



## 7. BROKEN SQUARES: NONVERBAL PROBLEM-SOLVING

### Goals

- I. To analyze some aspects of cooperation in solving a group problem.
- II. To sensitize participants to behaviors which may contribute toward or obstruct the solving of a group problem.

### Group Size

Any number of groups of six participants each. There are five participants and an observer/judge in each group.

### Time Required

Approximately forty-five minutes.

### Materials

- I. A set of broken squares (prepared according to directions following) for each group of five participants.
- II. One copy for each group of the Broken Squares Group Instruction Sheet.
- III. One copy for each observer of the Broken Squares Observer/Judge Instruction Sheet.

### Physical Setting

A table that will seat five participants is needed for each group. Tables should be spaced far enough apart so that no group can see the puzzle-solving results of other groups.

### Process

- I. The facilitator begins with a discussion of the meaning of cooperation; this should lead to hypotheses about what is essential to successful group cooperation in problem-solving. The facilitator indicates that the group will conduct an experiment to test these hypotheses. Points such as the following are likely to emerge:

1. Each individual should understand the total problem.
2. Each individual should understand how he can contribute toward solving the problem.
3. Each individual should be aware of the potential contributions of other individuals.
4. There is a need to recognize the problems of other individuals in order to aid them in making their maximum contribution.
5. Groups that pay attention to their own problem-solving processes are likely to be more effective than groups that do not.

II. The facilitator forms groups of five participants plus the observer/judge. These observers are each given a copy of the Broken Squares Observer/Judge Instruction Sheet. The facilitator then asks each group to distribute among its members the set of broken squares (five envelopes). The envelopes are to remain unopened until the signal to begin work is given.

III. The facilitator gives to each group a copy of the Broken Squares Group Instruction Sheet. The facilitator reads these instructions to the group, calling for questions or questioning groups about their understanding of the instructions.

IV. He then tells the groups to begin work. It is important that the facilitator monitor tables during the exercise to enforce rules established in the instructions.

V. When all groups have completed the task, the facilitator engages the groups in a discussion of the experience. Observations are solicited from observers/judges. The facilitator encourages the groups to relate this experience to their "back-home" situations.

### Variations:

I. When one member makes a square and fails to cooperate with the remaining members, the other four can be formed into two-person subgroups to make squares of the leftover pieces. They discuss their results, and the exercise is resumed.

II. The five-person teams can be given consultation assistance by the observer/judge or by one appointed member of the team. This may be a person who has done the exercise before.

III. Ten-person teams can be formed, with two duplicate sets of five squares each distributed among them. Teams of six to nine persons can be formed; in this case, prepare a broken square set with one square for each person, duplicating as many of the five squares as necessary.

IV. An intergroup competition can be established, with appropriate recognition to the group that solves the problem first.

V. Members may be permitted to talk during the problem-solving, or one member may be given permission to speak.

VI. Members may be permitted to write messages to each other during the problem-solving.

Similar Structured Experiences: Vol. I: Structured Experience 12; Vol. II: 29, 31, 32, 33; Vol. III: 54; 72 Annual: 80; Vol. IV: 102, 103, 105, 117.

Notes on the use of "Broken Squares":

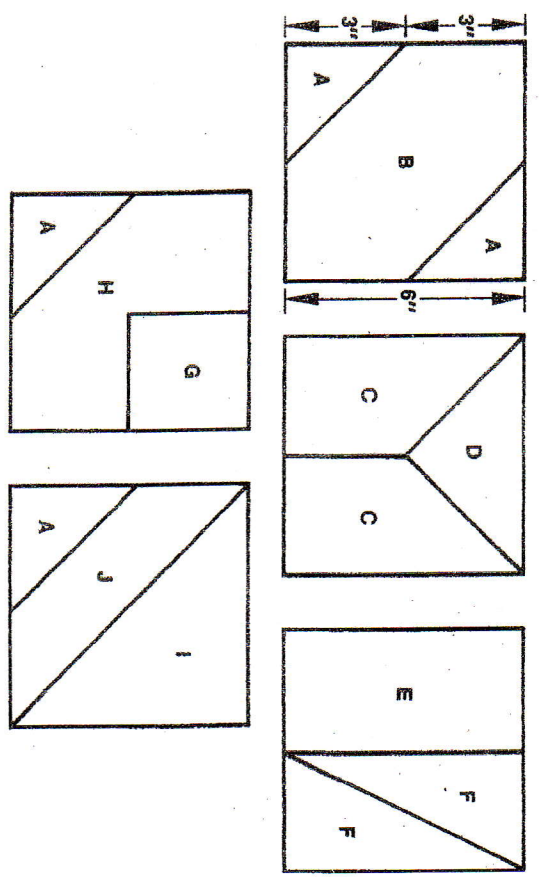
Adapted with permission from Alex Bavelas, Communication patterns in task-oriented groups. *Journal of the Acoustical Society of America*, 1950, 22, 225-230. See also Bavelas, The five squares problem: An instructional aid in group cooperation. *Studies in Personnel Psychology*, 1973, 5, 29-38. Variations I-IV were submitted by Tom Isgar, Case Western Reserve University, Cleveland, Ohio.

Structured Experience 7

DIRECTIONS FOR MAKING A SET OF BROKEN SQUARES

A set consists of five envelopes containing pieces of cardboard cut into different patterns which, when properly arranged, will form five squares of equal size. One set should be provided for each group of five persons.

To prepare a set, cut out five cardboard squares, each exactly 6" X 6". Place the squares in a row and mark them as below, penciling the letters lightly so they can be erased.



The lines should be so drawn that, when the pieces are cut out, those marked A will be exactly the same size, all pieces marked C the same size, etc. Several combinations are possible that will form one or two squares, but only one combination will form all five squares, each 6" X 6". After drawing the lines on the squares and labeling the sections with letters, cut each square along the lines into smaller pieces to make the parts of the puzzle.

Label the five envelopes 1, 2, 3, 4, and 5. Distribute the cardboard pieces into the five envelopes as follows: envelope 1 has pieces I, H, E; 2 has A, A, A, C; 3 has A, J; 4 has D, F; and 5 has G, B, F, C.

Erase the penciled letter from each piece and write, instead, the number of the envelope it is in. This makes it easy to return the pieces to the proper envelope, for subsequent use, after a group has completed the task.

Each set may be made from a different color of cardboard.

### BROKEN SQUARES GROUP INSTRUCTION SHEET

Each of you has an envelope which contains pieces of cardboard for forming squares. When the facilitator gives the signal to begin, the task of your group is to form five squares of equal size. The task will not be completed until each individual has before him a perfect square of the same size as those in front of the other group members.

Specific limitations are imposed upon your group during this exercise.

1. No member may speak.
2. No member may ask another member for a piece or in any way signal that another person is to give him a piece. (Members may voluntarily give pieces to other members.)

### BROKEN SQUARES OBSERVER/JUDGE INSTRUCTION SHEET

Your job is part observer and part judge. As a judge, you should make sure each participant observes the following rules:

1. There is to be no talking, pointing, or any other kind of communicating.
2. Participants may give pieces directly to other participants but may not take pieces from other members.
3. Participants may not place their pieces into the center for others to take.
4. It is permissible for a member to give away all the pieces to his puzzle, even if he has already formed a square.

As an observer, look for the following.

1. Who is willing to give away pieces of the puzzle?
2. Does anyone finish "his" puzzle and then withdraw from the group problem-solving?
3. Is there anyone who continually struggles with his pieces, yet is unwilling to give any or all of them away?
4. How many people are actively engaged in putting the pieces together?
5. What is the level of frustration and anxiety?
6. Is there any turning point at which the group begins to cooperate?
7. Does anyone try to violate the rules by talking or pointing as a means of helping fellow members solve the problem?