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ABSTRACT

Two experiments were conducted which studied seating distance of subjects in a small group discussion situation. In Experiment I groups of three subjects sat on cushions in a bare carpeted room along with a moderator and discussed a socially relevant issue. The distances generated by subjects' placement of their cushions serve as the main dependent variable. The predominant seating pattern was a semicircular arrangement of the subjects relative to the moderator. The interaction distances chosen were within Hall's (1966) personal and social zones. In Experiment II an attempt was made to influence where subjects sat by including in the group a confederate who always sat down first either very near or far from the moderator. Results showed that subjects attempted to accommodate both the moderator and the confederate in choosing their seating positions. When the confederate sat far way from the moderator, two distinct types of seating patterns emerged, but both seemed functionally equivalent in terms of orientation and distance accommodation to the moderator and confederate. (Author)

THE SOCIAL ECOLOGY OF FREE SEATING ARRANGEMENTS IN A SMALL GROUP INTERACTION CONTEXT

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THE SOCIAL ECOLOGY OF FREE SEATING ARRANGEMENTS IN A SMALL GROUP INTERACTION CONTEXT[1]

The way in which people use space for social interaction has received considerable attention recently. In a comprehensive review Lett, Clark, and Altman (1969) summarized in propositional form 31 generalizations concerning interpersonal distance. Only three propositions were considered as well established; the most important being that increasing intimacy and friendliness is associated with close interpersonal distance (e.g., Byrne, 1961; Friedman, 1966; Goldring, 1967; Mehrabian, 1968), except perhaps at extremely close distances (Dabbs, 1971; Dosey & Meisels, 1969).

Interest in distance as an important interaction variable was stimulated by the theoretical work of Hall (1966) on interaction distance zones, and Sommer's (1969) conception of "personal space." The bulk of the empirical research has relied on correlations of observational data or placements of symbolic figures relative to each other. The latter approach has received extensive attention, particularly from Kuethe (1962a; 1962b; 1964) and Little (1965; 1968). In general this research indicates that placement distance varies in an orderly manner as a function of several variables and indeed, this body of literature contributed substantially to Lett, Clark, and Altman's (1969) conclusion of a well established relation between distance and interpersonal intimacy.

Perusal of this literature suggests a possible over reliance on use of symbolic figures and distances, with consequent uncertainty as to applicability of the conclusions to humans in ongoing interaction (interesting recent

exceptions include Argyle, 1970; Argyle & Dean, 1965; and Mehrabian, 1968). In addition, much of the observational research has methodological problems, usually a confounding of distance with other variables. Finally, much of the research with both humans and symbolic figures has considered distance as a dependent variable. A few studies have considered seating preferences as a function of distance arrangements of chairs. In a classic study Sommer (1961) found that pairs of subjects preferred to sit opposite each other up to about 5.5 feet nose-to-nose distance. Beyond that distance side-by-side seating on the same couch was preferred, suggesting that comfortable conversation distance extends to about 5.0 feet. This result was substantiated in a later study (Sommer, 1962) in which subjects definitely preferred face-to-face seating up to distances of 4.0 to 5.0 feet.

In contrast to Sommer's findings for seating arrangements Baxter (1970) found that standing distance of pairs of people attending a zoo together varied from 1.78 to 2.66 feet. This study also showed significant effects due to ethnicity, age, and sex composition of pairs in preferred distance. Clearly, both Sommer's data for seating distance and Baxter's results indicate that ongoing interaction tends to occur within what Hall (1966) defined as intimate and social zones of interaction.

The present research was concerned with "free" seating distances when subjects have no constraints on how they shall position themselves in space. In most of daily life seating distance is largely predetermined by the furniture arrangements in a room. Also, even in experiments such as Sommer's (1961; 1962) free choice was severely restricted. There are no data on how subjects will disperse themselves in an informal interaction situation if they have complete freedom of choice in selecting their seating positions.

The present studies approached this problem by allowing small groups of subjects, about to engage in a moderated discussion, to sit wherever they wished on the carpeted floor of a room void of furniture. One variable of interest was the sex composition of the group. Although past evidence is weak, there seems to be a tendency for females to prefer closer interaction distances than males (Leibman, 1970; Willis, 1966). In Experiment I it was expected that given a free seating choice, males might dispense themselves more widely than females, and that mixed sex groups should be intermediate to all male and all female groups.

A second variable of interest was the effect of the moderator on subjects' seating distance. Since the moderator was a leader in a minimal sense, and accordingly had more prestige than group members, it seemed likely that subjects would sit further from the moderator than they sat from each other. A secondary question was whether these seating distances would be enhanced for male relative to female moderators.

Experiment I, then, was concerned with seating distances when subjects were unrestricted in their choice of how close or far apart they could sit from each other. Experiment II followed up an informal observation from the first experiment. The moderators noticed that the first subject to sit down seemed to exert a slight conformity pressure on the remaining two subjects with regard to where they sat. In Experiment II this "follow the leader" effect was studied systematically. One of the three subjects was in actuality an experimental confederate who always sat down first. The confederate sat either near or far from the discussion moderator. Distance measures of where the two real subjects sat relative to the confederate and moderator served as an index of conformity tendencies in seating choice. In each experiment evaluative ratings

were obtained from subjects after the group discussion.

Experiment I

Method

Subjects and design. Students from an introductory psychology course served as subjects for credit points in groups of three. There were 72 subjects of each sex, or a total of 144. Sex composition of the group was either all male (MMM), all female (FFF), or mixed, MMF and MFF. Each group of subjects was seen by one of four moderators. Two of the moderators were male and two were female.[2] Each moderator saw 12 groups or 36 subjects. The basic design was a 2 x 4 factorial with sex of the moderator fully crossed with four levels of sex composition of the subject groups.

Experimental setting. The experimental room was 7.5 x 15 feet in dimension, was carpeted, and was completely bare of furniture. Three cushions were hung in the middle of the long wall furthest from the entry door of the room. A fourth cushion for the moderator and a tape recorder were located on the floor at the far end of the room. The general layout of the room is shown in Figure 1.

Insert Figure 1 about here

Procedure. The moderator greeted the subjects in a waiting room and escorted them to the experimental room. The moderator closed the door, walked to the center of the room, and gave the following instructions.

Basically, what we are going to do today is have a small group discussion which I will moderate. During the discussion I will be sitting over there (gestures toward cushion on floor and moves toward it in a natural motion). If you will notice, we have some cushions hanging here on the wall with letters taped on them. The letters will be used for rating purposes which will be explained later. What I will ask each of you to do in a moment is to take one of the cushions and be seated wherever you like. We would like for you to stay seated on the cushions during the discussion, and please don't lean against the walls. Please take your cushions now and be seated.

The moderator avoided eye contact with the subjects while they were being seated, generally looking at the floor and making preparatory seating motions. However the moderator did not actually sit down until the subjects were seated. This aspect of the procedure was important since the subjects' seating distance relative to the moderator and each other was the main dependent variable of interest. Great care was required so that the initial "sit-down" would appear socially graceful and appropriate, and so that the moderator would not give off any cues which subjects could interpret as signals as to where they should sit.

When everyone was seated, the moderator indicated that the specific instructions were taped for control purposes, and turned on the recorded instructions. A male voice explained that the research was concerned with group dynamics, with how people interact, and the effects of different situations on interaction processes and the impressions that people form. The nature of the group discussion and ratings to be made afterwards was explained briefly.

The moderator turned off the recorder and introductions were exchanged. The group then engaged in a 15-minute discussion of womens' liberation. The moderator posed questions for discussion, but beyond that maintained a quiet, nonevaluative role. Almost without exception, the discussions were quite lively, since the topic was of current interest among students.

After the discussion the moderator distributed rating forms, and specific instructions for completing the forms were given via the recorder. After the ratings were completed subjects were debriefed and dismissed. Subjects were reminded not to move their cushions, and after they left the moderator measured the positions of the cushions by a grid plan which consisted essentially of recording the position of each cushion with respect to two walls. The inter-cushion distances were then obtained from these measurements.

Rating forms. Several different measures were included: (a) Ratings of moods during the discussion on 15 mood adjectives (e.g., jittery, elated, angry), (b) ratings of the group discussion situation on 8 items (e.g., intellectual level of discussion, compatibility with other members, satisfaction with the discussion), (c) one rating of perceived distance apart the members sat, (d) ratings by each subject of the other two subjects and the moderator on intelligence, morality, liking, adjustment, knowledge of women's liberation, desire to work with in the future, and degree of personal acquaintance. Each of these ratings was made on a 9-point scale with values ranging from 1-9. The endpoints of each scale were appropriately labeled. In addition, subjects rated seven Likert-type statements designed to assess attitude toward womens' liberation. Each item had five response categories: strongly disagree, disagree, uncertain, agree, and strongly agree. Responses were assigned weights

1-5 for scoring purposes. Finally, the last page of the form asked subjects to describe in their own words their reactions to the experiment, and their degree of prior acquaintance, if any, with the other persons in the experiment.

Results and Discussion

Seating distances. A map was made of the seating positions and distances for each group of subjects. Inspection of these seating patterns indicated that subjects predominantly chose a semicircular arrangement with a visual orientation toward the moderator. Given this dominant seating pattern, seating distances were defined as follows. The subject sitting closest to the wall on the moderator's right was defined as S_1, the subject in the center was S_2, and the subject nearest the wall on the moderator's left was S_3. This definition allowed determination of six seating distances for each group: moderator (M) to S_1, M to S_2, M to S_3, S_1 to S_2, S_1 to S_3, and S_2 to S_3.

An average was obtained for each of the six distances across all groups of subjects. These average distances to the nearest inch are plotted in re 1 (scale: one-half inch equals one foot). The mean value of each distance is shown on the figure. The positions relative to the walls of the room were determined by taking as anchor points the moderator's position (always a fixed point 18 inches from the wall), and the average distance of S_1 from the right wall (26 inches). Given these two anchor points, the position of the figure defined by the distance lines relative to the room was fixed.

Inspection of Figure 1 indicates two facts of interest. Subjects spaced themselves adjacent to each other just short of four feet. This distance is on the borderline of what Hall (1966) called personal distance-far phase (personal distance ends and social distance begins at four feet). In contrast, the three

seating distances from the moderator were considerably larger, 73 inches or better, and were well within Hall's category of social distance. One inference is that although the subjects and moderator were all equally strangers to each other, the subjects perceived themselves as more similar to each other and had less status in the situation than the moderator. These differences were reflected nicely in the subjects' spacing arrangements.

An analysis of variance was performed on the distance measures. Sex of moderator and sex composition of the groups were between subject variables. The six distances for each group were treated as six levels of a within subject variable. A summary of the analysis is shown in Table 1. As indicated, there

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Insert Table 1 about here

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was only one significant effect, seating distances. Newman-Keuls comparisions revealed that the M-S_1 and M-S_3 distances did not differ from each other. Also, the S_1-S_2 and S_2-S_3 distances did not differ. However, all of the other differences were significant.

The expectancy that spacing arrangements would vary as a function of moderator's sex and group sex composition was not confirmed, since none of the between subject effects was significant. It may be that interaction within the range of far personal-close social distance is relatively impervious to sex differences. Sex differences may possibly be observed only at the extremes (i.e., intimate or public distances).

As a final note, spacing arrangements for mixed sex (MMF and MFF) groups were inspected for uniformities in position preference, such as F in the MMF

(and M in the MFF) preferring the S_2 position. However, no consistent ordering relation was observed.

Questionnaire ratings. An analysis of variance was performed on each rating. For convenience in the analysis each subject was considered as an independent sampling unit. There was no particular reason to expect differences on the ratings, particularly since none of the between subject effects for seating distance was significant. There were 46 different questionnaire items, and of these the main effect of moderator's sex was significant for 11 items. The ratings consistently favored the male moderators. Careful inspection of the separate analyses for moderators of each sex indicated, however, that the effects were largely due to individual differences in moderators. On some items a male moderator had a higher mean than any of the other three moderators, but on other items a female had a lower mean than the other three moderators. Such fluctuations indicate differences due to individual moderators rather than true sex effects. The interaction between moderator sex and group composition was not significant for any of the 46 items. The only other effect of interest was a main effect of sex composition of subject groups for attitude toward womens' liberation. This result may be summarized as follows--the more males there were in a subject group, the more negative the group's attitude toward womens' liberation. This outcome was comparable to the results of a large scale opinion survey on the issue among introductory psychology students earlier in the quarter.

Experiment II

The present experiment was based on the moderators' informal observations during Experiment I that conformity influences seemed to be operating to determine where subjects sat. It appeared that the first subject to sit down affected the

positions chosen by the two remaining subjects. Such a conformity effect might attenuate spacing differences due to sex composition of group members. The possibility of a conformity effect was studied systematically in Experiment II, using the same general procedures used in the first study. The main difference was that one of the three subjects was actually a confederate who always managed to be the first to sit down. Half of the time the confederate sat close to the moderator, and the other half far away. Seating distance of the two actual subjects relative to the moderator and confederate was the main dependent variable of interest.

Method

Subjects and design. Students from an introductory psychology course served in groups of two of the same sex (with the confederate as an ostensible third subject). There were 64 actual subjects, 32 of each sex. The groups, including the moderator and the confederate, were always of the same sex. Thus sex of the groups, male or female, was one independent variable. The other variable was distance the confederate sat from the moderator (near or far). The basic design was a 2 x 2 factorial, with eight groups of two subjects assigned to each of the four conditions. The roles of moderator and confederate were rotated across groups within a condition by the two individuals of each sex who worked on the project (see Footnote 2).

Procedure. The moderator greeted subjects in a waiting room and escorted them to the experimental room. The confederate subject always managed to enter the room before the two actual subjects and took up a standing position near the cushions. The moderator's instructions were identical to those of the first experiment. When instructions to take a cushion and be seated were given, the

confederate always took a cushion first, paused momentarily while apparently deciding where to sit, and then proceeded directly to one of two fixed spots and sat down. The locations of these two spots are shown in Figures 2 and 3. On a direct line from the moderator's cushion, the distance to the confederate's cushion was either 42 inches or 132 inches.

After everyone was seated the remainder of the instructions was given and the discussion of womens' liberation ensued. After the discussion, ratings were completed on rating forms identical to those used in the first experiment. However, the seven rating items of each subject for each of the other two subjects were considered as separate dependent variables for the confederate subject, so that there was a total of 53 different rating measures.

Results

Seating distances. The average seating distances for the confederate-near condition are shown in Figure 2, and for the confederate-far condition in Figure 3. There was one predominant seating pattern in the near condition, but as shown in Figure 3 there were two distinct patterns in the far condition. Results for the near condition are considered first.

Insert Figures 2 and 3 about here

Figure 2 indicates that the two actual subjects, S_1 and S_2, spaced themselves so that in conjunction with the confederate, C, they formed a semi-circular pattern facing the moderator, M. This arrangement bears a strong similarity to the free seating arrangement obtained in Experiment I. Comparison of Figures 1 and 2 shows several similarities. The S_1 position was located in

about the same position and equally distant from M (78 and 79 inches) in both cases. The S_2 position was exactly the same distance (97 inches) from M in both cases. The S_2 position was shifted slightly closer to the wall with the S_1-S_2 distance at 54 inches as compared to 44 inches in Experiment I. The position of C was comparable to S_3 in Experiment I, although the latter was further removed from M. The comparison of the two figures shows overall only a slight deformation of the basic seating pattern found in Experiment I. Therefore it is not possible to conclude from this information whether S_1 and S_2 were conforming to C in Experiment II, or whether, since C in II and S_3 in I were not too different from each other, both patterns show relatively natural seating preferences uncontaminated by conformity pressures. Thus the issue must be decided based on seating preferences in the far condition.

Inspection of the two types of group seating patterns in Figure 3 indicates that the seating choice of C posed a dilemma for the two subjects. Careful study of the two patterns allows the following inference. The groups solved their seating dilemma in each instance by one subject accommodating his seating to M and the other subject to C. In Type A groups (top panel of Figure 3) the S_1 position was further removed from M (96 inches) than in Experiment I or the near condition of II. A social distance of 60 inches from C was chosen by S_1. The S_2 distance of 72 inches from M compared favorably with the S_1 distances in the two previously mentioned cases. Also, the S_2 position for Type A groups allowed spacing of 60 inches from both C and S_1. The seating pattern for Type A groups was on the whole very much like that shown in Figure 1, but with a slight elongation of distances.

Type B groups (bottom panel of Figure 3) chose a quite different solution to their seating dilemma. Both subjects remained on the same side of the room.

However, the S_1 position shifted closer to M (72 inches) and further away from C (81 inches) than occurred in Type A groups. The dramatic change occurred in the S_2 position which was located nearly 10 feet from M but a relatively close 58 inches from C. Thus both patterns seemed to indicate a dynamic inter-relationship in which subjects tried to satisfy seating amenities with respect to both M and C. Clearly subjects did not show a simple "follow the leader" conformity effect.

The two divergent patterns shown in Figure 3 made inappropriate the type of statistical analysis reported for Experiment I. However, two separate analyses did seem reasonable. In one analysis the two distances from M to S_1 and S_2 were treated as a within subject variable crossed with sex of the groups and the near-far seating of C. None of the effects were significant in this analysis. In the second analysis the three distances S_1-S_2, S_1-C, and S_2-C were considered as levels of a variable crossed with sex of the groups and the near-far seating of C. Several effects were significant. On the average male subjects sat further from each other and from C than did female subjects. Secondly, the three distances were on the average greater in the near than in the far condition. Third, the three seating distances were all significantly different from each other. Finally, the S_1-S_2 distance was comparable in both near and far conditions, but the S_1-C and S_2-C distances were greater in the near than in the far condition, thus yielding an interaction effect.

Questionnaire ratings. There were 53 measures with 3 effects for each measure for a total of 159 effects. Of these 13 were significant with about 8 expected by chance. Some of these differences were meaningful. For example, as in Experiment I males were more negative than females toward womens' liberation. Also, as might be expected, female moderators and confederates

were rated as more knowledgeable on the womens' movement than their male counterparts. Beyond these differences, however, the likelihood that the few remaining significant effects were due to chance was too great to warrant further interpretation.

Discussion

Most previous research has focused on interpersonal distance, usually with symbolic fugures. The present studies provide information not only on actual interaction distance, but on orientation and relative position in space as well. Several tentative conclusions are warranted. In a free seating situation people try to take all parties to the interaction into account insofar as possible. The results for the far condition in Experiment II indicated a compromise process in which the subjects adapted their visual orientation and seating distance to both the moderator and a recalcitrant confederate who preferred to sit in a far corner of the room. Two solutions for this seating problem emerged which seemed roughly equivalent in outcome, although the two patterns were very different in form. These results indicated, not simple conformity, but a dynamic adjustment of seating positions for the benefit of all concerned.

The results for seating distances in Experiment II suggest an extension of Argyle and Dean's (1965) model of interaction. When several people are in interaction, there is an "equilibrium point" for amount of eye contact (or perhaps more properly, facial orientation) and interaction distance. Figure 3 would indicate that different spatial distributions may be functionally equivalent in providing an optimal combination of distance and orientation. It may well be that the equilibrium tendency involves not so much visual contact as it does comfortable conversation distance (Sommer, 1961; 1962). The need to

maintain one's own personal space plus the limit for comfortable conversation distance would also lead to seating preferences like those obtained in Experiment II for the far confederate condition. The relative importance of the need for eye contact versus the need for comfortable speaking distance on seating preferences could easily be studied using experimental instructions in which subjects were led to expect they either would or would not talk to each other, and that they would or would not wear blindfolds.

A second conclusion from the present studies is that given a free seating choice, subjects choose interpersonal distances relative to each other in the personal and social zones. Sitting on the carpet probably created an informal atmosphere, which in turn created a highly social context for interaction. The actual seating distances chosen were mostly within Hall's (1966) social zone. There was more formality shown toward the moderator by the subjects than toward each other in their use of space. Inspection of the three figures indicates a consistent tendency toward greater S-M than S-S distance. Presumably these greater distances reflected the higher status of the moderator in the group situation.

Some of the previous research would suggest closer interpersonal distances for females than for males. However, in the free seating situation of the present studies there was little support for such a notion. Distances were slightly greater among male subjects and confederate in Experiment II than among females. However, this was not true in ExperimentI, and was not true in either experiment for S-M distances. Further research is required to decide the conditions under which females prefer closer distances.

Future research in this tradition might proceed in two directions. In one case, more research is required with seating distance and position as a

dependent variable. A number of interesting independent variables come readily to mind. For example, if subjects entered the room expecting a combative role with each other, a reasonable prediction would be greater seating distances and a relative lack of orientation accommodations like those shown in Figure 3.

A second major direction for research is to manipulate interaction distance as an independent variable. The affective and behavioral reactions of people to a wide range of spacing situations needs to be known in more detail. In particular, the effects of spacing arrangements on group productivity would be of considerable interest. More than a simple matter of crowding is involved, since spatial variables other than sheer closeness and the expected duration of crowding may be quite important. Recent work on this problem has produced largely negative results (Freedman, Klevansky, & Ehrlich, 1971; Freedman, Levy, Buchanan, & Price, 1972), but it seems clear that much more research is required before clear answers are available.

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Footnotes

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2. Thanks are due to Dan Baskin, Toni Fiucci, and Al Lopez who, along with the third author, served as moderators in both experiments. Two moderators of each sex were used to distinguish individual moderator differences from sex effects. All data collected were analyzed in two ways. Separate analyses were made for moderators of each sex, using the two moderators as levels of a factor. In the second type of analysis individual differences between moderators were ignored, and sex of moderator was treated as a variable with two levels. For economy of presentation in this report individual differences in moderators are discussed only when a significant sex effect was due to such differences.

Table 1

Summary Analysis of Variance of Seating Distances in Experiment I

Source	df	MS	F
Between subjects			
Moderator sex (A)	1	1.19	.68
Group sex mix (B)	3	4.09	2.31
A x B	3	.22	.13
Error	40	1.77	
Within subjects			
Seating distances (C)	5	144.02	116.60*
A x C	5	1.61	1.30
B x C	15	.73	.59
A x B x C	15	1.05	.85
Error	200	1.24	

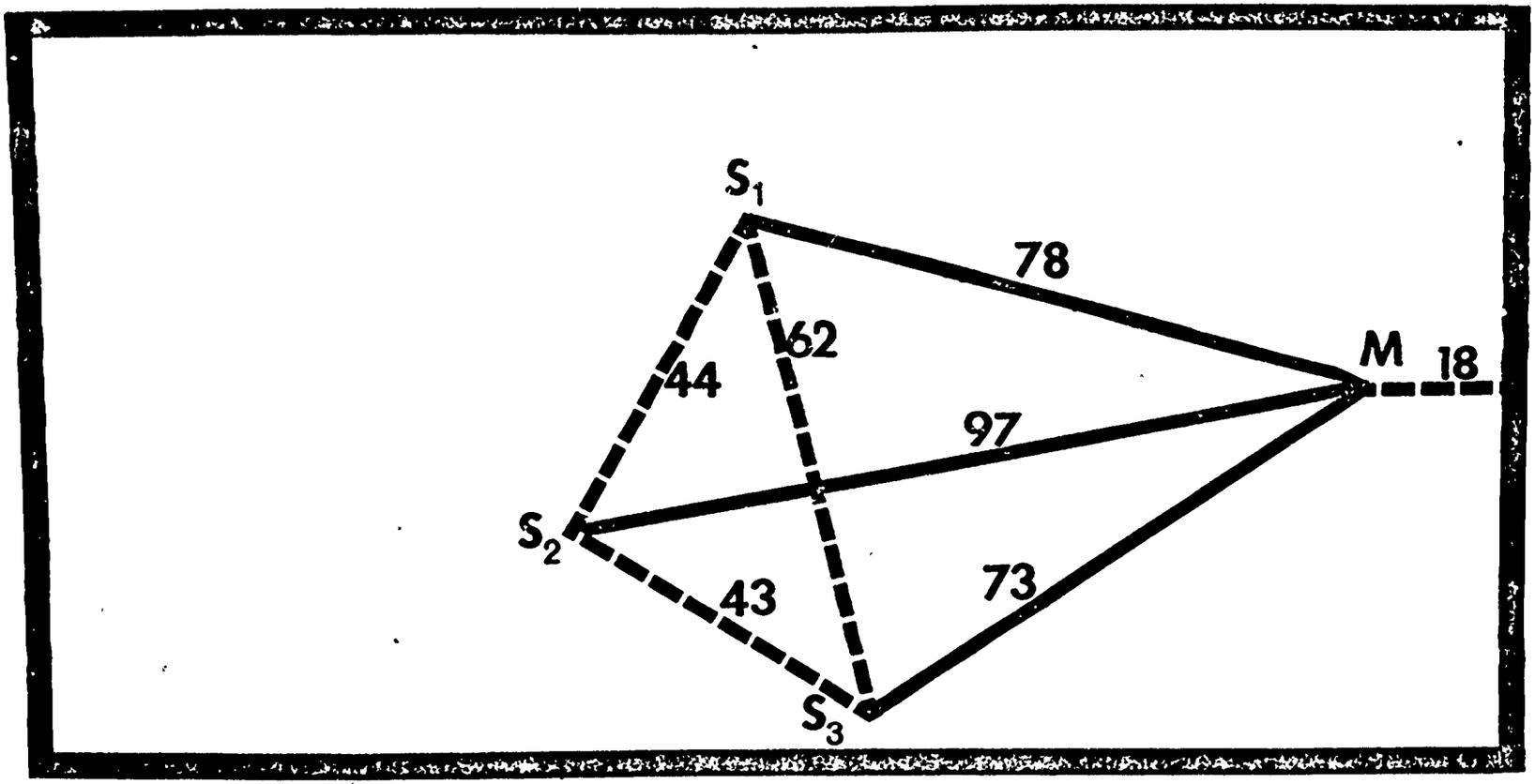
* $p < .00001$.

Figure Captions

Fig. 1. Average locations and seating distances between moderator and subjects in Experiment I.

Fig. 2. Average locations and seating distances for the near condition in Experiment II.

Fig. 3. Average locations and seating distances for the two seating patterns for the far condition in Experiment II.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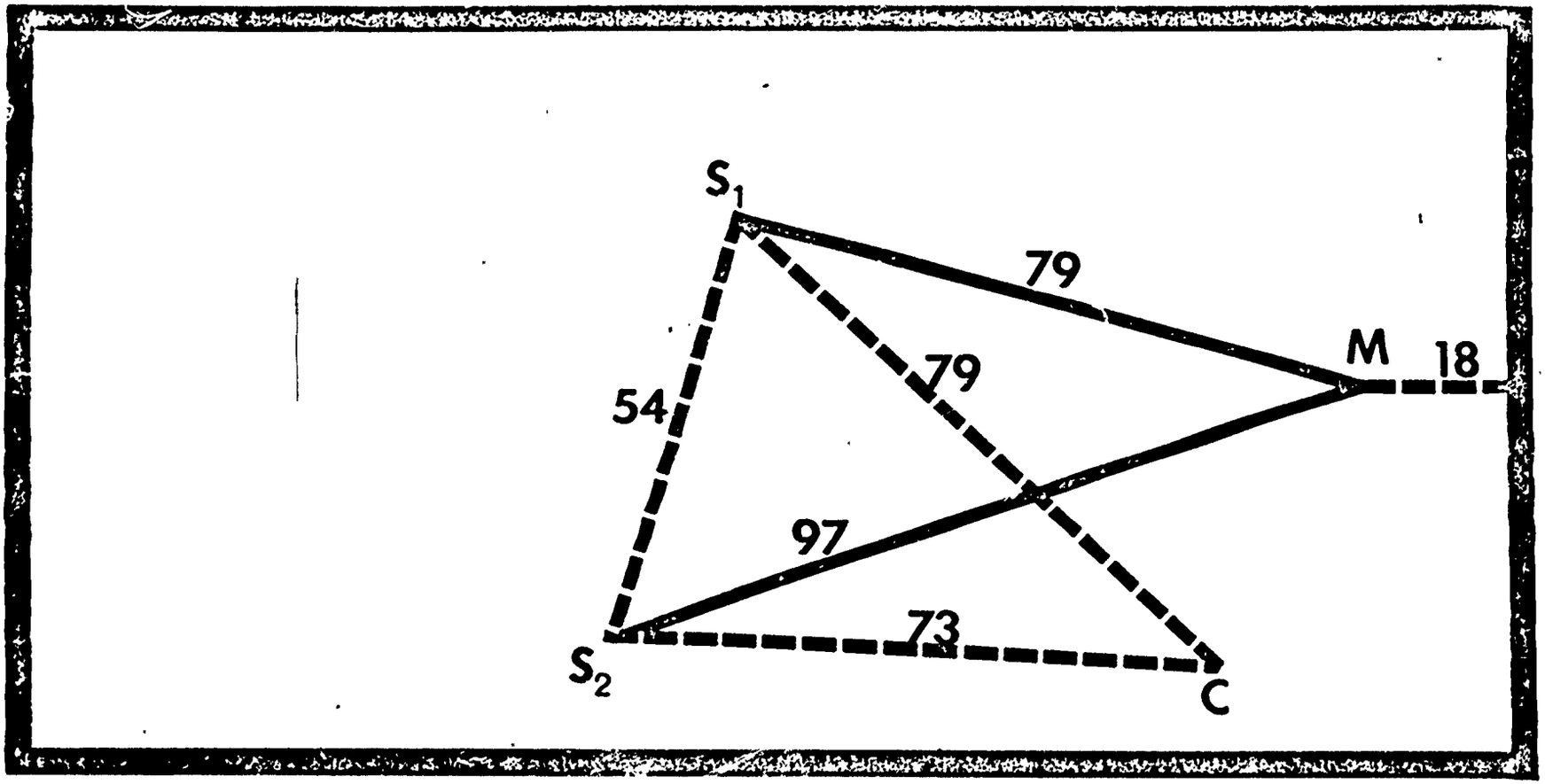
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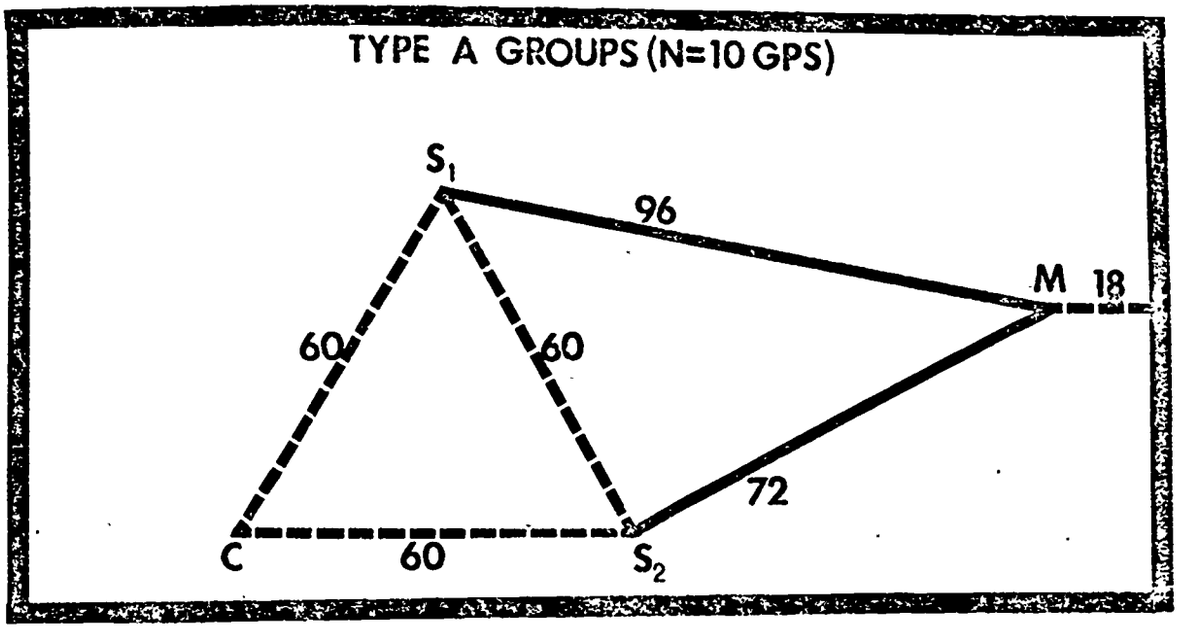
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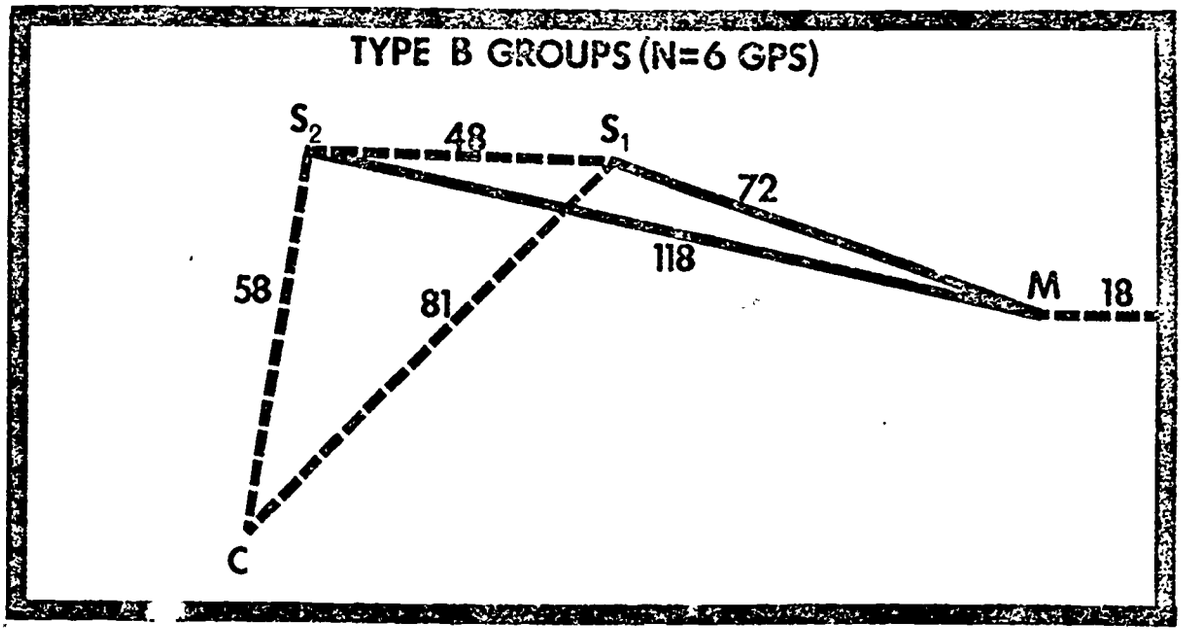
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