THE DEVELOPMENT OF WORK TEAMS IN A COMPLEX ORGANIZATION

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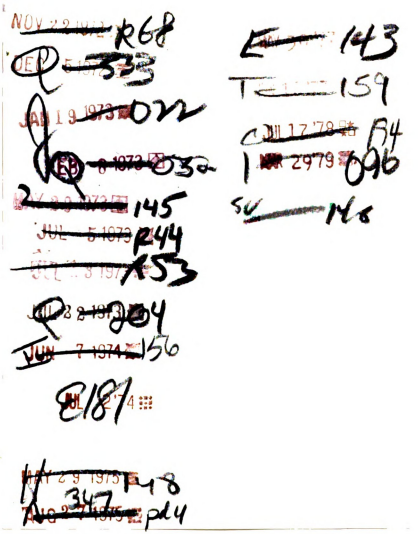

ABSTRACT

THE DEVELOPMENT OF WORK TEAMS IN A COMPLEX ORGANIZATION

By

John Stephen Heinen

The development of a work team approach to management is recommended by several organizational psychologists (Likert, 1961, 1967; Blake and Mouton, 1964; Nelson, 1949). However, very little research has been done on the industrial work group, especially the pattern of its development toward maturity.

This dissertation investigates the development of work teams within a complex organization. Tuckman (1965) in his review of the group development literature stressed the point that most of the studies of group development examined therapy or sensitivity groups and that there was a lack of studies involving industrial groups. The only study using inddistrial groups was Jacobson's (1956) post hoc analysis of voluntary organizational groups. Using the Jacobson analysis as the primary guideline, a model of work team development was proposed.

Group maturity was defined by the variables of cohesiveness, ability to solve problems, and shared norms. Four group process variables, identification, task development, communication, and leadership distribution, were hypothesized to contribute to the group's maturity. Each process was expected to be critical to the group as it moved through four

stages of increasing maturity. Identification was hypothesized to be most important to the group at its initial stage of development; task development most important at stage two; communication most important at stage three; and leadership distribution most important at stage four.

The model was tested in a medium sized Scanlon Plan company. A cross-sectional analysis of twenty work teams was used in an exploratory examination of the model of work team development.

None of the hypotheses was confirmed. Sources of error variance in the study were discussed and some recommendations for future research were made. With respect to the model, two points were stressed in the discussion. In testing the theoretical model, the sample of twenty teams was considered to be representative of industrial work teams on a maturity dimension. The representativeness of the sample was questioned since the teams seem to represent a relatively primitive level of development.

The second point emphasized the impreciseness of the model presented in this dissertation in articulating the pattern of events occurring within a given stage. This limitation in the theory seemed to prohibit an accurate test of the model in this situation.

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By

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I am indebted to all the members of the organization who participated in this research for their cooperation but especially to the manager of the organization development and personnel department for his support throughout this project. Mr. Steve Iman of the Institute for Social Research at the University of Michigan graciously extended his help in obtaining the cooperation of the Institute in the data collection.

My inspiration in this project came from the love of my wife, Jean, and my son, Chris. The birth and early

development of my son during this dissertation often stimulated my thinking about group development. However, more than that, his cheery laugh made all my problems seem small. Jean was always there to help perform some task, to listen to my troubles or to share my happiness.

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CHAPTER I

INTRODUCTION

The application of social psychological theory and methods to the study of industrial situations received its major impetus from two sources during the 1930's. They were Elton Mayo and his associates' Hawthorne studies and Kurt Lewin and his associates' studies of group process.

The Hawthorne studies (Roethlisberger and Dickson, 1939) stimulated a change in emphasis in organizational theory previously dominated by the scientific management approach of Taylor (1911). The mechanistic approach and analysis were actually the basis for the experiments at the Hawthorne plant of Western Electric. However, the keen observations of the researchers led to new explanations of work productivity.

> The study of the bank wiremen showed that their behavior at work could not be understood without considering the informal organization of the group and the relation of this informal organization to the total social organization of the company (Roethlisberger and Dickson, 1939, p. 551).

From an emphasis on fatigue factors and work conditions, the authors turned to the analysis of interpersonal relationships among the workers and between the workers

and management. The results suggested that important variables to examine in organizational research are the social organization of the work group, the social relations between the supervisor and his subordinates, the informal standards governing the behavior of members of the work groups, and the attitudes and motives of workers existing in a group context. The authors concluded:

> A great deal of attention has been given to the economic function of industrial organization. Scientific controls have been introduced to further the economic purposes of the concern and of the individuals within it. Much of this advance has gone in the name of efficiency or rationalization. Nothing comparable to this advance has gone on in the development of skills and techniques for securing cooperation, that is, for getting individuals working together effectively and with satisfaction to themselves (Roethlisberger and Dickson, 1939, p. 552-3).

These studies pointed towards a preoccupation with the social psychology of the industrial environment and more specifically with the group dynamics of specific industrial situations.

Equally important in this change of interest was the work of Kurt Lewin, the father of group dynamics research. His innovative development of theory and systematic methodological techniques have inspired and directed many researchers. Most notable of his research is the investigation of group atmosphere and leadership styles (Lewin, Lippitt, and White, 1939). At different periods in the study an authoritarian, a democratic, or a laissez-faire approach was employed by adult leaders of boys' groups.

The results showed that the boys under authoritarian leaders were dependent on the leader and often responded aggressively to each other; whereas the democratic groups were friendly and freer in their suggestions. In the democratic groups there was no change in productivity when the leader left the room. In contrast there was a sharp drop-off in productivity after the authoritarian leader left the room.

This study motivated many future studies of leadership style and many investigations of how different leadership styles lead to differential effects upon the group members.

These two major works gave rise to the human relations approach in industry. The most attention has been given to the characteristic pattern of decision making in an organization. Today, participative management as a preferred mechanism for decision making is integral to many organizational theories. There are several different theories about ways of improving organizational effectiveness, all of which identify increased participation as a major component. Involved in this approach for many is the development of the group or the development of teamwork. The work group is the basic unit or building block in the theories of Nelson (1949), Likert (1961, 1967) and Blake and Mouton (1964). The work group also has a prominent role in Shepard's (1965) theory of organic

structure and Burns and Stalker's (1961) interest in socio-technical systems. According to all these theorists the most effective managers tend to develop group process and involve the group in the management process.

Despite the importance attributed to the work group by these authors, there has been little empirical research on the work group within the complex organization. These organization theorists have generally been prescriptive in their treatment of small groups. Their emphasis has been upon the individual and his relationship to the total organization while the development and operations of the group have been neglected.

The small group in isolation has been studied extensively by social psychologists and sociologists (Cartwright and Zander, 1968; Hare, Borgatta, and Bales, 1965; McGrath and Altman, 1966). Yet, the development of a group, particularly an industrial group, rarely has been examined. Most small group research focuses upon a particular element of a group, such as communication structure, in a laboratory setting.

Weick (1965) in his discussion of laboratory experimentation pointed out that subgrouping and the interaction between groups is the essence of an organization. He further stated that the failure of many laboratory experiments was the inability of the laboratory groups to mirror natural groups in their history and processes of development.

Even though the importance of the groups in an organization is noted, Katz and Kahn (1966) in their monograph on The Social Psychology of Organizations could only talk about three levels of groups on a development scale. The first group they described is the primitive group in which all regulatory mechanisms are lacking. An intermediate level group is the informal group. Their use of this term is to denote groups which have well developed structures, but lack the specialized substructures that characterize formal organizations. The most developed group is the social institution which is bound together not only by organizational structure but also in many other ways.

Obviously, these three levels of development offer limited help in understanding group growth. The Katz and Kahn description is not concerned with the development of processes within a group but with the level of development of types of groups. Given the importance of groups to organizational psychology and to participative management especially, there appears to be a need to examine group development within an organizational setting.

Therefore, this dissertation is a pilot study (1) to describe the development of work teams in a complex organization and (2) to generate hypotheses about the relationships among the elements of group process in the development of a work team.

Group Development Literature

The most comprehensive review of the group development literature is found in a review article by Tuckman (1965). Tuckman devised a classification model based upon the group's setting, the realm of group behavior, and the position of the group in the developmental sequence. The four types of group settings distinguished are: (1) the group therapy setting, (2) the human relations training group setting, (3) the natural group setting, and (4) the laboratory-task setting. In the Tuckman review the last two types were combined because there were such a small number of studies in that area and because the theoretical statements in the research reviewed were generalized to both areas.

In the study reported in this thesis the primary interest is the industrial work group which would be a Type 3 group. In the discussion of the literature, Type 3 and Type 4 groups will be combined under the heading of task groups. A few representative studies of the development of Type 1 and Type 2 groups will be discussed in order to demonstrate the similarities and differences between the development of industrial work groups and other types of groups.

Tuckman's model of development describes two realms of group behavior, interpersonal and task, each of which passes through four stages of development. The pattern of

interpersonal relationships is referred to as group structure and the content of interaction is referred to as task activity.

According to Tuckman the stages are the same for all types of groups:

Stage 1 is labeled testing and dependence in the group structure realm and orientation to the task in the task activity realm. During this period the members are determining what behaviors are acceptable in the group, identifying the task boundaries, and defining the "ground rules" for the group.

Stage 2 is labeled intragroup conflict in the group structure realm and emotional response to task demands in the task activity realm. This stage is characterized by intense emotional responses particularly resistance, conflict, and hostility.

Stage 3 is labeled the development of group cohesion in the group structure realm and the open exchange of relevant interpretations in the task activity realm. Harmony is the key to this stage and conflict is avoided at all costs. Alternative interpretations of information are discussed openly.

Stage 4 is labeled functional role relatedness in the group structure realm and the emergence of solutions in the task activity realm. The group performs now in a constructive problem solving manner. The energy of the group is functionally related to the task.

Before discussing this model, other concepts concerning group development will be presented.

Therapy Groups

The work of Bion (1948, 1949, 1950, 1951) with group psychotherapy emerged from a psychoanalytic framework, and contributed very importantly to the ideas of many of the authors interested in group development.

Bion attributed emotional and dynamic properties to the group itself in addition to the properties of the individual members. The key concept in his theory is the work group or sophisticated group. Work group functioning parallels ego functioning within the individual. The work group translates the thoughts and feelings of the group into behavior which is adapted to reality. The work group is described as a sophisticated, well organized, relatively emotionless problem solving task unit.

In conjunction with the work group functioning, Bion discusses three basic assumptions under which the group operates in relation to its emotional climate. The three assumptions which he observed operating within the therapy group are the dependency assumption, the pairing assumption, and the fight-flight assumption. The dependency assumption is operating when the group meets to seek nurturance from the leader on whom it depends. The pairing assumption involves the subgrouping of two individuals in a relationship

based upon the Messianic hope that the relationship or group will be preserved for its own sake. The fight-flight assumption deals with the group's emotional response to self-preservation.

Work group functioning coacts with only one of the group assumptions at a time. According to his theory there is no developmental pattern to the three assumptions. Any assumption can operate within the group at any given time depending upon the group's emotional state. Development pertains only to the work group in terms of the degree of sophistication of its organizational structure.

Bach (1954) utilized the dynamics of the group situation in an intensive psychotherapeutic situation to reach the goal of free communication on a nondefensive, personal, and emotional level. He labeled seven developmental phases in the therapeutic growth process. The group starts with a situation testing phase where they learn something about each other and develop expectations about the group. Growing out of their initial apprehensions and insecurity about the group is the leader dependence phase. The next two stages are characterized by the group's increasing skill and strength in dealing with group members' dependency needs. At first the group assumes a family quality, then a style similar to adolescent peer groups.

The social needs and social anxieties aroused by the group are expressed and integrated into the work of the

group through a play and fantasy stage. An ingroup consciousness stage characterized by subgrouping and pairing precedes the attainment of the work group phase.

Other examples of the development of therapy groups can be found in Tuckman.

Sensitivity Groups

Three sets of investigators (Thelen and Dickerman, 1949; Miles, 1953; Bennis and Shepard, 1956) have presented very similar descriptions of the pattern of a sensitivity group's development. The first group studied was one attending a session at the National Training Laboratories in Bethel, Maine and the other two were groups of students in college sensitivity training classes. In all three the goal of the group was to improve the interpersonal relations of the members.

Among the three studies the Bennis and Shepard analysis is the most detailed in its description of the development process. The goal of the Bennis and Shepard approach was to improve the internal communication systems of the group and to achieve consensual validation of the group's experiences. Two major problem areas blocking this goal are the authority or dependence relations and the personal or interdependence relations.

In resolving the dependence problems there are three subphases which the group passes through. The ambiguity of

the group's situation at the start produces anxious searching for a common goal and a dependency on the leader to provide direction. The lack of response from the leader arouses hostility and rebelliousness within the group. Struggles for power among warring subgroups, characterize the second subphase. Resolution of the conflict is reached through the compromise efforts of the strong, independent members who had been relatively passive up to this point.

Next the group turns to personal relations. Patching the wounds of the warring period gradually leads to the legislation of a strong intermember identity demanding complete loyalty to the group. The degree of intimacy required by the group forces a breakdown in the group identity. The task demands of the final course evaluation activates certain members toward a willingness to express their own self concepts. Through rational discussion, consensus is established among the group members about each other's conceptual scheme of interpersonal relations.

Although labelled somewhat differently, the stages discussed by Thelen and Dickerman and by Miles are comparable in content. These three studies directly parallel Tuckman's four stages of forming, storming, norming, and performing.

An alternative description of group development is provided by the life cycle models of Mills (1964) and Mann (1967). Both theorists believe that any developmental

model must follow the birth to death life cycle of the group rather than the simple progression to some implicitly desired state. Learning groups are the type of groups used in the development of both models. Mills' model is derived from his experience with many different learning groups, whereas the Mann model comes from the observation of a Harvard class in interpersonal relations. The Mills' five stage developmental sequence differs very little from the previous three studies of sensitivity groups. He added a final stage of the termination of the group and the separation of the members, and placed less emphasis on the conflict of the second stage. In the second stage he stressed the group's initial attempts to replace anomie through goal establishment and role development.

Mann concentrated upon the changing relationships between the members of the group and their formal leader, and not the entire set of interrelationships within a group. The six phases of group development are defined in terms of the group members' willingness to take over the leader's interpretive, analytic role. The first phase of initial complaining is characterized by nurturance and control themes. Because of the abdication of the leader's expected role people respond with frustration. The response of the members follows their own basic mode of response to a novel situation. Phase two, premature enactment, is the beginning of some self-awareness of the members as a group. Tension

develops between those who prefer dependence on the leader and those who prefer autonomy. A confrontation phase of direct hostility between the group members and the leader follows. During this period the members complain that the leader is too passive and weak but at the same time that he is maipulative and overbearing in relation to task goals. A high level of enacting the leader role by the members occurs in the internalization phase. During this period there is a dramatic increase in identification and an emphasis on work. The last two stages of separation and terminal review are concerned with the death of the group. Depression is the dominant theme in the group, spreading to feelings of loss and abandonment in the final phase. Generally the phase is highly emotional with changes in emotions from mania to depression.

Task Groups

Fundamental Interpersonal Relations Orientation is a theory of interpersonal relations proposed by Schutz (1958) to analyze effective work groups. Schutz feels that every person orients himself toward others in characteristic ways based upon childhood experiences. Three interpersonal needs, inclusion, control, and affection, are used to explain characteristic behavior patterns. Inclusion refers to the need to develop and maintain a satisfactory relationship with others. Control refers to the decision making process between people, i.e. relations with others with respect to

authority and power. Affection refers to the need for close personal and emotional ties with others. Schutz postulates that the development of any group follows the pattern of concern for inclusion needs, then concern for control, and finally concern for affection needs.

The theoretical model of task group development that is supported by the largest amount of reported research is the model of Bales and his associates (Bales and Strodtbeck, 1951; Bales, 1953; Heinicke and Bales, 1953; Philp and Dunphy, 1959; Bales, 1970). All these studies are based upon the use of Bales' Interaction Process Analysis (1950) of discussion groups. Bales and Strodtbeck (1951) and Bales (1953) found that the interaction of a group within a single meeting or session moved from problems of orientation to problems of evaluation, to problems of control. Concurrent with these transitions, the relative frequencies of negative and positive reactions tended to increase.

Heinicke and Bales (1953) and Philp and Dunphy (1959) extended the analysis from a single session to four and eight sessions respectively. The studies examined changes in four types of acts: (1) attempted answers, (2) questions, (3) positive socio-emotional, and (4) negative socio-emotional. Across all sessions the attempted answers category accounted for over 50% of the acts, the questions and positive socio-emotional categories each about 20%, and the negative socio-emotional category about 6%. Both studies

showed a similar pattern of decreasing task oriented rates and increasing socio-emotional rates over time. Session one was heavy on task oriented types of interaction with an inhibition of affect and low rates of negative reactions. The second session was the period of greatest conflict. In the Philp and Dunphy group there was a sharp drop in positive statements with only a slight increase in negative statements, whereas the Heinicke and Bales group had a sharp increase in negative statements and only a slight drop in positive statements. The overall effect was still the same. Sessions three and four showed greater affect with sharper rises in positive reactions than negative, and less task oriented activities.

Schroder and Harvey (1963) have developed a model of group development related to their ideas of a conceptual organizational system. The model posits the growth of the group from an undifferentiated mass through stages of differentiation to a state of maximal integration. Initially the group begins with some overgeneralized and absolute definition of its situation. During the second stage some alternatives to the original situation definition enter and the absoluteness begins to change to some degree of conflict between subgroups. Stage three is the beginning of integration. The members recognize some mutual dependencies and are open to multiple alternatives. During the fourth stage integration proceeds more intensively as the group's capacity to integrate improves.

Olmsted (1962) suggested another developmental model of a social group. He divides the model into two preconditions and nine major group attributes classified as rudimentary, emergent, and mature; and refers to the relations to group products and member satisfactions.

In any particular analysis situation the preconditions are assumed to be constant in this model. Rudimentary attributes are concerned with the group getting acquainted and establishing its basic patterns of interaction. Emergent attributes focus upon the structural development of the group with respect to establishing standardized behavior patterns for accomplishing its tasks. Mature attributes reflect the results of the preceding development in the form of code of behavior and a dominant tone of the group interaction.

Two other group development models were deduced from the analysis of specific types of groups (Modlin and Faris, 1956; Jacobson, 1956). Modlin and Faris analysed the history of a staff team of professionals working in a mental hospital. They labeled the phases of the team's history: Structuralization, unrest, change, and integration. The structuralization phase was characterized by the team's definition of functional roles. The period of unrest involved interdisciplinary friction and personality clashes. The change phase was the beginning of the notion of the group as a functioning unit. Communication and group identification were improved. The integration stage involved internalization of the group

in such a way that the patients were not viewed as intruders, but temporary members.

The only group developmental model that was based upon an industrial work group emerged from a study of the effectiveness of committees in a voluntary agency (Jacobson, 1956). Jacobson's main concern was with the structural process in group growth. He labeled six different stages in the growth of his groups that were associated with the activity level of the committees.

> Stage one involves an identification of the individual with the group in terms of a congruency of his own needs with the requirements of the group.
>
> Stage two was characterized by an opportunity for the members to take part in group activities.
>
> Stage three was characterized by the emergence of a differentiated role structure.
>
> Stage four followed with some improvement in the communication practices of the group.
>
> Stage five signalled the point at which leadership practices had their greatest influence on the group's growth.
>
> Stage six led to the existence of a relatively enduring set of group processes.

Comparison of the Different Theoretical Approaches

The various theoretical ideas will be discussed and compared for the purpose of describing the model of

development for the industrial work group. The implications of the particular type of group for the type of model employed as well as the specific sequence of development will be highlighted.

A life cycle model of group development was proposed by two different people (Mills,.1964; Mann, 1967). Their contention was that the death of the group is left out of most theoretical conceptions. For both theorists the type of group they were focusing upon was the learning group in which the members knew upon entering the group that it was temporary and would end at a given time. The industrial work group, which is the concern here, has no definite time for its death. Thus, preparation for its demise does not appear to be a significant factor in the developmental process of the industrial work group. Consequently, a life cycle model does not appear appropriate for the industrial group.

The industrial work group is much different than either the therapy or sensitivity group in terms of the goals of the group and the motivation of the members for belonging to the group. The purpose of both the therapy and the sensitivity group is to improve the individual's ability to cope with the problems of living and to interact less defensively with others. The group is used as a medium to effect this individual development. In this case the task becomes the building of the interpersonal relationships. The difference

between the two types of groups is that the therapy group involves remedial training for those people with severe problems in interpersonal skills and the sensitivity group involves advanced training for those people who want to increase their capabilities in interpersonal skills.

One feature of therapy or sensitivity groups is the unusual structuring of the situation to emphasize the common problems among individuals in interpersonal relationships. The leader abdicates the normal leadership role to confront the individuals with their inefficient modes of behaving. At the same time the individual is constantly cajoled into analysing his own behavior in various situations. This situation tends to heighten the degree of threat and emotionality present within the group. In the groups' activity, specific relationships such as the member to leader and specific emotions such as hostility are concentrated upon.

The industrial work group, on the other hand, is characterized by its performance of a specific task. Instead of the interpersonal structure <u>being</u> the task, it is <u>serving or accomplishing</u> the task. The group is used to perform the task and not to help the individual solve his problems.

As Tuckman (1965) points out, most of the literature deals with therapy or sensitivity groups and not task groups. Although his sources were primarily reports about therapy and

sensitivity groups, Tuckman's synthesis is supposed to apply to all types of groups. His own discussion points out the fact that the poorest fit of his model is with the task groups. He deduced from his investigation of the task group literature that only the initial stage of forming and the final stage of performing were essential characteristics of task groups. In reviewing all the literature discussed here and by Tuckman, those two stages are the ones mentioned by almost all the theorists.

Sandwiched between the initial forming stage and the final performing stage in most of the therapy and sensitivity group models are stages related to changing characteristic behavior styles of individual members in interpersonal situations. Bion's theory of group functioning described these individual behavior styles in terms of his three group assumptions of dependency, pairing, and fight-flight. In his model these three assumptions follow no developmental pattern. Only work group functioning has the characteristics of development. His discussion of the structure of the group as the characteristic in the development of work group functioning is consistent with the emphasis upon the development of structure in the task group models (Jacobson, 1956; Schroder and Harvey, 1963; Olmsted, 1962).

From this analysis, it would appear that a model of the development of an industrial work group should

concentrate upon the interpersonal structure of the group in accomplishing the task. The characteristics of its developmental pattern should reflect primarily the progress of the group as a group and not the progress of individuals as good group members.

Concentrating on those models related to task groups there is a great deal of variation in the description of the phases of development. Two of the models discussed do not seem to follow the guidelines laid out above. Shutz (1958) presented a theory of interpersonal relations whose principal emphasis was the individual and his characteristics in the group and not group characteristics as such. Thus, the Schutz model is more similar to therapy and learning group models than to task group models.

The work of Bales and his associates focuses upon the content of interaction within the group. The specific form of the content patterns varies with the type of problem before the group. The Philp and Dunphy groups had a different distribution in the categories of acts than did the Heinicke and Bales groups, which Philp and Dunphy attributed to the differences in the tasks of the two groups. The task of the Philp and Dunphy groups was to do a class project and report it; the task of the Heinicke and Bales groups was to discuss a human relations problem. Their work is quite helpful in labeling the pattern of task activities to be observed in the development of the group's structure, but they do not directly focus upon the group structure.

Schroder and Harvey (1963) and Olmsted (1962) developed models that applied to a general group type, whereas, Modlin and Faris (1956) and Jacobson (1956) evolve models from a particular group situation. The first two models provide a more thorough understanding of group development at the abstract conceptual level. The last two models provide some data about the operations of group development in a specific situation.

The conceptual framework for the pattern of group development is best articulated by Schroder and Harvey (1963). They see the group moving from an undifferentiated mass through stages of differentiation to the point of maximal integration. They are less clear about the specific type of changes within this pattern primarily because they switch their discussion throughout from the total system to the single group and vice versa. Their description of the change that occurs in the group from stage one to stage two is useful in understanding the task group. In therapy and sensitivity groups, this is the period of high emotionality and conflict. Even though the task groups are not characterized by the same high emotionality, a higher degree of tension and conflict exists here than in other stages (Philp and Dunphy, 1959; Heinicke and Bales, 1953; Modlin and Faris, 1956). According to Schroder and Harvey (1963) this is the beginning of the differentiation of the group. The group begins a redefinition of its situation and the alternative

modes of operating and conceptualizations of the situation produce some tension.

The Jacobson model (1956) being the only model directly involved with the industrial situation will serve as the basis for the conception of the development of the industrial work group that follows. The Jacobson model was based upon a post hoc analysis of voluntary groups. The model here will be modified and extended to work groups within a complex organization.

CHAPTER II

A THEORETICAL MODEL OF GROUP DEVELOPMENT IN AN INDUSTRIAL SITUATION

From the analysis of the literature, several guidelines were set up for this model. The structure of the group in accomplishing its task will be the focus of the model. The emphasis will be upon the internal system of the group rather than the external system (Homans, 1950). Within the complex organization, the task of the group is fairly well specified for the group by its organizational context. The process it develops in accomplishing that task is more at its discretion.

In developing the model, it is necessary to define more clearly the traits of the fully developed or mature work group from the processes within its development.

Group Maturity

The concept of group maturity is not well defined. Bennis and Shepard (1956) claim that maturity for a group is analogous to maturity for a person: a mature group knows very well what it is doing. This idea is analogous to the syntality definition which refers to the final performance of the group as a group (Cattell, 1948). It is necessary

to examine the ways in which individual maturity has been conceptualized to determine whether the analogy between group and individual maturity seems reasonable.

Developmental psychology according to the organismic theory of Heinz Werner (1957) postulates a single regulative principle. His orthogenetic principle states:

> wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration (Werner, 1957, p. 126).

Mature organisms are characterized by the development of a stability of structure while maintaining the capability of reorganizing to adapt to a changing environment.

The developmental theories of Piaget (1932), Freud (1933), and Erikson (1950) rest upon a similar principle in discussing ways in which the individual adapts to his environment. Evidence for this concept of maturity can also be found in Heath's (1965) studies of mature and immature college men.

Offer and Sabshin (1966) and Jahoda (1958) have reviewed the literature on concept of mental health, which is often treated as a synonym of maturity. Offer and Sabshin synthesized the literature into four different approaches: (1) Normality as health, (2) Normality as the average, (3) Normality as utopia, and (4) Normality as process. Only the last two are consonant with the ideas of the maturity concept as used in developmental psychology.

Normality as utopia is conceived of as some state of self actualization or as the utilization of full potential (Maslow, 1954; Rogers, 1961). Normality as process is considered the end result of a set of interacting systems that change over time (Werner, 1957; Piaget, 1932; Freud, 1933; Erikson, 1950).

Jahoda described positive mental health as a multifaceted concept. She identified six positively related elements in her definition:

1. Attitudes of the individual toward himself.
2. The style and degree of individual growth, development, or self actualization.
3. Integration.
4. Autonomy.
5. Perception of reality.
6. Environmental mastery.

The construct of individual maturity described by these various theorists seems to be closely related to the ideas of group maturity in the work group of Bion, the integrated group of Schroder and Harvey, and the enduring set of group properties described by Jacobson. The analysis provided by Jahoda establishes a framework for operationalizing the concept of group maturity.

A reexamination of end states defined in the models of group development in relation to the constructs of individual maturity provides a construct of group maturity conceptualized as a composite of three factors:

1. The problem solving process of the group.
2. The cohesiveness of the group.
3. The existence of shared norms within the group.

In all the group development models the problem solving capability of the group represents the group's total functional integration and its ability to deal with the environment. Cohesiveness and shared norms within the group provide the dual capabilities of attaining stability while maintaining the flexibility for adaptation.

Stages in Group Development

A key concept derived from the theorists discussing individual maturity is that there exist critical periods during which particular behaviors are acquired and particular relationships are important. Each developmental stage of the individual revolves around a critical problem to which all the individual activities are directed. For example, in Freud's schema the critical factor during the phallic stage is the resolution of the Oedipal complex.

The same notion of critical periods can be applied to group development. During the developmental stages of a group, there exist critical periods for each of the processes involved. Group development differs from individual development in the sense that groups do not master one process or set of behaviors before they can begin the next stage. Each group process interacts with other processes and contributes to the development of a group at all stages. Thus one must

keep in mind that each process has its own critical period in the development of group maturity. This does not mean that the other processes do not contribute to group maturity at that stage but that the one particular process is more important at that particular stage.

In the very beginning of the group the most important process is identification. Identification comes first for many reasons. First, identification is not a group process as such. It describes the individual's relation to some other person, persons, or things. This process involves the incorporation of some need for the group within the individual. Some degree of identification with the group among the members is necessary for the survival of the group (Zalesnik & Moment, 1964). In addition, the type and degree of identification in the group determines a direction or pattern which the other processes will follow in their development.

All the groups described by the theorists mentioned had to go through some type of initiation and orientation phase. This is a period of defining the group situation for the individual. The descriptions of this stage fit together into Jacobson's idea of identification in which the individual discovers if his own interests and needs are congruent with the programs and goals of the group.

Once some degree of psychological acceptance of the group is established among the group members the

interpersonal structure of the group takes primary importance. The second critical period involves a redefining of the group situation and the beginning of the differentiation of the group's structure. This period is characterized by the development in the group of the performance of the appropriate task behaviors by the members of the group. These are a modification of the general task behaviors described by Benne and Sheats (1948) that any group needs to perform and not merely related to specific performance of their organizational tasks. This stage is a combination of the ideas of Jacobson in his second and third stages.

In the development of the group the next critical factor is the communication structure. The communication patterns established within the group serve as the connecting link between the further differentiation of the group and the integration of the group.

Finally, leadership practices are the critical process at stage four. The type of leadership practices referred to here is the total group's leadership practices. The distribution of leadership activities across the group builds upon and expands the effectiveness of the structural aspects of the group. As leadership functions become more widely distributed within the group, the group approaches the condition described by Likert and sensitivity group theorists as one in which the group can realize its full potential.

Each of these four processes are continually interacting with each other as a group moves toward maturity. One process contributes to and builds upon efforts to improve the other. Each stage of group process is associated with some degree or level of group maturity. The changes in the processes of the group are linked to increases in the group's total level of maturity.

From these ideas the following hypotheses are derived to state the relationship between the elements of group process and group maturity.

1. Identification is more strongly related to group maturity at level one than are role differentiation, communication practices, and leadership practices.

2. Identification is more strongly related to group maturity at level one than it is at levels two, three, and four.

3. Role differentiation is more strongly related to group maturity at level two than are identification, communication practices, and leadership practices.

4. Role differentiation is more strongly related to group maturity at level two than it is at levels one, three, and four.

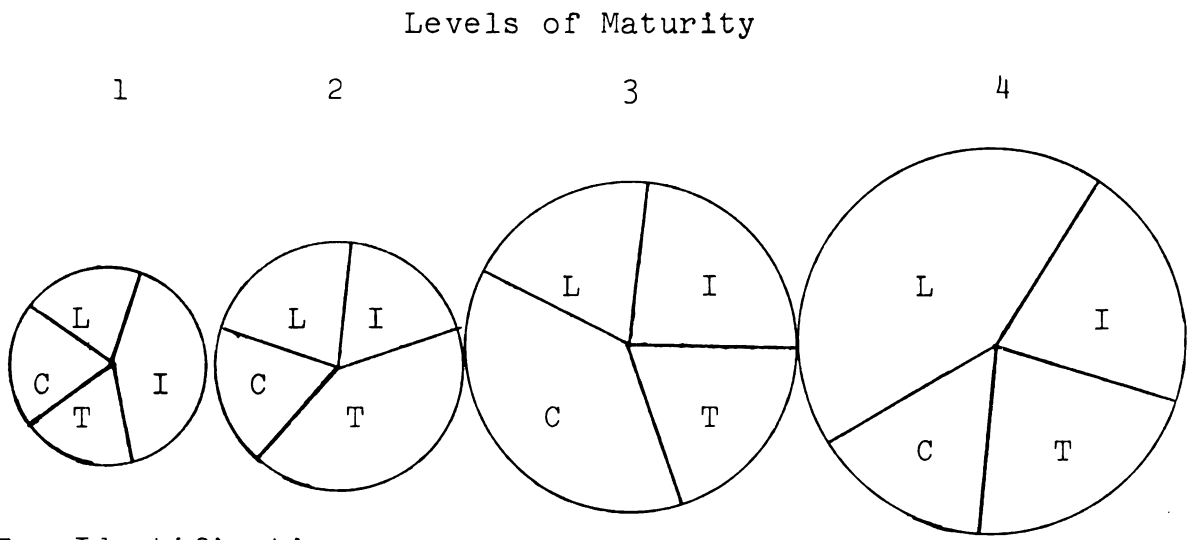
5. Communication is more strongly related to group maturity at level three than is identification, role differentiation, and leadership practices.

6. Communication is more strongly related to group maturity at level three than it is at levels one, two, and four.

7. Leadership practices are more strongly related to group maturity at level four than are identification, role differentiation, and communication.

8. Leadership practices are more strongly related to group maturity at level four than they are at levels one, two, and three.

A diagram of the relationship among the elements is presented as Fig. 1.



I - Identification
T - Task Development
C - Communication
L - Leadership Distribution

Fig. 1. Proportion of group maturity explained by the elements of group process at each level of maturity.

The idea expressed in these hypotheses is that all of these processes contribute to expanding the degree of maturity of the group over time. However, each process has a particular period in which it makes its greatest contribution to the group's maturity.

CHAPTER III

THE WORK TEAM CONCEPT AT THE RESEARCH SITE

The site of this research is a manufacturing operation which employs about 450 perple in four divisions.

The company installed the Scanlon Plan in 1952 with the aid of Dr. Carl Frost. The Scanlon Plan is a theory or philosophy of management, which consists of a set of assumptions about human motivation and behavior, some general principles concerning the effective management of organizations based upon these assumptions, and some specific structural recommendations for the implementation of these principles in ongoing organizations. The principles of the Scanlon Plan stress the need for: (1) a system for sharing with the employees information about the organization's objectives, plans, and problems; (2) a system for increasing organizational effectiveness through participation by the employees in decisions that affect them and their jobs; and (3) a system for establishing a reward structure and leadership practices that foster cooperation.

These three principles generally are implemented through a network of production committees at the department level, a screening committee at the divisional or corporate level,

and a monthly bonus based upon labor efficiency. The production committees meet to discuss ways of improving the efficiency of the department and to solve current production problems. The screening committee acts on suggestions referred to it by the production committee and reviews the bonus performance for the month. For every month in which the organization produces their products at less cost than the established standard labor cost, a monthly bonus is provided to employees for their part in improving the labor efficiency of the organization. The bonus is distributed to everyone in the company from the top to the bottom as a percentage of their salary. A more thorough discussion of the Scanlon Plan can be found in McGregor (1952), Lesieur (1958), and Doyle (1970).

Over the past twenty years a multitude of behavioral science inputs have been assimilated into the organizational management system of the company where this research was done through feedback to the organization from consultants and research projects and through individual training of the managers. From their experiences, a core of people throughout the organization has developed a "self-consciousness" about the nature of the organization. This core, through its internalization of the Scanlon Plan principles, provides the network of teams with the framework for the development of group process and the capability of adaptation to its environment.

In 1967, the company hired a full time organizational development manager and began to use more extensively a variety of behavioral science inputs. Several inputs led to changes in the operation of their Scanlon Plan.

First, every manager from the president to the first line supervisor has spent a week at a Managerial Grid training program (Blake and Mouton, 1964). This training helped the managers assess their impact upon others and gave them their first experiences in teamwork management. It also established a common language for the discussion of behavioral science concepts.

Second, the company became involved with Rensis Likert and the longitudinal organizational research project of the Institute for Social Research at the University of Michigan (Taylor and Bowers, 1970). Likert's (1961, 1967) conception of the supervisor as a linking pin in an interlocking network of teams throughout the organization stimulated additional thinking.

The combination of these two factors, the continued consultation of Dr. Frost, and other training programs and assessments led to modifications in their Scanlon Plan committee structures over the last three years. Originally the production committee consisted of two elected representatives from each department and the foreman. The screening committee included one representative from each production committee (no foremen) who would all meet with the division management.

Dissatisfaction arose within the organization over the operation of these committees. Management felt that the production committees were passing suggestions along automatically to the screening committee without taking action on them. Some production workers were complaining that their representative was not adequately representing them because he did not have the same job, and did not know nor understand their problems.

One of the foremen drew up a plan to cope with these problems based upon his experiences at the Managerial Grid training program. Independently, the organizational development manager, stimulated by the publications of Dr. Likert and by the analysis of the data about participation at the production level gathered from the University of Michigan employee survey and a Scanlon Plan employee survey from Michigan State University developed a set of recommendations.

From their analysis a new concept of the work group in the company emerged. Rather than a single workgroup, they discovered that each foreman actually had three or four distinct groups. A work team was defined as the group of people that have a common responsibility for one part of the organization's work. The work teams throughout the organization were identified and established.

The production committee, at this point, became an entire work team. Each supervisor has 1-3 work teams and 3-14 people per team. The committee meetings shifted from a

meeting with representatives to a meeting with the whole group. Quarterly Division team meetings, including representatives from each work team, the foremen, and Division management have been set up to replace the screening committee. The function of the work team is to plan the work, to identify and solve problems, and to evaluate the activities of its own team. The Divisional team is involved in divisional planning, policy making, and coordination and serves a communication link within the division.

CHAPTER IV

METHODS AND PROCEDURES

Data Gathering Procedures and Research Design

The data for this study were gathered through the joint efforts of the Midwest Scanlon Associates, Michigan State University, and the Institute for Social Research (ISR) of the University of Michigan. Mr. Steve Iman of the Institute for Social Research, cooperated in the study, design, and data gathering.

At the time that this research project was being developed, the company studied was an active participant in the longitudinal employee attitude survey of a number of organizations being conducted by the ISR at the University of Michigan. ISR's cooperation in the data collection phase of this project was obtained to take advantage of the opportunity to use the ISR data that were relevant to the purposes of the study.

A cross sectional correlational analysis of the two classes of variables--group process and group maturity--was used. Since the concept of a work team and its use was introduced to the whole organization at the same time, it was assumed that differences in maturity among groups at

the time of the study could be attributed to their rates of development resulting from their type of group process. Given this assumption and the exploratory nature of this study, the cross sectional design was used to generate a set of hypotheses for a more extended analysis of group growth in the future.

The measures of the group process and the group maturity variables were obtained in the fall of 1970 from the Inter Company Longitudinal Survey (ICLS) of ISR, which was being given for the third time, and the Heinen survey, which was developed specifically for this project. Appendix A contains a copy of the Heinen survey with its instructions. The procedures for administering these two surveys were different. For the ICLS, each individual in the organization was given a questionnaire packet which he took home. The completed survey was returned several days later to predetermined drop off points at the plant. During the four week period after the ICLS surveys were collected the Heinen survey was completed by the members of the organization in meetings of their own work teams.

Two additional measures were gathered as validation data for the group maturity measures. The two measures were the team's perception of its own growth and the managerial ratings of the work teams. The measure of the team's perception of its own growth was contained in the ICLS questionnaire. The managerial ratings of the work teams were gathered six months after the initial data collection.

Subjects

The unit of analysis for this study is the production level work team. Individual questionnaire responses were converted into work team indices. The study was limited to production level teams in order to exclude a possible source of extraneous variance due to differences in the primary purpose or function of the work team.

The data from the two separate questionnaires were matched for each work team. In the ICLS questionnaire the individual respondent was not identified, so the surveys were matched in terms of the number of respondents to both surveys in each work team. If the difference was greater than one, that team was dropped from the analysis.

Using these criteria twenty of the thirty-two production teams remained in the analysis (see Table 1). Thirteen teams were from the Division A and seven from the Division B. The twenty work teams ranged in size from 3 to 11 people and were managed by eight different foremen with each foreman having from 1 to 4 teams.

Definition and Measurement of the Variables

Group Maturity Measures

Cohesiveness (Coh) is the attractiveness of the group for its members. Operationally the variable will be defined in terms of the members (1) perceiving themselves to be part of a team, (2) preferring to remain in the team rather than

TABLE 1

Work Teams in Analysis

Team Number	Employees in Team	Questionnaires Returned	
		ICLS	Heinen
Division A			
1	5	4	4
2	11	9	10
3	4	3	4
4	4	4	4
5	6	5	6
6	11	9	8
7	11	10	9
8	10	9	9
9	11	8	9
10	6	5	5
11	6	6	5
12	11	6	7
13	4	4	4
Division B			
14	6	4	4
15	8	7	8
16	4	4	3
17	5	3	4
18	3	2	3
19	5	5	5
20	11	7	7

leaving it, (3) perceiving their team to be better than other teams with respect to the way the men get along together, the way they help each other out, and the way they stick together (Seashore, 1954).

The problem solving process (PS) measure examined the procedures a team follows in solving its problems. Four parts of the procedure were indexed: (1) outlining the problem, which refers to the preparation and planning in solving the problem; (2) discussing the problem, which concerns the manner in which the team deals with the problem; (3) solving the problem, which refers to the type of solution reached; and (4) overall problem solving ability, which is an expression of competence in handling a problem. This procedure is based upon Maier (1952).

Shared norms (SN) is a measure of the extent of agreement among members about how the team ought to behave. Sixteen normative items were selected on the basis of observing the organization and identifying relevant issues for the work teams. For several months prior to the study, this investigator discussed work team activities with people at all levels of the organization. These employees talked about their own work team as well as their thoughts about the whole work team operation. Items were selected to represent at least three broad areas of work team responsibility: (1) the total team responsibilities to individual members; (2) the domain of activities the teams were engaged

in, both some of those common to all teams and some of those only a few engaged in; and (3) some activities that might adequately be handled by production level teams but were now being handled by higher staff level teams.

Five point Likert scale items were used to measure each of these three variables. For the Coh and PS variables, each individual received a score of 1-5 on each item. For each variable items were combined to give the individual a mean Coh score and a mean PS score. Within each work team individual means were combined into mean work team scores to derive the work team's Coh score and PS score.

The shared norm measure was also a five point Likert scale asking the team member whether the team should or should not do something. The method of scoring was different for this. Since amount of agreement concerning norms was the key issue, the work team variance was computed for each of the sixteen normative statements. The work team SN score was the sum of the item variances for all sixteen items. On this measure a high score indicated few shared norms and a low score indicated many shared norms.

A second category of variables served as a type of criterion measure of the work team's maturity. The first measure was the team's perception of its own growth (PTG) and the second was the manager's ratings of the team's effectiveness (Mgr.R). PTG consists of five point Likert scale items filled out by the work team members describing

their own perceptions of the team's progress and development.

Mgr.R are paired comparison ratings of the production level work teams collected six months after the questionnaire measurements. A copy of the instructions to the managers for making the ratings is included in Appendix B. The production management work teams in each division rated all the production level work teams in their own division. In order to combine these two sets of ratings another group of the managers was used who could rate some teams in both divisions. Uhrbrock and Richardson's (1933) key man techniques were used to combine the three sets of ratings.

Using Guilford's Case III assumptions (1954), three scales were derived for the three sets of judges. The chi square probability of a larger value for each of the sets was .98, .95, and .91 respectively. The assumptions of the Guilford Case III method were met. The third set was used then to combine the other two sets into a single scale.

Group Process Measures

The identification process (Id) represents the work team member's relation to the group. Two factors were assessed in this relationship: (1) his evaluation of the group as instrumental to his goal attainment; and (2) his perception of the value congruence between himself and the group.

The Id variable was also comprised of five point Likert scale items. The procedure for establishing a work team Id score is the same as that for the Coh score and the PS score.

The task development variable (TD) was the number of role behaviors being performed in the team by members other than the supervisor. Each work team member was given a list of twenty role behaviors adapted from the Benne and Sheats (1948) role classification. Group task role behaviors and group maintenance role behaviors that applied to the work team situation were used. Certain representative role behaviors that referred to activities linking the work team with other teams were used in place of individual roles.

To complete the questionnaire role items, each person was asked to check off the person or persons in the team that were performing each of these twenty behaviors. If no one performed the activity, respondents were instructed to check no one; if more than one person performed the activity, respondents were to check each person who performed the activity.

Since each respondent could check more than one person, an agreement cut off score of 50% was established as a basis for a person being counted as performing a role behavior in the team. That is, at least 50% or more of the team members must have said person A performed role behavior 1 before person A would be counted as performing role behavior 1. Once it was determined who performed which role behaviors,

the number of role behaviors being performed by people other than the supervisor were counted. Since the possible range of this score was 0-20, the team's TD score was divided by four to put it on the same scale as the five point Likert measures.

The communication measure (Comm) was defined as the degree of interconnectedness among the members of the work team. Comm was derived using the quasi-sociometric procedures developed by Weiss and Jacobson (1955). Each person recorded the names of the people they countacted regularly in the company, and indicated the frequency and importance of the contact and number of years they had the contact.

The number of high frequency, high importance reciprocal contacts that existed within each work team was counted. The ratio of the number of these reciprocal contacts to the total number of possible reciprocal contacts within the team is the Comm measure. The ratio score was multiplied by five to put it on the same scale with the other measures.

Leadership distribution (LD) is defined as the extent to which all the members of the team are performing the leadership activities. The measure of leadership distribution was obtained from the individual team member's responses to questions about who performed which role behaviors in the work team. For each of the twenty role behavior items, the individual response was recoded into a

1-5 score. The recoding procedure for each item followed this formula:

1 - no one performs the behavior.
2 - the supervisor alone performs the behavior.
3 - the supervisor and one other performs the behavior.
4 - the supervisor and several others (more than two) perform the behavior.
5 - the entire work team performs the behavior.
0 - someone in the team performs the behavior, but not the supervisor.

After the recoding, two of the twenty items were dropped because they were behaviors performed almost exclusively by one member of the team, who was not the supervisor. For the remaining eighteen items, each individual received a mean LD score. The individual LD scores were then combined into a mean LD score for the work team.

Table 2 presents a summary of the sources used in the measurement of each of the variables in the study. The items used to measure each of the variables and an analysis of their empirical characteristics can be found in Appendix C.

TABLE 2

The Data Sources of Variables used in the Study

Variable	Data Source		
	ICLS	Heinen	Other
Maturity			
Coh	X		
PS	X		
SN		X	
Process			
Id	X		
TD		X	
Comm		X	
LD		X	
Criteria			
PTG	X		
Mgr. R			Paired Comp

CHAPTER V

RESULTS

Group Maturity Measures

The first step in examining the relationship of the type of group process to the stages or levels of group maturity was to compute, for each work team, an overall group maturity score. This total score was a composite of the team's cohesiveness, problem solving, and shared norm scores. Each team's cohesiveness, problem solving, and shared norm scores were transformed into Z scores and then summed. In summing the three scores, the sign of shared norm Z scores was reversed because a low score indicated high shared norms and vice versa. Table 3 lists each team's Z score for cohesiveness, problem solving, shared norms, and total. A constant was added to the total score to make the scores all positive. Among the twenty groups then the low total score was .01 and the high total score was 6.73 with a mean total score of 3.38 and a standard deviation of 2.08.

The total group maturity measure and each of its components were compared to the two independent ratings of the team's development by means of Pearson product moment correlations (see Table 4). The first rating was a measure

TABLE 3

Z Scores of Group Maturity Variables

Team	Cohesiveness	Problem Solving	Shared Norms	Total
1	-0.916	-0.085	-0.0080	-1.009
2	-0.777	-0.659	-0.2748	-1.711
3	-1.293	0.085	0.7151	-0.493
4	-0.559	-0.829	-0.2259	-1.614
5	-0.142	-0.191	-1.1670	-1.500
6	0.015	-1.255	-2.1006	-3.341
7	-0.460	-0.212	0.3016	-0.370
8	1.503	1.957	-1.1418	2.318
9	-0.976	-0.617	1.1286	-0.464
10	0.988	0.744	0.9596	2.692
11	-0.380	0.021	1.0960	1.455
12	0.531	0.021	-0.1192	0.433
13	1.186	0.553	-1.9524	-0.213
14	1.305	0.872	1.2042	3.381
15	-1.730	-1.489	0.7566	-2.462
16	-0.559	0.553	1.0530	1.059
17	1.027	1.553	0.6469	3.227
18	1.682	-1.510	0.0304	3.222
19	0.095	-1.297	-0.3726	-1.575
20	-0.519	-1.234	-0.5297	-2.283

TABLE 4

Correlations Among Group Maturity Measures and the Ratings of the Work Team

	Total	Coh	PS	SN
PTG	.69*	.69*	.80*	.09
Mgr. R	.20	.36	.42+	.36

*p < .01
+p < .10

of the team's own perception of its development (PTG) and the second measures were ratings by the managers of the team's development (Mgr. R).

Total group maturity, cohesiveness, and problem solving were all significantly correlated with perceived team growth, but none of the measures were significantly related to the managerial ratings. The problem solving measure approached a significant correlation with the managerial ratings ($p < .10$).

Relation of Group Process to Group Maturity

A 2 x 2 treatments x levels repeated measures analysis of variance was used to test the hypotheses relating group process variables to group maturity. The twenty production level work teams were rank ordered on their total group maturity score and divided into four levels of five work teams each. For each work team the repeated measures were their identification, task development, communication, and leadership distribution scores. Separate analyses of variance were also computed for each of the components of the group maturity measure. For each component the twenty production level work teams were again rank ordered and divided into four levels of five work teams. For all four analyses, each of the levels was not always composed of the same block of five teams. Some differences in the rank order of the maturity measures determined the shifts in level of a particular group.

Tables 5-8 present the AOV tables for each of the group maturity measures. Tables 9-12 present the mean summary tables for each of the AOV tables. For each of the AOV's there was only a singificant difference between types of group process. There were no significant differences between levels of maturity nor any significant interaction effects. With respect to the types of group process the highest mean was the identification process, with the task development and leadership distribution process about equal, and the communication process the lowest. An inspection of Tables 9-12 shows that this same pattern among the group process variables exist within levels of maturity as well as across all four levels.

Each work team's identification score, task development score, communication score, and leadership distribution score were transformed into a proportion of the team's total group process score. One way AOV's of these proportions within each group process type across the four levels of group maturity were used to determine the level of maturity at which the process has its greatest relationship. Tables 13-16 have the one way AOV's for each of the group process types with the four different measures of group maturity. Table 17 contains the mean summary tables for the proportions of group process x group maturity measures. The tables show that the only significant differences are between shared norms and task development. Task

TABLE 5

AOV of Group Maturity Total Score x Group Process

Source	SS	df	MS	F
Between teams	44.5771	19		
A (Levels of Maturity)	8.0242	3	2.6747	1.1708
Teams wn. blocks	36.5529	16	2.2846	
Within teams	62.3748	60		
B (Group Process)	30.6320	3	10.2107	16.1128*
AB	1.3239	9	.1471	.2321
B x teams wn. blocks	30.4189	48	.6337	

TABLE 6

AOV of Group Maturity Cohesiveness Score x Group Process

Source	SS	df	MS	F
Between teams	44.5771	19		
A (Levels of Maturity)	6.7126	3	2.2375	.9455
Teams wn. blocks	37.8645	16	2.3665	
Within teams	62.3748	60		
B (Group Process)	30.6320	3	10.2107	16.6760*
AB	2.3506	9	.2612	.4266
B x teams wn. blocks	29.3922	48	.6123	

*$p < .01$

TABLE 7

AOV of Group Maturity Problem Solving Score x Group Process

Source	SS	df	MS	F
Between teams	44.5771	19		
A (Levels of Maturity)	8.7912	3	2.9304	1.3102
Teams wn. blocks	35.7859	16	2.2366	
Within teams	62.3748	60		
B (Group Process)	30.6320	3	10.2107	18.1459*
AB	4.7323	9	.5258	.9344
B x teams wn. blocks	27.0105	48	.5627	

TABLE 8

AOV of Group Maturity Shared Norm Score x Group Process

Source	SS	df	MS	F
Between teams	44.5771	19		
A (Levels of Maturity)	1.6028	3	.5343	.1989
Teams wn. blocks	42.9743	16	2.6859	
Within teams	62.3748	60		
B (Group Process)	30.6320	3	10.2107	17.9041*
AB	4.3664	9	.4852	.8508
B x teams wn. blocks	27.3764	48	.5703	

*p < .01

TABLE 9

AOV Mean Summary of Group Maturity
Total Score x Group Process

	Id	TD	Comm	LD	Total
Level 1	15.93	13.00	7.10	11.80	47.83
Level 2	15.32	12.00	7.70	12.30	47.32
Level 3	18.35	17.00	10.70	16.76	62.81
Level 4	19.14	14.25	8.70	13.30	55.39
Total	68.74	56.25	34.20	54.16	213.35

TABLE 10

AOV Mean Summary of Group Maturity
Cohesiveness Score x Group Process

	Id	TD	Comm	LD	Total
Level 1	15.11	14.50	6.40	12.96	48.97
Level 2	16.92	13.25	8.85	13.68	52.70
Level 3	16.80	12.25	6.60	13.04	48.69
Level 4	19.91	16.25	12.35	14.48	62.99
Total	68.74	56.25	34.20	54.16	213.35

TABLE 11

AOV Mean Summary of Group Maturity Problem Solving Score x Group Process

	Id	TD	Comm	LD	Total
Level 1	15.83	11.50	8.70	11.00	47.03
Level 2	15.74	14.00	4.40	13.49	47.63
Level 3	18.03	16.50	12.40	16.37	63.30
Level 4	19.14	14.25	8.70	13.30	55.39
Total	68.74	56.25	34.20	54.20	213.35

TABLE 12

AOV Mean Summary of Group Maturity Shared Norm Score x Group Process

	Id	TD	Comm	LD	Total
Level 1	18.10	10.25	7.90	12.51	48.76
Level 2	15.48	16.25	7.80	13.81	53.34
Level 3	17.09	15.50	8.95	13.52	55.06
Level 4	18.07	14.25	9.55	14.32	56.19
Total	68.74	56.25	34.20	54.16	213.35

TABLE 13

One Way AOV's of Proportions of Group Process x Total Group Maturity

Source	SS	df	MS	F
Id				
Levels	.0148	3	.0049	.3952
Error	.1979	16	.0124	
TD				
Levels	.0017	3	.0006	.1111
Error	.0868	16	.0054	
Comm				
Levels	.0015	3	.0005	.0459
Error	.1737	16	.0199	
LD				
Levels	.0025	3	.0008	.6154
Error	.0209	16	.0013	

TABLE 14

One Way AOV's of Proportions of Group Process x Cohesiveness

Source	SS	df	MS	F
Id				
Levels	.0061	3	.0020	.1550
Error	.2066	16	.0129	
TD				
Levels	.0135	3	.0045	.9574
Error	.0750	16	.0047	
Comm				
Levels	.0056	3	.0019	.1792
Error	.1696	16	.0106	
LD				
Levels	.0029	3	.0010	.7692
Error	.0205	16	.0013	

TABLE 15

One Way AOV's of Proportions of Group Process x Problem Solving

Source	SS	df	MS	F
Id				
Levels	.0189	3	.0063	.5207
Error	.1938	16	.0121	
TD				
Levels	.0109	3	.0036	.7347
Error	.0776	16	.0049	
Comm				
Levels	.0240	3	.0080	.8421
Error	.1512	16	.0095	
LD				
Levels	.0063	3	.0021	1.9091
Error	.0171	16	.0011	

TABLE 16

One Way AOV's of Proportions of Group Process x Shared Norms

Source	SS	df	MS	F
Id				
Levels	.0530	3	.0177	1.7700
Error	.1597	16	.0100	
TD				
Levels	.0396	3	.0132	4.2581*
Error	.0489	16	.0031	
Comm				
Levels	.0036	3	.0009	.0833
Error	.1726	16	.0108	
LD				
Levels	.0003	3	.0001	.0714
Error	.0231	16	.0014	

*p < .05

TABLE 17

AOV Mean Summary of Proportion of Group Process x Group Maturity

	Id	TD	Comm	LD
Total				
Level 1	1.8887	1.2283	.6488	1.2345
Level 2	1.6662	1.2671	.7560	1.3109
Level 3	1.5399	1.3509	.7333	1.3759
Level 4	1.8228	1.2513	.6769	1.2489
Coh				
Level 1	1.6024	1.4524	.6119	1.3335
Level 2	1.8427	1.1242	.7362	1.2970
Level 3	1.7500	1.2620	.6415	1.3468
Level 4	1.7225	1.2590	.8254	1.1929
PS				
Level 1	1.9001	1.1153	.8051	1.1799
Level 2	1.7019	1.4431	.4362	1.4188
Level 3	1.4928	1.2879	.8968	1.3226
Level 4	1.8228	1.2513	.6769	1.2489
SN				
Level 1	2.1483	.9351	.6147	1.3020
Level 2	1.4670	1.5310	.6938	1.3082
Level 3	1.5862	1.3984	.7593	1.2563
Level 4	1.7161	1.2331	.7472	1.3037

development's highest mean proportion of group process measure occurs in level two of the shared norms maturity measure.

None of the AOV results support any of the eight hypotheses. A close inspection of Table 17 shows that for the shared norms and problem solving measures but not the total or cohesiveness measure, the identification, task development, and communications measures have their highest proportions of total group process in the appropriate levels. However, the differences between levels is non-significant.

Another estimate of the relationship between the group process variables and the group maturity variables was obtained through the Pearson product moment correlations of the variables with each other. Table 18 gives the correlations between the group maturity measures. Cohesiveness and problem solving were strongly related to each other, but neither was correlated with shared norms. Table 19 shows that task development, communication, and leadership distribution were all highly correlated with each other, but none of them were correlated with identification. However, identification was the only variable among the group process measures that was correlated with any of the group maturity measures (see Table 20). It was correlated with the total, cohesiveness, and problem solving maturity measures, but not shared norms.

TABLE 18

Correlations Between Group Maturity Variables

	Coh	PS	SN
Coh	1.00		
PS	.74**	1.00	
SN	.24	-.14	1.00

TABLE 19

Correlations Between Group Process Variables

	Id	TD	Comm	LD
Id	1.00			
TD	.28	1.00		
Comm	.30	.65**	1.00	
LD	.39	.84**	.60**	1.00

TABLE 20

Correlations Between Group Maturity and Group Process Variables

	Id	TD	Comm	LD
Total	.66**	.19	.14	.25
Coh	.76**	.12	.19	.17
PS	.69**	.21	.12	.34
SN	.11	-.08	.01	.00

**$p < .01$

CHAPTER VI

DISCUSSION

According to the model proposed in this dissertation, the group processes of identification, task development, communication, and leadership distribution, each have a critical period of importance in the development of an industrial work team's maturity. Identification is the most important process for the group's development in stage one, task development in stage two, communication in stage three, and leadership distribution in stage four. The model is not directly supported by the results of the analyses performed. In the analyses of variance, the proportion of error variance was always relatively high. Given the small number of teams and some of the methodological procedures used in this pilot study, there were many opportunities for the error variance to increase. Some of the methodological difficulties of this study will be discussed.

Group Maturity Measures

The group maturity measure was described as being composed of three components, problem solving, cohesiveness, and shared norms. However, only problem solving and cohesiveness correlated highly with each other and with other variables;

the shared norms component does not. The difference between the first two components and the last is in the procedures of measurement. Problem solving and cohesiveness were five point Likert scales upon which the individual respondent marked the degree to which he felt that the particular stimulus element existed in the team. Thus a high maturity score would reflect team members' perceptions of high amounts of these variables existing within the team.

An analysis of the shared norms measure indicates that it may have been possible for a team to get a high score on shared norms that, in fact, did not reflect high maturity of the team. In filling out the questionnaire, each individual in the team indicated his opinion about what things the team should or should not do. The sharedness of the norms was derived from the variance among their responses. It is possible that a low variance score could have been obtained among a set of people entering the team with similar values about organizational behavior without any knowledge of others' viewpoints as well as among a team who, through continued interaction, have arrived at a formal acceptance of an explicit set of rules for group behavior that express their group value system. In terms of governing the behavior of the team, these two different types of shared norms would produce very different effects. According to the theory of group development, the first type described would not be classified as having shared norms, but rather as having a

correspondence among individual values because the norm sharing was not part of the group process and did not regulate group behavior. It is not the contention here that individual value patterns do not affect the behavior in the team. However, it is the contention that the total team's behavior will only be affected by individual value patterns as the various members of the team become aware of each others' values and translate them into the team's value system through continued interaction.

In order to discover the norms of a particular group, four types of information are necessary: (1) the individual's position on an issue to indicate his own values; (2) the individual's perception of others' positions on an issue to indicate the perceived agreement between group members; (3) some information about the accuracy of group members' perceptions of each other; and (4) an indication of the saliency or relevancy of particular issues to the group. The only type of information directly available in this study concerns the individual's own perception on certain normative issues. The measure of shared norms used may or may not include the other types of information.

Using these four types of information, the development of norms within a group might follow a pattern such as: (1) the individual members have opinions on certain issues, but no knowledge of the other members' opinions on the same issues nor any indications of the importance of these issues

to the other members; (2) the individual members begin to get some indication of others' opinions on selected issues, but not necessarily a very accurate reflection of all the others' opinion; (3) through the group process each of the members gets a very accurate understanding of the group's position on a few salient issues; and (4) further group process leads to the internalization of a set of group values that gives the members the basis for stating and following the group's position on not only the most salient issues for the group, but also new issues that the group has not encountered or is facing the first time. Since a high group maturity score, using the shared norms measure, could be obtained for a group at any of these developmental stages, it is very probable that the low order correlations between shared norms and the other components of maturity are a result of this confounding.

Two independent measures of the development of the group were used as validation measures of the group maturity measures. The correlations were high and significant between the team's own perception of its growth and the total group maturity, cohesiveness, and problem solving; but were lower and nonsignificant between the management ratings and the group maturity measures. The correlation between the managerial ratings and problem solving did approach significance ($p < .10$). Since the cohesiveness and problem solving variables are based upon the team's perception of itself, it

would be expected that the correlations would be higher with the team's own ratings than with the managerial ratings.

Two other factors may account for the differences in the pattern of correlations with the two criterion measures of group maturity. Perceived team growth, cohesiveness, and problem solving are all variables measured by a set of attitude statements about the group contained in the same questionnaire. The correlations among these variables may be increased by a general halo of positive attitude toward the group expressed in the respondents' answers to each question.

The nonsignificance of the correlations among the managerial ratings and the group maturity measures might be accounted for by measurement error in the managerial ratings. Since no manager could rate all the teams, three sets of raters were used to combine the team ratings of the other two groups of raters in the manner described in the methods chapter. With the small number of teams the combination of the three sets of paired comparison ratings may have produced some additional error in the resulting scale values for each of the work teams.

The methodological problems encountered with the group maturity measures suggests the need for additional strong behavioral criterion measures of group maturity for validation purposes.

In addition to the problems concerning the construct of group maturity, there were another set of problems

encountered in the statistical analyses. The theory predicted an interaction between levels of maturity and types of group process. The requirements of the theory and of the analysis of variance design demanded that the twenty teams be divided into four levels of five teams on the basis of their group maturity scores. All twenty teams were rank ordered on each of the four maturity measures. The distribution of team scores on each maturity measure was separated into a level after every fifth team. The actual distribution of scores did not lend themselves to these types of divisions. Across the three components and the total maturity scores, the natural breaks in the distribution varied. For all four measures, the difference between the teams separating two levels of teams was always smaller than the differences between one pair of teams within the same level. For instance, the difference in the total maturity score between the two teams, which are rank ordered on total maturity ten and eleven and which divide level two and level three, was .09; whereas the difference between the two teams, which are rank ordered on total maturity ten and eleven and which both fall within level three, was .16. There always existed within each level at least one pair of teams which had a greater difference in their maturity scores than the pair of teams dividing the two adjoining levels. The distributions of each of the component maturity measures seem to fit more readily into three levels than four.

Another potential problem in the measurement of group maturity is the representativeness of this sample of twenty teams to the total hypothetical population of industrial work groups on a maturity dimension. Acting as if these twenty teams were in fact representative of all the levels of maturity of the total population of groups is probably a false assumption. From the distribution of group maturity scores and from observations of the teams' behavior, a more realistic assumption would be that these twenty teams form a relatively homogenous subset of teams that has been sampled from the hypothetical population of teams at some relatively low level on an absolute maturity scale.

Within the limits of this dissertation, the actual representativeness of this sample can not be determined. Future research must not only be directed towards further development of the construct of group maturity, but also the collection of normative data on the maturity level of groups over time.

Group Process Measures

Turning now to the group process variables, there were some similar problems in the measurement of the variables and the statistical analyses. The pattern of correlations among the group process measures showed that the task development, communication, and leadership distribution measures were highly interrelated, but not with the identification measure. Theoretically this pattern can be understood. The three

related variables were all measures of the structural processes of a group; the identification variable was a measure of the individual's relation, acceptance, and involvement with the group.

The operational independence of the task development variable and the leadership distribution variable is questionable. Essentially the same data is summarized in slightly different ways. The task development variable uses the matrix of who is performing what behaviors in the team and summarizes how much is being done by the team members. The leadership distribution score recodes each individual's perception of how much of the team is performing each leadership role and summarizes that for the entire team. Since practically every role behavior was a leader role behavior, the two measures result in very similar values.

Differences in the four process variables were treated as four repeated measures of group process. The identification score was derived from a summated set of five point Likert scale items. The communication score was a ratio of the actual reciprocated sociometric choices to the possible number of these choices. The task development score involved the counting of the number of role behaviors being performed in a team. The leadership distribution score was a summated score of team member reports of how many team members were performing each role.

Multiplicative transformations were used on the communication and task development scales to make the variances approximately equal and the scale values one to five. In fact, with both these variables the scale values ranged from zero to five. The zero points of these four scales do not appear to be equivalent, therefore the comparability of the four scales is questionable.

Relation of Group Process to Group Maturity

The only relationship found between the group process and group maturity measures was the correlation between identification and the cohesiveness, problem solving, and total group maturity measure. Since the identification measure was also an attitude scale measure contained in the same Likert questionnaire as were the cohesiveness and problem solving scales, there is a possibility that a common halo effect could have contributed to the correlation. However, the cluster analysis procedures give some evidence that these are independent but correlated variables.

Taking into account the previous discussion of the various types of method error variance that might have influenced this study, another explanation for the findings might be offered. If this sample of teams does in fact represent a set of teams in the early stages of development, then the pattern of results conforms to the theory. Among the group process measures, the set of twenty teams have relatively low scores on the structural variables of task

development, communication, and leadership distribution. The identification scores for the entire set of teams were relatively higher. In examining the correlations with the group maturity measures, the higher correlations with identification and the relatively low correlations with the structural measures would conform to the theoretical predictions for groups in the initial stage of development.

The non zero correlations among the group maturity measures and the structural measures of group process can be explained in the following terms: (1) some teams are beyond stage one and (2) each of the processes operates to some extent in every stage. If the above assumption is correct, then the results of this study do support the theory indirectly.

Comments About the Theory

The inconclusiveness of the results of this study suggest an examination of the theory. The theory hypothesizes that the four processes of identification, task development, communication, and leadership distribution each have a critical period in the development of an industrial work group. The theory, however, does not stipulate what actually occurs within each stage. Neither description of the characteristics of the critical process or the relationships among the processes within a specific stage, nor a description of the changes in the processes from one stage to the next is

explicit in the theory. This impreciseness in the theory may account for some of the problems in the data analysis.

A diagram of the theoretical model was presented in the form of a series of pies (see Fig. 2). The diagram illustrated the proportion of group process related to a given level of maturity. In the pie diagram the whole pie represented the total amount of maturity of a group at some stage of its development, but the slices referred to the proportion of group process associated with group maturity. Neither the theory nor the diagram indicated whether the total amount of group process increases, decreases, or remains the same as the group matures. At first, one assumes that the amount of group process increases in a direct linear relationship with maturity; however, the theory only discusses the changing relationships between each of the group process variables and group maturity as maturity increases.

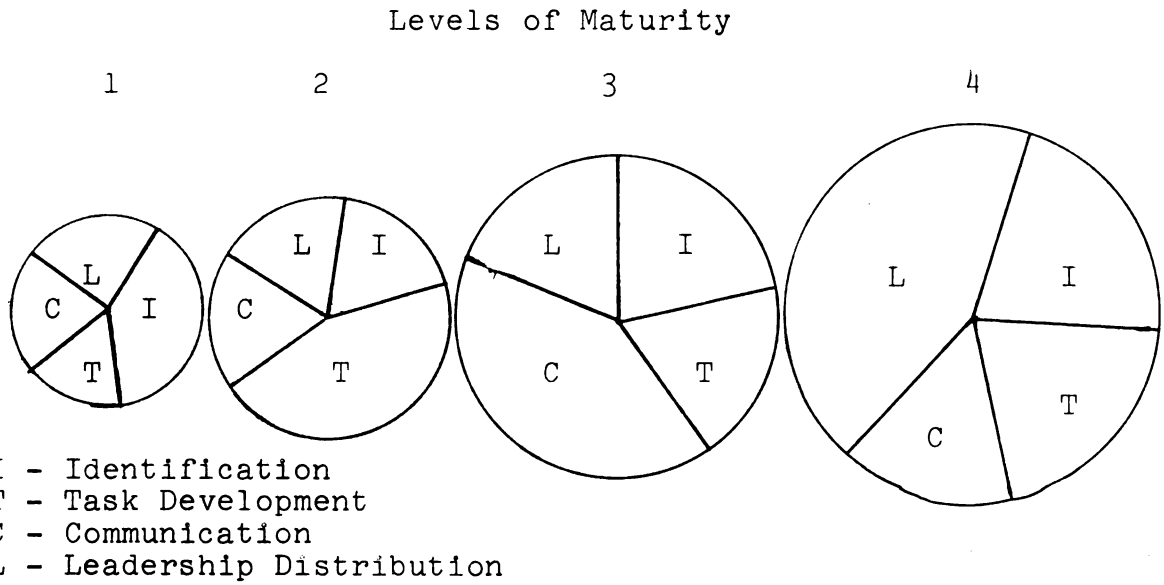


Fig. 1. Proportion of group maturity explained by the elements of group process at each level of maturity.

Using the numbers 1 to 5, with 1 representing a low score and 5 representing a high score, two alternative examples of data can be given that would confirm the idea that each group process has a critical period in the development of the group, but would yield very different conclusions about the relationship among the four processes in the development of the group.

Example 1.

	Level of Maturity			
	1	2	3	4
Group Processes				
Id	4.00	3.00	3.00	1.00
TD	3.00	4.00	2.00	3.00
Comm	2.00	2.00	4.00	2.00
LD	1.00	1.00	1.00	4.00

Example 2.

	Level of Maturity			
	1	2	3	4
Group Processes				
Id	4.00	4.00	4.25	5.00
TD	3.00	4.25	4.25	5.00
Comm	2.00	2.75	4.50	5.00
LD	1.00	1.75	2.75	5.00

In Example 1. the total amount of group process remains the same at each of the four levels, whereas in Example 2. the total amount of group process increases from one level of maturity to the next. The two examples also have different ways of indicating the contributions of the critical process.

In Example 1. the critical process always has a higher score and a higher proportion of total group process in its characteristic stage than the other processes have. However, this means that in Example 1. each process has a lower score in each of its non critical stages. For instance, identification would have to decrease as the group matures for the model of Example 1. to be true. Although such an event is possible, it does not seem to follow logically.

The second example defines the critical process in terms of the amount of change in the process variable from one stage to the next. According to this example, all four group processes increase as the group matures, yet the increase from one stage to the next is the greatest for the critical process. This model resembles the developmental pattern of many child behavior theorists and the pattern Jacobson (1956) described among the voluntary organization task groups.

This discussion of the group's development presumes that the changes in group process are ones of degree. Another alternative that would conform to the theory could be the hypothesis that the kind of identification, task development, communication, and leadership distribution would change from one stage to the next. The descriptions of groups developing in the literature tend to support the idea that changes in levels of group maturity are associated with qualitative changes in group process.

This type of conception of the group's development points to another basic distinction between the model developed in this study and the one presented by Tuckman. The model used here emphasizes that each stage in the development of a group is characterized by a particular critical process variable; the Tuckman model identifies a certain theme of activity associated with each stage in the development of a group. A combination of the two approaches may be helpful. Group development may be characterized by different qualitative patterns of group process with a spurt of activity in one process at each stage.

Future research should be directed at articulating the characteristics of each of the group processes within a stage and the changes in group process from one stage to the next. The first step may require the observation of a set of work groups over time to describe their pattern of development. This description should concentrate upon identifying exactly what happens within a group and not upon searching for evidence that confirms or disconfirms a particular theory. The emphasis used here was upon structural variables. Some other group variables not discussed in this model that might affect group's development were the leadership style of the formal leader, the group atmosphere, and the group goals. The descriptions of the group's behavior should attempt to identify what variables are actually relevant to group development, and also what type of changes occur among these variables over time.

Another step in the explication of the theory involves the distinction between group maturity and group processes. The construct of maturity must be clearly defined so that the patterns of group process associated with the development of maturity can be distinguished from the patterns of group process not associated with development of maturity.

After these aspects of the theory have been developed, one can turn to such questions as:

1. Are there different developmental patterns for groups with different pruposes or different kinds of task?

2. Will increases in group maturity always result in better achievement of organizational goals?

3. What happens to a group that follows a different sequence in its development or stops somewhere in its development?

These are only a few examples of the type of question that might be asked.

Summary

This study was designed to provide some preliminary information with which to build a model of the development of an industrial work group. The limited amount of empirical data available about the development of an industrial work group made necessary the exploratory nature of this dissertation. The data gathered in the study pointed out problems in both the measurement and articulation of the theory and suggested some directions for future research.

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APPENDICES

APPENDIX A

HEINEN WORK TEAM SURVEY

WORK TEAMS

This is part of our program to get additional data about how a work team develops. With it we hope to find things that we should start doing, other things that we should stop doing and things that we need to do better. There are no right or wrong answers, only your answer is important.

No matter who is in your work team, who are the people you work with. LIST on the next page the names of the people in the company with whom you work most closely. "Work most closely" means the people with whom you have regular contacts on any aspect of your job. Name as many or as few people as accurately describe your working contacts.

Check how frequently you contact in person, on the phone; or by letter or memo each of the persons you name.

Put a check mark after each name in the column which indicates the importance of this work contact.

Check the column which indicates how long you have worked closely with this person.

Names of People	Frequency of Contact						Importance of Contact						Time Known				
	Several Times daily	Daily	2 or 3 times weekly	Several times monthly	Several times per year		Very Great	Great	Somewhat	Little	Very Little		6 months or less	7 months to 1 year	1 year to 3 years	5 years to 10 years	10 years and over

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Below is a list of activities that might be performed in a work team. Not all of these activities are performed in every work team. For those activities that are performed in your work team, put a check mark under the name of the person who does it. If more than one person does it, check each person that performs the activity. If no one in your team performs the activity, leave it blank. Each of these activities can be performed in a team meeting or daily on the job.

NOTE: See the attached list for the number code of the people in your work team.

EXAMPLE:

Work Team Members

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Attends monthly work team meetings.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lectures to civic groups about the Scanlon Plan															
Goes to management grid training.	x														

Work Team Members

WORK TEAM NO. _____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
17. Records work team minutes															
18. Gives recognition for a job well done.															
19. Coordinates work team activities															
20. Coordinates our team with other production work teams.															
21. Coordinates our team with Engineering, maintenance, and other staff teams.															
22. Suggests new ways for solving production problems.															
23. Puts suggestions into effect.															
24. Emphasizes team work.															
25. Deals with conflicts of opinion within the team.															
26. Spends time chatting with and counseling work team members.															
27. Gathers information for work team activities.															
28. Encourages the work team members to improve their present performance.															
29. Encourages the work team members to talk together and share ideas.															
30. Tells the work team members how well they are doing their job.															
31. Obtains materials to perform the job.															
32. Trains new team members.															
33. Keeps the team moving toward their goal.															
34. Acts as a representative to the Employee's Committee.															
35. Encourages the work team members to set specific goals for their work.															
36. Makes comments about the effectiveness of team meetings.															

Below is a list of things your work team is doing or might do. Some of these things you may prefer your team to do; other things you may not want your team to do; and still others you may not care one way or the other. What is your own opinion about what the team as a whole should do, not just you individually or management?

	ALTERNATIVES				
	Strongly prefer the team not do it (1)	Somewhat prefer the team not do it (2)	Doesn't matter to me (3)	Somewhat prefer the team do it (4)	Strongly prefer the team do it (5)
1. Meet regularly once each month.					
2. Rate team members for merit increases.					
3. Decide what training and Work Team Development activities the team needs.					
4. Tell each team member in detail how well he is doing his job.					
5. Interview and select new team members.					
6. Discipline team members whenever company policies are violated.					
7. Allow team members a great deal of freedom in they way they do their work.					
8. Get Engineering, Maintenance, and other staff people involved in production problem solving meetings.					
9. Have social get togethers, parties, picnics, etc.					
10. Get together with other shifts to solve inter-shift problems.					
11. Decide what new products the company should develop.					
12. Take the responsibility to train team members to get ahead in the company.					
13. Go to other teams for help in solving problems.					
14. Set the standards for jobs within the work team.					
15. Decide what to do with people whose jobs are eliminated.					
16. Determine how lay-offs should be handled during periods of an economic slowdown or a strike.					

APPENDIX B

INSTRUCTIONS TO MANAGERS FOR PAIRED COMPARISON WORK TEAM RATINGS

In front of you is a deck of cards. On each card is listed a pair of work team names. For each pair you are to circle (or underline) the name of the work team which in your opinion is most effective. We want you to judge the overall effectiveness of the teams. You should consider their ability to work together, their creativeness in solving their problems, and their skill at handling conflict.

APPENDIX C

ITEM ANALYSIS

The characteristics of the items used in measuring each of the variables from the ICLS questionnaire were examined through the use of cluster analysis techniques (Hunter and Cohen, 1970). The cluster analysis was based upon a sample of 306 individuals from all of the company employees, who had returned completed questionnaires and not merely limited to those 114 individuals in the twenty work teams in the analysis. The total organizational pool of subjects was selected for purposes of generalizability and stability of measurement. The measures used in the study were intended to reflect characteristics of work teams in the whole organization rather than the twenty teams with complete data. Also, the characteristics of cluster analysis require a sample of several hundred to insure the stability of the measures in the analysis. For both these reasons the item analysis used the total organization subject pool.

The items used as measures of the variables for this study that were included in the ICLS questionnaire were:

Cohesiveness

1. To what extent do you feel that you and the other persons in your work group belong to a team that works together?

* 2. How much do the members of your work team want to stay in your work team rather than join any other work team?

How does your work team compare with the other work teams at _____ on:

* 3. the way they get along together?

* 4. the way they stick together?

5. the way they help each other on the job?

Problem Solving

*11. To what extent do persons in your work group keep each other informed about important events and situations?

*12. To what extent are persons in your work team willing to listen to your problems?

13. To what extent does your work team plan together and coordinate their efforts?

14. To what extent does your work team make good decisions and solve problems well?

15. In discussing a problem in your work team, to what extent do team members feel free to suggest ideas that are different from the majority opinion?

16. In arriving at a decision to a work team problem, how often does your work team outline a <u>detailed</u> action plan?

17. To what extent does the work team feel free to change a previous team decision?

Identification

21. To what extent do persons in your work team help you find ways to do a better job?

22. To what extent do persons in your work team provide the help you need so that you can plan, organize, and schedule work ahead of time?

23. To what extent are your interests and needs taken into account when work activities are assigned?

*24. To what extent are you important to the smooth operation of your work team?

25. To what extent do the members of your work team see eye to eye on most matters?

26. To what extent do the members of your work team agree with you on what are the basic purposes of your work team?

Perceived Team Growth

*31. To what extent do you have confidence and trust in the persons in your work group?

32. On the basis of your experience and information, how would you rate your work group on effectiveness? How well does it do in fulfilling its mission or achieving its goals in comparison with other work groups in the company?

*33. How do you feel about the progress your work team has made in the past year?

*34. To what extent do you believe you have ideas for improving your work team that have not been expressed and fully discussed.

*35. To what extent do you think you and the people you work with need training in how to build a more effective work team?

*items have been dropped from the scales through item analysis.

Table 21 gives the inter-item correlation matrix for these items and Table 22 presents the median and the range of the inter-item correlations, item-cluster correlations, and the item communalities for each of the scales contained in the ICLS questionnaire. For all the variables the inter-item correlations, item-cluster correlations, and the item communalities were moderately high to high.

TABLE 21

ICLS Scales Inter-Item Correlations

Items	1	2	3	4	5	11	12	13	14	15	16	17	21	22	23	24
1	1.00															
2	.27	1.00														
3	.44	.22	1.00													
4	.45	.27	.71	1.00												
5	.45	.15	.64	.64	1.00											
11	.47	.24	.35	.32	.42	1.00										
12	.41	.14	.28	.28	.26	.39	1.00									
13	.71	.23	.32	.35	.43	.47	.36	1.00								
14	.65	.25	.26	.24	.31	.42	.37	.68	1.00							
15	.36	.26	.21	.26	.17	.28	.35	.30	.34	1.00						
16	.33	.22	.20	.18	.27	.29	.22	.36	.34	.40	1.00					
17	.29	.28	.31	.23	.26	.37	.21	.32	.32	.52	.39	1.00				
21	.55	.08	.23	.22	.35	.39	.43	.56	.51	.34	.27	.25	1.00			
22	.52	.15	.24	.21	.31	.41	.41	.55	.47	.27	.24	.22	.68	1.00		
23	.40	.21	.20	.19	.24	.24	.31	.37	.41	.29	.32	.36	.37	.35	1.00	
24	.27	.14	.22	.25	.26	.18	.17	.18	.16	.13	.20	.16	.18	.05	.26	1.00
25	.41	.16	.31	.23	.35	.44	.37	.35	.31	.29	.29	.36	.34	.34	.41	.35
26	.45	.25	.34	.30	.40	.46	.37	.40	.39	.40	.32	.36	.36	.37	.41	.29
31	.58	.24	.39	.40	.40	.41	.45	.49	.50	.35	.22	.30	.41	.42	.37	.11
32	.55	.31	.43	.41	.41	.32	.27	.51	.49	.31	.35	.25	.35	.33	.30	.19
33	.47	.22	.37	.40	.40	.39	.27	.40	.34	.31	.34	.29	.28	.27	.35	.24
34	.25	.08	.07	.08	.07	.17	.20	.21	.25	.12	.07	.06	.10	.25	.09	-.03
35	.35	.17	.24	.24	.20	.26	.17	.30	.28	.23	.30	.18	.25	.27	.21	.10

TABLE 21

(Continued)

Items	25	26	31	32	33	34	35
25	1.00						
26	.59	1.00					
31	.37	.38	1.00				
32	.25	.38	.38	1.00			
33	.41	.52	.35	.47	1.00		
34	.10	.18	.13	.23	.25	1.00	
35	.22	.27	.20	.38	.41	.30	1.00

TABLE 22

Median and Range of Inter-Item Correlations, Item-Cluster, and Item Communalities of Scales in ICLS

Variable Scales	Inter-Item r's			Item-Cluster r's			Item Communalities		
	median	low	high	median	low	high	median	low	high
Coh	54	44	71	80	55	83	64	31	69
PS	35	30	68	62	58	68	39	34	46
Id	37	34	68	67	58	68	45	33	47
PTG	41	38	47	66	58	70	44	35	49

Alphas were computed for each of these scales for both the total organizational sample and also for the twenty production level work teams. The alphas generally are only slightly lower in the smaller production level work team sample (see Table 23).

TABLE 23

Alphas of ICLS Scales

Variable Scales	Total Organization	Twenty Production Teams
Coh	83	83
PS	77	71
Id	79	83
PTG	68	68

The normative behavior measure and the leadership distribution measure were composed of items contained in the Heinen questionnaire. The sixteen normative items used were:

1. Meet regularly once each month.
2. Decide what training and work team development activities the team needs.
3. Get engineering, maintenance, and other staff people involved in production problem solving meetings.
4. Get together with other shifts to solve intershift problems.
5. Set the standards for jobs within the team.
6. Go to other teams for help in solving problems.
7. Decide what to do with people whose jobs are eliminated.
8. Determine how layoffs should be handled.
9. Interview and select new team members.
10. Discipline team members whenever company policies are violated.
11. Rate team members for merit increases.
12. Tell each member in detail how well he is doing his job.
13. Allow team members a great deal of freedom in the way they do their work.
14. Have social get togethers, parties, picnics, etc.
15. Decide what new products the company should develop.
16. Take the responsibility to train team members to get ahead in the company.

Table 24 gives the norm inter-item correlations.

TABLE 24

Normative Inter-Item Correlations

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1.00															
2	.37	1.00														
3	.37	.36	1.00													
4	.44	.30	.41	1.00												
5	.36	.33	.22	.24	1.00											
6	.17	.17	.22	.34	.26	1.00										
7	.19	.24	.07	.06	.35	.26	1.00									
8	.13	.25	.07	.08	.30	.18	.70	1.00								
9	.21	.25	.18	.15	.25	.25	.41	.41	1.00							
10	.09	.16	.15	.10	.15	.08	.33	.29	.33	1.00						
11	.22	.25	.19	.24	.21	.20	.22	.25	.31	.27	1.00					
12	.17	.36	.23	.24	.24	.19	.24	.30	.33	.30	.46	1.00				
13	.29	.23	.25	.21	.18	.23	.22	.18	.23	.25	.11	.18	1.00			
14	.11	.13	.04	.16	.07	.15	.21	.15	.13	.14	.19	.21	.11	1.00		
15	.12	.18	.14	.15	.14	.21	.26	.30	.26	.18	.02	.11	.21	.22	1.00	
16	.25	.31	.28	.27	.22	.27	.21	.18	.15	.10	.15	.23	.19	.20	.38	1.00

The eighteen leadership distribution items were:

1. Suggests new ways for solving production problems.
2. Puts suggestions into effect.
3. Gathers information for work team activities.
4. Obtains materials to perform the job.
5. Trains new team members.
6. Tells the work team members how well they are doing their job.
7. Keeps the team moving toward their goal.
8. Encourages the work team members to set specific goals for their work.
9. Gives recognition for a job well done
10. Spends time chatting with and counseling work team members.
11. Emphasizes team work.
12. Deals with conflicts of opinion within the team.
13. Encourages the work team members to improve their present performance.
14. Encourages the work team members to talk together and share ideas.
15. Makes comments about the effectiveness of team meetings.
16. Coordinates work team activities.
17. Coordinates our team with other production work teams.
18. Coordinates our team with engineering, maintenance, and other staff teams.

Table 25 gives the leadership distribution inter-item correlations.

Table 26 contains the median and range of the inter-item correlations and the alphas for both measures. The

TABLE 25

Leadership Distribution Inter-Item Correlations

Items	1	2	3	4	5	6	7	8	9
1	1.00								
2	.40	1.00							
3	.31	.40	1.00						
4	.43	.40	.34	1.00					
5	.35	.21	.28	.45	1.00				
6	.20	.28	.40	.41	.33	1.00			
7	.35	.27	.32	.42	.39	.21	1.00		
8	.27	.29	.45	.37	.30	.46	.34	1.00	
9	.30	.27	.25	.35	.11	.33	.18	.37	1.00
10	.29	.30	.46	.42	.23	.41	.24	.39	.34
11	.39	.41	.38	.43	.25	.34	.44	.37	.35
12	.31	.26	.31	.37	.20	.39	.34	.34	.35
13	.33	.34	.49	.30	.30	.41	.36	.51	.32
14	.26	.38	.42	.41	.25	.44	.37	.45	.30
15	.43	.32	.38	.51	.37	.34	.46	.35	.35
16	.32	.28	.40	.32	.26	.32	.43	.32	.35
17	.23	.26	.40	.46	.24	.43	.32	.42	.36
18	.35	.36	.38	.50	.26	.47	.25	.39	.26

TABLE 25

(Continued)

Items	10	11	12	13	14	15	16	17	18
10	1.00								
11	.35	1.00							
12	.46	.42	1.00						
13	.42	.36	.35	1.00					
14	.44	.37	.42	.51	1.00				
15	.36	.45	.40	.33	.39	1.00			
16	.29	.29	.34	.36	.38	.39	1.00		
17	.42	.37	.41	.39	.30	.29	.50	1.00	
18	.33	.25	.32	.26	.21	.28	.28	.41	1.00

inter-item correlations are somewhat lower for these scales than for those scales included in the ICLS questionnaire, but the alphas are the same or a little higher.

TABLE 26

Median and Range of Inter-Item Correlations and Alphas for Normative and Leadership Distribution

Variable Scales	Inter-Item r's			Alpha
	Median	Low	High	
Norms	22	2	70	.78
Leadership Distribution	35	11	51	.90

Table 27 presents for each of the variables, the mean, the standard deviation, and the range of scores of the twenty work teams in the analysis. All the scales are five point scales except for the shared norms (SN) measure which is a variance score and the managerial ratings (Mgr.R) which are scale scores derived from paired comparison ratings.

TABLE 27

Variable Means, Standard Deviations, and Ranges for the Twenty Production Work Teams

Variable	Mean	Standard Deviation	Low Score	High Score
Coh	3.65	.50	2.78	4.50
PS	3.29	.47	2.59	4.21
SN	25.85	6.85	17.68	39.98
Id	3.44	.42	2.71	4.20
TD	2.81	1.14	.25	4.75
Comm	1.71	1.46	0.00	5.00
LD	2.71	.64	1.08	4.10
PTG	3.49	.37	2.95	4.18
Mgr. R	6.90	2.11	2.54	12.26