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EFFECT OF GROUP COMPOSITION ON GROUP PROCESS: HOMOGENEITY VS HETEROGENEITY ON TASK AND PEOPLE DIMENSIONS

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Summary.—An experimental study was designed to test whether task composition, people composition, or their interaction affected various aspects of group process, e.g., satisfaction, influence, conflict, communication, etc. Each composition variable was varied according to homogeneous or heterogeneous characteristics resulting in a 2 × 2 design. 18 groups of 5 persons each were distributed in the 4 cells and responded to a decision-making task. The results indicate a significant interaction effect between task and people composition, suggesting that the effect of each on group process is dependent on the state of the other, although task composition had the dominant impact in this study.

The relationship of group structure to group process is an important issue in the application of behavioral science knowledge. A fundamental question is, in what ways can groups be formulated or designed so as to enhance the processes that will occur? A central variable of group structure is group composition. Several reviews (Shaw, 1971; Steiner, 1972; Collins & Guetzkow, 1964; Hoffman, 1965; McGrath & Altman, 1965) have attempted to organize the numerous diverse and often contradictory studies. Simple conclusions or "principles" are not warranted, for as Shaw (1971) writes, "It is possible that homogeneity of some traits may be desirable." We believe that the difficulty may come in part from the conceptualization of *composition* as used in various studies. The crucial question is, *what dimensions of composition have a significant impact on group process?* We will develop a model that attempts to answer this question.

Two well known and frequently used categories of the group dynamics literature are *task* and *people* (Fiedler, 1964; Blake & Mouton, 1964) yet these have not been applied to group composition. We would define *people composition* as the similarity or dissimilarity of individuals in a group with regard to personality or personal preference. This implies that composition will be based on a characteristic or dimension that is inherent within the individual over a period of time before or beyond the particular task to be performed. *Task composition* would be defined as the similarity or dissimilarity of individuals in a group with regard to attitudes, abilities or skills that *directly* relate to the task to be performed. Since the two definitions suggest differences in forms of composition, the four can be combined in a model that has four quadrants (see Fig. 1). A group could be formed such that it was homogeneous on one dimension while being heterogeneous on the other dimension.

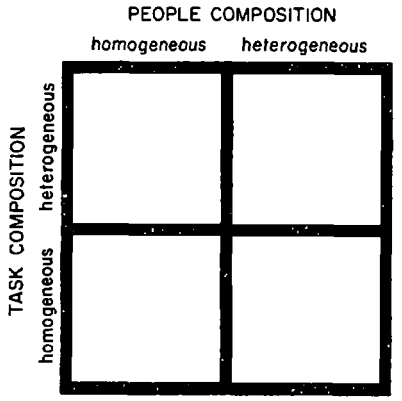

FIG. 1. A model of group composition

A number of experimental studies manipulated either task composition or people composition in a variety of ways. Shaw (1971) uses the term "trait homogeneity" to describe composition based on a single personality characteristic such as dogmatism (Steele, 1973), dominance (Lampkin, 1972), or acceptance of authority (Shaw, 1960). Several studies have used multiple-trait personality instruments including the Guilford-Zimmerman (Hoffman & Maier, 1961) and the Cattell 16-Personality factor (Wahi, 1967) to form homogeneous groups based on similar profiles. Other research has considered background variables or characteristics such as academic preparation (Pelz, 1956), age (Ziller & Exline, 1958), and sex (Kent & McGrath, 1969). Each of these studies could be taken as an example of people composition in that the variable to be manipulated relates to or is inherent in the individual and independent from the task to be performed. The classic Van Zelst (1952) study in which workers were allowed to choose their work partners (thus forming homogeneous groups) could be cited to describe the possible application of people composition.

Task composition, on the other hand, utilizes information directly relevant to, or part of, the task. Consider for example Goldman's (1965) use of intelligence as a basis for forming groups to do an intelligence test (also, Laughlin, Branch, & Johnson, 1969) or the use of a measure of creative ability in composing groups to work on creative problem-solving tasks (Triandis, Hall, & Ewen, 1965). The application of task composition would then require the collection of skill or ability ratings as related to a particular task.

Previous studies of composition including those discussed above have focused on either task or people composition but not both. The only exception is the Triandis, *et al.* (1965) research which investigated both creative ability and liberal-conservative attitudes, but its design considered group performance and not group process. The present research will measure group process with

regard to both forms of composition. Interaction effects seems likely in that task composition and people composition are not necessarily mutually exclusive or independent of each other. Rather there may be a good relationship between those things people like to or are able to do and aspects of their personality.

METHOD

The "Career Goals Task" (Nath, 1968) was chosen for this experiment for several reasons. First, it was possible to manipulate both task and people composition to form groups to fit the four cells of the model (see Fig. 1). Secondly, since the task emphasized "values" it could be both highly involving and personally important. Finally the task was complex, with no single or apparent solution. The latter two reasons are important to eliminate the "game" aspects of an experiment and to allow for generalization to other (especially organizational) settings in which groups work to solve complex problems and make important judgments about future plans.

A total of 90 students in two graduate management classes in behavioral science participated by responding to a questionnaire listing 33 statements about career goals, such as "to be in charge of others," "to be highly creative," "to contribute to the welfare of others," etc. For each item the respondents were asked, "Please indicate to what extent the following career goals are personally important to you" on a scale of 1 (not at all) to 7 (extremely). The second part of the questionnaire listed the other members of the class and asked, "Please indicate to what extent you would like to work with the following individual" on the same scale of 1 to 7 with the addition of 0 (don't know the person).

The responses to the questionnaires were analyzed with the use of the MAPS Computer Program (Kilmann, 1977) to form the various types of group composition; see Seltzer (1976) for details. Eighteen five-person groups were formed, with 5 groups homogeneous on both people and task composition, 5 groups homogeneous on people composition and heterogeneous on task composition, and 4 groups homogeneous on task composition and heterogeneous on people composition, and 4 groups heterogeneous on both. Each group was given a list of 9 career goals (a simplified version of the earlier questionnaire) and asked to rank-order them. After completion of the task, each individual was asked to respond to a 13-item group-process questionnaire which tapped the dimensions of satisfaction, influence, conflict, interpersonal relations, task perceptions, communications, cohesiveness, etc. (Seltzer, 1976). Each item was in the form of a statement with the question, "Please indicate to what extent the group that you were in had the following characteristics" and scaled from 1 (not at all) to 7 (extremely).

RESULTS AND DISCUSSION

The group-process questionnaire was analyzed by a two-way multivariate

analysis of variance for two levels of task composition (homogeneous and heterogeneous) and two levels of people composition. The results are displayed in Table 1. There were significant multivariate effects for task com-

TABLE 1

ANALYSIS OF VARIANCE FOR THE CAREER GOALS TASK

Variable	Interaction		People Composition		Task Composition		*df*
	F	*P*	*F*	*P*	*F*	*P*	
Multivariate test	2.15	.03	.65		4.96	.001	13,68
Univariate tests:							
Satisfied with performance	.47		.00		.01		1,80
Worked well together	.45		.04		7.94	.01	1,80
Able to influence others	.33		1.42		5.53	.03	1,80
Dissension in group	.07		.46		6.19	.02	1,80
Quality relative to potential	.46		.64		1.82		1,80
Got along well together	1.08		.78		3.65	.06	1,80
Stuck to task	.25		1.05		.00		1,80
Liked assigned task	2.31		.02		1.11		1,80
Difficulty in completing task	.84		.32		8.47	.005	1,80
Good distribution of skills	4.27	.05	.31		6.93	.01	1,80
Group members supportive	.23		.01		.45		1,80
Open communication	.43		.07		.77		1,80
Would work in same group	.51		.01		3.53	.07	1,80

position but not for people composition. An examination of the means for the process items (see Table 2) suggests that homogeneous task groups had better group process. In particular, people in homogeneous task groups:

1. Had more feeling that people worked well together.
2. Felt more strongly that individuals were able to influence others in the group.
3. Believed that people got along better with others in the group.
4. Felt that people were more likely to want to work together again.
5. Thought that there was less dissension.
6. Felt that the group had less difficulty in completing the task.
7. Had lower agreement that there was a good distribution of skills and expertise in the group.

There was also a significant multivariate interaction, but examination of the univariate tests suggests that only the item "there was a good distribution of skills and expertise" contributed strongly. It should be noted that groups homogeneous on both task and people composition had the lowest mean for this item, which suggests that the experimental manipulation of composition was effective.

The results of this experiment suggest several conclusions; although not startling, these give directions for future research and application. First is the central finding that the manipulation of group composition has an impact on

TABLE 2

PROCESS MEANS AND STANDARD DEVIATION BY TYPE OF COMPOSITION FOR CAREER GOALS TASK

Process Item	Group Composition							
	Task Homogeneous, People Homogeneous ($N = 22$)		Task Homogeneous, People Heterogeneous ($N = 18$)		Task Heterogeneous, People Homogeneous ($N = 24$)		Task Heterogeneous, People Heterogeneous ($N = 20$)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Satisfied with performance	6.1	.8	5.8	.9	5.3	1.7	5.3	1.1
Worked well together	6.0	.8	5.8	.9	5.3	1.3	5.4	1.1
Able to influence others	4.3	.9	4.4	.9	3.7	1.0	4.1	.7
Dissension in group	3.0	1.4	2.8	.9	3.7	1.4	5.6	1.3
Quality relative to potential	5.6	1.0	5.2	1.2	5.0	.1	5.0	1.2
Got along well together	6.0	1.0	6.0	.7	5.8	1.1	5.4	1.0
Stuck to task	5.9	.9	5.4	1.6	5.8	1.2	5.6	1.2
Liked the assigned task	5.2	1.0	4.8	1.5	4.5	1.3	5.0	1.3
Difficulty in completing task	2.3	1.0	2.4	1.1	3.4	1.6	3.0	1.5
Good distribution of skills	3.7	1.5	4.5	1.2	5.0	1.3	4.6	1.2
Group members supportive	5.1	1.2	5.3	.8	5.1	1.1	5.0	1.0
Open communication	5.9	1.4	6.1	.9	5.8	1.3	5.7	1.0
Would work in same group	5.4	1.7	5.7	1.4	5.0	1.9	4.8	1.7

group process. This reaffirms the importance of this variable for the design and formation of task or work groups. Relatively few authors have given composition sufficient emphasis in "application-oriented" articles and books. Hopefully with an improved technology for creating various forms of group composition (Seltzer, 1976; Kilmann, 1977) this problem will be remedied. Secondly, the results show that task composition and people composition are indeed different and may have different effects on group process. This confirms the model (see Fig. 1) and provides a response to a question posed in the review by Hoffman (1965): "On what dimensions should group members be heterogeneous?" It seems that the critical dimensions are those that relate directly to the task at hand. To the extent that people composition is related to task composition, it can also have impact.

A third conclusion could be developed if Hackman's (1968) typology of tasks is considered. We note that the experimental task fits his category of "discussion tasks." For the other categories of "production tasks" and "problem-solving tasks," other forms of composition might affect group process. Part of Seltzer's (1976) research was at the organizational rather than group level of analysis, but we might interpret it to imply that for "production tasks" people composition but not task composition has impact on group process. Clearly

further research with several types of tasks is needed to determine if the second or third conclusion above is warranted.

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