who maintains contact for a long time after the experience does so because of an initially more worldminded, less ethnocentric orientation than the person who loses contact.

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LEADERSHIP AND THE SPATIAL FACTOR IN SMALL GROUPS

GORDON HEARN[1]

University of Toronto

DURING discussion, people tend to interact more with those sitting opposite them in a circle than with their neighbors. This was the hypothesis proposed and supported by the results of a study reported by Bernard Steinzor some years ago in this Journal (5). In order to test the hypothesis, he had observed the meetings of two 10-member discussion groups, keeping a record of who followed whom in the interaction sequence.

In the course of an experiment (3) conducted for a quite different purpose, data were collected which permitted a replication of Steinzor's study under fairly similar conditions and an extension of his hypothesis to include a consideration of the influence of leadership upon the spatial factor.

METHOD

The subjects (*Ss*) in the present study were 30 male students enrolled in an introductory psychology course. For eight weeks of the course they were divided into six six-member groups, the investigator, as leader, constituting the sixth member in all of them. The purpose of the experiment was to test the relative effectiveness of two training methods in improving group productivity. Accordingly, three groups were assigned to what was called the *Self-Motivated Method* while the three remaining groups experienced the *Trainer-Induced Method.* These two methods differed essentially in the behavior of the trainer or leader and the assumptions about training upon which his behavior was based.

Training in the self-motivated method was based on an assumption that the group itself had the capacity and resourcefulness to improve its own functioning. Furthermore, it was assumed that the group, as the object of the training, should be actively involved in the direction of the training process. The leader was present and available should the group desire his help but he did not impose himself on the group. Throughout, his principal objective was to encourage the group to take maximum responsibility for improving its own performance. Thus, this method was somewhat similar to, although probably even less directive than, the Rogerian type of group-centered leadership used in Steinzor's Group I (4).

The trainer-induced method was based upon the assumption that an outside agent, in the person of a trainer or leader, is required to enable a group fully to understand and modify its behavior. He is an expert who knows better how the group needs to change in order to improve its performance. As such, in this method, the leader was very active during training, giving critical analyses of the group members' past performance, and functioning somewhat as a "coach" in urging them to modify, in certain ways, their future group behavior. Thus, in this case, the leader assumed major responsibility for improving the group's performance.

In the course of the experiment, the groups participated in eight two-and-a-half-hour weekly sessions. A typical session began with a training period which attempted to identify the ways in which the group needed to change in order to do better in the future, and each session concluded with a trial period in which the group was given a human relations problem to discuss and the task of formulating, as a group, a written solution to the problem. The members of each group and the leader, seated as shown in Fig. 1, occupied the same seats for all eight sessions. All groups had different problems from week to week but the same problem in any given week.

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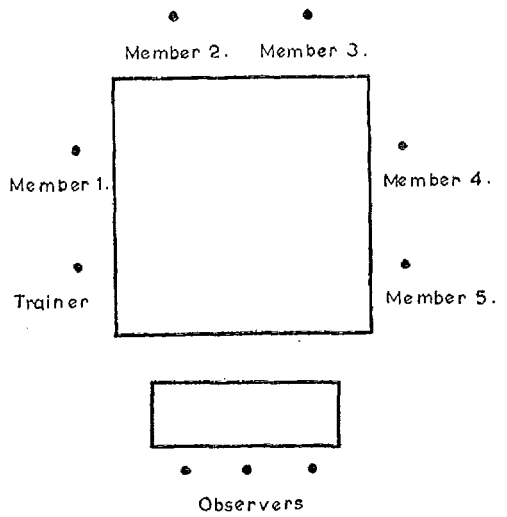

FIG. 1. SEATING ARRANGEMENT DURING EXPERIMENT

Using the Bales categories (1), an observer coded the interactions which occurred during the training periods. The "initiator," "object," and "interaction type" of each comment were coded for Sessions 4, 5, 6, 7, and 8, providing the data with which the Steinzor hypothesis was tested. Where Steinzor had recorded *who followed whom* in an interaction sequence, the present study noted *to whom* a comment was directed. These two measures appear to be sufficiently related, however, to justify a comparison of the results of the two studies. Except for the fact that Steinzor's groups sat in a circle whereas *S*s in the present experiment sat in a U-shaped arrangement, and that his groups were somewhat larger, the groups in the two studies operated under essentially similar conditions.

Steinzor's method of data analysis was employed in the present study. In a six-member group a comment can be directed to any one of the following positions: one seat to the left—1L, two seats to the left—2L, three seats away—3, two seats to the right—2R, or one seat to the right—1R. It should be noted, however, that in the U-shaped arrangement, interaction with one person to the left or to the right (1L or 1R) of the trainer or Member 5 could be either an interaction with a person across the table or an interaction with one's neighbor. This is a shortcoming of the present design which clouds the results to some extent. In the present study, the data from the self-motivated groups, I, II, and III, were combined as were those from the trainer-induced groups, IV, V, and VI, but were treated separately for Sessions 4, 5, 6, 7, and 8, these being the only weeks in which the essential data were collected. The results are shown in Fig. 2. There were instances in which a comment was coded as being directed to the group-as-a-whole. All such were excluded from the analysis. Analysis included all comments made by and toward the leader as well as those of the members. Table 1 shows for both studies those positions in which the obtained varied from the expected frequencies by an amount greater than expected at the .02 level of confi-

TABLE 1

DISTANCES WITH FREQUENCIES YIELDING CHI-SQUARE VALUES SIGNIFICANT AT AT LEAST THE .02 LEVEL OF CONFIDENCE

a. Leaderless (Steinzor)

Group Session	1	2	3	4	5
No. of positions possible	9	7	8	7	9
Overchosen positions*	5	4	—	4	4R
Underchosen positions	2L	—	—	—	1L, 1R

b. Self-Motivated (Hearn)

Group Session	4	5	6	7	8
No. of positions possible	5	5	5	5	5
Overchosen positions	2L, 3, 2R	2L, 3	3	—	3
Underchosen positions	1L, 1R	1L, 1R	1R	2L	1L, 1R

c. Group-Centered (Steinzor)

Group Session	1	2	3	4	6	7	9	12	16	18
No. of positions possible	9	7	9	9	9	9	9	9	8	7
Overchosen positions	4R	2L, 2R	5	—	3R	—	—	5, 4L	—	2L
Underchosen positions	—	1R	3L	—	1L	—	—	2L, 2R	1R	—

d. Trainer-Induced (Hearn)

Group Session	4	5	6	7	8
No. of positions possible	5	5	5	5	5
Overchosen positions	—	1L, 1R	1L, 1R	3	—
Underchosen positions	—	2L, 3	2L, 3	—	—

* The "overchosen position" row shows the seating positions in which the observed frequency was significantly greater than the expected frequency. The "underchosen position" row indicates the reverse, where the observed was significantly less than the expected frequency. Thus in session 1 of Steinzor's leaderless group, the frequency of comments over a 5-seat interval significantly exceeded the expected, while over the two-seat-to-the-left interval frequency of comments was significantly less than the expected.

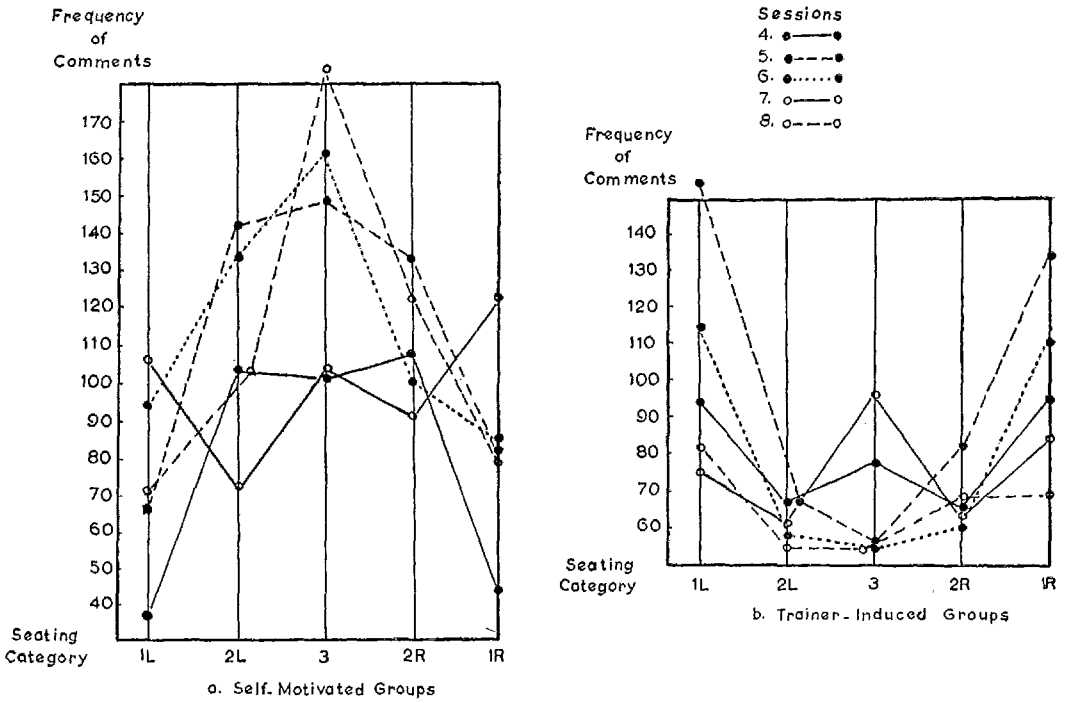

FIG. 2. DISTRIBUTION OF COMMENTS BY SEATING CATEGORY

dence,[2] according to chi-square analyses. The expected frequencies were derived from the assumption that the comments would be distributed equally into the five seating categories.

RESULTS

Data with respect to the self-motivated groups, as shown in Fig. 2a, give strong support to Steinzor's hypothesis. With the exception of Session 7, interaction is greater at the two- and three-seat intervals than at the one-seat interval. When the data from the five sessions are combined, the distribution into the five seating positions, 1L, 2L, 3, 2R, and 1R, deviates from the expected by an amount that permits us to reject the null hypothesis at the .001 level of confidence. In the self-motivated groups, therefore, there is strong evidence that people tend to interact more with persons sitting at a greater distance but more in their line of vision than with their neighbors to either side.

The situation in the trainer-induced groups, however, is just the opposite. An examination of Fig. 2b will show, again with the exception of Session 7, that there are more interactions at the one-seat interval than at the two- or three-seat intervals. Again, the combined distribution into the five positional categories deviates from the expected by an amount which is significant at the .001 level of confidence. There is strong evidence in the trainer-induced groups, then, that members tend to interact more with their neighbors on either side than with those at a greater distance. The atypical results in both group types in Session 7 remain unexplained.

Since the groups had been assigned randomly to their training method, it seems valid to assume that the principal difference between the self-motivated and trainer-induced groups was *the manner in which they were led.* The active, directive kind of leadership in the trainer-induced groups apparently produced the reverse of the effect noted in Steinzor's study.

In order to analyze the possible interactive effect of leadership and the spatial factor, the data from the two studies are presented as is shown in Table 1. And in order to facilitate comparison, they are presented approximately in the form used in the Steinzor article. They are ordered according to the amount of leader direction assumed to be inherent in each group type. Accordingly, because of its absence of designated leadership, Steinzor's "Leaderless" group is listed first. Hearn's "Self-Motivated," in which the leader interjected himself only when drawn in by the group, is second. Steinzor's "Group-Centered" is listed third, for

[2] The .02 level was selected in the present study in order to facilitate comparison with Steinzor's study which had used the .02 in preference to the more conventional .01 or .05 criteria.

while it was quite similar to the "Self-Motivated," it probably involved somewhat more activity on the part of the leader. Admittedly this was an arbitrary decision, but it seemed justified, nevertheless, on the basis of the descriptions of the two methods. Hearn's "Trainer-Induced" method which represented the highest degree of leader direction is listed last.

When the four methods were placed in this sequence, one observed an interesting trend. Steinzor's hypothesis was most strongly supported in the "Leaderless" and "Self-Motivated" groups. In the case of Steinzor's "Group-Centered," however, the effect began to break down. Those seating positions which were overchosen to a significant degree, in one session or another, covered a range from the two- to the five-seat interval while those underchosen to a significant degree ranged from one to three. Thus, there was an overlap and the results were somewhat equivocal. When one looked at the "Trainer-Induced" groups, the effect had become reversed. Greater activity by a designated leader seemed to have the effect of reducing the distance, in terms of seating interval, over which members would direct their person-to-person comments.

DISCUSSION[3]

Thus the present study appears to support as well as extend the Steinzor hypothesis. However, because it was conducted under somewhat different conditions of size and seating arrangement, it cannot be regarded as a definitive test. Furthermore, because the ordering in Table 1 of the four leadership methods in the two studies was made on the basis of assumption rather than established fact, these data do not warrant firm conclusions concerning the interactive effect of leadership and the spatial factor. They do, however, suggest the following hypotheses:

1. When direction by a designated leader is at a minimum, members of a face-to-face discussion group will direct more comments to those sitting opposite them than to their neighbors on either side.

2. When direction by a designated leader is at a maximum, members of a face-to-face discussion group will direct more comments to their neighbors on either side than to those sitting opposite them.

[3] The author is indebted to Leon Festinger, Thomas Gordon, Henry S. Maas, Carl R. Rogers, and Bernard Steinzor for a number of helpful suggestions in the interpretation of the results of this study.

3. When direction of the face-to-face discussion group is shared about equally by the members and the designated leader, factors other than the spatial factor will determine which will be the underchosen and overchosen seating intervals.

The present study suggests, further, that other group situations which, when observed in the future, reveal "no spatial influence," may not actually be negative findings but rather cases in which other conditions are in play to cancel out or overpower the spatial factor. One such case in point is a study by Bass and Klubeck (2) which suggests that the leadership status of group members in situations outside the experiment may operate to diminish and almost eliminate the Steinzor effect. And undoubtedly other factors which interact with the spatial factor may also be found.

SUMMARY

In an earlier study, Steinzor showed evidence to support the hypothesis that persons tend to interact more in group discussion with persons sitting opposite them than they do with their neighbors. The present study, conducted under somewhat different conditions, supports but also extends this hypothesis. Its results, in combination with those of Steinzor, suggest a further hypothesis to the effect that the manifestation of the *Steinzor effect* will depend upon the degree of direction given by a designated leader. That is, the effect will be most strongly manifested in the groups with no designated leader. It will tend to disappear in groups where group direction is shared about equally by the members and the designated leader, and it will be reversed in situations where the designated leader gives very strong direction.

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