

**Group Size, Composition, Cohesiveness
and Leadership: A Proposed Group
Performance Model**

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ABSTRACT

"Group size, composition, cohesiveness and leadership: A Proposed group Performance Model"

The main objective of this study is to investigate the potential effect of group size, composition, cohesiveness and leadership style on groups' performance. Hackman and Morris' model (1983) was used as a frame of reference. The proposed variables were embedded into that model to end up with a modified one.

The choice of the above mentioned variables was based on a comprehensive literature review. The researcher used "The ABI/Information Data Base" to complete such a review that covers articles from 1978 through 1993. Most of the recent articles related to the subject matter were thoroughly reviewed and integrated to the body of this research.

The study contains three parts. The first part was devoted to the examination of the underlying assumptions of (H&M) model. A new variable was introduced to the proposed model. The second part was devoted to study how each of the proposed variables would affect group performance. Finally, the third part was designed to incorporate the proposed variables into the (H&M) model. Four hypotheses were introduced to explain the expected impact of the proposed variables on group performance. Our major assumption here is that the impact on group performance is a product of the interaction of the proposed variables. In other words, although each individual variable is expected to have its own impact on the group performance, all variables are expected to have a unique impact on group performance.

RESEARCH OBJECTIVE

Although literally thousands of studies of group performance have been conducted over the past three decades, we still need to know more about why some groups are more effective than others. The literature review indicates clearly that we know even less about the major factors that would improve the performance of a given group and their relative importance.

The main objective of this study is to investigate the potential effects of group size, composition, cohesiveness and leadership style on groups' performance. The researcher used "The ABI/Information Data Base" to complete such a comprehensive literature review that covers articles from 1978 through 1993. Most of the recent articles related to the subject matter were thoroughly reviewed and integrated to the body of this research.

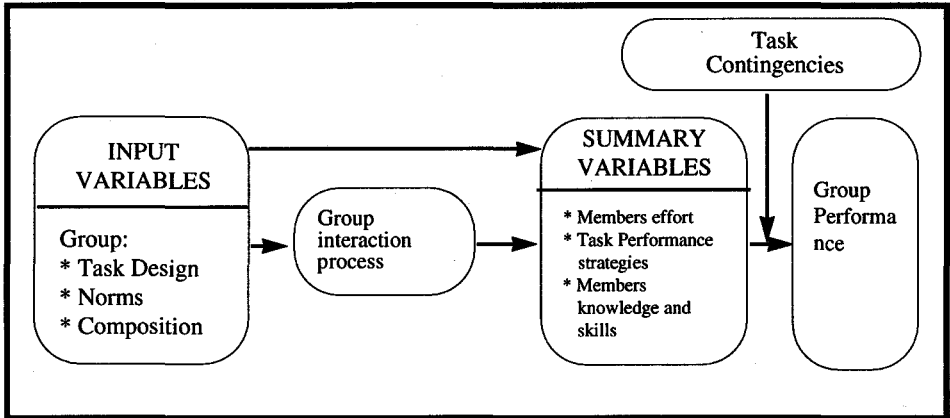
In the meantime, Hackman and Morris' model (1983) will be used as a frame of reference. The proposed variables will be embedded into that model to end up with a modified one. To do so, a critical study had been done to Hackman and Morris' model (H&M) to determine how the modified model will work.

The study contains three parts. The first part was devoted to the examination of the underlying assumptions of (H&M) model. A new variable was introduced to the proposed model. The second part was devoted to study how each of the proposed variables would affect group performance. Finally, the third part was designed to incorporate the proposed variables into the (H&M) model. Four hypotheses will be introduced to explain the expected impact of the proposed variables on group performance. Our major assumption here is that the impact on group performance is a product of the interaction among the proposed variables. In other words, although each individual variable is expected to have its own impact on the group performance, all variables are expected to have a unique impact on group performance.

I. HACKMAN AND MORRIS' MODEL

Hackman and Morris (1983) had explained the relations among certain input variables, group interaction process, and three summary variables in influencing group performance (Figure 1). The authors assume that the impact of group interaction process on group performance is not direct, instead it operates by affecting three summary variables that do directly determine how well a group does on its tasks. Based on that assumption, the influence of group interaction process on its performance can be understood by examining how the group interaction process affects the three summary variables. These summary variables are: Members' efforts, Task performance strategies, and Members' Knowledge and skills.

**FIGURE (1)
HACKMAN AND MORRIS' MODEL**



Hackman and Morris, 1983, p 369

Members' Efforts

Basically, group interaction can affect the level of effort actually brought to execute the group task by influencing (a) group coordination; and (b) the level of members' effort (raising or lowering it). The study of these two factors indicates that group size plays an important role in shaping group members efforts. Hackman and Morris also assumed that "the larger the size the less the critical efforts needed to accomplish certain tasks; the larger the size, the less the needs' satisfaction and less the efforts." The above assumption implies that group members' efforts can be viewed as a function of group size.

Task Performance Strategies

Strategy refers to the choice made by group members about how group will go about performing a specific task. Consequently, group interaction process can affect the group task performance strategies by influencing: (a) the implementation existing shared strategies, and (b) development strategic plans.

This summary variable deals with the conditions that encourage group members to engage in serious explorations of their norms about strategy when there is a reason to believe that existing norms are not optimal for the task at hand. These conditions, which are necessary to adjust the group norms, can be effectively tied to group cohesiveness. The

degree of group cohesiveness can determine - to a great extent- the degree of group members compliance to its standards and norms. Consequently, our proposed variables will include group cohesiveness as a determinate of group performance.

Members' Knowledge and Skills

It is the way that group knowledge and skills are brought to implement a specific group task. Therefore, the function of group interaction' include: (a) assessing and weighting knowledge and skill of members; and (b) affecting the level of talent available to the group. This summary variable reflects the importance of forming and maintaining the right group mix or group composition. Therefore, the proposed model will be extended to include the group composition variable as a major factor influencing group performance.

II. THE PROPOSED VARIABLES

Groups do not become groups simply because that is what someone calls them. Nor do group's values by themselves ensure group performance. Katzenbach and Smith (1993) indicated that the best groups invest time shaping a purpose into specific performance goals. Successful groups, they claim, pitch in and become accountable with their groupmates. Therefore, it is obvious that the fundamental distinction between successful groups and other forms of working groups turns to performance. In the following section, we will study carefully the impact of the three mentioned variables (group size, cohesiveness and composition). In addition, a fourth variables (leadership style) will be subject to a critical study. Our objective is to determine the impact of the above variables - individually and collectively - on groups' performance.

1. GROUP SIZE

As a property of a group, size has logical implications. Both Steniner (1966), and Meyers and Wilemon (1988) noted that an additional member above, one may add resources to the group or may be a complete redundant. At the same time, the additional process may complicate the amount of possible simple interactions among group members.

In his study, Nisbet (1990) concluded that there is no general agreement about what group size is the best. Five or seven people would seem to be an upper limit - big enough to get over tension and small enough to function efficiently.

Dunnette (1976) pointed out that there is a diverse relationship between the large size

groups and their performance. Dunnette also indicated that a study of two British automobile factories revealed that the relative output of 239 work groups at those factories was generally greater in the small groups. Accordingly, the small groups may have their highest morale and be more productive. Another study - made by McGrath and Altman (1966) - showed that smaller groups generally performed better than larger ones in operational settings when assigned to the same task. Stoneman and Dickinson (1989) studied the effects of small group incentive plans on the individual performance of a simple assembly task. The research findings indicated that individual performance did not differ as a function of group size. However, performance variability across individuals in the groups was found to be dependent on group size.

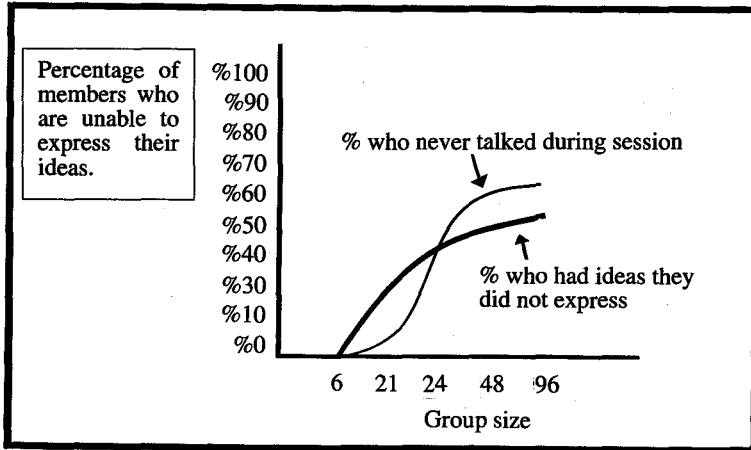
Evidently, it is clear that group size is not a mere "number game." Instead, it is an optimal size that affects the group's interaction process and motivation.

1.1 Interaction Process

As a group enlarges in size, the frequency of interaction between any two members decreases (Steiner, 1972). In the larger groups, more competition is possible in who will send and who will receive. In addition, the probability that role expectations are less clear is high; this would result in frustrations for the members and tendency to form informal groups.

The large disrupting effects of size in the interaction process was shown by Bass (1982). Bass proved that when group's size increases, there was a larger percentage of members who never talked directly (figure 2). Based on that, it is expected that those who fail to interact will feel more threatened in large groups. It is also expected that as groups increase in size, a smaller proportion of persons become central to the group, make decisions for it, and communicate to the total membership.

FIGURE (2)
DISCUSSION IN THE LARGE SIZED GROUPS *



* Bass, B., 1982, p. 179.

In their experiments, Gallup and his colleagues (1992) examined the effects of computer-mediated technology and group size on the productivity of brainstorming groups. The findings came in contrary to the findings of both Steiner (1972) and Bass (1982). The experiments showed that the larger groups generated more unique ideas and more high-quality ideas, and that members were more satisfied when they used electronic brainstorming than when they used verbal brainstorming. These results were interpreted as showing that electronic brainstorming reduces the effect of production blocking and evaluation apprehension on group performance, particularly for large groups. In brief, it is evident that members of large groups are less expressive, helpful and more likely to agree with other members.

1.2 Motivation

As a group increases in size, there is a great possibility that group members' efforts will be depressed. The reason behind that, as Hackman and Morris (1983) noted, is that members feel that their own efforts are less important to the whole group because there are many other people available to do the work. Moreover, individuals may find it increasingly difficult to obtain satisfaction of their own needs because of the limited amount of tasks

available to members of the large group. In addition, increased size tends to limit the possibility that a group will be able to interact regularly in the direct and meaningful face-to-face manner, and develop and maintain a consensus about norms for their behaviour as group members.

2. GROUP COMPOSITION

Haythron (1968) stated that group composition is important because it determines the group adequacy of communications; makes for systematic differences in interaction process because of the diverse rather than shared values, norms and goals; and reflects the extent to which individual members complement each other's skills in the interaction process.

With Haythron's notion in mind, both descriptive and behavioural attributes of potential members are important considerations in selecting members for a group. **The descriptive attributes** refer to a position an individual occupies within a group. Age, sex, ethnicity, education, skills, are examples of descriptive attributes. On the other hand, **the behavioural attributes** refer to the way in which an individual behaves in a specific task. The compromiser, competitor, evaluator, and harmonizer are examples of behavioural attributes.

Basically, group composition could be categorized on the basis of homogeneous or heterogeneous characteristics. These categories classify groups according to the extent to which members' individual descriptive and behavioural attributes are similar. Each of these categories also presents a different set of attributes that can improve a group's performance. However, as Szilagy (1983) pointed out, a discussion of the relationship between group composition and performance would be incomplete without considering the nature of the group task. Consequently, special attention will be given to the nature of the task and the degree of homogeneity and heterogeneity as major determinants of group performance.

2.1 Nature of the Task

Nisbet (1990) indicates that group composition must depend on the nature of the task. Heterogeneous membership is an advantage for task oriented groups, while a homogeneous group works best for tasks that require consensus solutions. Saavedra et. al. (1993) proposed a model of work group performance based on the consequences of complex interdependence. Complex interdependence was defined as the interactive effects of task, goal, and feedback combinations. The research findings showed that complex

interdependence exerted direct effects on performance quantity and quality, and also directly affected group task strategies and intergroup conflict. Generally, complex interdependence influenced group performance strategies which in turn affected group performance positively. Intergroup conflict, on the other hand, affected group performance negatively.

In another study, Mullins and Kimbrough (1988) studied group composition as a determinant of job analysis outcomes. The research findings indicated that job analysts should select with care the subject-matter experts to perform a job analysis.

In general, whether homogeneity or heterogeneity of membership is more conducive to group performance will depend on the task. The relationship between the "nature of the task" and "group performance" could be summarized as follows:

a) If the task is a simple one (e.g., folding and packing equipment into containers), then a homogeneous team is likely to be productive because a variety of resources are not needed to complete the task. Steiner (1972) added that if a group must work in a chain, then the overall performance of that chain is dependent on the adequacy of each link. He labelled that as a "**Conjunctive.**" Conjunctive task refers to the case where the chain fails if one link fails. The group can process no faster than its slowest members. One member can veto the decisions of the entire group.

Steiner (1972) suggested that group performance increases with increasing group size when the task is either additive (based on the sum of individual efforts) or disjunctive (based on the effort of the most competent members). On the other hand, group performance decreases with increasing group size when the task is conjunctive (based on the efforts of the least competent group members).

b) If the task is complex and the main reason for grouping is because no single individual has the various resources to deal with such complexity, then heterogeneity may prove more productive. The findings of Weingart (1993) study revealed that task complexity influenced group performance through the amount of planning performed by group members and the level of effort invested in their work.

2.2 Homogeneity vs. Heterogeneity

Interaction processes are expected to be better in homogeneous more than heterogeneous groups. Members of homogeneous groups can communicate more easily with each other. There will be fewer differences in opinions, standards, and way of doing things. Such similarities will result in less conflict and a smoother interaction process.

Similarity among members may also strengthen the cohesiveness of a group. One reason for that is that many persons join a group in order to understand themselves better because group membership give them an opportunity to compare themselves with others. And since such social comparisons are most trustworthy if they are made with persons close to the evaluators in ability, they are likely to seek out those who are most similar to them.

In a major study, Murry (1989) used a sample of 84 Fortune 500 firms to test the relationship between group's composition and performance. The study's main assumption stated that "homogeneous groups will interact more efficiently and therefore be preferable when competition is intense, but that heterogeneous groups will facilitate adaptation and therefore be preferable under conditions of environment change." A partial support was found for the above hypothesis. However, the pattern of the results highlights that many difficulties in untangling and identifying the determinants of the group performance.

In another study, Watson and his colleagues (1993) investigated the impact of cultural diversity on group process and problem solving. Initially, homogeneous groups scored higher on both process and performance effectiveness. Over time, both types of groups showed improvement on process and performance.

In brief, the relationship between the nature of the task and group composition could be summarized as indicated in table (1):

- a) When the task is simple or routine, a high degree of homogeneity and a low degree of heterogeneity are required.
- b) When the task is complex or a new one, a high degree of heterogeneity and a low degree of homogeneity are required.

To conclude, it is obvious that the nature of the task will determine, to a great extent, the right group composition to achieve certain tasks.

TABLE (1)
THE NATURE OF THE TASK AND GROUP PERFORMANCE

TASK COMPOSITION	The nature of the text	
	Simple or Routine	Complex or New
Homogeneity	High	Low
Heterogeneity	High	Homogeneity

3. GROUP COHESIVENESS

The term group cohesiveness refers to phenomena which come into existence if the group exists. Many organizational researchers regarded group cohesiveness as a key variable in their hypothesizing. However, as Mudrack (1989) pointed out, the presumed importance of the cohesiveness construct has not been always accompanied by a corresponding emphasis on theoretical and empirical advances. There are problems associated with the measurement of group cohesiveness, especially as they pertain to the continuous relationship between group cohesiveness and performance. One possible reason for the inclusive findings that characterise this literature is that each study operationalizes "cohesiveness" in its own way. Mudrack (1989) emphasises the importance of using a consistent and uniform measurement of cohesiveness.

In this research, we will employ Siegel and Lane's conception of cohesiveness. Siegel and Lane (1982) describe "cohesive group" by a high degree of mutual esteem and friendship. They also point out that the greater the cohesion, the greater is the individual members' desire to remain active and resistant to leaving. Siegel and Lane also hypothesized that a cohesive group may exert strong influence upon members to behave in accordance with group expectations. For example, Coch and French (1960) described how a group of workers lowered their production rate, and exerted strong pressures for conformity to this reduced speed, following a change to new work methods which was more difficult than former one (p. 319). The standards of this group apparently changed in

response to changes in the relation of the group to its environment. In general, once group pressures are so set as to create group standards, the uniform behaviour is difficult to change.

The proceeding discussion implies also that group cohesiveness is an indication of the degree to which members of a group desire to remain in the group. This view stresses the idea of group attractiveness as a major idea behind group cohesiveness. A person must have some notion about the properties of a given group before he can react to it favourably or unfavorably. Katz and Kahn (1978) pointed that group's attraction will depend upon two sets of conditions, they are:

- a) Needs satisfaction: A group may be attractive to a person primarily because it is a means of reaching some goals (affiliation, recognition, security) and other things which can be mediated by groups. In fact, it is highly unlikely that an individual will experience forces to remain in a group that he is dissatisfied with. Of course, it is possible that a person will be attracted to some aspects of a group without being satisfied with the group as a whole.
- b) The group itself: One of the most obvious reasons for joining a group is that one likes the people who are in it. In some groups this may be the sole source of attraction. More often, however, this attraction to group members is present along with interest in activity, or the programs of the group. Therefore a person may join a group because he places a high value on its purposes. Here, the group is attractive only because a person feels that the goal of the group is a worthy one, and if he comes to believe that the group will never achieve this end for any reason, he will become less attracted to it.

Thus, members of a highly cohesive group are more concerned with their membership to the group's performance, to advance its objectives, and to participate in its activities. It is also evident that group cohesiveness is reflected by the pride members feel in belonging, by gratification derived from the group and by coordinated group activity.

4. GROUP LEADERSHIP

The concept of leadership has been the subject to much research, and numerous definitions have been written in an attempt to explain it. However, most researchers have described the valued leaders as those who can accomplish the job, develop satisfaction and loyalty from the group, and strengthen group cohesiveness. Kison (1989) suggested that leadership could be defined in conjunction with the leader, the followers, the situation, communications, and the goals. In other words, the leadership process results from the

interaction of these variables, and many leadership styles would come to existence.

In this research, we will employ Katz and Kahn's definition of leadership. Katz and Kahn (1978) had defined leadership as "the influential increment over and above mechanical compliance with routine directives of the organization." Leadership, therefore, occurs when one person can influence others to do something because it is required or because they fear the consequences on noncompliance.

4.1 Leadership and Power

Nisbet (1990) indicates that the leader must be someone who lead decisively and gain acceptance from the group members. It has been suggested by Hollander (1978) that a solid understanding of leadership processes can be achieved by examining the transactions between leaders and followers. Hollander added that "the leader's individual characteristics must mesh with these functional demands. It is therefore no longer sensible to ask merely who the leader is, but rather to ask how leader functions are distributed" (Hollander, p.480).

With Hollander's notion in mind, one must consider the influence of the task environment on the follower's behaviour and performance outcomes. Generally speaking, for functions of leadership to take place, the leader must influence the subordinates' behaviour as indicated in figure (3) (Davis and Luthans, 1984):

- 1) directly and indirectly;
- 2) subordinate's behaviour, in turn, must produce positive performance outcomes;
- 3) the environment variables independent of the leader may possibly influence a subordinate's, but with result credit to leader; and
- 4) environment influences of the subordinate may also influence performance but due to the subordinate himself.

- a) Homogeneous groups facilitate communications, interactions and compatibility among group members. In addition, when the task is simple or routine, a high degree of homogeneity and a low degree of heterogeneity are required.
- b) Heterogeneous groups increase the possibility that members will perform both group task and maintenance roles. When the task is a complex or a new one, a high degree of heterogeneity and a low degree of homogeneity are required.

HYPOTHESIS IV.

Group performance is often closely tied to leadership effectiveness. This seems especially easy to appreciate for groups where leaders have earned their status by virtue of their function's performance. In the light of our above analysis, the leadership impact on group performance is hypothesised as follows:

"Leadership style has its impact on group interaction process, maintenance, adaption and goals attainment."

Leadership functions is expected to have a great impact on groups' interaction process. The study of interaction process as focuses on the following aspects (Nixon, 1979):

- a) Integration: how parts of a group fit together as a whole.
- b) Maintenance: How major patterns of culture and interaction are maintained.
- c) Goal attainment: How groups organise and controls to the pursuit of its tasks and goals.
- d) Adaptation: how a group relates to environment.

From this point of view it is hard to assume that group leadership function can include all the above mentioned aspects. Essentially, a leader has to exercise some power to influence group members' behaviour. However, power can be shared with other group members, and leadership function can be distributed to achieve the desired performance. The conception of leadership proposed in this research implies that the important group functions may be performed by various members of a group. The main idea behind that is derived from the following statement by Pfeffer (1983):

"Many factors that may affect organizational performance are outside a leader's control, even if he is to have complete discretion over major areas of organisations decisions"
(p.284).

The above statement implies that a leader cannot control all factors (internal/external) that might affect the group performance. As a consequence, part of his power has to be

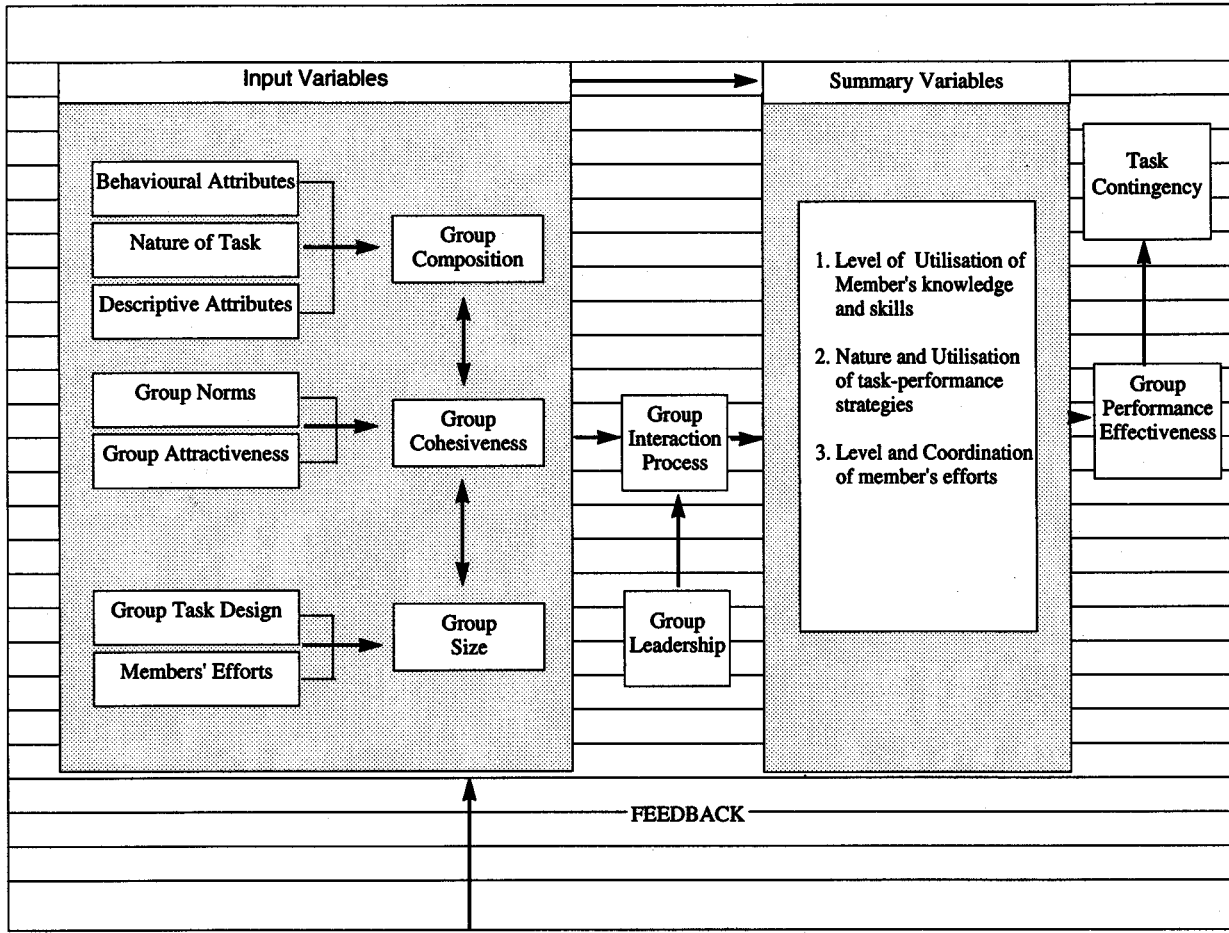
shared with the other group members, and the important functions can be performed by various members of a group. The leadership does not assume responsibility for the performance of group members. Instead he deals with the group as a unit. This involves the following leadership activities:

- Make sure that the group has appropriate size and composition; and
- Creating a support work environment for the group

In conclusion, the successful leadership has to do with sharing of leadership functions because group members will have greater feelings of commitment to a decision in which they have a part.

Finally, when the proposed variables are embedded into the original model, one may predict that those variables will show great impacts on group performance.

FIGURE 4
THE MODIFIED GROUP PERFORMANCE MODEL



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