when "the technically most effective procedure, whether culturally legitimate or not, becomes typically

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[1] Ibid.

[2] Neal and Rettig, "Dimensions of Alienation Among Manual and Non-Manual Workers," op. cit.

preferred to institutionally prescribed conduct."[1] To be true to Durkheim, anomie refers to a weakening of normative regulation, while alienation has reference to the psychological experience of individuals under conditions of discrepancy between cultural goals and the availability of socially approved means to reach them. Hence, the approach followed here is a distinctly social-psychological one. Seeman defines normlessness as "a high expectancy that socially unapproved behaviors are required to achieve given goals."[2]

In the present study normlessness in work is measured by five items regarding the degree to which intra-plant mobility is based on merit. Respondents were asked if people in the company got ahead on ability, if those who got ahead deserved it, if getting ahead was achieved through pull and connection, through being a good "politician" or by luck.

Aspects of Alienation from the Work Role

Social isolation-integration into the work organization.--This aspect of alienation refers to separation from cultural standards. Nettler's scale of alienation embodies this type. Nettler describes an alienated person as "one

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[1] Merton, op. cit., p. 128. Quoted from Seeman, op. cit.

[2] Seeman, op. cit., p. 789.

who has been estranged from, made unfriendly toward, his society and the culture it carries."[1] Seeman defines isolation as the assignment of "low reward value to goals or beliefs that are typically highly valued in the given society."[2]

As noted earlier, the social referent in this dissertation is work related activity, not the total society. Blauner writes of social isolation as the lack of identification or commitment with the work role and the absence of loyalty to one or more of the network of social relations derived from a work organization (e.g., fellow workers, management, organizational goals). This variant of alienation is operationalized in this study in terms of isolation from or integration (i.e., relative assignment of reward value) into organizational goals on the part of production workers. Six items making statements like "the reputation of this company in the community is very important to you," or "cutting the costs of this company is of little importance to you" were used to measure this concept.

Instrumental-consummatory work orientation.--Self-estrangement is said to occur when an activity is viewed as

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[1]Nettler, op. cit., p. 672.

[2]Seeman, op. cit., p. 789. This conceptualization differs from that of Dean's definition which refers to the individual's friendship status, that is, feelings of isolation from the group or of isolation from group standards. Dean, op. cit.

instrumental rather than consummatory. The Marxian tradition holds "self-alienation" (generally meant as the loss of intrinsic meaning or pride in work) to be the heart of alienation in modern society. This idea can be seen in Glazer's statement that compared to the alienated society, simpler societies are characterized by "spontaneous acts of work and play which were their own reward."[1] Putting this idea into social learning terms, Seeman defines self-estrangement as "the degree of dependence of the given behavior upon anticipated future rewards, that is, upon rewards that lie outside the activity itself."[2] An example of this is men who work merely for money. In short, self-estrangement "refers essentially to the inability of the individual to find self-rewarding--or in Dewey's phrase, self-consumatory--activities that engage him."[3]

Seeman refers to this variant as "self-estrangement." However, he points out that it is difficult to specify what the alienation is from: "to speak of 'alienation from the self' is after all simply a metaphor, in a way that 'alienation from popular culture,' for example, need not be."[4]

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[1]Nathan Glazer, "The Alienation of Modern Man," Commentary, XXX (April, 1947), 379. Quoted from Seeman, op. cit., p. 790.

[2]Seeman, op. cit., p. 790.

[3]Ibid.

[4]Ibid., p. 789.

Consequently, the latter can be concretely specified while the former presents great difficulties. The conception adopted here does no violence to Seeman's definition. It only drops measurement concern from "separation from self" to whether work is an end in itself or is an end to means outside of work activity. Moreover, it prevents confusion of this variant with the concept of self-evaluative involvement which will now be developed.

Operationalizing instrumental work orientation involved items such as "money is the most rewarding reason for working," and "your job is something you have to do to earn a living, most of your real interests are centered outside your job."

Self-evaluative involvement in the work role.-- Several propositions taken from self-other theory are appropriate to the conceptualization of self-evaluative involvement, the degree to which one utilizes a role to evaluate self. These propositions relate to the origin of self, optimization of positive self-evaluation and the maintenance of self-consistency.

> **Assumption 1**
>
> The self arises out of the interaction of the individual with his social environment (which includes primary groups, significant others and the generalized other).
>
> **Assumption 1a**
>
> Maintenance of self-image requires support from the social environment.

George Herbert Mead[1] and Charles Horton Cooley[2] maintain that an individual's self-concept arises from interaction with his social environment.

As one's self develops as a result of interaction with his environment, the evaluational interaction with others becomes significant. The self slowly emerges as an organized system of perceptions a person holds of himself along with certain values, positive or negative, attached to these perceptions.

Using Cooley's "looking-glass" analogy which suggests that self-evaluation is dependent upon evaluations from others, Zetterberg posits a "postulate of evaluative compliance": "In an action system, any actor has a tendency to develop self-attitudes that are synonymous with the uniform evaluations of him that are in the system."[3]

It is nothing new to note the relative lack of empirical research on the symbolic interaction approach.[4] The difficulty lies not in the absence of competent

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[1]George Herbert Mead, Mind, Self, and Society (Chicago: University of Chicago Press, 1934).

[2]Charles Horton Cooley, Human Nature and the Social Order (New York: Charles Scribner's Sons, 1922).

[3]Hans L. Zetterberg, "Compliant Actions," Acta Sociologia, II (1957), 187.

[4]Manford H. Kuhn, "Major Trends in Symbolic Interaction Theory in the Past Twenty-Five Years," Sociological Quarterly, V (Winter, 1964), 61-84.

researchers interested in self theory but in the nature of the perspective itself. Strauss[1] credits Mead with contributing an abstract frame of reference rather than a theory or specific hypotheses. Nevertheless, there is a growing body of empirical research which lends support to proposed self-other relationships. A number of studies either directly or indirectly present evidence that the response of others is related to self-conceptions and/or that a person's perception of others responses is more closely related to self-conceptions than the actual responses of others.[2]

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[1]Anselm Strauss, The Social Psychology of George Herbert Mead (Chicago: University of Chicago Press, 1956), p. xvi.

[2]A number of studies lend support to the first proposition. See Mary Engle, "The Stability of the Self-Concept in Adolescence," Journal of Abnormal and Social Psychology, LVIII (March, 1959), 211-215; Richard Videback, "Self-Conception and the Reaction of Others," Sociometry, XXIII (December, 1960), 351-359; Martin L. Maehr, Josef Mensing and Samuel Nafzger, "Concept of Self and the Reaction of Others," Sociometry, XXV (December, 1962), 353-357; Harold B. Gerard, "Some Determinants of Self-Evaluation," Journal of Abnormal and Social Psychology, LXII (March, 1961), 288-293; M. M. Helper, "Parental Evaluations of Children and Children's Self-Evaluation," Journal of Abnormal and Social Psychology, LVI (1958), 190-194; S. M. Jourard and R. M. Remy, "Perceived Parental Attitudes, the Self, and Security," Journal of Consulting Psychology, XIX (October, 1955), 364-366; M. Manis, "Social Interaction and the Self-Concept," Journal of Abnormal and Social Psychology, LI (November, 1955), 362-370; Manford H. Kuhn and Thomas S. McPartland, "An Empirical Investigation of Self-Attitudes," American Sociological Review, XIX (February, 1954), 68-76; Glen Rasmussen and Alvin Zander, "Group Membership and Self-Evaluation," Human Relations, XVII (1954), 239-251; and Bernard Rosen, "The Reference Group Approach to the Parental Factor in Attitude and Behavior Formation," Social Forces, XXXIV (December, 1955), 137-144.

Miyamoto and Dornbusch,[1] Reeder, Donohue, and Biblarz,[2] and Quarantelli[3] converge with empirical support for the symbolic interactionist relationship between self-conception and the perceived response of others. Their findings indicate that the responses of others were related to self-conception and that the subject's perception of the responses of others was even more closely related to self-conception than the actual responses of others.

Postulate one must be supplemented with others since a person may not, under certain conditions, accept the evaluation he perceives others to have of him. He may consider certain evaluations of others as inconsequential for his self-esteem. The discussion which follows suggests reasons for the acceptance or rejection of referents for evaluating self.

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[1]Frank S. Miyamoto and Sanford M. Dornbush, "A Test of Interactionist Hypothesis of Self-Conception," American Journal of Sociology, LXI (March, 1956), 399-403.

[2]Leo G. Reeder, George A. Donohue, and Arturo Biblarz, "Conceptions of Self and Others," American Journal of Sociology, LXVI (September, 1960), 153-159.

[3]E. L. Quarantelli and Joseph Cooper, "Self-Conceptions and Others: A Further Test of Median Hypotheses," Sociological Quarterly, VII (Summer, 1966), 211-215.

Self-Consistency[1] and Optimization of Self-Evaluation

Assumption 2

Persons strive to maintain a consistent and positive self-image.

The self, according to Murphy is the central value of existence. It must be defended not only from disparagement from outside forces but also against an unfavorable internal perception. The self is jealously guarded. To protect it individuals may, in the face of attack, tend toward what Murphy calls "self-idealization." That is, "the value tendencies which have supported the self come to support a bigger and stronger self than before."[2]

Sullivan[3] argues that the self leans toward stabilization of its structure generally not allowing new experiences contradicting the formation of the self to markedly alter the content.[4] Experiences which might reorganize

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[1]Self-consistency may be defined as the tendency to rapidly assimilate ideas consistent with the self-concept and to deny or distort new experiences related to the self in order that the existing organization of self may be retained with minimum alteration.

[2]Gardner Murphy, Personality: A Biosocial Approach to Origins and Structure (New York: Harper and Brothers, Publishers, 1947), p. 531.

[3]Harry Stack Sullivan, The Interpersonal Theory of Psychiatry (New York: Norton, 1953).

[4]It should be pointed out that this is a dynamic stability which is retained in spite of incorporation of new elements and constant revision.

self feelings are as a rule not allowed awareness by the self. Rogers[1] contends that any experience which the person views as inconsistent with his self-organization will be considered a threat to be defended against.

Combs and Snygg postulate a striving of the self toward consistency and dynamic stability. In fact,

> The phenomenal self with the self concept as its core represents our fundamental frame of reference, our anchor to reality; and even an unsatisfactory self organization is likely to prove highly stable and resistant to change.[2]

Thus, an individual tends to interpret experiences as congruent with the opinions he has of himself. The individual seems to look for support for the self-conception he has established.

The nuclear theory of the mind posited by Lecky[3] begins on the premise that at the very core lie the ideas of self.[4] As various ideas of the self radiate from this core ("distance" being a function of importance of the idea to the self), they will tend to be consistent with it.

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[1]Carl R. Rogers, Client-Centered Therapy (Boston: Houghton Mifflin Co., 1951).

[2]A. W. Combs and Donald Snygg, Individual Behavior: A Perceptual Approach to Behavior (New York: Harper and Brothers, Publishers, 1959), p. 130.

[3]Prescott Lecky, Self-Consistency (Hamden, Connecticut: The Shoe String Press, Inc., 1961).

[4]Lecky makes no assumption regarding the tendency toward optimization of self-image. Ideas about the self may be positive or negative but they are consistent.

Since these ideas of self are the most fundamental and highly valued to the organization of the personality, they are very closely guarded:

> An individual who, as a reulst of experience, has assimilated ideas of superiority [or inferiority] and has been successful in maintaining these ideas of self, . . . strongly resist[s] any direct threat to these ideas, for the striving for unity demands that these ideas be maintained.[1]

Persons strive to maintain self-consistency. Any value which is markedly inconsistent with the person's evaluation of himself finds difficulty in being accepted and, unless a major reorganization occurs, will be rejected.[2]

Dai[3] postulates a tendency toward self-consistency or integration. The nature of the striving for consistency is dependent upon the socio-cultural situation:

> This tendency [toward consistency] often necessitates the exclusion or dissociation of those impulses and behavior patterns from personal

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[1] Ibid., p. 222.

[2] It should not be overlooked that self-consistency as discussed here is a dynamic consistency. It is stated plainly in Lecky's book that, "as a person progresses through the various eras of life such as childhood, adolescence, adulthood and old age, maturational changes in his own constitution together with varying patterns of environmental stimulation produce a constant evolution of all ideas and particularly those of self. In order for the individual to function with a reasonable degree of stability and happiness, it is indispensable that gradual and genuine changes of ideas of self take place." (Ibid., pp. 223-224). Thus, room is made for "nuclear reorganization."

[3] Bingham Dai, "A Socio-Psychiatric Approach to Personality Organization," American Sociological Review, XVII (February, 1952), 44-49.

> awareness that are not consistent with the individual's preferred self-picture in a given socio-cultural situation. . . .[1]

Some empirical evidence supports a tendency toward self-consistency. Engel[2] investigated the stability of self-concept among adolescents over a two-year period. The hypothesis that the self-concept of adolescents would be relatively stable over the two-year period was supported. In a study of persons in a voluntary reading improvement class on the college level, Roth[3] found those who achieve improvement as well as those who do not, do so as a result of their own self-system, which in terms of performance, is relatively stable.

In a study using 203 fourth, fifth and sixth graders, Davidson and Lang[4] assert that the child with the more favorable self-image was more likely than not to perceive his teachers' feelings toward him as being more favorable.

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[1] Ibid., p. 46.

[2] Engel, op. cit.

[3] Robert M. Roth, "The Role of Self-Concept in Achievement," Journal of Experimental Education, XXVII (June, 1959), 265-281.

[4] Hellen H. Davidson and Gerhard Lang, "Children's Perceptions of Their Teacher's Feelings Toward Them Related to Self-Perception, School Achievement and Behavior," Journal of Experimental Education, XXIX (December, 1960), 107-118.

Deutsch and Salomon[1] found that in their study the respondents tended to react more favorably to evaluations from others which were consistent with their own evaluations than to evaluations appearing inconsistent. Israel,[2] in a study dealing with self-evaluation and attractiveness of a goal, reported that failing to achieve a goal, an individual with a positive self-evaluation depreciates the goal, not himself. On the other hand, a person with a negative self-evaluation who achieves a goal tends to depreciate the goal and himself as a result. In other words, the direction of self-evaluation is protected.

The conclusion drawn from the findings of this limited number of empirical studies is that individuals tend to behave in such a manner as to defend and to maintain their self-consistency.

Zetterberg[3] makes an assumption about human motivation not dissimilar to the economists' assumption of the profit motive. That is, a person desires to achieve, maintain and to maximize a favorable self-evaluation. The "postulate of ego needs" is stated in this way: "An actor's

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[1]Morton Deutsch and Leonard Salomon, "Reactions to Evaluations by Others as Influenced by Self-Evaluation," Sociometry, XXII (June, 1959), 93-112.

[2]Joachim Israel, "The Effect of Positive and Negative Self-Evaluation on the Attractiveness of a Goal," Human Relations, XIII (February, 1960), 33-47.

[3]Zetterberg, op. cit.

actions have a tendency to become dispositions that are related to the occurrence of favorable self-evaluations."[1] This postulate involves a variant of social visibility and is stated by Zetterberg as the "postulate of social visibility." "Actions have a tendency to be part of an action system to the extent they are related to favored self-attitudes among the actors of the system."[2]

The importance of these two postulates lies in their suggestion that an actor's judgment of himself relative to social roles is not a random process but is selective in the direction of maintenance of positive self-evaluation. Activities which promote positive self-evaluations are more likely to be selected and maintained by the actor as referents for self-esteem testing.

Proposition 1

An actor tends to evaluate himself in a social system to the extent that he can maintain positive evaluations of himself and his actions in the system.

Supporting this proposition, Sherwood[3] found that when evaluations of others confirmed a person's self-evaluation he tended to accept the group norms used to evaluate him. Otherwise, the norms were rejected. The degree of

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[1] Ibid., p. 184.

[2] Ibid., p. 185.

[3] John J. Sherwood, "Self Identity and Referent Others," Sociometry, XXVIII (March, 1965), 61-81.

self-involvement in the group conditions the reaction to evaluations of others in the system. Reference group theory presents an important alternative to accepting the evaluation of others. Couch's[1] results showed a tendency for individuals who did not identify themselves in terms of group membership on the "Twenty Statements Test" to depend less upon their perception of immediate other's evaluations than did individuals identifying themselves in terms of group membership.

Assumption 3

In industrial societies where status structures are multidimensional self-esteem maintenance can be a selective process.

The problem becomes one of relating particular social structures to the degree of self-evaluative involvement in work. One social structural factor making possible the choice of alternatives for self-evaluation is that of a heterogeneous society with a multidimensional status structure.

Some important values in American society relate to equal opportunity, ambition and upward occupational mobility. In this context Hughes states that a man's occupation is an

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[1]Carl J. Couch, "Self-Attitudes and Degree of Agreement with Immediate Others," American Journal of Sociology, XLIII (March, 1958), 491-496.

important criterion for judging others as well as himself.[1] As a matter of fact, occupation is often considered the single most important dimension in assigning social status. And there is a relationship between social ranking and self-evaluation. However, the universality of Hughes' proposition is open to question under conditions where alternatives exist for social ranking and evaluation of self. Alternatives to the work role dimension in self-evaluation are most prevalent where integration among various statuses is low. Prior to the emergence of the "market economy" social institutions were woven into a whole fabric. The rise of the "self-regulated" market economy led to the extrication of economic institutions from the dominance of traditional social institutions such as the family, church and state.[2] According to Polanyi,[3] the market became the independent variable determining the character of other social institutions reversing the earlier relationship wherein economic institutions were subservient to other societal institutions. Polanyi states that,

> Once the economic system is organized in separate institutions, based on specific motives and

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[1]Everett Hughes, Men and Their Work (Glencoe, Illinois: The Free Press, 1958), p. 42.

[2]The pervasive influences of economic institutions upon other social institutions are set forth in the works of Marx, Weber, Durkheim and Polanyi.

[3]Karl Polanyi, The Great Transformation (5th printing; Boston: Beacon Press, 1964).

> conferring a special status, society must be shaped in such a manner as to allow that system to function according to its own laws.[1]

The development of new separate institutions having the functions formerly performed by one institution is called structural differentiation.[2] Increased structural differentiation promotes the potential for a lower degree of integration among the dimensions used for self-evaluation. Participation in a wide number of socially segmented roles permits the choosing of alternative dimensions for self-evaluation, some of which may not be work-related roles.

Proposition 2

> If an actor's actions in a social system with a multidimensional status structure do not provide social support for the maintenance of positive evaluations of himself and his actions, he will tend to change the criteria by which he evaluates himself.

Due to sustenance needs a man may not be able to withdraw from his social system of work in a physical sense. Furthermore, though the nature of work may not promote involvement it may satisfy other needs such as occupying and

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[1] Ibid., p. 57.

[2] Smelser outlines the model of structural differentiation in the form of an abstract theory of social change: "When one social role or organization becomes archaic under changing historical circumstances, it differentiates by a definite and specific sequence of events into two or more roles or organizations which function more effectively in the new historical circumstances. The new social units are structurally distinct but together are functionally equivalent to the original unit." See Neil J. Smelser, Social Change in the Industrial Revolution (Chicago: The University of Chicago Press, 1959), p. 2.

organizing one's time or providing sustenance. Morse and Weiss found that most men would continue to work even if they were financially independent. This does not mean they are involved in work, as is testified by the high percentage of lower status workers who, though they would continue to work, would continue at different kinds of jobs. Clark, in a study of a cooperative, reports that the more powerless members felt, the more likely they were to be dissatisfied with its operations. However, the degree of association between powerlessness and participation in cooperative activities was low. This suggests that persons who experience powerlessness may continue to participate in the social system but may harbor feelings of being manipulated and engaged in a meaningless social situation.[1] Thus, while a man may stay on the job physically (for financial reasons or whatever) he may not consider the work role as a significant area for evaluating self.

These two items give a flavor of the operationalization of self-evaluative involvement in the work role: "Success in the things you do away from the job is more important to your opinion of yourself than success in your work career" or "to you, your work is only a small part of who you are."

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[1]Clark, op. cit., p. 849.

Actually, little empirical research has been done to inform us of the characteristics of persons who evaluate themselves in terms of work and those who do not. The assumption that an activity used for self-esteem testing is considered <u>important</u> permits the use of literature on social status, technology and attitudes toward work from which inferences can be made. A suggestion that this literature makes is that workers in lower status and in jobs characterized by extreme functional specialization are less "involved" in work than persons in higher status occupations or in jobs with less functional specialization.

CHAPTER III

THEORY AND RESEARCH: SOCIAL STATUS, TECHNOLOGY, MAN-MACHINE RELATIONSHIPS AND ATTITUDES TOWARD WORK

Introduction

This chapter attempts to link levels of technological development to distinctive types of man-machine relationships.[1] Automation is defined as "the automatic, centralized control of an integrated production system."[2] Mechanized, automated and craft type jobs are discussed in terms of their relationships to powerlessness, meaninglessness and normlessness and hence, to the likelihood of alienation from work.

The inference drawn from the literature on social status, technology and attitudes toward work reviewed in this chapter involves this logic. Occupations viewed by workers as means to ends extrinsic to work (e.g., money for

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[1]This section follows the structure of the arguments regarding the relationship between technology and division of labor presented in William A. Faunce, "Automation and the Division of Labor," Social Problems, XIII (Fall, 1965), 149-160.

[2]Faunce, Problems of Industrial Society, op. cit., p. 46.

leisure or family) serve as the starting point. Persons in higher status occupations tend to value intrinsic aspects of work and higher status occupations are generally characterized by freedom and control, knowledge of functional relationships among organizational positions and find upward mobility channels premised on expertise as the criterion for advancement. One important reason that this is so is that these occupations do not contain many functionally specialized jobs.

Some types of jobs, however, have characteristics similar to high social status ones even though occupationally they have relatively low status. Incumbents in lower social status jobs which are not functionally specialized (in this case maintenance craftsmen in an automobile factory and/or refinery control room monitors) will, like persons in higher status occupations, experience less powerlessness, meaninglessness and normlessness than persons with similar occupational status who hold highly functionally specialized jobs (in this study, final assembly line automobile workers).[1]

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[1]Hatt lists the following prestige ratings for manual workers in the construction trades: electricians (73), carpenters (65), and plumbers (63). Unfortunately craftsmen in factory work were not listed. Machine operators in the factory had a prestige score of 60. Presumably this would include assembly line workers and control room operators. The differences in prestige scores are not great, particularly comparing machine operators with craftsmen such as carpenters and plumbers. Consequently, status recognition for these types of workers is more likely to be attached to

Like persons in higher status occupations, persons in lower status occupations with jobs not highly specialized will value work for its intrinsic aspects. It will be hypothesized that viewing work as a consummatory rather than as an instrumental activity reflects low isolation from company goals and values and high self-evaluative involvement in the work role. By way of summary, the assumptions and propositions implicitly or explicitly formulated in this chapter and the preceding one will be translated into testable hypotheses at the end of this chapter.

Automation Defined

Whatever the shortcomings of the literature on automation, a lack of definitions cannot be numbered among them. Regardless of the particular definition adhered to, a point of contention appears to be whether automation is novel or simply a continuation of mechanization. This debate over whether automated technology represents a revolutionary

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differences in control over various aspects of the work environment than to social status level in the larger society. Moreover, there is an intimate relationship between social status, whether on the societal, occupational, or plant levels, and the degree of control over aspects of the work environment. In addition, one study reports a .99 correlation between Hatt's 1947 rank order and a replication in 1963, indicating little change in occupational prestige ratings in the intervening years. See Robert W. Hodge, Paul M. Siegal and Peter H. Rossi, "Occupational Prestige in the United States," American Journal of Sociology, LXX (1964), 291.

change or an evolutionary development is crystallized in the works of Bright and Diebold. Taking an evolutionary point of view, Bright conceives of automation in the dictionary sense. That is, automation refers to making something more automatic than it has previously been.[1] In Bright's mind "automaticity" involves an increase in control of its operations by the technology itself and greater integration of the total production system.

The linking of control with automaticity can be seen in his mechanization profile. Where the level of mechanization involves hand work, hand tools and power hand tools, man initiates control and the "machine" responds variably according to the worker's actions. When the level of mechanization involves fixed cycle power tools, program controlled power tools, remote controlled tool systems and actuation of the machine by the introduction of a work piece or material, the type of machine response is fixed within the machine and control is initiated from a control mechanism that directs a predetermined pattern of action. With technology that can measure the characteristic of work, that can signal pre-selected values of measurement, including error detection, and can record performance, the initiating control source comes from a variable in the environment and

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[1] J. R. Bright, Automation and Management (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1958), pp. 6-7.

the machine responds with a signal to the worker. When the capability of technology includes changing speed, position and direction according to measurement signal, when the technology can segregate or reject according to measurement or, at a higher level of mechanization, when the technology can identify and select appropriate sets of action, the machine itself responds by selecting from a limited range of possible pre-fixed actions and the initiating control source comes from a variable in the environment. The highest levels of mechanization include machines that can correct performance after operating, correct performance while operating and anticipate required action and make adjustments. At this level of mechanization the initiating control source is still from a variable in the environment, and the type of machine response is one of modifying machine action over a wide range of variation. These latter stages of machine response, that is, selecting from a limited range of possible pre-fixed actions and modifying action over a wide range of variation, involve what is commonly known as "feed-back," and constitutes what is generally considered to be automation. In short, as automaticity increases, the initiating control source moves from man to technology and the type of machine response is increasingly one in which the technology responds independently of man's action.[1]

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[1]For the seventeen levels of mechanization and their relationship to power and control sources, see ibid., p. 45.

Another crucial dimension of automation is the integration of the production process. Mechanization, according to Bright, has three qualities: level of mechanization, span across the total sequence of the production process and penetration which refers to the degree to which secondary activities in the production process are performed by the technology. The greater the span of mechanization of the total production process and the greater the degree to which secondary functions are performed by the technology, the greater the degree of integration in the production system.[1]

The leading proponent of automation as a revolutionary breakthrough, John Diebold, argues that automation is not merely a level of mechanization, but "marks a breakthrough with past trends, a qualitative departure from the more conventional advance of technology that began with jagged pieces of flint and progressed up to the steam engine."[2] If one is to believe Diebold,

> automation is more than a series of new machines and more basic than any particular hardware. It is a way of thinking as much as it is a way of doing. It is a new way of organizing and analyzing production, a concern with the production process as a system and a consideration of each element as a part of the system. It is something of a

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[1] Ibid., p. 11.

[2] John Diebold, Automation: The Advent of the Automatic Factory (New York: D. Van Nostrand Co., Inc., 1952), p. 2.

> conceptual breakthrough as revolutionary in its way as Henry Ford's concept of the assembly line.[1]

Diebold suggests that confusion over whether automated technology represents an evolutionary or a revolutionary process stems from emphasis on the machines associated with automation. Automation, however, he contends, is more than electronic computers, transfer machines, numerical tool controls and oil refining instrument panels. Heretofore technological improvements have still left room for direct human intervention and control. Automation, based on the principle of feedback, institutes a new type of technology which controls its own operations. Concerns for human limitations in the design of machines can be put aside. A second distinctive feature of automated technology is the concept that individual machines fall into obsolescence when an automated system introduces an integrated system for production or information handling. In addition, automation, resting as it does on a theoretical premise rather than on a specific method of work organization or type of machine, finds applicability in a variety of work situations including the factory and the office. For all of his concern with automation as a revolutionary departure, Diebold's description of automation does not seem to differ significantly from that of Bright, an evolutionary protagonist--they both see

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[1] Ibid., p. 3.

control and integration as characteristic of the most highly developed technological systems.

The debate over the evolutionary or revolutionary character of automation seems to be somewhat academic and partly depends on one's conception of time. Henry Ford's assembly line may be considered revolutionary in its impact but was technologically built on previous knowledge organized in a unique fashion. It seems that each new technological advance from the factory to the assembly line to automated technology is in its time considered revolutionary and in retrospect is always viewed as part of an evolutionary process known as technological development. In short, yesterday's revolutionary is today's evolution. This is not to say that the effects of a change, technological or otherwise, are not revolutionary, however.

Another compelling argument for the evolutionary theory of automation is that materials handling technology and control technology may be quite rudimentary as in certain manufacturing industries and in banking computer systems, or materials handling and control technology may be highly developed as in oil refining and chemical industries. In short, the level of development of these components of technology are a matter of degree. Failure to recognize this has resulted in a variety of levels of technological development being described as "automated." As a result, studies on "automation" often reveal contradictory results.

For example, Walker's study of a semi-automatic steel tube plant and Faunce's study of a semi-automatic automobile factory do not find a feeling among workers that they have an increase in responsibility. On the other hand, studies by Blauner, and Mann and Hoffman, conducted in industries with highly developed materials handling and control technology find that workers in the new automated jobs do experience an increase in responsibility. The difference in results may stem from the differing levels of development in the materials handling and control components of technology.

A fruitful way out of this semantic tangle may be found in the work of Faunce. Most discussions of technology, Faunce points out, make the mistake of considering technology as a unitary phenomenon. Technological development should be conceived "as a sequence of changes in separate production components that form developmental stages characterized by different types of man-machine relationships."[1] The production process is broken into four components. Power technology refers to energy sources in production. Tools and technology used in production from raw materials constitute processing technology. The transfer of materials between processing operations involves materials

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[1]Faunce, "Automation and the Division of Labor," op. cit., p. 150.

handling technology. Control technology regulates the quality and quantity of production. In order to relate these technological components to historical stages of technological development it must be noted that "while technological development may occur independently in any one of the production components, a certain level of development of each is a necessary condition for further development of the others."[1]

Technological development in many industries reveals this pattern of change in technological components. A substitution of inanimate for animate power will encourage changes first in processing, next in materials handling and finally in production control. This sequence of events may be linked to stages in the history of industrialization. Technological development has proceeded in three stages: handicraft (non-mechanized), mechanized and automated. The handicraft stage occurred prior to the mechanization of the production components already described. Mechanized production, the second stage, involved development of inanimate power technology and mechanical processing technology. Automated technology takes its characteristic form in highly developed materials handling technology and the use of

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[1] Ibid., p. 151.

automatic production controls.[1] Faunce's definition of automation emphasizes the same features as Bright and Diebold (control and integration). Automation is defined as "the automatic, centralized control of an integrated production system."[2]

Operationalization of technology in terms of non-mechanization, mechanization and automation is crude but purposefully so. This is in line with the primary objective of the research, which is to discern any differences in worker attitudes among the supposed three stages in the development of industrial technology. Relevant here is Bright's contention that mechanization has at least three fundamental dimensions: span, level and penetration.[3] By span he means the degree to which a series of production events are mechanized. Level of mechanization refers

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[1]This series of changes in power technology, processing technology, materials handling technology and control technology does not follow this neat sequence of events for all industries. For example, some industries such as oil refining, chemical plants and power plants had highly developed materials handling and control technology almost from the beginning. For a number of reasons other industries may not advance beyond processing technology or a high development of materials handling technology. In addition, some industries may have part of their production process in one stage of technological development and another part at a different stage.

[2]Faunce, Problems of Industrial Society, op. cit.

[3]James R. Bright, "Does Automation Raise Skill Requirements?" Harvard Business Review, XXXVI (July/August, 1958), 88.

essentially to the degree to which the machinery itself responds to environmental conditions. The degree to which secondary production tasks are mechanized is called penetration. The use of these three dimensions of mechanization, Bright contends, are essential to the study of an automated system. However, at this point in the development of technology there are few totally automated production systems. That is, certain aspects of the production process in some industries are automated while other aspects of the general production process may be either mechanized or non-mechanized. In order to discern the effects of job attributes on worker attitudes in different kinds of technological environments it was decided to select workers by a quota method whereby only workers performing tasks corresponding to the different stages of technological development were selected. In each case the workers characterized by one of the three man-machine relationships were part of a larger work organization containing workers with relationships to technology quite different from their own.

Technology and the Division of Labor

Assumption 1

There is a curvilinear relationship between the levels of technological development (proceeding from non-mechanization to mechanization to automation) and the type of division of labor (lower, higher and lower differentiation).

The division of labor is fundamentally related to the type of production technology. Faunce associates a characteristic form of division of labor with each level of technological development. This association, he argues, is due to the presence of a unique man-machine relationship attending each type of production technology. In the craft production stage the skill rests with the worker's ability to manipulate hand tools in the fashioning of total products. Mechanized processing technology builds skills into machines which are attended by special purpose machine operators. The advent of highly developed automatic materials handling and automatic controls creates jobs in which the worker becomes a monitor in an integrated production system. It is, then, the man-machine relationship which relates technological development with changes in the form of division of labor (see Table 1).

Faunce contends that automated technology represents a dramatic change in production technology and, in time, will produce major changes in the division of labor. An important hypothesis is that automated technology will produce a change toward a less specialized division of labor.[1]

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[1]Arguments for decreased functional specialization of work tasks are forwarded by Davis, "Job Design and Productivity: A New Approach," op. cit.; Davis, "The Design of Jobs," op. cit.; Davis and Werling, "Job Design Factors," op. cit.; Davis, "The Effects of Automation on Job Design," op. cit.; George Friedmann, The Anatomy of Work: Labor,

Table 1. Relationship of production technology to division of labor*

Stage of Mechanization of Production Components**	Phase in Man-Machine Relationship	Type of Division of Labor
1. Power source: animate 2. Processing procedure: tools and simple machines 3. Materials handling procedure: not mechanized 4. Control procedures: not mechanized	Craft Production (Worker as skilled artisan)	Low degree of differentiation
1. Power source: inanimate 2. Processing procedures: low-speed, special purpose machines 3. Materials handling procedures: early stages of mechanization 4. Control: not mechanized	Mechanized Production (Worker as machine operator)	High degree of differentiation
1. Power source: inanimate 2. Processing procedures: high-speed multipurpose machines 3. Materials handling procedures: automatic 4. Control: automatic	Automated Production (Worker as machine monitor)	Low degree of differentiation

*Reproduced from Faunce, "Automation and the Division of Labor," op. cit., p. 153.

**Technology is not so much operationalized as defined by several characteristics considered important in distinguishing levels of technological development. For more elaborate approaches to the operationalization of levels of technology see: Turner and Lawrence, op. cit., pp. 148-151; and Bright, Automation and Management, op. cit., pp. 39-56.

The man-machine relationships characteristically found at different stages of technological development for production will be discussed at this point. An attempt is made to find in mechanized jobs some of the characteristics found in lower status jobs and in automated and non-mechanized jobs characteristics linked with higher status jobs. The main connection lies in the existence of responsibility for a greater span of the production process in automated and non-mechanized work environments as compared to mechanized jobs. Correlated with an enlarged span of responsibility are increased freedom, control and meaning in work.

In the handicraft stage of production, artisans equipped with hand tools fashioned products from raw materials to finished articles. Mechanization resulted in the proliferation of many special-purpose machines each of which was designed to perform limited operations on the total product. This produced the need for special purpose machine operators who were semiskilled operatives performing an occupational specialty. All of these specialties contributed to the final product but each specialty performed only

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Leisure and the Implications of Automation (Glencoe, Illinois: The Free Press, 1961); and R. H. Guest, "Job Enlargement--A Revolution in Job Design," Personnel Administration, XX (March-April, 1957), 9-16. They would agree with Blauner that technology sets limits on the variations in the division of labor but it is possible to distribute work tasks in different ways within the same level of technological development.

a small part of the total operation. The division of labor tended toward increasing differentiation.

Some sociological research tends to corroborate the relationship between mechanized production technology and increased division of labor. Smelser[1] relates technology as an independent variable to the dependent variables, structural differentiation in the British textile industry and the family economy of its working classes. Structural differentiation is a general process of which the division of labor is a part. Smelser contends that structural differentiation is associated with the introduction of mechanized production technology. Research by the Lynds and Warner and Low and others indicate this same pattern.[2]

Mechanization, Powerlessness, Meaninglessness and Normlessness

Assumption 2

The degree of powerlessness, meaninglessness and normlessness vary directly with the degree of differentiation in the division of labor at work.

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[1]Smelser, op. cit.

[2]See Lloyd W. Warner and J. O. Low, The Social System of the Modern Factory (New Haven, Connecticut: Yale University Press, 1947); Robert S. Lynd and Helen M. Lynd, Middletown (New York: Harcourt, Brace, & Co., 1929); and Fred Cottrell, Energy and Society (New York: McGraw-Hill, 1955), pp. 209-211.

The separation of occupational groups into low and high status or even into white-collar and blue-collar masks many variations in orientation toward the work role. Consideration of variations in levels of technology and types of division of labor may specify some differences. Sayles[1] argues against the human-relation-in-industry approach which assumes that all work groups are alike and can be affected positively by the proper supervisor-worker relationship. In order to explain the range of work group behavior, he contends, it is necessary to take into account the work structure as influenced by technology. This represents an attempt to explain behavior in relation to the heavy influence of technology upon the structure and behavior of work groups. It attempts to explain, for example, why one group reacts to an event as a problem while another group assimilates the event as an inevitable condition of work. Similarly, Blauner[2] takes the human-relations-in-industry school to task for virtually ignoring the relationship of the worker to his job in favor of emphasizing the relationship between the worker and his fellow workers in the plant.

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[1]Leonard R. Sayles, Behavior of Industrial Work Groups (New York: John Wiley and Sons, Inc., 1958).

[2]Blauner, "Worker Satisfaction . . .," op. cit., p. 350. In an interesting footnote Blauner links this bias to Durkheim's influence on Elton Mayo. While Marx viewed the restoration of control over the work environment as the antedote for the disintegrating impact of industrialization, Durkheim advocated the formation of solidarity groups. Ibid., p. 359.

Blauner utilizes occupational prestige and control over the immediate work process as factors accounting for occupational differences in job satisfaction.[1] Occupational prestige seems to be the most predictive of attitudes toward work. It is Blauner's contention that the high degree of association between occupational prestige and job satisfaction may be attributed to the fact that occupational prestige is a composite of several important factors influencing attitudes toward work including skill level, degree of education or training requisites, amount of income and extent of control and responsibility linked with the job. Despite its high predictive value in a general sense, there are anomalous variations not expected when occupational prestige is employed. Though white-collar occupations are accorded higher prestige than manual occupations, Inkeles consistently found job satisfaction to be higher among skilled manual workers than among white-collar employees.[2] Blauner mentions another case, that of the assembly line worker who exhibits higher job dissatisfaction than persons in other semiskilled occupations. Also, Walker and Guest found utility men more positively oriented toward their jobs than other final assembly workers. Moreover, persons in some

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[1] Two other factors used by Blauner in this discussion are degree of integration of work groups and existence of occupational communities. Ibid., pp. 349-352.

[2] Inkeles, "Industrial Man . . .," op. cit.

lower social status occupations reflect higher job satisfaction than assembly line workers. This suggests the play of factors on job satisfaction other than occupational prestige.

Walker and Guest, for example, found that among assembly line workers in the automobile industry, the job aspects most often cited as sources of dissatisfaction were mechanical pacing of work, repetitiveness and lack of skill requirements.[1] Of their total sample, only 10 percent preferred or were indifferent to jobs with the above characteristics. The preponderant expression was varying degrees of dislike.

In Blauner's study of alienation and freedom, type of technology and division of labor, important determinants of the way work is experienced were related to the relative degree of alienation among factory workers. Conceived as a multidimensional concept, alienation was defined in terms of powerlessness, meaninglessness, social isolation and self-estrangement. Four types of industrial workers were selected to represent the historical development toward higher levels of technology and division of labor: printing craftsmen (non-mechanization with a low degree of job specialization), textile workers and automobile assembly line workers (mechanization with a higher degree of job specialization) and chemical operators (automated technology with a low

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[1]Walker and Guest, op. cit., p. 62.

degree of job specialization). Alienation was lower among printing craftsmen and chemical operators than among textile and automobile workers.

Responsive to the research on man-machine relationships and attitudes toward work is "job design analysis." One argument is that job specialization may have an optimal point, beyond which organizational performance may be impaired. This, of course, is in response to the prevailing assumption in job designing: that specializing increases productivity. Evidence from a number of experiments with job enlargement and/or job rotation suggests that such programs not only improve worker attitudes but lead to better organizational performance (as measured by increased productivity, improved quality and quantity of work and reductions in absences, turnover rates and requests for transfers).

This approach has not been immune to detraction. MacKinney[1] argues that responses to work must be attributed to individual differences rather than to job specialization. Goldthorpe,[2] too, maintains that the prevalence of an instrumental orientation toward work, characteristic of mass production workers, can be accounted for by their prior

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[1]A. C. MacKinney et al., "Has Specialization Reduced Job Satisfaction?" Personnel, XXXIX (1962), 8-17.

[2]John H. Goldthorpe, "Attitudes and Behavior of Car Assembly Workers: A Deviant Case and a Theoretical Critique," British Journal of Sociology, XVII (September, 1966), 227-244.

orientations brought into the job rather than the nature of work fostering an instrumental orientation.

Evidence supporting the pro-specialization position does not appear very strong. MacKinney criticizes the methodology of anti-specialization research, citing the work of Kennedy and O'Neill[1] as truly experimental research in which confidence can be placed. However, contradictions appear in the Kennedy and O'Neill study. While no significant differences in attitudes toward work content and supervision were found among assembly line workers and utility men in two departments, significant differences were reported among the same types of workers in two other departments. Glossing over the contradictions with conjecture, MacKinney chose that part of the evidence supporting his position. Also, Kilbridge[2] questions the relationship between extreme job specialization and job dissatisfaction as manifested in high turnover, absence and transfer rates. Finding inconsistencies in the two manufacturing companies studied, Kilbridge concluded that:

> Significant differences in turnover, absence and transfer rates are in each case explainable by conditions peculiar to the companies and the

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[1] O'Neill, op. cit.

[2] Maurice D. Kilbridge, "Turnover, Absence and Transfer Rates as Indicators of Employee Dissatisfaction with Repetitive Work," Industrial and Labor Relations Review, XV (October, 1961), 21-32.

> work situations, without reference to repitiveness. That is, the effect, if any exists, of repetitiveness on turnover, absence, and transfer rates is submerged by other factors of overriding importance.[1]

The evidence does not warrant such a seemingly conclusive statement. Other factors such as group pressures, the opportunity to earn incentive pay, and the absence of night shift work, which vary by organization, are said to have greater influence on absence and turnover rates than repetitiveness. However, this again is conjecture since no tests were made.

Powerful ammunition for maintaining the status quo in job design is the body of literature consistently reporting low job dissatisfaction. Herzberg reports that over the past twenty years the total of percentages compiled show a median value of 13 percent for job dissatisfaction. Herzberg and Wilensky,[2] however, view the low level of job dissatisfaction as a serious underestimation. The cultural bias against negative attitudes toward work and the human aversion to revealing oneself to be a failure may lead, consciously or otherwise, to favorable answers to the direct question, "taking into consideration all things about your work, how satisfied or dissatisfied are you with it?"

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[1] Ibid.

[2] Herzberg, op. cit., and Harold Wilensky, "Varieties of Work Experience," Man in a World of Work, ed. by Henry Borow (Boston: Houghton Mifflin Company, 1964), pp. 125-154.

Indirect probing is more instructive about attitudes toward work. Wilensky asked, "what type of work would you try to get into if you could start all over again?" This study revealed fairly low "job satisfaction": "only one in four men of the upper working class in the Detroit area would try to get into anything like their present work; well over half of the lower-middle class (clerks, salesmen, technicians, office supervisors, small proprietors, etc.) would try something else. The range of 'satisfaction' is from about nine in ten of the professors and mathematicians to 16 percent of the unskilled auto workers." Findings of Morse and Weiss,[1] derived from a national sample of 401 employed males, fall in the same pattern. Eighty percent indicated they would continue working even if they inherited sufficient money to live comfortably without working. Further probing revealed that about 30 percent gave as their reason "to keep occupied." Negative responses such as would "feel lost," "bored," "go crazy," "habit," etc. comprised another third of the sample. Only 9 percent said they would continue working with financial incentive removed because they enjoyed the kind of work.

A Fortune survey[2] indicated that half of all the factory workers felt their jobs did not really give them a

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[1]Morse and Weiss, op. cit.

[2]Elmo Roper, "The Fortune Survey--The American Factory Worker: What's Good About His Job . . . What's Bad About It?" Fortune, XXXV (May, 1947), 5-12.

chance to try out ideas of their own. If given another chance, over half would choose a different occupation. It is stated in the survey report that management and unions give workers nice eating accommodations, washrooms and baseball, as well as seniority, shorter hours and higher pay. However, "the simple fact is that the worker wants to be treated like a human being. He wants to be able to hope for advancement, to have honest effort recognized and to have an outlet for personal initiative." As an inference, it seems evident that the former benefits can be offered without altering the nature of the factory work, while meeting the human needs in the latter categories would entail changes in the factory job.

Dubin[1] found work not to be a central life interest as measured by informal group experiences and personal satisfactions. The majority of workers looked outside of work for their intimate human relationships and for their feelings of enjoyment, happiness and worth. While the majority of workers did not prefer the work place for intimate human relationships, they did prefer the work place as the arena for experiences with technology and participation in formal organizations. In spite of the small proportion of workers (one-fourth) who could be classified as job oriented in their life interests, it was in the area of technological

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[1]Dubin, op. cit.

relationships that the highest percentage of workers (63 percent) were found to be job oriented. These workers had developed a sense of attachment to work without, however, a sense of total or personal commitment. He contends that his findings call into question the proposed negative relation between job specialization and job satisfaction. Another interpretation is that highly atomized jobs lead to lack of personal satisfaction in work. Maintenance of the work place as the locus for technological and organizational ties may be a way of "remaining among the living," as Wilensky puts it.

Powerlessness, Meaninglessness and Normlessness: Assemblers

A common argument reiterated by Blauner is that when mechanization evolved in the factory system, the division of labor became increasingly differentiated leaving the factory worker a work role devoid of freedom and control (powerlessness) and without purpose and function (meaninglessness). With respect to powerlessness, industrial workers under mechanized technology, among other things, lacked control over the immediate work process.[1] However, argues Blauner, continuous-process technology returns some freedom and control to the industrial worker in the form of freedom

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[1]For further substantiation see Walker and Guest, op. cit.; Chinoy, op. cit.; and Walker, op. cit.

of movement, control over work pace and at least a medicum of freedom in the selection of work methods.

There are a myriad of indices of control over work environment. One shortcoming of job satisfaction studies is that a variety of job aspects are not used. Often employed is a question ascertaining general or overall satisfaction. Most workers may be expected to vary in the degree of satisfaction according to particular facets of their immediate job situation. This does not mean that general statements regarding the relative degree of job satisfaction among occupations cannot be made legitimately. It does suggest that a number of job elements should be introduced when tapping attitudes toward work. A number of job aspects are relevant to control over the immediate work situation: control over the work pace, freedom of physical movement, regulation of work pressure, control over time, control over the technical and social environment, freedom from close supervision, control over the quality and quantity of production and choice in the selection of work methods.

Mechanical control of work pace is a prominent source of dislike among assembly line workers. A limited number of operations, whether one or five, must be performed within a space of time geared to the speed of the conveyors. When a finished automobile rolls off the line at the speed of one per minute, little control over the pace of work is permitted. Working up the line to get ahead of the pace is

possible for some assembly line workers, but not as a general rule. It is in the logic of the assembly line mode of production that the speed of the line be closely geared to the time required for a set of operations. Pacing, characteristic of assembly line production in the automobile industry, results in the relative absence of control over the dispensation of time on the part of the worker. The statement about wishing the line would break down made by one of Walker's workers indicates the inability of assembly line workers to regulate the degree of pressure they feel on the job. Assembly line workers do not experience close human supervision, but then it is not necessary due to the nature of the technology. Control over quality and quantity of work is not often experienced. Rationalization has precluded selecting work methods, except through the suggestion box. Most jobs on the line are done in a very limited spatial span. Consequently, lack of movement from the immediate working area has real meaning. The spatial distribution of workers on the line, noise and speed of the line, curtail social interaction, resulting in limited control over the social environment.

By the rules, large bureaucratic organizations promote on the basis of merit. However, Chinoy found among automobile workers:

> that persistent effort, a good performance record, and faithful adherence to company rules, all sanctioned by tradition and encouraged by management

> as representing evidence of merit and ability, were not in themselves enough to gain promotion; and that whatever a man's other qualifications, he also needed "pull" or "connections" in order to become a foreman.[1]

This feeling most likely reflects frustration with perceived inability to rise occupationally. Factors contributing to the feeling of little mobility opportunities among assemblers are the compressed wage scale and the small number of job classifications to which workers can aspire. Placing blame upon the system rather than upon themselves, these workers are led to comments such as "it's one-third ability and two-thirds pull."[2]

Blauner also contends that modern industry, based on standardization and minute division of labor, reduces the workers' contributions to the production process and promotes meaninglessness. Meaninglessness results from the fact that:

> As the division of labor increases in complexity in large-scale organizations, individual roles may seem to lack organic connection with the whole structure of roles, and the result is that the employees may lack understanding of the coordinated activity and a sense of purpose in his work.[3]

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[1] Chinoy, op. cit., p. 53.

[2] Ibid.

[3] Blauner, Alienation and Freedom, op. cit., p. 22.

Workers know only their own limited tasks and need not know the tasks of other workers, other departments or how their work relates to the products of the larger organization. On the other hand,

> The most characteristic feature of automation is its transfer of focus from an individual job to the process of production. The perspective of the worker is shifted from his own individual tasks to a broader series of operations that includes the work of other employees.[1]

Contributions to the production process are unique functions[2] rather than unique products.

Extreme fractionalization of operations produces repetitiveness and requires little skill. Performing one or more minute operations day after day does not give the workers a sense of the connection of his job to the jobs of others or to the larger organization:

> Workers have no claim to the goods they produce; in that respect they are alienated from the fruits of their labor. Although automobile workers, unlike many other industrial workers, can recognize the finished product to which they have contributed, their contribution is so small because of the extensive division of labor, and so insignificant because of the substitution of machines for manual skill, that the psychological tie between worker and product is tenuous enough to be almost meaningless.[3]

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[1] Ibid., p. 173.

[2] This ties in with the earlier discussion on decreased occupational differentiation and increased responsibility for a wider span of the production process with automated technology.

[3] Chinoy, op. cit., p. 85.

Automation, Powerlessness, Meaninglessness and Normlessness

Another fundamental change in the man-machine relationship emerged with automated technology. The worker in an automated plant is a monitor of a group of special purpose machines[1] or of a completely integrated production system.[2] Essentially, he makes appointed checks on gauges of various sorts which relay information to him as to whether the production process is functioning normally. Faunce discusses several ways in which automation may decrease the division of labor. The general thrust is that, while automation may not produce the general upgrading of industrial workers once expected, research does suggest that it contributes to a decrease in the number of separate job classifications. Automation produces job enlargement in the sense that workers are responsible for a larger share of the production process as job classifications are reduced.

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[1] As in Faunce's study of an automated automobile engine plant. See William A. Faunce, "Automation in the Automobile Industry: Some Consequences for In-Plant Social Structure," American Sociological Review, XXXIII (August, 1958), 401-407.

[2] See Blauner, Alienation and Freedom, op. cit.; and Floyd C. Mann and Richard L. Hoffman, Automation and the Worker (New York: Henry Holt, 1960).

Skill, in the traditional sense is not the kind of upgrading that may be experienced by operators in automated settings. A popular question of debate in the automation literature asks whether automated technology will "raise or raze" production operator skill level. Bright's thesis is that skill level increases to a point in the development of "automaticity" but declines as the technology assumes more control.[1] Bright views automation as an evolutionary continuation of mechanization rather than as a technology so unique as to mark the "second industrial revolution." Defining skill as "the combination of the necessary experience, dexterity and requisite technical knowledge," Bright argues that his conclusions cast doubt on the assumption of upgrading for factory workers. On the whole, he concludes that automation seems to make skill less important as a criterion for employment. This is because the more automatic the machine the less the operator has to contribute. Automation, then, in his view may require less, certainly not more, operator skill.

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[1]Bright, Automation and Management, op. cit., pp. 187-188. A good concise discussion of definitions of automation, along with the use of the concept in research may be found in Paul E. Sultan and Paul Prasow, "Automation: Some Classification and Measurement Problems," Labor and Automation, Bulletin No. 1, 1964.

Blauner argues that the shift from skill to responsibility is the most significant historical trend in the development of blue-collar work. Even Bright recognizes that while increased mechanization decreases skill, the degree of responsibility among operators may be increasing with automation. Mann, in a summary of research on automation in industrial plants, notes this process: "The integration of what were formerly discrete units of equipment also means the integration of jobs. Old boundaries between tasks are being wiped out as jobs are combined and enlarged."[1]

That the number of job classifications may be reduced in automated plants is suggested in several case studies. When a large bakery was automated, the number of separate job classifications went from sixteen to seven.[2] Walker's study[3] of a semiautomatic steel pipe mill revealed

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[1]Floyd C. Mann, "Psychological and Organizational Impacts," Automation and Technological Change, ed. by John T. Dunlop (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962), p. 51.

[2]U.S. Department of Labor, Bureau of Labor Statistics, A Case Study of a Large Mechanized Bakery (Washington, D.C.: Government Printing Office, 1956), p. 16.

[3]Charles R. Walker, Toward the Automatic Factory: A Case Study of Men and Machines (New Haven: Yale University Press, 1957), p. 61.

that the number of positions were reduced from seventeen to eight. In their study of an automated power plant, Mann and Hoffman have this to say about the impact of automation upon division of labor:

> the distinctions among operators in the older (non-automated) plant according to the type of equipment they operated were eliminated in the new plant. Only one class of operators was established for the new plant: power plant operator.[1]

A number of studies conclude that associated with automation is increased job enlargement as reflected in responsibility for a larger span of production.[2] The relationship between the decrease in occupational classifications and increased responsibility for a larger span of the production process is summarized by Mann:

> Greater system integration, with fewer workers manning it, typically means a single member has responsibility for a larger span of the line. While an operator's work may involve only patrolling and inspecting a system when all is functioning properly, he is expected to recognize an incipient crisis and to do "the right thing." Responsibility of this character requires more of a systemic sense--knowledge and competence of a depth essential to handle a highly interlocked system of machines, and perhaps of machines and men.[3]

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[1] Mann and Hoffman, op. cit., p. 72.

[2] Ibid.; Bright, op. cit.; Faunce, "Automation in the Automobile Industry," op. cit.; and Blauner, Alienation and Freedom, op. cit.

[3] Mann, op. cit., p. 51.

Powerlessness, Meaninglessness and Normlessness: Monitors

Decentralization is the characteristic mode of work organization in a refinery. Control rooms are spread over vast acreage. For one thing, the production units themselves, whose performance appears on the control room instruments, are quite large and must be located near the control room. An overhead and underground complex of pipes transport chemical derivatives from one processing unit to another. Products, from their introduction as crude oil until pumpers release them to railroad tank cars or riverboats, are not touched by human hands.

At set intervals during the shift, each operator checks his indicators and records readings on standard forms. At one time, the operator will check the instrument panel in the control room. After a designated period, he will leave the control room to check the indicators on the production unit outside for which he is responsible. At Circle Oil operators made readings every two hours in the control room and once every half-hour or hour they checked the production unit outside the control room. Except for emergencies, the operator is free to do as he pleases the rest of the time.

From this brief description of work organization and job tasks, several statements can be made about control, meaninglessness and normlessness among continuous-process operators. Making readings at the intervals indicated above,

plainly shows an absence of mechanical pacing. Dials and gauges can be read with considerable variation in time. Of course, errors are easily detected and the danger and costliness of mistakes promote frequent checking of the instrument panel with an operator's area of responsibility. Supervision is normally quite loose and orders are given only during periods of emergency. The number one operator is technically the unit supervisor but operators are oriented normally toward the technology for directives. Not uncommon are emergencies when something has gone amiss. Operators cannot regulate the pressure of responsibility but it is not normally intense.

Selection of work methods is not within their power except in varying reading times. Control over quality and quantity of production is a part of their scope of influence in the prevention and quick detection of errors in the production process.

Operators cannot leave the plant during their shift. Control rooms are equipped with ovens and refrigerators for meals. Movement is not as limited as first impression indicates. Operators can leave the control room at any time to smoke (smoking in the control room is prohibited due to the high inflammability of the products) or otherwise take a break. Only the number one operator is severely restricted to the control room and he can leave when the number two operator is in the unit. Additional freedom of movement is

interjected as part of the operator's job: at frequent intervals he leaves the control room to check the production unit(s) outside.

Upon entering a control room one can regularly expect to see at least two or three operators talking together. Since they are free during intervals between reading, much time can be spent interacting, reading, smoking, or eating. One question asked operators if they enjoyed their work more than their leisure time. To get clarification, one refinery operator queried: "do you mean leisure time on the job or off the job?"

A challenge is provided operators via the considerable responsibility they carry for the smooth functioning of the production process and the quick detection and correction of malfunctions. An oil refinery control room is manned by only a few operators. At Circle Oil control rooms were typically staffed by seven operators. Each operator is assigned a bank of dials and gauges which indicate flows, pressures and temperatures of the various derivative products of crude oil as they are processed. Operators are classified from one to seven and are promoted in a numerically ordered fashion. The number one operator knows all the operator jobs below him since he has held them all in the past. A number six operator has held all jobs below him and so on down the line. Presence of these job gradations probably militates against feelings of normlessness. If an

operator does a good job he usually moves to the next level operator when a vacancy occurs. Also because any level operator had held all the control room jobs below him and anticipates operator levels ahead of him, meaninglessness is reduced. Since the production system is integrated, mistakes in one part of the process affect large portions or all of the operations. Operators may act in concert during emergencies or have ample exposure to what others in the control room are contributing to the production process.

Powerlessness, Meaninglessness and Normlessness: Craftsmen

Maintenance journeymen are certified by the union normally after serving a three or four year apprenticeship. Consequently, they are highly skilled workers as measured by their degree of manual dexterity, exercise of judgment and length of time required to learn thoroughly their trade. Maintenance craftsmen are generally issued a list of jobs at the day's beginning. From that point they enjoy a high degree of freedom from direct supervision and have wide latitude in the dispensation of their work time. Their work implements are hand tools which permit them to control their work pace and to regulate the degree of pressure to suit their personal needs. Sometimes they do work under conditions of emergency since their ultimate function is to make repairs so that production continues unabated.

Assignment of several jobs daily means that maintenance craftsmen face a variety of work situations requiring application of a body of knowledge and skills they possess. It is within their power to control the quantity of work they do. They are not normally rushed so that they can devote attention to quality. Each type of job is fairly well specified with regard to the requisite steps for completion. More importantly, however, they are free to choose the appropriate tools, materials and work methods from a backlog of experience. Such decisions are made often to match the frequently changing job assignments.

Since skilled maintenance personnel have a number of jobs on any given day, their ability to move freely about the plant is considerable. Opportunities for social interaction are frequent in the shop area itself. Often, a given job demands, whether for technical or craft boundary maintenance reasons, men from several crafts. One expected result is that maintenance craftsmen will know a great deal about the operation of the larger plant.

Normlessness among craftsmen is expected to be low as Chinoy's comment indicates:

> Pull and connections were widely looked upon as the major supplements to or alternatives for merit and ability as prerequisites for foremenship, although, it should be noted, this view seemed to be less prevalent among skilled workers whose technical competence, initiative, and leadership could be more readily appraised.[1]

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[1]Chinoy, op. cit., p. 54.

Occupational Status, Instrumental Work Orientation, Self-Evaluative Involvement and Isolation from the Work Organization

Assumption 3

Status recognition constitutes social support from the social environment for positive self-evaluation and therefore tends to prevent alienation.[1]

Assumption 4

Status recognition is most likely where a person has some control over the activity in which he is engaged (powerlessness dimension), can achieve given goals by socially approved behaviors (normlessness dimension) and can predict the outcomes of his behavior (meaninglessness dimensions).

Assumption 2

The degree of powerlessness, meaninglessness and normlessness vary directly with the degree of differentiation in the division of labor at work.[2]

Proposition 1

"Alienation" from work is more likely to occur where the division of labor at work is highly differentiated.

a. Self-evaluative involvement is more likely to occur in activities where status recognition can be maintained.

b. Social isolation is less likely to occur where there is self-evaluation in terms of the activity in which the person is involved with others.

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[1]Assumptions 3 and 4 and proposition 2 are built upon the assumptions and propositions of self theory developed in Chapter II.

[2]This assumption has been discussed on pp. 68ff. prior to assumptions 3 and 4. This was because powerlessness, meaninglessness and normlessness come first in the order of discussion of the variables. However, logically, assumption 2 fits in the order above.

c. Activities are more likely to be perceived as instrumental where there is no self-evaluation in terms of the activity and where social isolation is high.

A major inference from Blauner's research is that within a general occupational status level (where social prestige is fairly uniform across occupations) there are differences with respect to the degree of powerlessness, meaninglessness, social isolation and self-estrangement among workers. This suggests that some lower status jobs may have characteristics which promote occupational involvement while others of nearly equal social prestige do not.

Faunce[1] suggests that higher status occupations more often than lower status occupations have work roles which involve: (1) skill and personal responsibility; (2) clear specification of the meaning of role performance and appropriate sanctions; (3) a role which is part of a sequence of increasingly prestigeful roles; (4) a high ratio of more to less prestigeful positions within the occupation or work organization; (5) where the audiences evaluating role performance have prescribed frames of normative and comparative reference, are large and prestigeful, are homogeneous with respect to criteria of evaluation and are able to frequently

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[1]William A. Faunce, "Occupational Involvement and the Selective Testing of Self-Esteem," Paper read at the annual meetings of the American Sociological Association, 1959, p. 8.

evaluate performance. According to Faunce, where these attributes exist, whether in high or low status occupations, the work role is likely to be a significant referent by which a man evaluates himself.

One body of literature compares attitudes toward work across situses, mainly along a manual-nonmanual occupational demarcation. This literature suggests that higher status occupations are more likely to be valued for their intrinsic aspects than is the case among lower status occupations.

Lyman[1] was concerned with the relationship between differences among socio-economic groups with respect to the value placed on various aspects of work. Her central hypothesis was in line with other studies: lower socio-economic groups tend to emphasize economic aspects of work (extrinsic rewards) more than upper socio-economic groups, while upper socio-economic groups are more likely to emphasize satisfaction in intrinsic aspects of work. She concludes that there are occupational differences in the value attached to various aspects of work. Blue-collar workers emphasized the physical nature of work, economic rewards, conditions of

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[1]Elizabeth Lyman, "Occupational Differences in the Value Attached to Work," American Journal of Sociology, LXI (September, 1955), 138-144.

work and cleanliness. Jurgensen[1] found that mechanical workers ranked job aspects in this order: security, advancement, type of work. Sales and clerical workers ranked in order: type of work, advancement and security. Economic rewards received a higher rank among the mechanical than among the white-collar workers. In a similar study Lindahl[2] asked factory and office workers to compare ten job aspects. Office workers gave the highest average rank to interesting work. Security was accorded the highest average rank by factory workers. A nationwide study conducted by Centers[3] indicated among those satisfied with their jobs, manual workers were less likely than business, professional and other white-collar respondents to mention a feature of the work itself as a reason for liking their jobs. A larger proportion of manual workers mentioned economic rewards. In a nationwide survey, Hyman[4] asked this question: "what

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[1]Clifford E. Jurgensen, "Selected Factors Which Influence Job Preference," Journal of Applied Psychology, XXXI (December, 1947), 553-564.

[2]Lawrence G. Lindahl, "What Makes a Good Job," Personnel, XXV (January, 1949), 263-266.

[3]Richard Centers, "Motivational Aspects of Occupational Stratification," Journal of Social Psychology, XXVIII (November, 1948), 187-217.

[4]Herbert H. Hyman, "The Value Systems of Different Classes: A Social-Psychological Contribution to the Analysis of Stratification," Class, Status, and Power, ed. by Reinhard Bendix and Seymour Lipset (Glencoe, Illinois: The Free Press, 1953), pp. 426-442.

do you think is the most important single thing for a young man to consider when he is choosing his life's work?" A smaller proportion of respondents in the higher income levels mentioned economic benefits. Morse and Weiss,[1] in a study of the functions of work, found that persons in middle class occupations typically emphasized the interest their jobs held for them and the sense of accomplishment they derived from work. Working class respondents tended to equate work with activity which served to occupy their time. Riesman and Bloomberg[2] see leisure activities as alternatives for status comparisons among working class people whose jobs do not permit mobility up an occupational prestige hierarchy. Blum's[3] study of packing house workers indicates that where jobs do not permit self-expression workers turn to economic rewards and the off-the-job uses to which these rewards can be put. Dubin[4] found that for the majority of industrial workers work and the work place were not central life interests measured in terms of informal group experiences and personal satisfactions. Rather, they look outside of work for intimate human relationships

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[1]Morse and Weiss, op. cit.

[2]Reisman and Bloomberg, op. cit.

[3]Fred H. Blum, Toward a Democratic Work Process (New York: Harper, 1953).

[4]Dubin, op. cit.

and for feelings of enjoyment, happiness and worth. Workers life interests had moved from work to the community. On the other hand, Orzack,[1] in a study of nurses, concluded that for professionals, work is a focal point for self-identification and is both important and valued. While Dubin found that three-fourths of industrial workers did not view work and the social relations at work as central life interests, Orzack found that among nurses, four-fifths considered work itself and social relations at work to be central life interests. Mills[2] contends that work is not considered as an end in itself among lower white-collar and industrial blue-collar workers.

In his earlier, more philosophical writings, Marx started with the basic economic fact of the separation of labor from ownership. Separation from the means of production resulted in the worker's separation from his labor, his fellow man and finally himself. To lose control over work is to become alienated. In the process of the objectification of labor, the worker loses the ability to express himself in work. Such "self-estrangement" is, then, the central kernal of alienation for Marx. Some of Marx's comments on the alienation of labor have a familiar ring in light of

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[1]Louis H. Orzack, "Work as a 'Central Life Interest' of Professionals," Social Problems, VII (Fall, 1959), 125-132.

[2]C. W. Mills, White Collar (New York: Oxford University Press, Inc., 1951).

contemporary writings on work and leisure. In one paragraph Marx states what he means by the alienation of labor:

> the work he performs is extraneous to the worker, that is, it is not personal to him, is not part of his nature; therefore, he does not fulfill himself in work, but actually denies himself; feels miserable rather than content, cannot freely develop his physical and mental powers, but instead becomes physically exhausted and mentally debased. Only while not working can the worker be himself; for while at work he experiences himself as a stranger. Therefore only during leisure hours does he feel at home, while at work he feels homeless. His labor is not voluntary, but coerced, forced labor. It satisfies no spontaneous creative urge, but is a means for the satisfaction of wants which have nothing to do with work.[1]

Capitalist economic institutions, then, reduce manual work to an instrumentality.

Chinoy develops a similar thesis in his study of the automobile worker, the prototype of the factory worker. In a success-oriented society holding a job which does not permit the development and maintenance of self-esteem holds special problems. One consequence may be to shift the context of success from work itself to tangential aspects of work and/or the activities outside the work place. Chinoy found that the automobile workers he interviewed made a defensive effort to stem frustration and self-depreciation by assigning to success on the job a less important place in

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[1]Karl Marx, "Alienated Labor," Man Alone: Alienation in Modern Society, ed. by Eric Josephson and Mary Josephson (New York: Dell Publishing Co., 1962), p. 97.

their scheme of values. For these factory workers ambition and advancement at work were replaced by the pursuit of security, small goals in the factory, accumulation of consumer goods and displacement of aspirations on their children. Some workers did aspire to independence in the form of small businesses and farming. Chinoy contends that these aspirations represented an opportunity to gain what they could not achieve in the factory, that is, a well developed sense of self-esteem. Among the comments made by Chinoy's workers were that what mattered most was "happiness--and you don't need a lot of money for that" and that what counted most was "the kind of person you are and not how much money you have."[1] The nature of factory work, according to Chinoy, is making leisure more important as work declines as an arena for self-evaluation. Work becomes valuable primarily in terms of what it can provide monetarily. The earlier Marx argued for polytechnical training for the attainment of meaning in life. Meaning could come only through work. Productive labor, he felt, was a "first necessity of life." Later Marx changed his emphasis to the attainment of freedom outside of work as he saw the specialization of labor winning in the industrial revolution. Interestingly enough, Chinoy comes to this same conclusion:

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[1]Chinoy, op. cit., p. 127.

> This changing emphasis, which plays down the values of production and stresses the values of consumption, is both a consequence and a completion of workers' alienation from their labor. Since leisure is becoming the major area of self-fulfillment, the job becomes increasingly instrumental, and workers are tied to their jobs primarily by the cash nexus. Work in the factory, as a fifty-year-old machine-operator put it, is "just bread and butter," a necessary evil to be endured because of the weekly pay check.[1]

Summary

Literature in Chapters II and III lead to this framework. There is a tendency to choose for evaluating self those social contexts within which favorable self-images can be maintained. Alternative referents for self-evaluation are more prevalent in industrialized societies where status structures are multidimensional. In these societies self-esteem maintenance can be a selective process. Therefore, incumbents of roles where there is little social support for the maintenance of positive self-evaluative will tend to change their audience or criteria of evaluating self. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of differentiation in the division of labor at work (craft technology-low differentiation, mechanized technology-high differentiation, automated technology-low differentiation). Status recognition constitutes support from the social environment for

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[1] Ibid., p. 130.

positive self-evaluation. Status recognition is more likely where perceived powerlessness, meaninglessness and normlessness are not part of the social situation. The degree of powerlessness, meaninglessness and normlessness varies directly with the degree of differentiation in the division of labor. Hence, alienation from work is more likely to occur where the division of labor at work is highly differentiated. That is, self-evaluative involvement is more likely to occur in activities where status recognition can be maintained; social isolation is less likely to occur when there is self-evaluation in terms of the activity in which the person is involved with others; and activities are more likely to be perceived as instrumental when there is little self-evaluation in terms of the activity and when social isolation is high. Using some aspects of self theory, man-machine relationships, powerlessness, meaninglessness and normlessness are viewed as predisposing factors in the development of alienation.

Summary: Assumptions, Propositions and Hypotheses

Though involving some repetition, this section will attempt to summarize the arguments, relating the variables into propositions, stating the assumptions underlying the propositions and deriving hypotheses.

Self Theory

Assumption 1

The self arises from interaction with the social environment.

Assumption 1a

Maintenance of self-image requires support from the social environment.

Assumption 2

Persons strive to maintain positive self-evaluation.

Proposition 1

An actor tends to evaluate himself with regard to a social referent to the extent that he can maintain positive evaluations of himself and his actions in the system.

Assumption 3

In industrial societies where status structures are multidimensional self-esteem maintenance can be a selective process.

Proposition 2

If an actor's actions in a social system with a multidimensional status structure do not produce social support for the maintenance of positive evaluations of himself and his actions, he will tend to change the criteria by which he evaluates himself.

Technology, Status Recognition and Alienation

Assumption 1

There is a curvilinear relationship between the phase in the man-machine relationship (proceeding from non-mechanization to mechanization to automation) and the degree of differentiation in the division of labor (lower, higher and lower differentiation).

Assumption 3

Status recognition constitutes support from the social environment for positive self-evaluation and therefore tends to prevent alienation.[1]

Assumption 4

Status recognition is more likely where a person has some control over the activity in which he is engaged (powerlessness dimension), can achieve given goals by socially approved behaviors (normlessness dimension), and can predict the outcomes of his behavior (meaninglessness dimension).

Assumption 2

The degree of powerlessness, meaninglessness and normlessness vary directly with the degree of differentiation in the division of labor at work.[2]

Proposition 1

Alienation from work is more likely to occur where the division of labor at work is highly differentiated.

1a. Self-evaluative involvement is more likely to occur in activities where status recognition can be maintained.

1b. Social isolation is less likely to occur when there is self-evaluation in terms of the activity in which the person is involved with others.

1c. Activities are more likely to be perceived as instrumental when there is little self-evaluation in terms of the activity and when social isolation is high.

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[1]Assumptions 3 and 4 are logically tied to the assumptions and propositions developed from self theory.

[2]In the discussion of the literature this assumption preceded assumptions 3 and 4. In terms of logical order, however, assumption 2 follows assumptions 3 and 4.

Hypotheses

Man-machine relationships, predisposing factors and alienation.--1. There is a curvilinear[1] relationship between the phase in the man-machine relationship and the degree of powerlessness in work (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

2. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of meaninglessness in work (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

3. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of normlessness in work (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

4. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of self-evaluative involvement in the work role (higher among craft

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[1]The prediction of a curvilinear relationship is based on conceiving the three man-machine relationships as historical stages in the development of industrial technology (from non-mechanization to mechanization to automation). While all three types of technological production systems exist simultaneously today, they still represent stages in the development of technology as applied to industrial manufacturing.

production workers, lower among mechanized production workers and higher among automated production workers).

5. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of social isolation from the work organization (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

6. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of instrumental work orientation (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

Relationships among the dimensions of alienation.--

7. There is a negative relationship between the degree of perceived powerlessness, meaninglessness, normlessness in work and the degree of self-evaluative involvement in the work role.

8. There is a positive relationship between the degree of perceived powerlessness, meaninglessness, normlessness in work and the degree of social isolation from the work organization.

9. There is a negative relationship between the degree of perceived powerlessness, meaninglessness, normlessness in work and the degree of instrumental work orientation.

CHAPTER IV

PROCEDURES

Introduction

This chapter is partially devoted to describing some salient economic and organizational features of the automobile and continuous process industries.[1] Representativeness of the two work sites sampled will be highlighted in view of these defining characteristics of the larger industrial picture. Finally, the samples, methods of selecting respondents, techniques of data analysis, the interview instrument and index construction will be discussed.

The choice of industries for inclusion in this study was dictated by the need for samples tapping three man-machine relationships: craft-production (worker as a skilled artisan), mechanized production (worker as a machine operator) and automated production (worker as a machine monitor). Two industries, automobile manufacturing and oil refining, in combination, contained the types of workers needed for comparisons.

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[1]This discussion relies heavily on Blauner, "Alienation and Freedom," op. cit. See pp. 89-94 for the automobile industry and pp. 124-131 for continuous process industries. Only original sources will be footnoted.

The remarks which follow regarding the social organizational and economic characteristics of the automobile manufacturing and continuous process industries should be taken as conditions beyond technology which may affect worker attitudes. Interpretation of the findings may make use of this information, though these factors are not measured or tested as part of the dissertation design. The primary reason for discussing these characteristics in this chapter is to relate the broader industrial picture to the specific plants sampled as well as to identify some economic and organizational characteristics of the two industries.

Automobile Manufacturing and Continuous-Process Industries: Some Economic and Organizational Characteristics

Blauner discusses four factors imparting to industries their distinguishing character: technology, division of labor, social organization and economic structure. A comparative analysis of industries must look to these four variables.[1] Technology and division of labor are of central concern to this study and were discussed in detail in preceding chapters. A brief description of the two industries in terms of social organization and economic structure follows.

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[1]Blauner, Alienation and Freedom, op. cit., p. 10.

Social organization.--Social organization refers to the traditional bureaucratic models of industrial operation. Typically the automobile industry assembly plants are large-scale organizations. Around 55 percent of the automobile workers are employed in firms which exceed 2,500 employees.[1] The UAW local from which the craftsmen and final assembly samples were drawn, has a membership in excess of 10,000. The automobile samples may be considered representative in terms of organization size.

Continuous-process industries generally have large companies. Oil refining, in particular, is highly concentrated. However, on the average individual firms are not manned by as many workers as are automobile factories. Compared to 55 percent of automobile workers employed in factories with over 2,500 employees, only 28 percent of oil workers and 19 percent of chemical employees fall in this size plant. Two factors contribute to this distribution: automated technology diminishes the need for workers and companies attempt to decentralize.

Circle Oil and Refining Company does not vary substantially from this description. This company has experienced a rapid growth by merger since 1948, resulting in a number of holdings in several states. Still, Circle Oil is

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[1]Cited from U.S. Department of Labor, Occupational Outlook Handbook, 1959, p. 499.

an "independent" in the industry and can be best classified as a medium size organization.

The original refinery was chosen for this study. This complex includes two plants, an oil refinery and a petro-chemical plant. In regard to size, the No. 1 refinery employs approximately 176 production workers and the No. 2 refinery employs about 211 production workers.

Both plants in this refinery are decentralized. Unlike automobile factories, the units of production are quite small, scattered over a large area. Main units of production include four manufacturing control rooms and a boiler house. Additional job classifications include maintenance, pumpers, blenders and laborers.

Important for describing the organizational nature of Circle Oil are the persistent efforts of the company's founder to prevent bureaucratization up to his death in 1966:

> There was no attempt to establish "positions" with definite titles or clearly defined duties. In the early 1930's organization planning first took on importance. Observation of organization disadvantage experienced by other companies caused the founder to take a definite stand against the use of organization charts in his company. In spite of advice from new executives, external pressures to establish a clear-cut structure, and additional pressures resulting from increased size, the chief executive continued to oppose formal organization planning.[1]

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[1]Taken from a monograph on the managerial philosophy of the company founder.

This entrepreneur had little use for status systems and job descriptions among executives. He espoused a "flat" organization and short lines of authority.

Economic characteristics.--The "Big Three" automobile manufacturers are among the top corporations in the American economy. Vast economic expansion has continued throughout the first half of this century. Unprecedented profits were realized in 1965-66. However, there are several sources of economic instability. One source is the fact that the purchase of an automobile can be deferred. In times of economic recession the industry feels the impact. Secondly, marketing becomes an increasing problem as the industry becomes more successful. Thirdly, annual model changes require a short period when production is stopped.

Unemployment for the period 1958-61 was on the average higher for the automobile industry than for any other. Hence, automobile workers may be expected to experience a degree of insecurity due to the industry's sensitivity to prevailing economic conditions. Blauner reports that in Roper's 1947 survey, automobile workers were more concerned about job security than any other industrial workers.

Strong union organization helps to allay some of the insecurity through specific economic measures as well as the UAW's strong industrial relations position vis-á-vis the

auto makers. The economic position of the major auto manufacturers will not permit bankruptcy. Permanent loss of employment is not a likely prospect for the majority of workers in the industry. Particularly, older workers are protected from economic fluctuations by seniority. Moreover, the nature of unemployment is often periodic short layoffs or short work weeks.

Oil and chemical industries have experienced very rapid expansion. Measures of capital investment trends, total output and employment show these industries to be a dynamically growing segment of the manufacturing economy.

A high ratio of capital investment to employees places chemical and oil workers in an enviable employment situation. Continuous-process industries are the most technologically advanced, requiring relatively fewer workers to man operations. In oil refining, the capital investment per production worker is $110,000 while in total manufacturing the average is only $15,000. As a result, volume of production is not dependent upon the number of production workers but on the technical equipment. Fluctuations in the economy do not affect employment as is the case for automobile producing firms. The labor force at individual plants has already been pared to the minimum needs of operation. Labor in continuous-process industries is viewed as a fixed rather than a variable cost in production. This means that the basic labor force in a plant has very high job security.

In oil and chemicals, individual workers are responsible for very expensive technology and products. A mistake in an oil refining control room could result in damage to the technology, loss of a batch of products and loss of operating time far out of proportion to a mistake made by a worker on the assembly line. Management's interests in a stable labor force to man operations and maintain the plant enhances job security.

Excellent welfare benefits contribute to job security among oil and chemical workers. In these industries labor costs are small relative to capital investments. Fringe benefits and high wages therefore do not reach the cost proportions found in labor-intensive industries such as automobile manufacturing.

Roper's survey supports the idea that feelings about job security vary by industry. Among automobile workers 29 percent thought they were likely to be laid off in the next six months; 14 percent of all factory workers responded in the same direction. Only 2 percent of the oil and chemical workers indicated this (which represented the lowest percentage). The percentage distribution by industry in response to whether workers felt they could have their jobs as long as they wanted indicated the same trend. Out of sixteen industries, oil refining and chemicals had the highest percentage, indicating they could have their jobs as long as they wanted (92 and 94 percent, respectively). By

contrast, automobiles ranked fifteenth with 73 percent giving a positive answer.

Unemployment rates by industry, 1958-61, show an average of 13.4 percent for automobiles (the highest rate among 14 industries) compared to 3.8 percent among chemical workers (next to the lowest rate).[1]

In spite of the fact that Circle Oil is an "independent" in an industry characterized by larger firms, its economic success has been noteworthy: "Circle's ratio of net income after taxes to capital and surplus was consistently higher than the ratio for eighteen of the major companies and also higher than the ratio for nineteen independents except for the war years."[2] Economically, Circle Oil is favorably established in the industry.

Sample Selection

The respondent selection process for Circle Oil involved an attempted saturation sample of operators in the plant. Respondents were chosen on the basis of their relationship to a particular kind of production system, and technologically, may be considered representative of the oil

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[1]Cited from "1961 Statistical Supplement," Monthly Labor Review (Washington, D.C.: Government Printing Office, 1961), p. 3.

[2]Quoted from monograph on Circle Oil.

refining industry. Table 2 shows the size of the actual samples relative to the labor force at Circle Oil.

According to the seniority list dated December 31, 1966, the UAW local had an approximate membership of 12,000. Total number of workers on the assembly power controlled line was 1,252. Nearly half of this number did not conform to the man-machine relationship criterion, i.e., they performed jobs not directly on the final assembly line. The universe of final assembly workers in this plant was 690. Excluded from this number were those with less than a year's seniority. A table of random numbers was used to select a sample of 150 workers. Of this original sample 30 were legitimately eliminated leaving 120 to be interviewed. Those eliminated were either in military service, female, trainees, retired, or no longer working at the auto plant. The final sample (N = 120) is 17 percent[1] of the plant population of final assemblers.

Including employees in training, maintenance and engineering journeymen totaled 1,907. Journeymen in maintenance,[2] excluding apprentices, formed the universe for the

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[1]This percentage and the analogous one for maintenance craftsmen are approximate. They are based on totals which do not take into account people who should have been dropped from or added to the union list at the time the samples were selected.

[2]Skilled trades included pipefitters, welders, machine repairmen, electricians, millwrights, carpenters, tinsmiths and pneumatic tool repairmen.

Table 2. Samples by company and job

Phase in the Man-Machine Relationship	Job Classification	Circle Oil						Auto Plant			Total Number Interviewed
		Plant # 1			Plant # 2						
		Total* Sample	Number and % of Sample Interviewed		Total Sample	Number and % of Sample Interviewed		Total Sample	Number and % of Sample Interviewed		
		No.	No.	%	No.	No.	%	No.	No.	%	
Craft Production	Craftsmen	...	...	...	...	...	...	143	117	82	117
Automated Production	Monitors	32	20**	63	77	72	94	...	...	...	92
Mechanized Production	Final Assembly Line Workers	...	...	...	...	...	...	120	96	80	96
											N = 305

*The total sample for Circle Oil means the entire labor force in the plant fitting the man-machine relationship. The total number of workers in the UAW local was too large for saturation sampling. Two samples were randomly selected from among final assembly line workers and maintenance craftsmen.

**For Circle Oil discrepancies between the total number and the number actually interviewed are due to refusals or men sick during the period of data collection. Discrepancies for the auto plant sample are accounted for by refusals, persons sick, persons moved, or union members for whom no addresses were known.

plant (N = 573). By a table of random numbers a sample of 150 journeymen was selected. Seven of the 150 were eliminated since they were either retired, quit, deceased, or still apprentices. The actual sample (N = 143) constitutes a 25 percent sample of the plant population of maintenance craftsmen. Table 2 indicates the results of the sampling and interviewing process.

The data for this study were obtained from an interview schedule requiring approximately an hour to complete. Administration of the instrument to Circle Oil employees took place on the job. The UAW local union provided names and addresses of persons in the samples selected. Interviews were conducted in consenting workers' homes.

Analysis Design

In choosing techniques for data analysis the researcher is torn between practicality in terms of time and money and appropriateness in terms of the nature of his data. For the present study contingency analysis, zero-order correlation, partial correlation and multiple correlation will be used.

Correlation analysis, like any parametric statistic, presumes that certain assumptions are satisfied by the data. One assumption, met by the sampling procedures for the present study, is that of random or saturation selection.

Another assumption, which cannot be proved or disproved for these data, is that the variables are "normally" distributed in the population. An often cited assumption is that measures of the independent and dependent variables be at an interval level. However, there is little consensus on this criterion. Multiple correlation analysis was used for its advantage over cross tabulation in multivariate analysis.

Statistics and the Reason for Their Use

1. Contingency analysis.--Contingency analysis will be used for testing the hypotheses involving the predisposing factors, the aspects of alienation and the phases in the man-machine relationship. The phases in the man-machine relationship may be considered as an ordinal variable only in the sense that it represents historical stages in the development of technology in industry. This permits making predictions of curvilinear relationships. These hypotheses will be tested using chi-square as a test of the existence of association and the contingency coefficiency C as a measure of the degree of association.

2. Zero-order correlation.--This statistic will be used in examining the relationships of powerlessness, normlessness and meaninglessness taken singly to self-evaluative involvement, social isolation and instrumental work orientation.

3. Partial correlation.--Age, income and education were considered as factors which might produce spurious relationships. The correlation analysis described in (2) above will be done with the effects of age, income and education partialed out. Partials will also be used to determine the relative predictive power of the three disposing factors with regard to alienation.

4. Multiple correlation.--Part of the theoretical framework suggests that powerlessness, meaninglessness and normlessness are predisposing factors in the development of alienation. Multiple correlation analysis provides a way of ascertaining the predictive power of powerlessness, normlessness and meaninglessness with regard to the variation in self-evaluative involvement, social isolation and instrumental work orientation. In this part of the analysis age, income and education will also be considered as independent variables.

Index Construction[1]

For the present study this procedure was followed for making indexes of powerlessness, normlessness,

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[1]This description is patterned after the presentation of index construction found in F. B. Waisanen and Jerome T. Durlak, A Survey of Attitudes Related to Costa Rican Population Dynamics (American International Association for Economic and Social Development, San Jose, Costa Rica, 1966), pp. 101-115.

meaninglessness, self-evaluative involvement, social isolation and instrumental work orientation:[1]

1. A series of items included in the interview schedule were formulated on the basis of theoretical definitions. The initial criterion for item inclusion was "face validity."

2. Each item for each potential index was checked to make sure that the frequency of responses were adequately distributed along the continuum ("minimum" to "maximum" or "strongly agree" to "strongly disagree"). Preponderant overloading of responses into one end of the continuum robs the item of power to differentiate subjects.

3. Each item showing an adequate frequency distribution along the continuum of responses for any particular index was correlated with the sum of the scores of all the other items potentially to be included in the index. Any standard regarding the value of a product-moment correlation coefficient sufficient for inclusion is arbitrary. With a few exceptions, each item which showed a correlation with the sum of the other items below .30 was excluded.

4. Information regarding the internal consistency of an index is provided by size of the inter-item correlations.

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[1]The interview schedule containing the items forming the indexes is contained in Appendix 2.

Items attempting to measure powerlessness, meaninglessness and normlessness each contained a characteristic of work. For each characteristic respondents were to answer to what extent the characteristic existed in their job or company. Responses ranged from 1 ("minimum") to 7 ("maximum"). Scores on each item in any given index were merely summed. For example, eight items form the powerlessness index. Possible scores ranged from 8 (for persons answering "minimum" to all eight powerlessness items) to 56 (for persons responding "maximum" to all eight items). Self-evaluative involvement, social isolation and instrumental work orientation indexes were formed by answers to Likert type items. For example, the social isolation index contained 6 items so that possible scores went from 6 to 30. For chi-square analysis, index "scores" of 0 and 1 were assigned, broken as near the median as possible of each index score distribution.

Index of Powerlessness in Work

The items composing the powerlessness index refer to feelings of freedom and control on the job. Table 3 contains the inter-item correlations and correlations of single items to the sum of all the others. Looking at the latter first, the correlations are all substantial. The fact that all but item 4 have zero-order correlations near .60 or above indicates that some single factor is being measured.

Table 3. Inter-item correlations and item-total correlations: index of powerlessness in work

Item Description	Inter-Item Correlations*								Item-Total Correlations**
	1	2	3	4	5	6	7	8	
1. Perceived feeling that you can vary the steps involved in doing this job.	1.00***								.60
2. Perceived feeling that you can move from immediate area during work hours.	.46	1.00							.61
3. Perceived feeling that you can control how much work you produce.	.38	.46	1.00						.59
4. Perceived feeling that you can help decide on methods & procedures used in job.	.39	.26	.38	1.00					.46
5. Perceived feeling that you have influence over what happens to you at work.	.39	.44	.42	.44	1.00				.63
6. Perceived feeling that you can work ahead & take short rest breaks during work hrs.	.38	.48	.36	.21	.43	1.00			.55
7. Perceived feeling of freedom from close supervision while doing your job.	.42	.41	.38	.41	.54	.39	1.00		.59
8. Perceived feeling that you can increase or decrease speed at which you work.	.49	.46	.50	.27	.45	.47	.37	1.00	.62

*Product-moment correlations, with each item ranging from seven ("high powerlessness") to one ("low powerlessness").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

In the inter-item correlations all correlations are near .40 except for those involving item 4. Even in the case of item 4 only one correlation falls below .25 (correlation with item 6).

Index of Meaninglessness in Work

This index is concerned with the perceived connection of one's work to the jobs of others and to the larger organization. Except for item 3 ($r = .35$) and item 8 ($r = .41$) the correlations of single items with the sum of all other items are .50 or above (Table 4). As would be expected, the inter-item correlations (except those involving items 3 and 8) range from near .40 to .68. Items 3 and 8 were retained since the correlations were at least moderate and were statistically significant.

Index of Normlessness in Work

Normlessness questions were designed to measure the extent to which persons perceived mobility in their company to be based on ability. Excluding item 5 ($r = .31$) product-moment correlations of single items to the sum of other items ranged from .49 to .54 (Table 5). Inter-item correlations did not fall below .31 for any items and reached as high as .54 except for those involving item 5. Since the total number of items was not large and the correlation of item 5 to the sum of the others was above .30, the item was retained.

Table 4. Inter-item correlations and item-total correlations: index of meaninglessness in work

Item Description	Inter-Item Correlations*								Item-Total Correlations**
	1	2	3	4	5	6	7	8	
1. Perceived feeling of knowing how your job fits into total work organization.	1.00***								.63
2. Perceived feeling of knowing how your work contributes to company products.	.54	1.00							.50
3. Perceived feeling management gives workers enough information about what is going on in the company.	.20	.14	1.00						.35
4. Perceived feeling of knowing how your job fits into work of other departments.	.59	.46	.17	1.00					.69
5. Perceived feeling of knowing how your work affects the jobs of others you work with.	.46	.42	.11	.55	1.00				.53
6. Perceived feeling of knowing how your job fits with others jobs in the company.	.60	.48	.24	.69	.50	1.00			.70
7. Perceived feeling of learning a great deal about company while doing your job.	.37	.23	.19	.55	.40	.50	1.00		.50
8. Perceived feeling management gives workers enough information about what is going on in your department.	.26	.18	.58	.26	.16	.27	.19	1.00	.41

*Product-moment correlations, with each item ranging from seven ("high meaninglessness") to one ("low meaninglessness").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

Table 5. Inter-item correlations and item-total correlations: index of normlessness in work

Item Description	Inter-Item Correlations*					Item-Total Correlations**
	1	2	3	4	5	
1. Perceived feeling that people who get ahead in the company do not deserve it.	1.00***					.54
2. Perceived feeling that pull and connection get a person ahead in the company.	.45	1.00				.53
3. Perceived feeling that to get ahead in the company you would have to become a good "politician."	.31	.46	1.00			.49
4. Perceived feeling that getting ahead in the company is not based on ability.	.54	.38	.34	1.00		.54
5. Perceived feeling that people who get ahead in the company are usually just lucky.	.23	.17	.28	.25	1.00	.31

*Product-moment correlations, with each item ranging from seven ("high normlessness") to one ("low normlessness").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

Index of Self-Evaluative Involvement in the Work Role

An index of self-evaluative involvement was constructed to indicate the extent to which workers felt that the work role was a more important referent for evaluating self than activity in non-work spheres. During the interviewing the writer conducted it seemed that the most difficulty in comprehension was encountered on these items. Considering the importance that work is supposed to have to the American male, there may have been some ambivalence regarding the questions and hence inconsistency in answers from item to item. Somewhat lower product-moment correlations in both inter-item and item to sum of other items reflect this. Though some of the inter-item correlations were low (particularly in items 1 and 5) the correlations of single items to the sum of other items ranged from .29 to .49 (Table 6).

Index of Social Isolation from the Work Organization

Items in this index pertain to the degree of subscription to some of the goals and values of the work organization. Table 7 contains the correlations of individual items to the sum of other items. They ranged from .36 to .64. Except for items 3 and 6 the inter-item correlations vary from .41 to .60. Considering items 3 and 6 all inter-item correlations are above .25 and most of these approach .30 (with the exceptions of item 2 correlated with item 3 and item 3 correlated with item 6).

Table 6. Inter-item correlations and item-total correlations: index of self-evaluative involvement in the work role

Item Description	Inter-Item Correlations*					Item-Total Correlations**
	1	2	3	4	5	
1. You would like people to judge you for the most part by what you spend your money on, rather than by how you make your money.	1.00***					.31
2. Success in the things you do away from the job is more important to your opinion of yourself than success in your work career.	.33	1.00				.49
3. To you, your work is only a small part of who you are.	.25	.41	1.00			.43
4. If you had to choose, you would much prefer that others not judge you by the kind of job you hold, but rather by your off-the-job accomplishments.	.11	.29	.27	1.00		.39
5. The best description of who you are would not be based on the kind of job you hold.	.09	.18	.20	.38	1.00	.29

*Product-moment correlations, with each item ranging from five ("high self-evaluative involvement") to one ("low self-evaluative involvement").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

Table 7. Inter-item correlations and item-total correlations: index of social isolation from the work organization

Item Description	Inter-Item Correlations*						Item-Total Correlations**
	1	2	3	4	5	6	
1. The reputation of this company in the community is not very important to you.	1.00***						.64
2. Successful competition of this company with other firms is not important to you.	.49	1.00					.51
3. Only reason company's profits are important to you is that they affect money you make.	.33	.20	1.00				.36
4. Cutting the costs of this company is of little importance to you.	.44	.41	.31	1.00			.54
5. The quality of this company's products is not very important to you.	.60	.44	.32	.43	1.00		.61
6. This company does not have the right idea about what a fair day's work should be.	.33	.26	.15	.29	.29	1.00	.36

*Product-moment correlations, with each item ranging from five ("high social isolation") to one ("low social isolation").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

Index of Instrumental Work Orientation

Instrumental work orientation is a measure of the extent to which work is considered to be primarily a means to ends outside of work as opposed to experienced work activity as intrinsically meaningful. Table 8 contains the correlations of single items to the sum of other items which range from .38 to .48. Though some inter-item correlations fell below .30, all four items were included in the index (only these four items were contained in the interview schedule to measure this concept).

Table 8. Inter-item correlations and item-total correlations: index of instrumental work orientation

Item Description	Inter-Item Correlations*				Item-Total Correlations**
	1	2	3	4	
1. Your job is something you have to do to earn a living; most of your real interests are centered outside your job.	1.00***				.38
2. Money is the most rewarding reason for working.	.32	1.00			.44
3. Working is a necessary evil to provide things your family and you want.	.31	.38	1.00		.48
4. You are living for the day when you can collect retirement and do the things that are important to you.	.23	.27	.34	1.00	.38

*Product-moment correlations, with each item ranging from five ("high instrumental work orientation") to one ("low instrumental work orientation").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

In this chapter some economic and organizational characteristics of the automobile and continuous-process industries were presented. Also discussed were sample selection, analysis design and index construction. The following chapter contains the data analysis.

CHAPTER V

ANALYSIS

Introduction

In this chapter chi-square analysis is used to test the six hypotheses relating phases in the man-machine relationship to powerlessness, meaninglessness, normlessness, self-evaluative involvement in the work role, social isolation from the work organization and instrumental work orientation. Age, education and income are introduced into the tests of the hypotheses as control variables.

This chapter also reports the relationships between powerlessness, meaninglessness and normlessness as predisposing factors in the development of alienation (self-evaluative involvement, social isolation and instrumental work orientation). Statistical techniques include zero-order, partial and multiple correlations.

Relationships Between the Phase in Man-Machine Relationship and Powerlessness, Meaninglessness, Normlessness, Self-Evaluative Involvement Social Isolation and Instrumental Work Orientation

Hypothesis 1

There is a curvilinear relationship between the phase in the man-machine relationship and the degree

of perceived powerlessness in work[1] (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

A strong curvilinear relationship obtained between the phase in the man-machine relationship and the degree of perceived powerlessness on the job (Table 9). It is clear from the percentages that few craftsmen (19 percent) experience lack of freedom and control in their work. At the other extreme 93 percent of the assemblers feel a sense of

Table 9. Perceived powerlessness in work by phase in the man-machine relationship

Perceived Powerlessness in Work	Phase in the Man-Machine Relationship		
	Craft	Mechanized	Automated
High	19% (22)*	93% (89)	43% (40)
Low	81 (95)	7 (7)	57 (52)
Total	100% (117)	100% (96)	100% (92)

$X^2 = 117.14$, d.f. = 2, $P < .01$, $\overline{C} = .77$

*The observed frequency is in parentheses in this and subsequent tables.

[1]See Table 3, Chapter IV for the items comprising the powerlessness index.

powerlessness. For monitors, slightly more than half (57 percent) are on the low end of the powerlessness index. A sense of powerlessness at work is at a low point among craftsmen, extends to a high peak among assemblers, and among monitors descends to a point higher than craftsmen (a difference of 24 percent) but lower than final assembly line workers (a difference of 50 percent).

Hypothesis 2

> There is a curvilinear relationship between the phase in the man-machine relationship and the degree of perceived meaninglessness in work[1] (lower among craft production workers, higher among mechanized production workers, and lower among automated production workers).

It is apparent from Table 10 that the phase in the man-machine relationship is related in a curvilinear direction to perceived meaninglessness in work at a statistically reliable level. A slightly larger percentage of craftsmen (8 percent) are high on the meaninglessness index than monitors. Among assemblers three-fourths exhibit lack of knowledge of the relationship of their jobs to the rest of the organization. Forty-two percent of the craftsmen also rank high on meaninglessness.

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[1]See Table 4, Chapter IV for the index items.

Table 10. Perceived meaninglessness in work by phase in the man-machine relationship

Perceived Meaninglessness in Work	Phase in the Man-Machine Relationship		
	Craft	Mechanized	Automated
High	42% (49)	73% (70)	34% (31)
Low	58 (68)	27 (26)	66 (61)
Total	100% (117)	100% (96)	100% (92)

$X^2 = 32.96$, d.f. = 2, $P < .01$, $\overline{C} = .45$.

Hypothesis 3

> There is a curvilinear relationship between the phase in the man-machine relationship and the degree of perceived normlessness in work[1] (lower among craft production workers, higher among mechanized production, lower among automated production workers).

Table 11 attests to the curvilinear relationship between the phase in the man-machine relationship and the degree of perceived normlessness in work. Smaller percentage differences among the three types of workers indicates that this relationship is not as strong as in the first two hypotheses tested. Still, the result was significant at the .01 level. A greater percentage difference obtained between monitors and assemblers high on normlessness (36 percent

[1]The items composing the normlessness index are contained in Table 5, Chapter IV.

Table 11. Perceived normlessness in work by phase in the man-machine relationship

Perceived Normlessness in Work	Phase in the Man-Machine Relationship		
	Craft	Mechanized	Automated
High	52% (61)	63% (60)	36% (33)
Low	48 (56)	37 (36)	64 (59)
Total	100% (117)	100% (96)	100% (92)

$X^2 = 13.53$, d.f. = 2, $P < .01$, $\overline{C} = .30$.

compared to 63 percent) than for either of the other comparisons in the table. Slightly over half (52 percent) of the craftsmen were high on the normlessness index while 63 percent of the assemblers were similarly ranked. Normlessness appears to be more prevalent among the automobile workers regardless of their jobs (craftsmen: 52 percent, assemblers: 63 percent) as compared to the oil refinery monitors (36 percent).

Hypothesis 4

> There is a curvilinear relationship between the phase in the man-machine relationship and the degree of self-evaluative involvement in the work role[1] (higher among craft production workers, lower among mechanized production workers, higher among automated production workers).

[1] See Table 6, Chapter IV for the index items.

The hypothesized relationship with type of job was significant at the .05 level. Table 12 displays a curvilinear relationship. A 9 percent difference appeared between craftsmen and assemblers. A 9 percent difference obtains between craftsmen and monitors. The largest difference (18 percent) appeared in comparing monitors with assemblers.

Table 12. Self-evaluative involvement in the work role by phase in the man-machine relationship

Self-Evaluative Involvement in the Work Role	Phase in the Man-Machine Relationship		
	Craft	Mechanized	Automated
High	52% (61)	43% (41)	61% (56)
Low	48 (56)	57 (55)	39 (36)
Total	100% (117)	100% (96)	100% (92)

$X^2 = 6.22$, d.f. = 2, $P < .05$, $\overline{C} = .20$.

Hypothesis 5

> There is a curvilinear relationship between the phase in the man-machine relationship and the degree of social isolation from the work organization[1] (lower among craft production workers, higher among mechanized production workers, lower among automated production workers).

[1]The items used in constructing the social isolation index appear in Table 7, Chapter IV.

Disclosed in Table 13 is a strong curvilinear relationship supporting this hypothesis. In terms of percentages, slightly less than half of the craftsmen were highly isolated, 78 percent of the assemblers were so ranked, and a low 24 percent of the monitors were classified as highly isolated from the goals and values of the work organization.

Table 13. Social isolation from the work organization by phase in the man-machine relationship

Social Isolation from the Work Organization	Phase in the Man-Machine Relationship		
	Craft	Mechanized	Automated
High	48% (56)	78% (75)	24% (22)
Low	52 (61)	22 (21)	76 (70)
Total	100% (117)	100% (96)	100% (92)

$X^2 = 55.63$, d.f. = 2, $P < .01$, $\overline{C} = .57$.

Hypothesis 6

> There is a curvilinear relationship between the phase in the man-machine relationship and the degree of instrumental work orientation[1] (lower among craft production workers, higher among mechanized production workers, lower among automated production workers).

[1] Table 8, Chapter IV shows the items composing the instrumental work orientation index.

Reasonable evidence in favor of the hypothesis relating instrumental work orientation to phase in man-machine relationships is contained in Table 14. Instrumental work orientation was highest among assemblers (69 percent), lowest among monitors (29 percent) and in between among craftsmen (48 percent).

Table 14. Instrumental work orientation by phase in the man-machine relationship

Instrumental Work Orientation	Phase in the Man-Machine Relationship		
	Craft	Mechanized	Automated
High	48% (56)	69% (66)	29% (27)
Low	52 (61)	31 (30)	71 (65)
Total	100% (117)	100% (96)	100% (92)

$X^2 = 29.26$, d.f. = 2, $P < .01$, $\overline{C} = .43$.

Effects of Controlling for Age, Income and Education

Theoretically, age, income and education were expected to influence the proposed relationships. Age and income did show some effects. However, when education was held constant the relationships did not differ from those found in the uncontrolled tests. Controlled tests on age and income must be interpreted with caution. Due to the small number of cases and the overloading of assemblers in

the younger and lower family income categories, some cells involving assemblers contained as few as one case.[1]

Nearly two-thirds of the controlled runs remained significant at least at the .05 level and in most cases at the .01 level (see control analysis section of Table 15). With a few exceptions, a curvilinear pattern of relationship appeared in the controlled tests of the hypotheses. These exceptions cannot be explained by the theory developed in this dissertation but should be noted. Among lower income workers, there was a relationship different from the hypothesized curvilinear one between phase in the man-machine relationship and normlessness. The order of the percentage high on normlessness was low income craftsmen (92 percent), low income assemblers (63 percent), and low income monitors (60 percent). A similar relationship appeared among older workers with respect to normlessness. Fifty-two percent of older craftsmen were high on normlessness, as were 50 percent of the older assemblers and 35 percent of the older monitors (Table 7, Appendix A). Among lower income workers

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[1]Ninety-one percent of the assemblers have annual family incomes below $8,000. Only 21 percent of the craftsmen and 22 percent of the monitors fall in this category. Similarly, 90 percent of the assemblers are 35 years old or younger. Among the craftsmen 85 percent are older than 35 years as are 67 percent of the monitors. In short, assemblers are much more likely to be under 35 years of age and to have an annual family income under $8,000. Monitors and craftsmen are more likely to have a gross family income above $8,000 and be over 35 years of age (see Tables 1 and 2, Appendix A).

Table 15. Summary of the relationships between the phase in the man-machine relationship and powerlessness, meaninglessness, normlessness, self-evaluative involvement, social isolation and instrumental work orientation

	Uncontrolled Tests of Hypotheses				Controlled Tests of Hypotheses			
Dependent Variables	Chi-Square* Value	$\overline{C}$**	Degrees of Freedom	Significance Level	Controls	Chi-Square Value	$\overline{C}$	Significance Level
1. Powerlessness	117.14	.77	2	P < .01	Income			
					Low	67.50	.84	< .01
					High	12.34	.37	< .01
					Age			
					Young	55.77	.78	< .01
					Old	16.15	.43	< .01
2. Meaninglessness	32.96	.45	2	P < .01	Income			
					Low	10.45	.39	< .01
					High	3.96	.22	N.S.
					Age			
					Young	10.75	.39	< .01
					Old	6.04	.28	< .05
3. Normlessness	13.53	.30	2	P < .01	Income			
					Low	8.14	.35	< .05
					High	3.96	.22	N.S.
					Age			
					Young	6.52	.30	< .05
					Old	4.00	.22	N.S.
4. Self-evaluative involvement	6.22	.20	2	P < .05	Income			
					Low	14.26	.45	< .01
					High	1.50	.13	N.S.
					Age			
					Young	6.40	.30	< .05
					Old	.90	.10	N.S.
5. Social isolation	55.63	.57	2	P < .01	Income			
					Low	18.55	.51	< .01
					High	16.00	.42	< .01
					Age			
					Young	30.43	.62	< .01
					Old	9.41	.33	< .01
6. Instrumental work orientation	29.26	.43	2	P < .01	Income			
					Low	16.99	.49	< .01
					High	4.86	.25	N.S.
					Age			
					Young	23.67	.55	< .01
					Old	5.03	.24	N.S.

*N = 305 in all cases

**Coefficient of contingency corrected following Thomas C. McCormick, Elementary Social Statistics (New York: McGraw-Hill, 1941), pp. 207-208.

the percentage high on self-evaluative involvement followed this pattern: craftsmen 20 percent, assemblers 39 percent and monitors 75 percent (Table 9, Appendix A). Eighty percent of the lower income craftsmen were high on instrumental work orientation while the same was true of 69 percent of the lower income assemblers and 25 percent of the lower income monitors (Table 13, Appendix A).

In three other instances, the hypothesized curvilinear pattern of association appeared but the relative position of craftsmen and monitors changed as a result of controlling for income and age. Whereas, in the uncontrolled test, monitors had a lower percentage high on the dependent variable than craftsmen, in these three instances, lower income and younger craftsmen were lower on meaninglessness than monitors (Tables 5 and 6, Appendix A) and higher income craftsmen had a greater percentage on self-evaluative involvement than monitors[1] (Table 9, Appendix A). In all other instances, even where the relationship was not statistically significant, the hypothesized curvilinear pattern remained (see Tables 3-14, Appendix A for specific tables controlling on age and income).

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[1]In the case of lower income craftsmen and monitors the difference on high meaninglessness was 6 percent (44 versus 50 percent). Among younger craftsmen and monitors a 14 percent difference emerged on those high on meaninglessness. Four percent more higher income craftsmen were high on self-evaluative involvement than higher income monitors.

Age and income clearly exerted some influence upon the hypothesized relationships. Although all the controlled tests of the effects of man-machine relationship upon powerlessness and social isolation were significant at the .01 level, some of the relationships did not remain statistically significant in the case of meaninglessness, normlessness, self-evaluative involvement and instrumental work orientation. An explanation for these results is not contained within the theoretical framework developed in this study.

Of more importance is the systematic fashion in which age and income altered the degree of relationship found in all of the hypotheses tested. Except in the case of normlessness and self-evaluative involvement ($P < .05$) the relationships remained significant at the .01 level among lower family income and younger workers. In other words, the only nonsignificant relationships appeared among workers over 35 years of age and among workers with annual family incomes above $8,000.[1] Observation of the $\overline{C}$ values in Table 15 reveals that the degree of relationship found among younger and lower family income workers was nearly as strong or stronger than in the uncontrolled tests. Further, Table 15 indicates that in every instance the degree of relationship as measured by the $\overline{C}$ values is higher among younger

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[1]The relationship between age and income was substantial: $r = .54$.

than older workers and higher among workers with higher family income than among those with lower family income.

It appears that with higher family income and advancing age the impact of technology upon attitudes toward work is altered in the direction of reducing differences among workers in the three man-machine relationships. By examining the tables involved in controlling for age and income it can be seen why the degree of association is reduced among older and more affluent workers.[1] The most important observation about these tables, however, is that the reduction in the degree of association among older and higher income workers cannot be accounted for by systematic changes with age or increasing income for workers in any one man-machine relationship. That is, a large percentage difference between higher and lower income and older and younger workers occurred among assemblers in one instance and among monitors or craftsmen in another. The general pattern of the $\overline{C}$ values suggests, however, that intrinsic aspects of work related to production technology have a less differentiating affect upon the attitudes toward work of older and higher income workers.

While there is no single pattern of difference that explains the decrease in association between man-machine

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[1]These tables are contained in Appendix A, Tables 3-14.

relationships and alienation with older age and higher income, there appears to be a general decline in the sense of powerlessness, meaninglessness and normlessness and also in alienation from work among older and higher income workers. The pattern in the $\overline{C}$ values reported in Table 15 could, of course, appear irrespective of the direction of the relationship between age, income and alienation from work. The data suggest, however, that the direction of this relationship is inverse: older and higher income workers are, for the most part, less alienated. Percentage changes toward decreases in powerlessness, meaninglessness and normlessness among older and higher income workers occurred almost without exception within each man-machine relationship. The pattern of change in self-evaluative involvement, social isolation and instrumental work orientation among older and higher income workers, however, reflects some differences among man-machine relationships (Table 16 contains changes in the degree of alienation among older and higher income workers as compared to younger and lower income workers).

All percentage changes among older and higher income assemblers as compared to younger and lower income assemblers were in the direction of a reduction in the percentage high on the three aspects of alienation. Older assemblers were somewhat more ego involved in work than younger ones (by 8 percent), while higher income assemblers were considerably

Table 16. Differences in the degree of alienation from work between older and younger and between higher and lower income workers by phase in the man-machine relationship

Aspect of Alienation From Work	Phase in the Man-Machine Relationship					
	Craft		Mechanized		Automated	
	Older Than 35 Years	More Than $8,000	Older Than 35 Years	More Than $8,000	Older Than 35 Years	More Than $8,000
Self-Evaluative Involvement	-(10%)*	+(41%)	+(8%)	+(39%)	-(9%)	-(18%)
Social Isolation	-(16)	-(10)	-(12)	0	+(1)	-(8)
Instrumental Work Orientation	+(10)	-(41)	-(2)	-(2)	+(14)	+(6)

*Indicates a decrease in the percent high on the alienation measure; + means an increase in the percent high on the alienation measure; 0 means no percentage change.

more ego involved than lower income assemblers (by 39 percent). Older assemblers were less socially isolated than younger ones (by 12 percent). Higher income assemblers were no different with respect to social isolation than those with lower incomes. Older and higher income assemblers displayed only slight percentage reductions in instrumental work orientation (2 percent in each case). In summary, older and higher income assemblers had higher self-evaluative involvement in the work role than younger and lower income assemblers; older assemblers were less socially isolated than younger ones; and older and higher income assemblers were slightly less instrumentally oriented toward work. Alienation tended to decrease with age and income among assemblers.

Older craftsmen and monitors, however, showed decreases in the percentage high on self-evaluative involvement in the work role compared to younger workers (10 and 9 percent fewer, respectively). Higher income monitors also had a smaller percentage high on self-evaluative involvement than did lower income monitors (18 percent fewer). Self-evaluative involvement, however, increased among higher income craftsmen (41 percent). Older monitors and craftsmen showed increases in instrumental work orientation (10 and 14 percent) as did high income monitors (6 percent). Higher income craftsmen decreased in instrumental work orientation (41 percent). Percentage changes were in the direction of

reduced social isolation among older (16 percent) and higher income (10 percent) craftsmen. Social isolation increased minutely among older monitors (1 percent) and decreased among higher income monitors (8 percent).

When age and income were controlled there were differences in the degree of alienation and a reduction in the degree of association between the phase in the man-machine relationship and the predisposing factors to alienation as well as the three aspects of alienation. The important fact remains that nearly two-thirds of the controlled tests of the original hypotheses remained significant at least at the .05 level. While it is clear that age and income have some affect upon alienation independent of man-machine relationships, for the most part neither controlling for age nor income significantly affect the tests of the hypotheses. Controlling for education did not affect the results at all.

Effects of Powerlessness, Meaninglessness, Normlessness, Age, Income and Education on Alienation

The associations between man-machine relationships and powerlessness, meaninglessness and normlessness have been discussed. The affects of different man-machine relationships upon the three aspects of alienation from work have also been demonstrated. Effect of age, income and education on these relationships have been elaborated. The question remains: how much of the variation in alienation

can be accounted for by each of the predisposing factors to alienation (powerlessness, meaninglessness and normlessness) and how much by differences in age, education and income?

Hypothesis 7

> There is a negative relationship between perceived powerlessness, meaninglessness and normlessness and the degree of self-evaluative involvement in the work role.

Table 17 shows that powerlessness, meaninglessness and normlessness are all significantly and negatively related to self-evaluative involvement in the work role ($P < .01$). The correlations, however, are not high in any case (-.17, -.23, -.25). It is also evident in Table 17 that the relationship between powerlessness and self-evaluative involvement in the work role disappeared when income was partialled out (-.002). The relationship between these two variables remained significantly at the .05 level when the effect of age was partialled out (-.12). The correlation between meaninglessness and self-evaluative involvement remained significant at the .05 level when income was partialled out (-.12) and at the .01 level when age was partialled out (-.19). Normlessness and self-evaluative involvement in the work role were correlated at the .01 level when age and income were partialled out in turn (-.19, -.23).

Table 17. Predisposing factors to alienation and three aspects of alienation: zero-order and partial correlations

	Self-Evaluative Involvement	Social Isolation	Instrumental Work Orientation
Powerlessness	-.17	.46	.23
r with income partialled out	(-.002)	(.33)	(.09)
r with age partialled out	(-.12)	(.36)	(.21)
Meaninglessness	-.23	.49	.15
r with income partialled out	(-.12)	(.40)	(.04)
r with age partialled out	(-.19)	(.41)	(.12)
Normlessness	-.25	.34	.35
r with income partialled out	(-.19)	(.27)	(.30)
r with age partialled out	(-.23)	(.31)	(.34)

It can be observed from Table 17 that powerlessness, meaninglessness and normlessness, taken singly, do not account for a large percentage of the variation in self-evaluative involvement in the work role. This may be attributed to the fact that a number of factors in combination affect this and the other two aspects of alienation. A refinement of the analysis can be provided by multiple correlation. This statistic has the advantage of determining the

amount of variation in one dependent variable accounted for by the combination of several independent variables.

Some explanation is needed for interpretation of the multiple correlation tables. Independent variables are successively deleted on the basis of the partial correlations. The independent variable deleted first is the one with the lowest correlation with the dependent variable when all the other independent variables in the matrix have contributed all they can to the variation in the dependent variable. The last variable remaining is the one with the highest partial correlation with the dependent variable.

In Table 18 it can be seen that powerlessness, meaninglessness and normlessness in combination are moderately related to self-evaluative involvement ($r = .30$). The partials in Table 18 and the zero-order correlations in Table 17 indicate that the relationship is negative. Zero-order correlations between powerlessness, meaninglessness, normlessness and self-evaluative involvement were of this magnitude: -.17, -.23, -.25. Of the three, powerlessness is the least related to the dependent variable. The correlation between powerlessness and self-evaluative involvement disappears (.04) when meaninglessness and normlessness are partialled out (Table 18). Partials involving meaninglessness (-.17) and normlessness (-.20) when powerlessness is deleted indicate little difference in their power to predict variation in the dependent variable. Meaninglessness and

Table 18. The effects of powerlessness, meaninglessness and normlessness on self-evaluative involvement in the work role

Index Combinations	Variables in Order Deleted	R^2	R	Significance Level	Partial Correlation Coefficients	Significance Level
Powerlessness	No variable deleted	.0889	.2981	< .0005	-.04	.532
Meaninglessness					-.13	.023
Normlessness					-.19	.001
Meaninglessness	Powerlessness deleted	.0876	.2960	< .0005	-.17	.004
Normlessness					-.20	.001
Normlessness	Meaninglessness deleted	.0615	.2480	< .0005	-.25	< .0005

normlessness carry nearly equally most of the weight in explaining variation in self-evaluative involvement in the work role. Powerlessness and meaninglessness are moderately correlated (r = .52),[1] so that powerlessness had little independent affect upon self-evaluative involvement above meaninglessness.[2] Since meaninglessness is more highly related to self-evaluative involvement (r = .23) than powerlessness (r = .17), the partial correlation between powerlessness and self-evaluative involvement was quite low (.04) when the effects of meaninglessness and normlessness were taken into account.

Age, income and education were included along with powerlessness, meaninglessness and normlessness as independent variables in another multiple correlation analysis.

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[1]See Table 15, Appendix A for all the zero-order correlations among powerlessness, meaninglessness, normlessness, self-evaluative involvement, social isolation, instrumental work orientation, age, education and income.

[2]Blalock has this to say about interpretation of a multiple correlation matrix: "If we wish to explain as much variation in the dependent variables as possible, we should look for independent variables which are relatively unrelated to each other but which have at least moderately high correlations with the dependent variable. Put another way, if we have two highly interrelated independent variables, the second will be explaining essentially the same variations as the first since there will be considerable overlap. If they are uncorrelated, they will each explain a different portion of the total variation." See Hubert M. Blalock, Jr., Social Statistics (New York: McGraw-Hill Book Company, Inc., 1960), p. 348.

Since age and income were highly correlated (r = .54) and income was more highly correlated with self-evaluative involvement than age (r = .29 versus r = .13), Table 19 shows that age had little independent effect upon the dependent variable above income. As in Table 18, due to the high correlation between meaninglessness and powerlessness and the higher correlation between meaninglessness and self-evaluative involvement than between powerlessness and self-evaluative involvement, powerlessness contributed little to the total R above meaninglessness. After age and powerlessness were deleted there was little difference among the partials involving income, normlessness and education. Education had an independent effect since it was not related to income (r = -.05) or to normlessness (r = -.02). It may be concluded that all the variables contribute to the variation in self-evaluative involvement but the strongest independent effects were exercised by income, education and normlessness. A moderate multiple correlation between powerlessness, meaninglessness, normlessness, income, education, age and self-evaluative involvement exists (r = .38). This multiple correlation is an improvement over the simple correlations of any of the six independent variables with self-evaluative involvement.

Table 19. The effects of powerlessness, meaninglessness, normlessness, age, education and income on self-evaluative involvement in the work role

Index Combinations	Variables in Order Deleted	R^2	R	Significance Level	Partial Correlation Coefficients	Significance Level
Income	No variable deleted	.1424	.3773	< .0005	.22	<.0005
Powerlessness					.04	.478
Meaninglessness					-.12	.042
Normlessness					-.17	.003
Age					-.08	.185
Education					-.12	.033
Income	Powerlessness deleted	.1409	.3753	< .0005	.21	<.0005
Meaninglessness					-.11	.057
Normlessness					-.17	.004
Age					-.09	.116
Education					-.12	.029
Income	Age deleted	.1339	.3659	< .0005	.20	.001
Meaninglessness					-.09	.118
Normlessness					-.17	.003
Education					-.10	.074
Income	Meaninglessness deleted	.1270	.3564	< .0005	.24	<.0005
Normlessness					-.19	.001
Education					-.10	.083
Income	Education deleted	.1185	.3442	< .0005	.25	<.0005
Normlessness					-.19	.001
Income	Normlessness deleted	.0866	.2943	< .0005	.29	<.0005

Hypothesis 8

> There is a positive relationship between powerlessness, meaninglessness and normlessness and the degree of social isolation from the work organization.

It can be observed in Table 17 that moderate positive correlations were found between the degree of social isolation from the work organization and powerlessness (.46), meaninglessness (.49) and normlessness (.34). Partialling out first income and then age did not reduce the size of the correlations substantially. In all cases, the partials were significant at the .01 level.

In combination powerlessness, meaninglessness and normlessness showed a multiple correlation of .57 with social isolation from the work organization (Table 20). Partials in Table 20 and the zero-order correlations in Table 17 indicate that the relationship is positive. Partial correlations in the analysis contained in Table 20 suggest little difference in explanatory power among powerlessness, meaninglessness and normlessness. Introducing age, education and income into a multiple correlation analysis along with powerlessness, meaninglessness and normlessness added nothing substantial to the total R (see Table 21).

Table 20. The effects of powerlessness, meaninglessness and normlessness on social isolation from the work organization

Index Combinations	Variables in Order Deleted	R^2	R	Significance Level	Partial Correlation Coefficients	Significance Level
Powerlessness	No variable deleted	.3300	.5745	< .0005	.26	< .0005
Meaninglessness					.30	< .0005
Normlessness					.21	< .0005
Powerlessness	Normlessness deleted	.2980	.5459	< .0005	.28	< .0005
Meaninglessness					.33	< .0005
Meaninglessness	Powerlessness deleted	.2393	.4892	< .0005	.49	< .0005

Table 21. The effects of powerlessness, meaninglessness, normlessness, age, education and income on social isolation from the work organization

Index Combinations	Variables in Order Deleted	R^2	R	Significance Level	Partial Correlation Coefficients	Significance Level
Income					-.04	.461
Powerlessness					.18	.002
Meaninglessness	No variable deleted	.3408	.5837	< .0005	.27	< .0005
Normlessness					.21	< .0005
Education					-.09	.139
Age					-.08	.140
Powerlessness					.20	.001
Meaninglessness					.27	< .0005
Normlessness	Income deleted	.3395	.5827	< .0005	.22	< .0005
Education					-.11	.066
Age					-.09	.127
Powerlessness					.21	< .0005
Meaninglessness	Education deleted	.3345	.5783	< .0005	.28	< .0005
Normlessness					.22	< .0005
Age					-.08	.154
Powerlessness					.26	< .0005
Meaninglessness	Age deleted	.3300	.5745	< .0005	.30	< .0005
Normlessness					.21	< .0005
Powerlessness	Normlessness	.2980	.5459	< .0005	.28	< .0005
Meaninglessness	deleted				.33	< .0005
Meaninglessness	Powerlessness deleted	.2393	.4892	< .0005	.49	< .0005

Hypothesis 9

> There is a positive relationship between powerlessness, meaninglessness and normlessness and the degree of instrumental work orientation.

This hypothesis was upheld with low but significant ($P < .01$) correlations between instrumental work orientation and powerlessness (.23), meaninglessness (.15) and normlessness (.35). Partialling out age and income separately significantly reduced the relationships in two instances. The relationship between powerlessness and instrumental work orientation was not significant at the .05 level ($r = .09$) when income was partialled out (Table 17). The same thing was true of the relationship between meaninglessness and instrumental work orientation when the effect of income was removed ($r = .04$). Meaninglessness and instrumental work orientation were related at the .05 level when age was partialled out. In all other cases the correlations remained significant at the .01 level.

A multiple correlation of .38 gives moderate support to this hypothesis and the direction of relationship is positive. Examination of the zero-order correlations in Table 17 leads to the conclusion that of the three independent variables normlessness is more highly predictive of instrumental work orientation ($r = .35$) than either powerlessness ($r = .23$) or meaninglessness ($r = .15$). Table 22 presents evidence that neither powerlessness nor meaninglessness substantially

Table 22. The effects of powerlessness, meaninglessness and normlessness on instrumental work orientation

Index Combinations	Variables in Order Deleted	R^2	R	Significance Level	Partial Correlation Coefficients	Significance Level
Powerlessness	No variable deleted	.1447	.3804	< .0005	.15	.011
Meaninglessness					-.02	.726
Normlessness					.31	< .0005
Powerlessness	Meaninglessness deleted	.1444	.3799	< .0005	.16	.007
Normlessness					.31	< .0005
Normlessness	Powerlessness deleted	.1232	.3510	< .0005	.35	< .0005

increase the multiple correlation above the contribution of normlessness. Considering just powerlessness and meaninglessness, the former contributes more to the multiple correlation.

A multiple correlation analysis was run including age, income and education along with powerlessness, meaninglessness and normlessness (Table 23). Age was not correlated with instrumental work orientation ($r = .01$) and consequently contributed nothing in the multiple correlation analysis. Powerlessness and meaninglessness were highly related to each other ($r = .52$) and somewhat related to instrumental work orientation ($r = .23$ and $r = .15$, respectively). Meaninglessness therefore was deleted before powerlessness. However, since income was highly related to powerlessness ($r = -.57$) and meaninglessness ($r = -.41$) and more highly related to instrumental work orientation ($r = -.29$) than either powerlessness ($r = .23$) or meaninglessness ($r = .15$), powerlessness contributed little to the variation in the dependent variable above income. In sum, age, meaninglessness and powerlessness added minutely to the total R. Income, normlessness and education do not contribute substantially different amounts to the R. This is because normlessness, income and education are not highly intercorrelated but each is correlated with instrumental work orientation ($r = .35$, $r = -.29$ and $r = -.17$, respectively).

Table 23. The effects of powerlessness, meaninglessness, normlessness, age, education and income on instrumental work orientation

Index Combinations	Variables in Order Deleted	R^2	R	Significance Level	Partial Correlation Coefficients	Significance Level
Income	No variable deleted	.2009	.4482	< .0005	-.18	.002
Powerlessness					.07	.239
Meaninglessness					-.05	.411
Normlessness					.29	< .0005
Age					.03	.653
Education					-.18	.002
Income	Age deleted	.2004	.4476	< .0005	-.18	.002
Powerlessness					.06	.274
Meaninglessness					-.05	.369
Normlessness					.30	< .0005
Education					-.20	.001
Income	Meaninglessness deleted	.1982	.4452	< .0005	-.17	.003
Powerlessness					.05	.419
Normlessness					.29	< .0005
Education					-.19	.001
Income	Powerlessness deleted	.1964	.4431	< .0005	-.23	< .0005
Normlessness					.30	< .0005
Education					-.19	.001
Income	Education deleted	.1652	.4064	< .0005	-.22	< .0005
Normlessness					.30	< .0005
Normlessness	Income deleted	.1232	.3510	< .0005	.35	< .0005

Summary and Conclusions

This analysis yields reasonably strong support for the argument that the relationships men have to technology at work contribute to the degree of perceived powerlessness, meaninglessness and normlessness in work, the degree of self-evaluative involvement in the work role, the degree of social isolation from the work organization and the degree of instrumental work orientation. A substantial degree of association appeared in a curvilinear relationship between the phase in the man-machine relationship and perceived powerlessness in work.[1] Powerlessness had the lowest percentage among craftsmen, increased among assemblers and among monitors dropped below assemblers. Though the degree of association in the case of meaninglessness was not as high as for powerlessness,[2] the curvilinear relationship was marked. With regard to meaninglessness, craftsmen ranked lower than did assemblers. The percentage of monitors dipped below that of craftsmen. This identical curvilinear pattern held when normlessness was the dependent variable.[3] Again, monitors were lower on perceived normlessness than craftsmen or assemblers. And assemblers had a larger percentage on the high side of the index than craftsmen. From

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[1] $\overline{C} = .77$.

[2] $\overline{C} = .45$.

[3] $\overline{C} = .30$.

the statistical results it can be said, although with less confidence, that a relationship obtained between the phase in the man-machine relationship and the degree of self-evaluative involvement in the work role. Table 12 showed that the percentage differences, though small, followed the same curvilinear pattern.[1] Social isolation from the work organization or lack of subscription to company goals and values appeared to be strongly related to the phase in the man-machine relationship[2] in a curvilinear direction. The percentage socially isolated from the company was highest among assemblers. A precipitious decline in social isolation was manifested among monitors. Craftsmen fell in between. Instrumental work orientation by phase in the man-machine relationship revealed a pattern quite similar to social isolation.[3] Instrumental work orientation was higher among assemblers than among monitors. Again, craftsmen were in between.

A warranted conclusion is that both the potentially alienating conditions in work (powerlessness, meaninglessness and normlessness) and the three types of alienation (self-evaluative involvement in the work role, social isolation from the work organization and instrumental work

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[1] $\overline{C} = .20$.

[2] $\overline{C} = .57$.

[3] $\overline{C} = .43$.

orientation) were significantly associated in a curvilinear manner with the phase in the man-machine relationship. Confirmation is thus provided for Blauner's thesis. One contribution of the present research is that further specification is provided. While Blauner's design compared industries, specific man-machine relationships comprised the independent variable in the present study.

One quite important and new finding emerged from our data--oil refinery monitors consistently displayed less alienation than craftsmen. It may be that skilled workers in large organizations experience work differently than more independent craftsmen such as those in the construction industry or the typographers included in Blauner's study.

Education as a control variable had no effect upon the relationships. For the most part, controlling separately on age and income did not alter the findings: nearly two-thirds of the controlled tests involving age and income remained significant. In all cases, however, the degree of relationship decreased among workers with an annual family income above $8,000 and among workers over 35 years of age. Among lower income and younger workers the degree of relationship remained nearly the same as in the uncontrolled tests. Also, the tests which proved not to be statistically significant involved in every instance higher income and older workers. It appears, then, that higher income and

advancing age exercise some affect upon the attitudes contained in the dependent variables. The direction of influence is toward a decrease in the attitudinal differences between workers in different man-machine relationships.

Further analysis revealed that the decrease in the degree of association was not accounted for by change among workers in any one man-machine relationship. Percentage changes among older and higher income workers sufficient to decrease the differences among the three types of workers occurred among monitors in some instances and among craftsmen or assemblers in others.

Though the decline in the degree of association between technology and the dependent variables was independent of man-machine relationships, there appeared to be some systematic affects when changes in the degree of alienation was examined by age and income. The main trends were that older and high income assemblers tended to become less alienated than younger and lower income assemblers. Older and higher income monitors tended to become less ego involved in the work role and more instrumentally oriented toward work. Higher income monitors were less socially isolated than lower income monitors. Older craftsmen were less ego involved in work, more instrumentally oriented toward work and less socially isolated. Higher income craftsmen were more ego involved in work, less socially isolated and less instrumentally oriented toward work.

In sum, assemblers tended to become less alienated with age and higher income. Older and higher income monitors tended to become more alienated than younger and lower income monitors with one exception. That is, higher income monitors were less socially isolated than lower income monitors. For craftsmen, the pattern was mixed. Older craftsmen were more alienated than younger ones (more like monitors) but higher income craftsmen were less alienated than those with lower income (more like assemblers).

It may be that with age (seniority) assemblers gravitate to the least alienating "positions" within the context of their particular man-machine relationship. Older assemblers may be shifted to the "best" spots on the line (i.e., one line job may involve three operations requiring several minutes while another requires only one operation taking seconds). These variations within this man-machine relationships are subtle but may be quite important to workers who see them as important in the context of the status structure in which they work. They do not constitute basic changes in the relationship of workers to technology.

Craftsmen and monitors apply essentially the same skills and perform nearly the same tasks throughout their work careers. Failing to experience improvements in work over time, craftsmen and monitors may tend to be somewhat more alienated from work as they grow older.

It should be noted that while controlling for age and income revealed increased alienation among workers in one man-machine relationship and decreased alienation in another, the same curvilinear pattern of differences found in the uncontrolled tests of the hypotheses remained in about two-thirds of the controlled tests. Moreover, in only two of twelve possibilities did the curvilinear pattern found in the uncontrolled tests of the hypotheses disappear among older and higher income workers. These changes in the degree of alienation were not sufficient to alter the basic findings.

The next part of the analysis was an examination of the zero-order correlations between powerlessness, meaninglessness and normlessness and the three aspects of alienation. Significant zero-order correlations ($P < .01$) appeared between each of the predisposing factors to alienation and the three aspects of alienation (Table 17). Age, education and income were then partialled out individually. With a few exceptions[1] the partial correlations (adjusting for age, income and education) were statistically significant at least at the .05 level. In all but three instances[2]

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[1]Powerlessness and self-evaluative involvement, partialling out income, powerlessness and instrumental work orientation partialling out income, and meaninglessness and instrumental work orientation partialling out income.

[2]Powerlessness and self-evaluative involvement, meaninglessness and self-evaluative involvement and instrumental work orientation all with age partialled out.

the partials were significant at the .01 level (Table 17). In general, the relationships between powerlessness, meaninglessness and normlessness, considered separately, and the three dependent variables diminish somewhat when age is partialled out, diminish to a greater degree but remain statistically significant when income is adjusted for, and change minutely if at all when education is partialled out.

The results of the multiple correlation analysis are consistent with the theoretical expectation that perceived powerlessness, meaninglessness and normlessness in work tend to produce "alienation" from work. Workers who feel they lack freedom and control at work, fail to know the relationship of their work to the work of others in the organization and believe advancement in the company is not based on individual merit are likely to withdraw ego from work, be less concerned with company goals and values and view work as a means for pursuing non-work goals.[1]

It was apparent, however, that the predisposing factors exercised varying degrees of influence upon the variation in self-evaluative involvement in the work role.

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[1]Lack of ego involvement in the work role is likely to produce lack of subscription to company goals and values ($r = .36$). A smaller correlation suggests that the greater the involvement of self in the work role the less likely is work to be viewed as merely instrumental ($r = -.23$). There is good evidence ($r = .42$) that the less the commitment to organizational goals and values the less the likelihood that work will be a consummatory experience.

Powerlessness explained no significant variation above meaninglessness and normlessness. There was little difference in explanatory power between the latter two factors (Table 18).

There was not much difference in the ability of powerlessness, meaninglessness and normlessness to explain variation in social isolation from the work organization (Table 20).

Meaninglessness explained virtually no variation in instrumental work orientation above powerlessness and normlessness. And normlessness explained more of the variation in this dependent variable than did meaninglessness (Table 22).

Adding income, age and education to the predisposing factors in multiple correlation matrices indicated that these control variables in some instances exerted influence upon alienation above the effects of powerlessness, meaninglessness and normlessness. Powerlessness and age had little affect upon self-evaluative involvement above the other four variables. Income and normlessness explained the most variation and were nearly equal in their explanatory power (Table 19).

The control variables contributed little toward explaining variation in social isolation from the work organizations above the three predisposing factors (Table 21).

Age, meaninglessness and powerlessness added minutely to the variation in instrumental work orientation above income, normlessness and education. These latter three factors contributed similar amounts to the variation in this dependent variable (Table 23).

In combination age, education, income, powerlessness, meaninglessness and normlessness are moderately correlated with self-involvement in the work role ($r = .37$), isolation from the work organization ($r = .58$) and instrumental work orientation ($r = .45$). Still, the percentage of variation in the dependent variables explained by all six independent variables is not large. There must exist in the social world of these workers other factors which, in concert with powerlessness, meaninglessness, normlessness, income, education and age, produce varying degrees of alienation from work. For this reason, rather than to claim "causality," it is better to conclude that the independent variables isolated for the present study <u>contribute</u> to variation in the dependent variables. The six independent variables may or may not be necessary causes (only additional tests of the hypotheses can answer this) and the results suggest that they are not sufficient causes of these three aspects of alienation. The data indicate significant covariation among the variables but to test the processual relationships among these dimensions requires a longitudinal design. In this manner something could be said about the causal order of the

variables. That is, whether or not the phase in the man-machine relationship, overtime, leads to variations in perceived powerlessness, meaninglessness and normlessness, which, in turn, promote withdrawal of self-evaluative involvement in the work role, social isolation from the work organization and an instrumental orientation toward work. Study of the causal sequence in the development of these attitudes toward work would be an important next step in this area.

CHAPTER VI

SUMMARY AND IMPLICATIONS

Introduction

Large-scale business organizations are premised on a highly developed division of labor or occupational specialization which in turn is founded on a highly developed technological system. One positive contribution of this complex technological base and its accompanying occupational specialization has been its unprecedented potential for increasing productivity. However, since the beginning of the industrial revolution, attention has also been focused on problems produced by the impact of these factors upon workers, skill requirements and meanings in work.

The movement of mechanization has been from a production system with skilled workers fashioning a total product to an assembly line principle where workers become at best semiskilled, making minute contributions to the total production process. Automation appears to introduce a further alteration in the relationship between worker and technology. Workers in highly automated industries such as chemicals or petroleum find themselves responsible for production under a technology which is complex and delicate.

Errors become increasingly large, apparent and costly; quality control is more important. A great part of the significance of highly automated technology is its ability to permit integration of steps in the production process. One consequence is that the same or even greater output is possible with a reduction in both the amount and division of labor, but with an increase in the amount of responsibility required of workers.

Guiding this study was the central question "does a worker's unique relationship to technology engender in him a set of feelings about work distinguishable from the experience of others laboring under other technological systems?" For this study three man-machine relationships were sampled--craft, mechanized and automated. Variations in some social psychological experiences regarding work were examined through comparisons of these three man-machine relationships.

Studies on occupational status and meanings in work permit the conclusion that lower status occupations are less likely to be intrinsically valued by incumbents (instrumental work orientation), that self-esteem is more difficult to maintain and evaluation of self is likely to be withdrawn from the work role (self-evaluative involvement), and that loyalty to company goals and values is less prevalent (social isolation). These attitudes reflect lack of freedom and control (powerlessness), relative absence of feeling of connection of one's job to the work of others or to the

products of the larger organization (meaninglessness) and the belief that occupational advancement is based on criteria other than merit (normlessness).

Linkage was made between the literature on occupational status and man-machine relationships. Jobs in a mechanized production system (in this case automobile workers on the final assembly line) have characteristics of lower social status jobs. They permit little freedom or control, minute specialization robs the job of meaning and a flattening of the occupational structure precludes advancement. More similar to higher status jobs in these respects are those in craft (maintenance craftsmen in an automobile factory) and automated (oil refinery control room monitors) production systems.

One set of attitudes toward work relates to experiences flowing from the technical and social organization of work: powerlessness, meaninglessness and normlessness. These attitudes do not constitute "alienation"--which itself implies withdrawal or separation--but are conditions which promote alienation from the work role and the work organization. Alienation from work is used in three senses: removal of evaluation of self from the work role (withdrawal of self-evaluative involvement), lack of commitment to certain organizational goals and values (social isolation from the work organization) and the separation from work as a source of consummatory experiences (instrumental work orientation).

From the theoretical framework, then, two sets of hypotheses were formulated:

Man-Machine Relationships, Predisposing Factors to Alienation and Alienation

1. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of powerlessness in work (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

2. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of meaninglessness in work (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

3. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of normlessness in work (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

4. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of self-evaluative involvement in the work role (higher among craft production workers, lower among mechanized production workers and higher among automated production workers).

5. There is a curvilinear relationship between the phase in the man-machine relationship and the degree of social isolation from the work organization (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

6. There is a curvilinear relationship beween the phase in the man-machine relationship and the degree of instrumental work orientation (lower among craft production workers, higher among mechanized production workers and lower among automated production workers).

7. There is a negative relationship between the degree of perceived powerlessness, meaninglessness and normlessness in work and the degree of self-evaluative involvement in the work role.

8. There is a positive relationship between the degree of perceived powerlessness, meaninglessness and normlessness in work and the degree of social isolation from the work organization.

9. There is a negative relationship between the degree of perceived powerlessness, meaninglessness and normlessness in work and the degree of instrumental work orientation.

Alienation Conditions in Work: Powerlessness, Meaninglessness and Normlessness

A strong curvilinear relationship obtained between the phase in the man-machine relationship and perceived powerlessness. Freedom to do such things as vary the steps involved in the job, move from the immediate work station during work hours, or increase or decrease the speed at which one works was the most prevalent among craftsmen. Several years of apprenticeship service instills in craftsmen a body of technical knowledge, manual dexterity and the ability to exercise judgment in the course of performing their work. Since knowledge, dexterity and judgment are vested in the mind and hands of the workmen rather than in the technology, skilled maintenance workers enjoy considerable control over selection of work methods, pace at which they work, time, quality and quantity of production and physical movement. Among assemblers only a small percentage indicated that freedom and control were part of their daily work experience. Mechanical control of the work pace, repetitiveness and lack of skill requirement deprives workers on the assembly line of freedom and control. Part of the logic of the assembly

line is to reduce the contribution made by individual workers and to fit workers to the requirements of the technology. Stoppage of the line is cited as a source of joy among assemblers primarily because of its infrequency. The inexorable march of partially completed automobiles demanding another part from the next man on the line precludes the exercise of control and feelings of freedom. Monitors fell between assemblers and craftsmen in the claim that their jobs permitted freedom and control. The primary task among monitors is to record readings from control room indicators at pre-set intervals. Confinement within an area near the control room is part of the nature of their job. Even meals must be taken in the control room since workers cannot leave the plant during their shift. However, close observation of their daily work routine belies the conclusion that freedom and control are denied them at work. Within safety limits, readings both inside and outside the control room, can be varied at their discretion. In this limited sense, they can vary their work procedures. Control over quality and quantity of production is theirs in the sense that they can prevent excessive loss of petroleum products and minimize "down time" by detecting malfunctions while making readings and acting swiftly and accurately during emergencies. Supervision is normally light except during emergencies.

Freedom of movement is not as restricted as it might appear at first. Breaks for smoking or fresh air can be taken in a shed provided outside the control room. Only the number one operator, who is responsible for the entire control room, is required to be physically present all of the time. Even so, he can leave the number two operator in charge. Also, part of the operator's job is to check periodically production units outside the control room.

Responsibility is more characteristic of their jobs than is manual work. Between readings monitors are free to dispense time as they see fit. Talking, reading or eating are common activities in the control room. Still the costliness of malfunctions and the potential danger to life and limb of volatile products keeps operators looking over their shoulders at their control banks frequently between regular readings.

With respect to meaninglessness, a curvilinear pattern of association was apparent. Knowledge of the relationship of one's job to the company products, work in other departments and jobs of work mates was more characteristic of monitors than craftsmen. Assemblers were considerably below both. Considering the minute contribution each assembler makes to the final product and the degree to which they are physically tied to their work areas, it was expected that they would experience little connection between their jobs and the work of others in the manufacturing of

automobiles. Craftsmen were expected to experience lower meaninglessness since they move around frequently as jobs are assigned throughout the factory. Also, though craft lines may preclude doing the jobs of other trades, a skilled worker may know the jobs of other craftsmen either by overlapping training or observation.

Oil refining control rooms require only a few operators. Technical and social interaction on the job promotes inter-job knowledge. Operators in Circle Oil were classified from one to seven and advancement went from number seven to number one operator. Each operator at a higher level knows all the operator jobs below him since he has worked at each of them earlier. Knowledge of jobs below and anticipation of operator levels ahead militates against meaninglessness. The production process is highly integrated. As a result the responsibility of one monitor is intimately linked to the jobs of others in the control room. The integrated nature of the production process, the small size of the work group, the frequency of technical and social interaction and the hierarchically ordered promotion scheme foster meaning in work among monitors.

Assemblers displayed the largest percentage of workers feeling that promotion in the organization was based on criteria other than merit, e.g., "pull and connection." Craftsmen were below assemblers in perceived normlessness.

It was among monitors that normlessness was experienced least.

Relative lack of perceived mobility opportunities among assemblers is due partly to the compressed wage scale and the small number of job classifications between which meaningful distinctions can be made. Lack of educational background blocks upward occupational mobility in the plant except for the generally undesirable position of foreman. And foreman positions are few relative to the size of the work force. Entrance into apprenticeship for a skilled trade is infrequent. Perhaps out of frustration, semi-skilled automobile workers designate "politicking," "pull and connection," or a host of other less genteel adjectives as the means of gaining promotion.

Craftsmen enjoy a higher hierarchical position in the factory. Below them are laborers, semiskilled personnel, apprentices and many others. They may not be able to aspire higher than a foremanship but they have already gained occupational distinction, however limited in the broader view. Also, gradations in technical expertise and initiative are more evident in skilled work.

In the case of monitors the next highest operator level is usually filled by the incumbent of the operator level immediately below it. Seniority and adequate performance go a long way to ensure promotion. In fact, monitors

have an advancement hierarchy before them more definite than skilled tradesmen.

Alienation From Work: Self-Evaluative Involvement, Social Isolation and Instrumental Work Orientation

It was theorized that differences in the possibility of securing social support for positive self-evaluation in work would lead to variations in ego involvement in the work role. Jobs characterized by powerlessness, meaninglessness and normlessness offer scant social support for self-evaluative involvement. Hence, assemblers were expected to exhibit lower self-evaluative involvement in the work role than either craftsmen or monitors. Similarly, when self-evaluative involvement is withdrawn from the work role, subscription to company goals and values was predicted to decline and instrumental orientation toward work to show an increase.

These hypotheses (4-9) were examined in two ways. First, chi-square tests were run to test for association between the phase in the man-machine relationship and self-evaluative involvement, social isolation and instrumental work orientation. Multiple correlation analyses were conducted to determine how much of the variation in these dependent variables could be accounted for by perceived powerlessness, meaninglessness and normlessness. Results of the chi-square tests will be presented first, followed by the multiple correlation analyses.

The particular pattern of the cuvilinear relationships between the phase in the man-machine relationship and alienating conditions in work (powerlessness, meaninglessness and normlessness) suggest that in assembly jobs potentially alienating conditions exist to a greater extent than for monitors or craftsmen. Consequently, if the same pattern of curvilinear relationship obtains between the phase in the man-machine relationship and types of alienation, indirect support is given to the hypothesis that where social support is not forthcoming, separation from the work role and work organization is likely.

A weak but statistically significant relationship was found between the phase in the man-machine relationship and self-evaluative involvement in the work role. The pattern of association was curvilinear with self-evaluative involvement lowest among assemblers, somewhat higher among craftsmen and highest among monitors. Similar, but stronger curvilinear relationships were apparent between the independent variable and social isolation from the work organization and instrumental work orientation.

These findings permit the conclusion that man's relationship to technology at work exerts an effect upon his attitudes toward his job and company that must not be ignored. The organization of work under which the assembler laborers produces greater alienation, in all three senses, than is true among craftsmen in the same organization.

Furthermore, work in an automated technological environment is the least likely to promote separation from the world of work.

Education as a control variable altered neither the degree of association between technology and the dependent variables nor the direction of the relationship. Age and income did display some patterned effects. The degree of association was consistently lower among older and higher family income workers than among younger and lower income workers. Technology appeared to have less differentiating effect with regard to the dependent variables among older and higher income workers. Percentage changes sufficient to reduce the degree of association were independent of any particular man-machine relationship.

Nearly two-thirds of the controlled tests removing the effects of age and income separately remained statistically significant. Of the seventeen significant controlled tests, four were significant at the .05 level and the remaining thirteen at the .01 level. In over two-thirds of the controlled tests the same curvilinear pattern found in the uncontrolled tests of the hypotheses remained.

Changes in the degree of alienation among older and higher income workers within each man-machine relationship fell into the following pattern. Older and higher income assemblers showed higher self-evaluative involvement in work, were less socially isolated from the work organization and

were slightly less instrumentally oriented toward work than younger and lower income assemblers. Older and higher income monitors showed increases in alienation (with the exception that higher income monitors were less socially isolated from the work organization) compared to younger and lower income monitors. Older craftsmen had less self-evaluative involvement in work, were more instrumentally oriented but were less socially isolated from the work organization than younger craftsmen. Older craftsmen appeared to be more like older monitors in terms of alienation changes. However, higher income craftsmen were more like assemblers with higher income: they had higher self-evaluative involvement in work, were less socially isolated from the work organization and less instrumentally oriented than craftsmen with lower income.

But, it should be emphasized that in only two instances did the same curvilinear pattern of association found in the uncontrolled tests of the hypotheses disappear among older and higher income workers. Age and income appeared to exercise some affect upon alienation independent of man-machine relationships. Overall, however, age and income did not basically alter the findings.

Multiple correlation analysis permitted ascertaining the combined contribution of powerlessness, meaninglessness and normlessness to each of the three aspects of alienation from work. Powerlessness, meaninglessness and normlessness,

in combination, accounted for a modest multiple correlation with self-evaluative involvement in the work role. More substantial multiple correlations appeared between the combination of the powerlessness, meaninglessness and normlessness with respect to social isolation and instrumental work orientation as dependent variables.

Advancing age may place assemblers in better positions within the context of the line. That is, changing from a highly confining job, which involves one or two operations taking only a few seconds, to a job requiring several operations over a longer time span does not constitute a basic change in the man-machine relationship but may be meaningful to those working on the assembly line. On the other hand, craftsmen and monitors perform nearly the same tasks and apply the same skills throughout their work careers. They may feel disappointed at the lack of improvement in their work situation as they grow older. Therefore, craftsmen and monitors may display some increase in alienation from work with age.

The predisposing factors explained varying amounts of the variation in the alienation variables. With respect to self-evaluative involvement, powerlessness explained almost no variation above meaninglessness and normlessness. The latter two factors explained nearly equal amounts of the variation in self-evaluative involvement. There was little

difference in the predictive power among the three predisposing factors with social isolation as the dependent variable. Meaninglessness explained no variation in instrumental work orientation above the contributions of powerlessness and normlessness. Education, age and income, in some instances, affected the dependent variable above the contributions of powerlessness, meaninglessness and normlessness. In various combinations, these six variables contributed moderately to variation in the three aspects of alienation from work.

A moderate correlation suggests that self-evaluative involvement in the work role is negatively related to social isolation from the work organization. A stronger correlation indicates that social isolation and instrumental work orientation are positively related. A smaller but statistically significant correlation showed a negative relationship between self-evaluative involvement in work and instrumental work orientation.

Implications

The findings suggest that factors other than social status, supervision or friendships at work influence meanings derived from the time spent earning one's living. Currently technology usually determines the social and technical organization of work, which reflects distinctive man-machine relationships. The particular relationship of

workers to technology produces variations in attachment to various aspects of work life. Job content is much more important to the understanding of the human factor in industry than past attention paid to it suggests. Models of man held by management, derived variously from early economics, engineering, personnel relations, industrial psychology and sociology, have all neglected the central concerns of "job design" analysis: "the role of the individual in a productive organization, and his control over the functions performed."[1] In contrast to earlier approaches, "job design analysis" considers technology as a variable. Interaction between personal, social, organizational and technical needs can then be examined. Earlier conceptions of job design deemed technology a constant, not utilized as a variable deserving observation and alteration. Production technology, it is argued, can accommodate not one but a number of alternative job designs.

A caveat is necessary. Variations in attitudes toward work cannot be completely attributed to job content. Job security, supervision, pay, promotion opportunities, group relations and working conditions are all part of the mix. One purpose of this presentation is to call attention to the impact of the man-machine relationship which often

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[1]Davis, "The Design of Jobs," op. cit., p. 25.

suffers neglect at the hands of management and social scientists alike.

Considerably more than half of the civilian manufacturing labor force is engaged in industries with mechanized technology. Whether extreme job specialization promotes an instrumental work orientation or whether highly specialized jobs attract people who bring such an orientation with them, it is not enough to maintain such a large segment of the labor force which is merely "content" to work for financial rewards. Work may not be a "central life interest" but one has only to consider the force with which retirement or especially unemployment strikes many former labor force participants. Work becomes extremely important when one is deprived of it. It is only a short step to the conclusion that a restoration of meaning in work would improve the quality of experience among people in highly mechanized jobs.

The argument that employees in highly specialized jobs resist change toward more responsibility does not stand the test. One may fear deep water, and rightly so, until he learns to swim. Men not acclimated to responsibility may shrink from it unless they experience it over a period of time. For example, Walker found in the semiautomatic steel tubing plant that the workers' fear that they could not handle their new jobs disappeared after a period of adjustment. Other evidence from Walker's study lends additional

support to this point. In the early stages of the change-over close consultation was needed between workers and several supervisory levels. With stability the urgent need for consultation diminished and communication was curtailed. After two years employee morale was decidedly lower than it had been. What did the workers see as the solution?

> Listen to us, ask our advice, take our suggestions--with the demand implicit and sometimes explicit, treat us like men with intelligence, imagination, and judgment. That will take the curse off Number 4 and make it a good place to work.[1]

Perhaps in exercising one's own initiative a new taste is developed.

Moreover, because a man with twenty years experience at a minutely specialized job does not take easily to changes toward variety, skill, control and responsibility does not mean that future generations must be trapped by occupational experiences which instill the same feelings of inadequacy.

"Job design" research indicates that the worker is not the only beneficiary. Organizational performance may be improved if management thinking can be made more flexible. If loyalty to the work organization is important to management and if consummatory involvement and ego involvement in work are positive values in the welfare of industrial workers,

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[1]Walker, Toward the Automatic Factory, op. cit., p. 75.

then changes in the organization of work in the direction suggested by this study will accrue benefits to both employers and employees. In the quest for improvement in the quality of work experience among the blue-collar sector of the labor force, attention should be directed toward technology and job content. The final results are not at hand. However, evidence seems strong that the reduction of job specialization, whether by the creation of new man-machine relationships with automation or the redesign of jobs under mechanized technology, will produce salutory results both for the worker and management.

Subsidiary evidence from the present study weakens the arguments that job satisfaction is uniformly high among industrial workers and that industrial workers are an undifferentiated mass. Eighty-seven percent of the craftsmen were high on a job satisfaction index. On the other hand, only 13 percent of the assemblers indicated high job satisfaction. Fifty-two percent of the monitors were highly satisfied with their jobs.[1] Two conclusions can be drawn. Degree of job satisfaction varies by man-machine relationship rather markedly. And job satisfaction is not as high among some types of industrial workers as is often supposed.

A cardinal characteristic of large business organizations in modern industrial society is promotion based on

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[1]See Table 16, Appendix 1.

universalistic criteria. Nevertheless, like Chinoy's study, the present study revealed that a substantial percentage of industrial workers, irrespective of their skill or responsibility level, believe that occupational advancement is ruled by a standard other than ability. This observation may be accurate. Or the complaint of "pull and connection" may be a product of frustration. Faced with the realization that promotion is unlikely, workers may protect themselves by blaming the system rather than themselves for their lack of mobility.

It is important that normlessness was not equally distributed among the industrial workers in the present study. This feeling was experienced least by monitors, who had the longest, most obtainable, and most clearly defined promotional ladder. Correspondingly, the greatest percentage ranking high on normlessness was among assemblers. A depressed wage scale, minute job skill differences and lack of education requisite for advancement rendered them most susceptible to this condition. Normlessness contributes to withdrawal of self-evaluative involvement from the work role, social isolation from the work organization and an instrumental work orientation as the results indicate. Therefore, steps toward dispelling this attitude among workers would profit employers as well as those on their payrolls.

A comment is in order on the lower "alienation" among monitors than craftsmen. Practicing a craft in a

large bureaucratic work organization may be quite different than the exercise of skill as a traditional, "independent" artisan. Zweig offers this observation.

> A craftsman will take a greater interest in his job and often feel a pride in it, if it is not repetitive. It is often observed that a building craftsman works better on interesting new buildings like churches, schools, and town halls, than he does on standard houses, and he also works better on new houses than he does on repair work. A man likes to use his own tools skillfully and to see the result of his own labour. Many labourers complained to me that they did not see the fruit of their labour, and that this took away the interest of their jobs.[1]

A test of this assumption would involve a study of independent craftsmen such as those in construction or craftsmen engaged in turning out hand made products. However, independent artisans are disappearing much like independent soldiers, inventors and scientists.

Another paramount implication of this research relates to the "central life interest" and leisure issues. Many observers have suggested that work is no longer an important arena for intrinsic satisfactions and feelings of personal worth. Dubin,[2] for example, lumped industrial workers together presumably including all levels of skill and concluded that for the majority of industrial workers non-work activity had eclipsed work as a central life focus.

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[1]Ferdynand Zweig, The British Worker (Baltimore: Penguin Books, 1952), p. 99.

[2]Dubin, op. cit., pp. 57-58.

There may have been an overrepresentation of low skilled workers in Dubin's sample. Or if skilled people had been excluded, the percentage abandoning work as a central life interest might have been increased. The implication of the present study is that proportions of workers regarding work as a central life interest will vary by man-machine relationship. Quality experience in leisure pursuits may not be the sole alternative. Improvements in man's relationship to technology at work may resuscitate work as an integral part of life for many industrial workers. Application of Dubin's CLI schedule in a study with a comparative design such as the one employed in the present research would be informative.

Certainly the inspiration, and to a great extent the design for this dissertation comes from Blauner's very original monograph. Previous studies on technology and attitudes toward work were primarily case studies focusing on one industry. In addition to putting the alienation thesis to empirical test among industrial workers, Blauner uniquely presented a design for comparative industrial analysis. Inevitably a ground breaking piece of research carries with it many shortcomings, some of which the present study attempts to overcome.

Based as it was on a secondary analysis of data gathered in 1947, two criticisms are immediately invited. First, conditions may be expected to have changed with the

time span of seventeen years between data collection and the secondary analysis. For this reason, generalization may be impaired. Second, using data secured for other purposes, Blauner was forced to fit available items to theoretical definitions in operationalization.

A central argument forwarded by Blauner is that industries vary by the nature of their technological production systems.[1] Each industry, so goes the argument, possesses a characteristic form of production technology. A broader proposal emanating from Blauner's study is for a subfield of industrial sociology to be called the "sociology of industries." The idea is to place emphasis on "the importance of individual industries and groups of similar industries, as units of economic and social organization."[2] In this way a systematic, comparative approach can supplant or supplement the previously held notion of the industrial work environment as an undifferentiated mass.

It does not escape Blauner that complete homogeneity in any given industry or firm is seldom the case. Internally, a factory most likely has different types of

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[1] Blauner cites three factors conditioning the type of technology employed in a given industry: "the overall state of the industrial arts, that is, the existing level and variety of mechanical and scientific processes, the economic and engineering resources of individual firms, and most important, the nature of the product manufactured." Ibid., p. 6.

[2] Ibid., p. 186.

technology applied to producing goods at various stages of production. This raises the question of internal technological differences by industry and even by firm. By way of recognizing a weakness in the "sociology of industries" perspective, Blauner makes a point crucial to the present study:

> Just as industrial sociology fosters an undifferentiated view of industry in general and tends to ignore differences among industries, the "sociology of industries" exaggerates the unity of an individual industry and necessarily underplays the important variations within that industry, as well as its similarities to other industries. Our understanding of the conditions and causes of alienation in manual work would also be furthered by an intensive investigation which focused on the variations in worker freedoms and job attitudes among the firms within any one of the four industries I have considered.[1]

If man's relationship to technology at work contributes to the prediction of his attitudes toward work-related roles, then it is important not to combine different man-machine relationships into one "category" such as Blauner did when he made inter-industry comparisons. A sample of automobile workers may contain craftsmen, assembly-line workers, laborers and janitors. As discussed in the previous chapter, attitudes toward work were found to vary by the relationship to technology in the studies of automobile workers conducted by Walker and Guest, Kennedy and O'Neill and Walker and Marriott. Similarly, studies on "automation"

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[1] Ibid., p. 187.

often reveal contradictory results. For example, Walker's study of the semiautomatic steel tube plant and Faunce's study of a semiautomatic automobile factory did not find a feeling among workers that they had an increase in responsibility. On the other hand, studies by Blauner, and Mann and Hoffman, conducted in industries with highly developed materials handling and control technology found that workers in the new automated jobs did experience an increase in responsibility. Also Blauner and Mann and Hoffman offer some evidence of a reduction in alienation in automated continuous-process work settings. The difference in results may stem from the differing levels of development in the materials handling and control components of technology.

Moreover, and this is part of Blauner's contribution, a number of studies have consistently found that higher status occupations are more likely to be valued for their intrinsic aspects while persons in lower status occupations emphasize instrumental rewards. This evidence tends to undermine the idea that occupational experience does not have some uniform effects. Responses to work content cannot merely be attributed to individual differences as some would have us believe. Such "psychologizing" prematurely closes the issue of causes of variations in attitudes toward work. We must conduct studies across aggregates of workers in various work settings.

Substantiation of Blauner's thesis adds weight to its validity. Successful replication makes attention to the implications more imperative. However, the present study represents more than a replication. It provides further specification of the factors promoting alienating experiences in work. Large differences were manifested consistently between craftsmen and assemblers, though they were in the same industry, company and local union. Consequently, stronger credence is given to the impact of technology and to the nature of work. More research is necessary comparing workers within industries or firms working under different man-machine relationships.

The present study isolated three man-machine relationships. Built into the independent variable was the idea that these man-machine relationships represent historical stages in the development of industrial technology from premechanization to mechanization in the factory system to automation.

Much more sophisticated operationalization of work attributes have been devised. Turner and Lawrence, for example, selected from the literature job attributes which seemed to cross technological lines. These include among others, object variety (number of different kinds of objects, tools and controls worked on), motor variety (e.g., change in work pace and change in physical location), autonomy (e.g., pace determination, method choice), interaction

opportunities on the job (e.g., number of people and amount of time in interaction), learning time and responsibility (e.g., probability of serious error).[1] Their method was to directly observe 47 different jobs in 11 industries. They used pre-determined ranking scales to place workers on a "requisite task attribute index." As a technique, field researchers directly observed a particular job for a period of time and ranked each job on the series of sub-scales of job attributes. However, their intention was not to differentiate between types of production technology such as automation or mechanization, but rather to discern differences in task attributes within and across technologies.

Most production systems are not composed of only one man-machine relationship (for example, an automobile factory employs workers of various skill levels and, hence, contains many man-machine relationships). It would be fruitful to develop a series of job characteristics which meaningfully differentiate man-machine relationships within production systems. Such an approach should prove especially useful in the study of automation and mechanization in the office where relatively little is known about the relationship of different categories of employees to automated technology.

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[1]See Arthur N. Turner and Paul R. Lawrence, Industrial Jobs and the Worker (Boston: Harvard Business School, 1965), pp. 148-158.

Future research should involve a profile of job attributes by which workers can be classified. It is not the man-machine relationship as such which produces variations in job attitudes but the characteristics of work which follow from a particular relationship to technology such as varying amounts of skill, control, autonomy and responsibility.

Automated technology has not been applied in industry at the phenomenal rate predicted by some observers. This cannot gainsay the inroads automation has made into the factory and office. Moreover, some levels of operations may be easily automated in the future. Scientific studies in automated work settings have been few. This research contributes to knowledge about the little known impact of automated technology upon worker attitudes.

Depending on the viewpoint, worker skill may be increased or reduced under automated technology. A most likely result is the shift from skill in the traditional sense to worker responsibility in automated work places. Some data not previously reported from the present study displayed a strong curvilinear association between phase in the man-machine relationship and an index composed of items tapping variety, autonomy and responsibility in work.

Should automation contribute to such alterations in the job then changes in the meaning and function of work will be an attendant consequence. If the spread of automated technology has not kept the pace predicted for it, the

extent of research on automation and meanings in work also has failed to be commensurate to the proportion of the labor force presently employed in automated work sites. Evidence regarding the impact of automation is both sparse and often reportorial rather than scientific. However, research conducted in both semiautomated (transfer technology or "Detroit" automation) and automated (continuous-process) work settings reveals improved attitudes toward work among production personnel. Both Walker and Faunce found that workers preferred their new automated jobs over their previous mechanized ones. Among the workers Faunce studied, the most liked aspects of the automated jobs were a decrease in materials handling and greater intrinsic interest of jobs. In Mann and Hoffman's study, job content in the automated plant had been altered through both job enlargement, job rotation, and increased responsibility, with this outcome:

> the results of transferring men from more specialized jobs in other plants to the enlarged jobs in the plant were for the most part positive. Expressions of increased job interest and job satisfaction were found in a large proportion of these transferred operators.[1]

The unification of previously separate jobs provided greater opportunities for use of skills, variety in work and learning more about the operation of the power plant as a whole.

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[1]Mann and Hoffman, op. cit., p. 103.

> With the goals of greater system integration and efficiency (as with continuous process technology) the design engineer may have accomplished what the industrial engineer failed to do--provide the worker with an environment of tasks appropriate to the skills of a human.[1]

The present study has implications for automation and mechanization in the office. Before the relatively recent, widespread introduction of electronic data processing equipment, white-collar offices resembled the handicraft period of industrial history. Abilities of office workers were brought to bear on office equipment rather than skills being built into the machines. Currently, the use of computers tends to increase occupational specialization as office workers (card sorters, key punchers, tabulators) perform tasks contributing to the operation of electronic data processing technology. In this form, so-called "office automation" more nearly resembles mechanization of information processing; that is, office workers may increasingly take on the character of semiskilled workers as the assembly line principle is transformed from a production technique into a principle of organization in the office. In its highest application, however, automation permits the linking together of a wide variety of self-correcting and self-programming machines capable of automatically performing a sequence of logical operations via electronic control

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[1]Mann, op. cit., p. 51.

devices. Automation in this sense is the highest development of the feedback principle, where information is fed to the computer from the problem itself, automatically influencing the end result. Potentially, computer technology of this sort will permit the installation of a system for handling the bulk of the information needed for the operation of an organization. When needed, the stored information can be retrieved and processed. Under approximations to these automated conditions, white-collar workplaces may be expected to experience changes in the division of labor paralleling those experienced in the blue-collar sector in industries like chemical processing and oil refining.

Drawing diametric conclusions, one researcher reports little increase in skill requirement and small incidence of upgrading after the introduction of automated technology in an office, while another equally confidently reports raised skill levels. It seems obvious that there exist some underlying factors producing these conflicting results. Part of the answer may lie in the fact that the term "office automation" has been used to describe offices that vary considerably in the types of man-machine relationships. A major purpose of future research would be to study several types of office technology in regard to man-machine relationships and attitudes toward the work organization and work itself. Research must be done taking into account the fact that

varying technology goes under the rubric "automation" and that the implications depend on the specific character of the technology. Clarification of contradictory findings becomes increasingly important if automation is to be the technological wave of the future. Adding urgency is the relative expansion of the white-collar segment of the labor force.

The kinds of attitudes occupying this study are not likely to fulfill the promise of Marx's vision. And amelioration of these conditions is icing on the cake for a nation with the unprecedented employment figures of the United States. Concern for the unemployed in our society has gained hegemony and should without quarrel. Still, lack of impoverishment in industrial workers' pay packets should not be mistaken for fulfillment. Industrial workers may rank wages as the primary source of job dissatisfcation but not as the greatest source of satisfaction. If money has gained ascendency perhaps this can partly be attributed to the crush for the better life. Other important sources of an instrumental orientation toward work, withdrawal of ego from the work role and lack of commitment to company goals and values include a job stripped of skill or responsibility, denial of freedom and control at work, fractionalization of jobs to the point of meaninglessness and an occupational structure so leveled that a sense of upward movement is seen as only possible for others.

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APPENDIX A

TABLES

Table A-1. Age by phase in the man-machine relationship

Age	Phase in the Man-Machine Relationship					
	Craft		Mechanized		Automated	
35 yrs. or younger	15%	(18)	94%	(90)	33%	(30)
36 yrs. or older	85%	(99)	6	(6)	67	(62)
Total	100%	117	100%	96	100%	92

$X^2 = 139.21$, d.f. = 2, $P < .01$, $\overline{C} = .81$.

Table A-2. Annual family income by phase in the man-machine relationship

Annual Family Income	Phase in the Man-Machine Relationship					
	Craft		Mechanized		Automated	
Below $8,000	21%	(25)	91%	(87)	22%	(20)
$8,000 or more	79	(92)	9	(9)	78	(72)
Total	100%	117	100%	96	100%	92

$X^2 = 127.93$, d.f. = 2, $P < .01$, $\overline{C} = .78$.

Table A-3. Perceived powerlessness in work by phase in the man-machine relationship and annual family income

Perceived Powerlessness in Work	Below $8,000			$8,000 or More		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	20% (5)	97% (84)	55% (11)	18% (17)	56% (5)	40% (29)
Low	8 (20)	3 (3)	45 (9)	82 (75)	44 (4)	60 (43)
Total	100% (25)	100% (87)	100% (20)	100% (92)	100% (9)	100% (72)

$X^2 = 67.50$, d.f. = 2, $P < .01$, $\overline{C} = .84$, $X^2 = 12.34$, d.f. = 2, $P < .01$, $\overline{C} = .37$.

Table A-4. Perceived powerlessness in work by phase in the man-machine relationship and age

Perceived Powerlessness in Work	35 Years or Younger			36 Years or Older		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	17% (3)	93% (84)	53% (16)	19% (19)	83% (5)	39% (24)
Low	83 (15)	7 (6)	47 (14)	81 (80)	17 (1)	61 (38)
Total	100% (18)	100% (90)	100% (30)	100% (99)	100% (6)	100% (62)

$X^2 = 55.77$, d.f. = 2, $P < .01$, $\overline{C} = .78$, $X^2 = 16.15$, d.f. = 2, $P < .01$, $\overline{C} = .43$.

Table A-5. Perceived meaninglessness in work by phase in the man-machine relationship and annual family income

Perceived Meaninglessness in Work	Below $8,000			$8,000 or More		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	44% (11)	75% (65)	50% (10)	41% (38)	56% (5)	29% (21)
Low	56 (14)	25 (22)	50 (10)	59 (54)	44 (4)	71 (51)
Total	100% (25)	100% (87)	100% (20)	100% (92)	100% (9)	100% (72)

$X^2 = 10.45$, d.f. = 2, $P < .01$, $\overline{C} = .39$, $X^2 = 3.96$, d.f. = 2, N.S., $\overline{C} = .22$.

Table A-6. Perceived meaninglessness in work by phase in the man-machine relationship and age

Perceived Meaninglessness in Work	35 Years or Younger			36 Years or Older		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	39% (7)	74% (67)	53% (16)	42% (42)	50% (3)	24% (15)
Low	61 (11)	26 (23)	47 (14)	58 (57)	50 (3)	76 (47)
Total	100% (18)	100% (90)	100% (30)	100% (99)	100% (6)	100% (62)

$X^2 = 10.75$, d.f. = 2, $P < .01$, $\overline{C} = .39$, $X^2 = 6.04$, d.f. = 2, $P < .05$, $\overline{C} = .28$.

Table A-7. Perceived normlessness in work by phase in the man-machine relationship and annual family income

Perceived Normlessness in Work	Below $8,000			$8,000 or More		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	92% (23)	63% (55)	60% (12)	41% (38)	56% (5)	29% (21)
Low	8 (2)	37 (32)	40 (8)	59 (54)	44 (4)	71 (51)
Total	100% (25)	100% (87)	100% (20)	100% (92)	100% (9)	100% (72)

$X^2 = 8.14$, d.f. = 2, $P < .05$, $\overline{C} = .35$, $X^2 = 3.96$, d.f. = 2, N.S., $\overline{C} = .22$.

Table A-8. Perceived normlessness in work by phase in the man-machine relationship and age

Perceived Normlessness in Work	35 Years or Younger			36 Years or Older		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	56% (10)	63% (57)	37% (11)	52% (51)	50% (3)	35% (22)
Low	44 (8)	37 (33)	63 (19)	48 (48)	50 (3)	65 (40)
Total	100% (18)	100% (90)	100% (30)	100% (99)	100% (6)	100% (62)

$X^2 = 6.52$, d.f. = 2, $P < .05$, $\overline{C} = .30$, $X^2 = 4.00$, d.f. = 2, N.S., $\overline{C} = .22$.

Table A-9. Self-evaluative involvement in the work role by phase in the man-machine relationship and annual family income

Self-Evaluative Involvement in the Work Role	Below $8,000			$8,000 or More		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	20% (5)	39% (34)	75% (15)	61% (56)	78% (7)	57% (41)
Low	80 (20)	61 (53)	25 (5)	39 (36)	22 (2)	43 (31)
Total	100% (25)	100% (87)	100% (20)	100% (92)	100% (9)	100% (72)

$X^2 = 14.26$, d.f. = 2, $P < .01$, $\overline{C} = .45$, $X^2 = 1.50$, d.f. = 2, N.S., $\overline{C} = .13$.

Table A-10. Self-evaluative involvement in the work role by phase in the man-machine relationship and age

Self-Evaluative Involvement in the Work Role	35 Years or Younger			36 Years or Older		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	61% (11)	42% (38)	67% (20)	51% (50)	50% (3)	58% (36)
Low	39 (7)	58 (52)	33 (10)	49 (49)	50 (3)	42 (26)
Total	100% (18)	100% (90)	100% (30)	100% (99)	100% (6)	100% (62)

$X^2 = 6.40$, d.f. = 2, $P < .05$, $\overline{C} = .30$, $X^2 = .90$, d.f. = 2, N.S., $\overline{C} = .10$.

Table A-11. Social isolation from the work organization by phase in the man-machine relationship and annual family income

Social Isolation From the Work Organization	Below $8,000			$8,000 or More		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	56% (14)	78% (68)	30% (6)	46% (42)	78% (7)	22% (16)
Low	44 (11)	22 (19)	70 (14)	54 (50)	22 (2)	78 (50)
Total	100% (25)	100% (87)	100% (20)	100% (92)	100% (9)	100% (72)

$X^2 = 18.55$, d.f. = 2, $P < .01$, $\overline{C} = .51$, $X^2 = 16.00$, d.f. = 2, $P < .01$, $\overline{C} = .42$.

Table A-12. Social isolation from the work organization by phase in the man-machine relationship and age

Social Isolation From the Work Organization	35 Years or Younger			36 Years or Older		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	61% (11)	79% (71)	23% (7)	45% (45)	67% (4)	24% (15)
Low	39 (7)	21 (19)	77 (23)	55 (54)	33 (2)	76 (47)
Total	100% (18)	100% (90)	100% (30)	100% (99)	100% (6)	100% (62)

$X^2 = 30.43$, d.f. = 2, $P < .01$, $\overline{C} = .62$, $X^2 = 9.41$, d.f. = 2, $P < .01$, $\overline{C} = .33$.

Table A-13. Instrumental work orientation by phase in the man-machine relationship and annual family income

Instrumental Work Orientation	Below $8,000			$8,000 or More		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	80% (20)	69% (60)	25% (5)	39% (36)	67% (6)	31% (22)
Low	20 (5)	31 (27)	75 (15)	61 (56)	33 (3)	69 (50)
Total	100% (25)	100% (87)	100% (20)	100% (92)	100% (9)	100% (72)

$X^2 = 16.99$, d.f. = 2, $P < .01$, $\overline{C} = .49$, $X^2 = 4.86$, d.f. = 2, N.S., $\overline{C} = .25$.

Table A-14. Instrumental work orientation by phase in the man-machine relationship and age

Instrumental Work Orientation	35 Years or Younger			36 Years or Older		
	Craft	Mechanized	Automated	Craft	Mechanized	Automated
High	39% (7)	69% (62)	20% (6)	49% (49)	67% (4)	34% (21)
Low	61 (11)	31 (28)	80 (24)	51 (50)	33 (2)	66 (41)
Total	100% (18)	100% (90)	100% (30)	100% (99)	100% (6)	100% (62)

$X^2 = 23.67$, d.f. = 2, $P < .01$, $\overline{C} = .55$, $X^2 = 5.03$, d.f. = 2, N.S., $\overline{C} = .24$.

Table A-15. Inter-index and control variable correlations*

Indexes and Control Variables	Inter-Index and Control Variable Correlations**								
	1	2	3	4	5	6	7	8	9
1. Powerlessness	1.00								
2. Meaninglessness	.52	1.00							
3. Normlessness	.26	.29	1.00						
4. Self-evaluative involvement	-.17	-.23	-.25	1.00					
5. Social isolation	.46	.49	.34	-.36	1.00				
6. Instrumental work orientation	.23	.15	.35	-.23	.42	1.00			
7. Age	-.52	-.39	-.14	.17	-.33	-.01	1.00		
8. Education	.03	-.02	-.02	-.15	-.05	-.17	-.28	1.00	
9. Income	-.57	-.41	-.26	.26	-.37	-.29	.54	-.05	1.00

*Product-moment correlations based on N = 305.

**All product-moment correlations among the alienation indexes are significant at the .01 level.

Table A-16. Inter-item correlations and item-total correlations: index of job satisfaction

Item Description	Inter-Item Correlations*																Item-Total Correlations**
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1. Your job is like a hobby to you.	1.000***																.462
2. Your job is interesting--not boring.	.393	1.000															.724
3. You consider your job rather unpleasant.	.344	.544	1.000														.702
4. You enjoy your work more than your leisure time.	.339	.290	.259	1.000													.401
5. You are often bored with your job.	.380	.705	.571	.319	1.000												.727
6. You feel fairly satisfied with your job.	.365	.586	.524	.304	.503	1.000											.670
7. Usually have to force yourself to go to work.	.203	.380	.477	.362	.380	.417	1.000										.547
8. Satisfied with your job for time being.	.282	.347	.375	.265	.359	.511	.374	1.000									.540
9. You definitely dislike your work.	.267	.521	.583	.200	.490	.531	.531	.446	1.000								.674
10. You are happier in your work than others.	.274	.415	.460	.186	.377	.334	.320	.379	.376	1.000							.569
11. Most days you are enthusiastic about work.	.251	.392	.339	.356	.474	.326	.313	.329	.392	.343	1.000						.538
12. Work day seems like it will never end.	.171	.491	.494	.212	.448	.419	.460	.358	.546	.373	.309	1.000					.573
13. You like your job better than average worker.	.295	.447	.445	.192	.461	.412	.323	.383	.376	.688	.334	.308	1.000				.601
14. Your job is pretty uninteresting.	.415	.659	.550	.353	.705	.521	.415	.384	.556	.402	.481	.497	.446	1.000			.755
15. You find real enjoyment in your work.	.411	.578	.516	.329	.589	.540	.380	.361	.472	.474	.446	.407	.517	.633	1.000		.721
16. You are disappointed that you ever took this job.	.213	.295	.487	.131	.302	.349	.297	.284	.449	.279	.279	.257	.297	.316	.390	1.000	.456

*Product-moment correlations, with each item ranging from five ("high job satisfaction") to one ("low job satisfaction").

**Product-moment correlations to the sum of other items.

***Product-moment correlations based on N = 305.

APPENDIX B

THE INTERVIEW SCHEDULE

(Present this information to the respondent):

I am (interviewer's name), a student at Michigan State University. We have gotten approval from Messers. (names of union leaders) of your union to ask you some questions for a study of work and job attitudes. The study is being conducted under the sponsorship of the School of Labor and Industrial Relations at Michigan State University. (Show the UAW letter.)

This project is a part of the continuing study of people in various work places (including banks, automobile factories, and insurance companies) being conducted by Michigan State University. You are being asked to answer some questions as a part of this larger effort. Your answers, along with those from people in other organizations, will be analyzed to help discover what things are most important in making the work situation better for the people in it.

The value of this study rests on the frankness and care with which you answer the questions. This is not a test of any kind. The answers are neither right nor wrong. People feel differently about their jobs and work, and I am interested in your opinions and feelings.

Your name appears nowhere on the questionnaire and no attempt will be made by anyone to identify questionnaires individually. Your information will be held in the strictest confidence and the results of the study will be tabulated on a group basis only, that is, in terms of <u>percentages</u>. The information collected in this study will be compared with information regarding employee attitudes toward their work gathered at an oil refinery in Kentucky. A report of the findings will be provided for the union.

PART I

INTRODUCTION: The way people feel about their jobs may be different because of different ages, number of years worked, educational level, and so on.

To help in this study, we need some background information about you.

We would like to remind you again that no one will be informed of your individual answers to these questions.

1. What is your age? _____

2. ____Male ____Female

3. What is your marital status?
____single
____married
____divorced or separated
____widowed

4. How many more years do you expect to work?
____less than 1 year
____1 - 2 years
____3 - 5 years
____6 - 10 years
____11 or more years

5. How long have you worked for your present employer?
____6 months or less
____between 6 months and 1 year
____between 1 and 2 years
____between 2 and 5 years
____between 5 and 10 years
____between 10 and 15 years
____15 years or longer

6. What is your present job title? (Get as specific answers as possible.)

7. How long have you had the job you now have at the company?
____6 months or less
____between 6 months and 1 year
____between 1 and 2 years
____between 2 and 5 years
____between 5 and 10 years
____between 10 and 15 years
____15 years or longer

8. Please list the last six jobs you have held. (Start with the job held just prior to the present one and work backwards. Exclude school and service.)

Job (examples: typist, lathe operator)	Dates Held (years) (example: 1950 to 1953) (year) to (year)		Company (example: Acme Corp.) (If the company in which you held this job is the same as the present one, write "same.")
1.			
2.			
3.			
4.			
5.			
6.			

9. Which shift do you usually work?

____do not have shift work
____day
____afternoon
____night
____rotation

10. If you could go back to the age of 15 and start life over again, would you choose a different trade or occupation? (Emphasize start life over again, including getting more education.)

____yes ____no

11. If by some chance you inherited enough money to live comfortably without working, do you think that you would work anyway or not? (This means work in some capacity for money, whether for self or others.)

____yes ____no

IF YES to question 11

12a. Why do you feel you would continue working even if you inherited enough money to live comfortably without working?

(Hand respondent card number 1.)

Read all the statements and give me the five statements which best describe why you would continue working.

____enjoy the kind of work
____to keep out of trouble
____to be associated with people
____habit, have always worked
____to keep occupied (interested)
____not know what to do with my time, can't be idle
____justified my existence
____feel useless
____gives feelings of self-respect
____feel lost, go crazy
____other reason (specify)_____

12b. Now, which two of these five best describe why you would continue working? (Circle the two indicated.)

13. Would you still keep on doing the same type of work you are doing now? (This assumes enough money to live comfortably.)

____yes ____no

IF NO to question 13

14. What type of work would you change to? (Get as specific answers as possible.)

_____

PART II

INSTRUCTIONS: I am going to ask you several questions about some characteristics related to your job and company. Again, these are your own opinions.

In order to get your answers, I am going to use this rating scale. (Hand interviewee card number 2 and refer to his card when explaining.) In answering each question, I want you to give me the number which best describes your feelings.

There are seven possible answers from which you will choose one:

1	2	3	4	5	6	7
(Minimum)	(Just a little)	(Below average)	(Average)	(Above average)	(Great deal)	(Maximum)

(Use question number 3 as an example. Listen very carefully for comments on questions since they often indicate failure to understand the questions. Much probing may have to be done, particularly in the beginning.)

1a. To what extent can you vary the steps involved in doing your job.
(name respondent's job) (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to vary the steps involved in doing your job?
(name respondent's job) (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to vary the steps involved in doing your job?
(name respondent's job) (min) 1 2 3 4 5 6 7 (max)

2a. To what extent do you know how your job fits into the total plant?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should you be able to know how your job fits into the total plant?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you to know how your job fits into the total plant?	(min)	1	2	3	4	5	6	7	(max)
3a. To what extent can you move from your immediate working area during work hours (other than lunch, etc.)?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should you be able to move from your immediate working area during work hours (other than lunch, etc.)?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you to be able to move from your immediate working area during work hours (other than lunch, etc.)?	(min)	1	2	3	4	5	6	7	(max)
4a. To what extent do you know how your work contributes to the plant products?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should you be able to know how your work contributes to the plant products?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you to know how your work contributes to the plant products?	(min)	1	2	3	4	5	6	7	(max)
5a. To what extent do you feel that people who get ahead in the plant deserve it?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should people get ahead in the plant by deserving it?	(min)	1	2	3	4	5	6	7	(max)

c. How important is it to you that people in the plant get ahead by deserving it? (min) 1 2 3 4 5 6 7 (max)

6a. To what extent do you feel that it is pull and connection that gets a person ahead in the plant? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should a person get ahead in the plant by pull and connection? (min) 1 2 3 4 5 6 7 (max)

c. How important would it be to you if people got ahead in the plant by pull and connection? (min) 1 2 3 4 5 6 7 (max)

7a. To what extent can you control how much work you produce? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to control how much work you produce? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to control how much work you produce? (min) 1 2 3 4 5 6 7 (max)

8a. To what extent does management give workers information about what is going on in the plant? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should management give workers information about what is going on in the plant? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you that management give workers enough information about what is going on in the plant? (min) 1 2 3 4 5 6 7 (max)

9a. To what extent do you feel that to get ahead in the plant you would have to become a good "politician"? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should a person feel that to get ahead in the plant he would have to become a good "politician"? (min) 1 2 3 4 5 6 7 (max)

c. How important would it be to you if getting ahead in the plant required becoming a good "politician"? (min) 1 2 3 4 5 6 7 (max)

10a. To what extent can you help decide on the methods and procedures used in your job? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to help decide on the methods and procedures used in your job? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to help decide on the methods and procedures used in your job? (min) 1 2 3 4 5 6 7 (max)

11a. To what extent do you have influence over the things that happen to you at work? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you have influence over the things that happen to you at work? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to have influence over the things that happen to you at work? (min) 1 2 3 4 5 6 7 (max)

12a. To what extent can you do your work ahead and take a short rest break during work hours? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to do your work ahead and take a short rest break during work hours? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to do your work ahead and take a short rest break during work hours?	(min)	1	2	3	4	5	6	7	(max)
13a. To what extent is getting ahead in the plant based on ability?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should getting ahead in the plant be based on ability?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you that getting ahead in the plant be based on ability?	(min)	1	2	3	4	5	6	7	(max)
14a. To what extent are you free from close supervision while doing your job?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should you be free from close supervision while doing your job?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you to be free from close supervision while doing your job?	(min)	1	2	3	4	5	6	7	(max)
15a. To what extent do you know how your job fits in with the work of other departments in the plant?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should you be able to know how your job fits in with the work of other departments in the plant?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you to know how your job fits in with the work of other departments in the plant?	(min)	1	2	3	4	5	6	7	(max)
16a. To what extent do people in the plant get ahead by being just plain lucky?	(min)	1	2	3	4	5	6	7	(max)

b. To what extent should people in the plant get ahead by being just plain lucky? (min) 1 2 3 4 5 6 7 (max)

c. How important would it be to you if people did get ahead in the plant by being just plain lucky? (min) 1 2 3 4 5 6 7 (max)

17a. To what extent do you know how your work affects the jobs of others that you work with? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to know how your work affects the jobs of others that you work with? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to know how your work affects the jobs of others that you work with? (min) 1 2 3 4 5 6 7 (max)

18a. To what extent can you increase or decrease the speed at which you do your work? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to increase or decrease the speed at which you do your work? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to increase or decrease the speed at which you do your work? (min) 1 2 3 4 5 6 7 (max)

19a. To what extent do you know how your job fits in with other jobs in the plant? (min) 1 2 3 4 5 6 7 (max)

b. To what extent should you be able to know how your job fits in with other jobs in the plant? (min) 1 2 3 4 5 6 7 (max)

c. How important is it to you to be able to know how your job fits in with other jobs in the plant? (min) 1 2 3 4 5 6 7 (max)

20a. To what extent have you learned how the plant works while doing your job?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should you be able to learn how the plant works while doing your job?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you to be able to learn how the plant works while doing your job?	(min)	1	2	3	4	5	6	7	(max)
21a. To what extent does management give information about what is going on in your department?	(min)	1	2	3	4	5	6	7	(max)
b. To what extent should management give information about what is going on in your department?	(min)	1	2	3	4	5	6	7	(max)
c. How important is it to you that management give enough information about what is going on in your department?	(min)	1	2	3	4	5	6	7	(max)

PART III

INSTRUCTIONS: I am now going to read you several statements. Instead of answering "minimum" to "maximum": (Hand respondent card no. 3)

You may STRONGLY AGREE with the statement - SA

You may AGREE (but not strongly) with the statement - A

You may be UNDECIDED (that is, you may neither agree nor disagree) - U

You may DISAGREE (but not strongly) - D

You may STRONGLY DISAGREE with the statement - SD

A number of these statements will make a distinction between "work or job" activity and "off the job" activity. "Off the job" activities refer to whatever you may do while not on the job - including family, church, hobbies, clubs, etc.

(If you detect some inconsistency on the first nine of these questions, tell the respondent that at this point you always go over the first few to make sure that you both are communicating to each other. Some of these statements are often misinterpreted. If you sense an inconsistent answer, explain the question until the respondent understands it.)

1.	A person should base his worth as a person on his life outside his job?	SA	A	U	D	SD
2.	To be a success in your job means to be successful in life.	SA	A	U	D	SD
3.	Your job involves a great deal of responsibility.	SA	A	U	D	SD
4.	Your kind of people are those who don't judge themselves in terms of job success.	SA	A	U	D	SD
5.	The reputation of this company in the community is very important to you.	SA	A	U	D	SD
6.	A person should judge himself primarily by the kind of job he has.	SA	A	U	D	SD
7.	There is opportunity for trying out ideas of your own in doing your work.	SA	A	U	D	SD
8.	The successful competition of this company with other firms is of little importance to you.	SA	A	U	D	SD
9.	You'd like people to judge you for the most part by what you spend your money on, rather than by how you make your money.	SA	A	U	D	SD
10.	There is opportunity to exercise judgment in your job.	SA	A	U	D	SD
11.	Success in the things you do away from the job is more important to your opinion of yourself than success in your work career.	SA	A	U	D	SD
12.	To you, your work is only a small part of who you are.	SA	A	U	D	SD

13. The only reason this company's profits are important to you is that they affect the amount of money you make.	SA	A	U	D	SD
14. The most important test of a person's worth as a person is the kind of job he holds.	SA	A	U	D	SD
15. Your job involves a variety of tasks.	SA	A	U	D	SD
16. If you had to choose, you would much prefer that others judge you by the kind of job you hold, rather than by your off-the-job accomplishments.	SA	A	U	D	SD
17. Most people like yourself judge a man most of the time by what he does for a living.	SA	A	U	D	SD
18. There is opportunity for independent thought and action on your job.	SA	A	U	D	SD
19. Your job is something you have to do to earn a living; most of your real interests are centered outside your job.	SA	A	U	D	SD
20. There is opportunity for personal planning on your job.	SA	A	U	D	SD
21. You can measure a person fairly well if you know what kind of a job he has.	SA	A	U	D	SD
22. Cutting the costs of this company is of little importance to you.	SA	A	U	D	SD
23. The best description of who you are would be based on the kind of job you hold.	SA	A	U	D	SD
24. There are few dependable ties among workers any more.	SA	A	U	D	SD
25. The opinions of other workers about how well you do your work is very important to you.	SA	A	U	D	SD
26. Real friends are as easy as ever to find at work.	SA	A	U	D	SD
27. The company in which you work is basically a friendly place.	SA	A	U	D	SD
28. The quality of this company's products is very important to you.	SA	A	U	D	SD

29. Money is the most rewarding reason for working. SA A U D SD

30. Sometimes you feel all alone at work. SA A U D SD

31. Working is a necessary evil to provide the means for things your family and you want. SA A U D SD

32. One can always find friends at work if he shows himself friendly. SA A U D SD

33. This company has the right idea about what a fair day's work should be. SA A U D SD

34. If by some chance you inherited enough money to live comfortably without working, you would quit working. SA A U D SD

35. Most workers today seldom feel lonely while at work. SA A U D SD

36. It is very important to you that you get ahead in your job. SA A U D SD

37. You are living for the day when you can collect your retirement and do the things that are important to you. SA A U D SD

38. It is very important to you that you have friends to whom you can talk on the job. SA A U D SD

39. There's little use writing to public officials because often they aren't really interested in the problems of the average man. Agree_____ Disagree_____

40. Nowadays a person has to live pretty much for today and let tomorrow take care of itself. Agree_____ Disagree_____

41. In spite of what some people say, the lot of the average man is getting worse, not better. Agree_____ Disagree_____

42. It's hardly fair to bring children into the world with the way things look for the future. Agree_____ Disagree_____

43. These days a person doesn't really know whom he can count on. Agree_____ Disagree_____

PART IV

INSTRUCTIONS: Some jobs are more interesting and satisfying than others. We want to know how people feel about different jobs. This part contains 22 statements about jobs.

You may STRONGLY AGREE with the statement.

You may AGREE (but not strongly).

You may be UNDECIDED (that is, you neither agree nor disagree).

You may DISAGREE (but not strongly).

You may STRONGLY DISAGREE with the statement.

1.	Your job is like a hobby to you.	SA	A	U	D	SD
2.	Your job is usually interesting enough to keep you from getting bored.	SA	A	U	D	SD
3.	It seems that your friends are more interested in their jobs.	SA	A	U	D	SD
4.	You consider your job rather unpleasant.	SA	A	U	D	SD
5.	You enjoy your work more than your leisure time.	SA	A	U	D	SD
6.	You are often bored with your job.	SA	A	U	D	SD
7.	You feel fairly well satisfied with your job.	SA	A	U	D	SD
8.	Most of the time you have to force yourself to go to work.	SA	A	U	D	SD
9.	You are satisfied with your job for the time being.	SA	A	U	D	SD
10.	You feel that your job is no more interesting than others you could get.	SA	A	U	D	SD
11.	You definitely dislike your work.	SA	A	U	D	SD
12.	You feel that you are happier in your work than most other people.	SA	A	U	D	SD

13. Most days you are enthusiastic about your work.	SA	A	U	D	SD
14. Each day of work seems like it will never end.	SA	A	U	D	SD
15. You like your job better than the average worker does.	SA	A	U	D	SD
16. Your job is pretty uninteresting.	SA	A	U	D	SD
17. You find real enjoyment in your work.	SA	A	U	D	SD
18. You are disappointed that you ever took this job.	SA	A	U	D	SD
19. Overall, you are satisfied with this company as a place to work.	SA	A	U	D	SD
20. Overall, you are satisfied with the supervision here.	SA	A	U	D	SD
21. Overall, you are satisfied with the people you work with.	SA	A	U	D	SD
22. Overall, you are satisfied with the union.	SA	A	U	D	SD

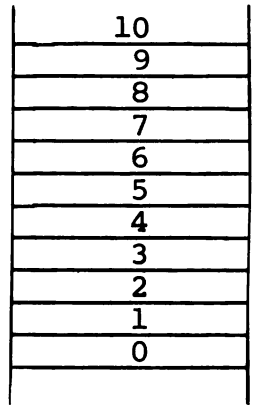
PART V

(A) All of us have certain ideas about ourselves. When you think about yourself, what type of person would you most like to be? In other words, if you imagine that you are the kind of person you would ideally like to be, what would you be like? Think about this for a moment.

(B) Now, taking the other side of the picture. If you imagine that you are the type of person you would least like to be, what would you be like then? Think about this for a moment.

(Hand respondent card number 4.)

Here is a picture of a ladder. Suppose we say the top of the ladder (Step 10) represents the kind of person you would <u>most</u> like to be and the bottom (Step 0) represents the kind of person you would <u>least</u> like to be.



(C) Where on the ladder do you feel you personally stand at the present time? Step number_____.

(A possible probe is to say "Are you closer to the kind of person you would most like to be or closer to the kind of person you would least like to be or somewhere in between?" This question is a general one including work and non-work ideas about the self. The referent is not a particular person the respondent knows necessarily, but the sort of person he would like to be.)

PART VI

Below are some more questions on your background.

1. How many years of school have you completed? Check highest grade completed.
   ____less than 7th grade
   ____7th grade
   ____8th grade
   ____9th grade
   ____10th grade
   ____11th grade
   ____12th grade
   ____some college
   ____college

2. In what size place did you live while you were from 10 to 20 years old? (Hand card number 5 to respondent.)
   ____farm area
   ____small town (under 5,000 people)
   ____small city (5,000 to 75,000 people)
   ____city (over 75,000 people)

3. What is (was) your father's occupation throughout most of his life? (Get specific answer)_____

4. Considering your community, in which of the following classes do you consider yourself a member? (Hand card number 6 to respondent.)
   ____upper class
   ____upper middle class
   ____middle class
   ____lower middle class
   ____working class
   ____lower class

5. What is your religious preference?
   ____Protestant
   ____Catholic
   ____Jewish
   ____other_____
   ____none

6. What is the total annual income (before taxes) of your family, including your wife if she works? (Hand respondent card number 7.) (Get an average over the last 2 or 3 years.)
   ____less than $3,000
   ____$3,000 to $4,000
   ____$4,000 to $5,000
   ____$5,000 to $6,000
   ____$6,000 to $7,000
   ____$7,000 to $8,000
   ____$8,000 to $9,000
   ____$9,000 to $10,000
   ____more than $10,000