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Function of Task Structure and Machiavellianism

James M. Gleason, F. James Seaman, and Edwin P. Hollander
State University of New York at Buffalo

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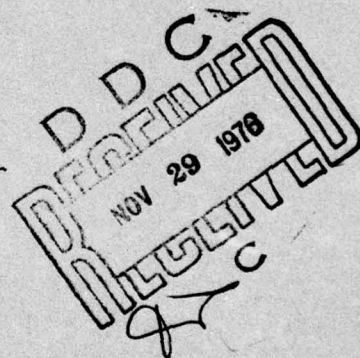
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Sixteen groups participated in an experiment involving a model-building task. Half were given explicit procedural instructions (High Structure) and half were not (Low Structure). Of the four males in each group, one had scored High, one Low, and two Medium on the Machiavellianism Scale. Medium Machs were significantly more likely to be rated as leaders than High or Low Machs, especially in the Low Structure condition. In general, Low Structure was found to increase emergent leadership across Machiavellianism level, while High Structure was positively associated with group members' satisfactions. *		

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Emergent Leadership Processes as a
Function of Task Structure and Machiavellianism*

James M. Gleason, F. James Seaman, and Edwin P. Hollander

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Historically, leadership has been viewed either as a function of the personality and character traits of the individual or of situational factors. Newer conceptions, especially those regarding "emergent leadership" phenomena, consider leadership a product of the interaction between personality and the demands of situational constraints (Fiedler, 1967; Hollander, 1974). Leaders are seen to be part of the situation, as "definers of reality" for the group, who structure and organize the group's activities. Proponents of this position, such as Hollander and Julian (1968), point out that neither the trait nor situational emphases alone have proved to be adequate to understanding leadership processes. Indeed, they argue that an interactional approach, taking account of leader and situational characteristics, is vitally needed.

A traditional problem with the concept of emergent leadership is defining and measuring its occurrence, particularly regarding who is the leader. Several different measures have been used. Among the most prominent of these are: (1) manifest influence over group decisions; (2) ascendancy and task directiveness; (3) quantity of verbal output in discussion with other group members; (4) sociometric choice of the person named most as "leader" by others in the group; and, (5) control over key resources in the group, including channels of communication and information. No one measure, on any a priori grounds, has gained consensus as the best or most appropriate indicator of who is the leader in

*We are extremely grateful to Carolyn Hansen and Janet Near for serving as the expert observers of the groups' interactions.

emergent situations.

Furthermore, several related measures have been found to be highly correlated indices of effective leadership. Among these are: perceptions of the leader as highly competent in contributing to the group's achievement of its goals; the leader's interest and motivation to see to it that the task is done well; and the enjoyment leaders and followers take in participation in the group's activities.

In studying emergent leadership in task-oriented groups, two classes of dependent measure have been used. These are behavioral observations, and questionnaire ratings and scales, usually secured after the completion of a task phase. Both of these dependent measures are used to identify leaders in the study to be reported here.

Statement of the Problem

Background

The primary objective of this study is to gather data on emergent leadership under conditions in which both a situational factor, task structure, and a personality characteristic, Machiavellianism, are varied. The design is therefore a 2 x 3, with a task situation that is either High or Low in structure, and with group members who are High, Medium, or Low on Machiavellianism.

Machiavellianism was selected as a personality variable for study because it has been found to be associated with "emotional detachment in interpersonal relations, a tendency to exploit situations and others for self-gain, and a tendency to take over control in small groups" (Geis, 1968). As an interpersonal style, Machiavellianism has shown some success in the prediction of social behavior. Those scoring High on the Machiavellianism ("Mach") Scale developed by Christie and Geis

(1970), characterized as High Machs, tend to initiate and control structure in a situation when taking initiative is a viable position. Relatedly, Sorrentino (1973) found that an "interactionist" concept also fit rather well when the characteristic of achievement motivation was studied in emergent leadership situations.

There appears to be a large amount of similarity between the behaviors exhibited by High Machs and emergent task-leaders. The most striking is their ability to take charge, organize, structure situations, and define them for others, especially under ambiguous conditions. Regarding emergent leadership in group discussions, a consistent finding is that the leader talks more to other members, and they to the leader, than to each other (e.g., Riecken, 1958). In this respect, High Machs have been shown to act in a way analogous to emergent leaders in discussion groups where communications are relevant to a group task. Furthermore, there is usually a common element in leadership and the bargaining game situations which are used in many Machiavellianism studies, namely, the function of initiating and controlling structure for the interaction of the group (see Christie & Geis, 1970).

Illustrative of work relating Machiavellianism to leadership is an experiment by Geis (1968) who gave the Mach IV and V scales to two classes totalling two hundred and seventy-six students. They were then assigned to 69 mixed or single-sex four-person groups, as follows: 20 groups were composed entirely of Low Machs; 20 entirely of High Machs; the remaining 29 groups had two High Machs and two Low Machs. Slightly over a quarter of the groups of each type were all-male groups; a quarter were all-female, and the rest were mixed-sex groups of two males and two females.

Students were assigned to groups by the instructor in the Geis (1968) experiment, and the four members were unacquainted at their first meeting. They knew that they would work together as a group all semester and that the single product of their group project would count one-fourth toward their individual final course grade. They were first told to get acquainted and begin thinking about their laboratory project. Then each group was instructed to "choose a group leader" without being told what procedures to use.

The number of groups whose leaders were highest Mach, second highest, second lowest, and lowest were respectively: 30 (43%), 12 (18%), 11 (16%), and 16 (23%), ($\chi^2 = 8.18, p < .05$). This pattern was particularly pronounced in the groups of all High Machs, and in the mixed-sex groups. Furthermore, these effects persisted. Students were asked at the end of the semester to name the current leaders in their groups. Though a few changes of name had taken place in the leadership ranks, the substantive results were the same, using either the initial or the final leaders. Group effectiveness was assessed by comparing the group's laboratory project grade against the mean course grade of the four members.

The groups with High Mach leaders received project grades averaging 4.50 points higher than the average exam grades of their members. In contrast, the groups of Low and mixed Machs in which the highest Mach member was not leader received project grades averaging 6.47 points lower than their average exam grade. This difference was statistically significant ($t = 2.14, p < .025$). The two sets of groups did not differ in exam grades to any appreciable extent. Geis (1968) concluded that the High Mach's ability to ignore task-irrelevant distractions and mobilize his or her resources to achieve task goals in the laboratory also makes

a difference in achieving group goals in the "semi-real" world of the classroom.

Hypotheses

As applied to emergent leadership, our specific hypotheses, derived from previous conceptual and empirical work on Machiavellianism, were as follows: (a) Subjects high on Machiavellianism (High Mach) will exhibit more leadership related behaviors, such as talkativeness and directiveness, and be perceived to be leaders more than Low Machs, when there is a task of Low Structure; (b) Low Mach subjects, on the other hand, will exhibit more leadership and related behaviors, as well as be perceived to be leaders more than High Machs when there is a task of High Structure. Accordingly, we expect an interaction to be found between Machiavellianism level and situational structure, for both behavioral and post-interaction rating measures.

Method

Subjects

Two hundred fourteen male introductory psychology students at SUNY at Buffalo, completed the Mach V scale (Christie & Geis, 1970). Their scores were tabulated using the newer triadic choice model (Rogers & Semin, 1973) which eliminates some biases of the original scoring method. On the basis of these scores, subjects were designated as High (above 106), Mid level (85-100), and Low (below 79) Machs. The breaks for High and Low Machs were at plus and minus one standard deviation (13.5 points) respectively, from the mean score of 92.5.

Potential subjects were chosen randomly from within each Mach level category. They were contacted by telephone to ask if they would participate in a study of "group productivity" as part of their experiment-

participation requirements for their psychology course. Groups of four members each, composed of one High, two Medium, and one Low Mach, were randomly assigned to either a High or Low Structure condition. Subjects were not aware that their being contacted was in any way related to the tests which they had taken two months earlier.

Procedure

Subjects assembled outside the experimental room and were led inside and given identification tags by experimenter 1. Experimenter 2, who was blind to subjects' Mach levels, and two expert observers who were blind both to hypotheses and conditions, observed through a well-concealed one-way mirror. The expert observers were part of a group process observation training program.

Experimenter 1 explained to the groups that he was an assistant and that he would go to get experimenter 2 who was conducting the experiment. After the first left, the second experimenter entered and administered the appropriate treatment.

Groups in both High and Low Structure conditions were told the following:

You have been asked to come here today to participate in a study of group productivity. In a few minutes you will be building several models with the materials on this table. You will have 10 minutes to complete the task. The models you are to build are pictured on this card. They are an airplane, a bridge, and a ferry steamer. You will notice that building the plane is worth 5 points, the bridge worth 10 points, and the steamer worth 14 points. Point values reflect how difficult each of the models is to build. Hence, the airplane is the least difficult to build, and the steamer the most difficult. You must build the models exactly as pictured in order to receive the full point values. Your task will be to accumulate as many points as you can in the allotted time of 10 minutes.

In the structured condition, groups were further told:

Before actually building the models, you will have up to 10 minutes to make several important decisions about how to organize and to proceed. You are only to work on one model at a time. Therefore, you must decide in what order the models are to be built. Remember that the allotted time may not be sufficient to build all of the models and that they vary in point value.

Because you will all be working on different parts of the same model, it will be very much to your advantage to choose a coordinator to assure that there will be no duplication of effort. Please record your decisions on the paper provided.

Groups in the unstructured condition were told only:

Before actually building the models, you will have up to 10 minutes to decide how you will proceed in the construction.

In both conditions the models to be built were to be made from three "Supertransit" Tinkertoy sets. Diagrams for the models--the airplane, bridge, and ferry steamer--came from the "Tinkertoy Instructions and Idea Book" which is provided with the sets.

After delivering the instructions, experimenter 2 set a 10 minute timer and returned to the observation room. There he used four stop watches to time how long each of the four group members maintained possession of the single plan sheet. The two observers independently coded the interaction among group members. All verbalizations were classed as ascendent or accepting in a method derived from Bales' (1950) Interaction Process Analysis (IPA). "Accepting" behaviors were those that the Bales system would classify as: agreeing, asking for information, opinions, or suggestions. "Ascendent" behaviors were those that IPA would code in the categories: gives suggestions, opinions, or information. Inter-rater reliability between the expert observers for these two categories derived from the IPA was .94, computed as a Pearson product-moment correlation.

At the conclusion of 10 minutes, the alarm sounded and experimenter 2 returned and answered any questions by paraphrasing the instructions. He then gave the group the construction materials, set the timer for 15 minutes and returned to the observation room where the same types of data were recorded as before.

At the end of 15 minutes, the alarm rang again and experimenter 1 entered the room. He announced that the construction period was over and led the group to another room where they completed post-interaction questionnaires and were debriefed. Experimenter 1 was blind to the structure condition and was ignorant of the interaction which had heretofore taken place among the group members.

Results and Discussion

Each leadership-related measure, both behavioral and paper-and-pencil, was analyzed using a 2×3 analysis of variance. One exception was the questionnaire item which asked: "Other than yourself, which member of the group would you be most willing to have as the leader in a similar group in the future?" It was analyzed by chi-square, and the results were revealing, though not consistent with the hypothesis. Table 1 shows that Medium Machs were chosen more as future leaders than either the High or Low Machs, in both the High and Low Structure conditions ($\chi^2 = 8.94$; $df = 2$; $p < .02$). When chi-squares were done on the

Insert Table 1 about here

High Structure and Low Structure conditions separately, a statistically significant effect was found for the Low Structure condition ($\chi^2 = 6.68$;

$df = 1$, $p < .01$), but not for the High Structure condition ($\chi^2 = 2.25$; $df = 1$, n.s.). However, the trend toward choosing Medium Machs clearly occurred in both of the Structure conditions.

On only one measure did the expected interaction occur between High Machs and Low Structure conditions. This effect was found on the questionnaire item asking: "How well do you imagine your group did relative to other groups at the same task?" Table 2 shows the means which yielded a Mach x Structure Interaction in the expected direction and significant ($F = 3.64$; $df = 2/58$) at the .05 level. Of the results for each of the other measures found to be statistically significant, only a main effect for Structure was obtained. There was no main effect for Mach level found.

Insert Table 2 about here

While the results shown in Table 2 support the interaction hypothesized, the other significant findings show the effect of Low Structure in encouraging emergent leadership. By contrast, satisfaction was associated positively with High Structure. The first question on the post-interaction questionnaire asked: "How satisfied were you with the performance of your group?" The results of an analysis of variance yielded a main effect for Structure ($F = 5.53$; $df = 1/58$) ($p < .05$) with subjects in the High Structure condition being more satisfied with their group's performance than those in the Low Structure condition, as seen in Table 3.

Insert Table 3 about here

The two major behavioral measures taken in the study were: (1) the time of possession of the plan sheet (control of a key resource), recorded by experimenter 2; and (2) "accepting" and "ascendent" behaviors, recorded by the expert observers. Analysis of variance of the total "time of possession" measure, for the task and discussion periods together, produced a main effect for Structure ($p < .02$; $F = 6.62$; $df = 1/58$), with subjects holding the plan sheet longer in the Low Structure condition than the High Structure condition. Means for this analysis are shown in Table 4.

 Insert Table 4 about here

Total time of possession scores were subjected to log transformation to normalize variance, and the same results were found. Separate analyses were conducted for task and discussion periods, and a main effect for Structure ($p < .001$; $F = 16.82$; $df = 1/58$) was found for the task period. In that period, subjects in the Low Structure condition held the plan sheet for longer ($\bar{x} = 22.1$ minutes) than did those in the High Structure condition ($\bar{x} = 4.6$ minutes). No significant effects were found in the analysis of the discussion period. The correlation of time of possession between the discussion and task periods was .43 ($p < .001$).

 Insert Table 5 about here

Analysis of "ascendent" statements showed no significant effects for either the Mach or the Structure variables. However, when "accepting" statements were analyzed, a main effect for Structure ($p < .05$; $F = 4.47$; $df = 1/58$)

was obtained. As Table 5 shows, more accepting statements were made under the High Structure condition than the Low Structure condition. Interestingly, the greatest mean for accepting statements ($\bar{x} = 12.2$) is found for High Machs in the High Structure condition, and the smallest mean ($\bar{x} = 3.4$) for the Low Machs in the Low Structure condition. Also noteworthy is the fact that the total numbers of accepting and ascendent statements were positively and significantly correlated ($r = .50$; $p < .001$). However, a separate analysis of "all verbalizations" produced no significant relationships.

The correlation between subjects' enjoyment of participating in the group, and perceived group performance relative to other groups, was statistically significant ($r = .23$; $p < .05$). The correlation between subjects' satisfaction with their group's performance, and their perception of their group's performance relative to other groups, was also statistically significant ($r = .37$; $p < .001$). But the correlation between subjects' satisfaction with their group's performance and their enjoyment of participating in the group was not significant ($r = .12$).

Two of the measures associated with leadership were significantly and negatively related. These were subjects' ratings of their satisfaction with their group's performance and their total time of possession of the plan sheet ($r = -.30$; $p < .01$). Correlations of satisfaction ratings with the total number of ascendent statements was statistically significant ($r = .21$; $p < .05$), while that for satisfaction ratings with accepting statements was not significant ($r = .13$).

On the post-interaction questionnaire, each member of the group was asked to rate each of the other members on his task competence, influence, interest in the activity, and sticking to agreed group procedures. For

the question rating "...each of the members on how interested he seemed to be in the group activity," there was a main effect for Structure ($p < .05$; $F = 4.23$; $df = 1/57$) on ratings of the High Mach. Here the mean rating under the High Structure condition ($\bar{x} = 3.90$) was greater than that for the Low Structure condition ($\bar{x} = 3.45$). A five-point scale was used, with 1 equaling not very interested, and 5 equaling very interested. For the same question-ratings of the Low Mach, there was a significant main effect for Structure ($p < .005$; $F = 11.42$; $df = 1/57$) in the same direction. Mean ratings in the High Structure condition ($\bar{x} = 4.03$) were greater than those in the Low Structure condition ($\bar{x} = 3.18$).

The question calling for ratings "...of each of the members on his sticking to the agreed upon group procedures" was also rated on the same five-point scale, with 1 equaling very much and 5 equaling very little. Here a main trend was found for Structure ($p < .06$; $F = 3.72$; $df = 1/57$) on ratings of the High Machs. For sticking to agreed upon procedures, ratings were higher under the High Structure ($\bar{x} = 1.23$) than Low Structure condition ($\bar{x} = 1.58$).

Conclusions

The results substantially do not confirm the major prediction of an interaction between Machiavellianism and task structure. There was only one major effect for the personality variable: the notable finding that Medium Machs were preferred as leaders to those at either extreme, in both the High Structure and Low Structure conditions.

Machiavellianism did make a difference in leader choice. There was at least the suggestion of a preference for the moderate person, in this aspect of leader personality. The absence of an interaction effect with Structure on any of the behavioral measures suggests of course that other contingencies were also involved.

Perhaps the most important finding regarding these contingencies in emergent leadership is the main effect for Structure. The Low Structure situation evidently provided more maneuverability for emergent leadership, as shown dramatically in the measure of "time of possession" of the plan sheet. On the other hand, as might well be expected, the Low Structure situation provided less satisfaction for group members in general.

There are also other findings regarding Structure, from the post-interaction questionnaire and behavioral observation, which clearly indicate its importance in setting the climate of leadership. Not least, in this regard, is the significantly greater number of "accepting" responses to others in the group found under the High Structure condition, compared with the Low Structure one.

In sum, this experiment does reveal some of the major effects of structural factors on emergent leadership. The importance of personality, especially in interaction with these situational conditions, may have been masked by the powerful effects of Structure. Therefore it may be premature to conclude that personality variables, such as Machiavellianism, have only limited consequences for emergent leadership. Indeed, in the sociometric leadership ratings, there is still some suggestion of support for the interactional position.

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		Machiavellianism Level of Members Chosen to be Future Leaders			
		High	Medium	Low	All
Task Structure	High	7 (8)	20 (16)	5 (8)	32
	Low	6 (8)	23 (16)	3 (8)	32
	Total	13 (16)	43 (32)	8 (16)	64

Table 1: Frequency distribution showing Machiavellianism Level of subjects chosen by others as future leaders for the two conditions of Task Structure, separately and together. Expected frequencies are given in parentheses.

		Machiavellianism Level of Respondents			
		High	Medium	Low	All
Task Structure	High	2.13 (8)	2.44 (16)	2.38 (8)	2.38 (32)
	Low	3.13 (8)	2.19 (16)	2.38 (8)	2.47 (32)
	All	2.63 (16)	2.31 (32)	2.38 (16)	

Table 2: Mean response by respondents at three Mach Levels, and in two task structure conditions, to the question of how well the group did relative to other groups. The scale runs from 1 to 6, with 1 being the high end. The numbers in parentheses are the Ns upon which each mean is based.

		Machiavellianism Level of Respondents			
		High	Medium	Low	All
Task Structure	High	2.13 (8)	1.63 (16)	1.75 (8)	1.78 (32)
	Low	3.25 (8)	2.31 (16)	2.75 (8)	2.66 (32)
	All	2.69 (16)	1.97 (32)	2.25 (16)	

Table 3: Mean response by respondents at three Mach levels, and in two task structure conditions, to the question of how satisfied they were with their group's performance. The scale runs from 1 to 7 with 1 being the high end. The numbers in parentheses are the Ns upon which each mean is based.

		Machiavellianism Level of Respondents			
		High	Medium	Low	All
Task Structure	High	11.5 (8)	9.1 (16)	18.8 (8)	12.2 (32)
	Low	62.0 (8)	38.3 (16)	19.6 (8)	39.6 (32)
	All	36.8 (16)	23.7 (32)	19.3 (16)	

Table 4: Mean time of possession of plan sheet, in minutes, for discussion and task period together, by subjects at three Mach Levels, and in two task structure conditions. The numbers in parentheses are the Ns upon which each mean is based.

		Machiavellianism Level of Group Members			
		High	Medium	Low	All
Task Structure	High	12.2 (8)	9.2 (16)	9.5 (8)	10.0 (32)
	Low	4.4 (8)	5.8 (16)	3.4 (8)	4.8 (32)
	All	8.3 (16)	7.5 (32)	6.4 (16)	

Table 5: Mean number of "accepting" statements and actions for group members at three Mach levels, and in two task structure conditions. The numbers in parentheses are the Ns upon which each mean is based.

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