Some effects of attribution of responsibility upon the effectiveness of small problem-solving groups*

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An experiment was conducted to examine the effects of attribution of responsibility for a negative event to one member of a group upon the effectiveness of that group. Three experimental conditions were studied: (1) AR + S—members of the group were made aware that one of them had been accused of passing bad checks and had been sanctioned (given a suspended sentence) for it; (2) AR only—members of the group were made aware that one of them had been accused of the negative event (passing bad checks) but was not sanctioned for it (charges were dropped); and (3) control—no information about the negative event. Each group solved three problems. The results showed that the AR + S condition required the longest time for task completion, the AR-only condition required an intermediate amount of time, and the control condition required the least amount of time for task completion. These findings were interpreted in terms of member acceptance/rejection: the accused member was not fully accepted into the group, and this rejection interfered with effective group interaction.

The "knowledges" that individuals have about other persons provide the basis for social interaction. When the other person is perceived favorably, reactions to him are likely to be positive; when he is perceived unfavorably, the reactions are likely to be negative. Thus, the pattern of interaction in a group is strongly influenced by the way each group member is viewed by others in the group. Some of these effects have been demonstrated in the laboratory by Worthy, Wright, & Shaw (1964) and by Shaw & Breed (1969). There is also evidence that the behavior of a group member is affected by the mere belief that other group members view him as a stigmatized person. For example, Farina, Allen, & Saul (1968) led Ss to believe that others in the group had been given information indicating that he either was a homosexual, had been hospitalized for mental illness, or was a typical college student. This manipulation influenced his performance in the group and various aspects of their conversation. An important implication of these findings is that the effectiveness of groups may be influenced in significant ways by the things that group members "know" about each other.

This paper is concerned with the consequences for group effectiveness of group members' knowledge that one group member has been accused of wrongdoing. Consider the situation in which a group member has been accused of being responsible for some negative event but who, nevertheless, must serve as a member of a problem-solving group. How will others in the group react to the accused member? Certainly it is reasonable to expect that they would have a less favorable impression of him, which in turn should have negative consequences for group effectiveness.

The study reported in this paper involved three conditions: (1) attribution of responsibility plus sanctioning (AR + S); (2) attribution of responsibility but no sanctioning (AR only); and (3) a control condition. In the AR + S condition, group members were made aware that one of them had been held responsible (accused) of producing a negative event (passing bad checks) and that he had been sanctioned for it (given a suspended sentence). In the AR-only condition, group members were made aware that one of them had been held responsible for the negative event but that no sanctions had been imposed (the charges were dropped). In the control condition, no mention was made of the negative event. It was expected that the AR + S situation would produce the most unfavorable impression of the accused member, since it would appear that the accusation had some legitimacy. The AR-only condition should also produce an unfavorable impression but to a lesser degree, since it is unclear whether or not the accusation had a valid basis. Therefore, it was predicted that the interaction patterns would be different for groups subjected to the three experimental variations and that these differences in interaction patterns would lead to differential group effectiveness. Specifically, it was expected that groups would be least effective in the AR + S condition, intermediate in the AR-only condition, and most effective in the control condition.

EXPERIMENTAL DESIGN

The experimental design was a 3 by 2 factorial, involving three experimental treatments (AR + S, AR only, and control) and two group sizes (three- and four-person groups). The experimental treatments are described in detail in the Procedure section.

SUBJECTS

The Ss were 60 male undergraduates drawn from the introductory psychology courses at the University of Florida. Each S was assigned randomly to either a three- or four-person group, within the limits imposed by scheduling. Within replications, each group was assigned randomly to one of the three treatment conditions. That is, one group was run in each condition before the next replication was begun, thus controlling to some extent for sequence (experience) effects. In addition to the 60 naive Ss, two male undergraduates drawn from the same population served as confederates. In each instance, one of the confederates served as a member of the group and the other aided in creating the experimental treatment. Each confederate served an equal number of times in each condition, except for one three-person control group in which one confederate substituted for the other (due to scheduling difficulties).

MATERIALS

The pattern of communication in the group was recorded by means of a voice-actuated chronograph (Shaw & Sadler, 1965). The voice-actuated chronograph (VAC) consisted of four throat microphones, four voice-operated relays, a power source, and a four-pen event recorder. The relationships among the parts were such that activation of a throat microphone closed a relay, which in turn operated a pen on the event recorder. By fitting each S with a microphone, it was possible to record the amount of time each person talked and the number of times he interrupted others and was himself interrupted.

Each group attempted to solve three problems: an arithmetic problem, a human relations problem, and a city ranking problem. The arithmetic

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Table 1
Mean Number of Times Others Were Interrupted by the Accused and by Naive Ss as a Function of Experimental Conditions

Treatment		Accused	Non-accused
Three-Person Groups	AR + S	6.75	4.55
	AR Only	2.95	1.50
	Control	2.43	2.25
Four-Person Groups	AR + S	7.90	5.05
	AR Only	8.03	5.65
	Control	6.08	5.63

problem was the horse trading problem first used by Maier & Solem (1952). It required the group to determine the amount of money a man made in the horse trading business after three transactions involving the same horse. The human relations task was taken from Bass (1960) and involved the case of a young politician who is burdened with an alcoholic wife. The group must decide which of five possible courses of action the politician should follow. The city ranking task required a group ranking of six cities in the United States in order of population, using the 1960 census figures as the criteria. This task was adapted from Bass & Gaier (1955). The confederates were instructed to support a solution to each task that was neither the best nor the worst possible solution, as determined from data reported in previous research.

PROCEDURE

One of the confederates reported to the experimental waiting room early and waited for the experiment to begin. As other Ss arrived, he played the role of a naive experimental S. When all Ss had arrived, the second confederate reported to the waiting room, also enacting the role of a naive S. While they were waiting for the E, the two confederates engaged in a conversation that constituted the experimental treatment for that group. For the AR + S condition, the conversation proceeded as follows:

A (non-participating confederate): "Aren't you _____?"
B (the accused group member): "Yes"
A: "I'm _____, a friend of Bill Rogers."
B: "How is Bill? I haven't seen him lately."
A: "He's working at Lums."
(pause)
A: "Bill was telling me that you were accused of passing bad checks. How did that come out?"
B: "I was given a suspended sentence."

For the AR-only condition, the conversation was the same except that the accused's final statement was, "The charges were dropped." In the control condition, the conversation was omitted, but other aspects of the experimental situation were the same as in the other conditions.

At the end of the experimental conversation, the E entered the waiting room and noted that there seemed to be too many Ss present. At this point, Confederate A asked, "Isn't this the sleep lab?" When the E told him that the sleep laboratory was next door, he excused himself and left the room. The remaining confederate and other Ss were then escorted into the group discussion laboratory and seated around a work table. Throat microphones were adjusted as the E explained that the pattern of interaction would be recorded. The general purpose of the experiment was stated (that we were interested in group problem solving), and the first problem was handed out. When all three tasks had been completed, a questionnaire was administered which asked Ss to rate each of the other group members with respect to satisfaction and competence, to indicate which member contributed the most and which the least to the group product, and to evaluate how well group members cooperated with each other. When the questionnaires had been completed, Ss were debriefed.

RESULTS

The confederates reported that they felt excluded from the group in the attribution conditions, and this feeling was at least partially supported by the interaction data recorded by VAC. The accused member talked less than other group members on all tasks, but this difference in amount of talking was significant only for the city ranking problem (means = 0.59 vs 1.14 min in the AR + S condition; 0.57 vs 0.80 min in the AR-only condition; and 0.35 vs 0.38 in the control condition; $F = 5.33$; $df = 1,23$; $p < .05$). There was also a significant difference between the accused and naive Ss in the number of interruptions ($F = 9.40$; $df = 1,18$; $p < .01$). Table 1 gives the mean number of interruptions by Ss and by the accused in each of the experimental conditions. The accused interrupted another group member more frequently than naive Ss interrupted others. Furthermore, there was a nonsignificant tendency for the accused to be interrupted by others less frequently than the naive Ss. It appeared that the accused often had to interrupt another person if he was to speak at all; when he was talking, others tended to listen politely until he had finished.

Mean time required to complete each task in each of the experimental conditions is shown in Table 2. Significant differences were observed for treatments ($F = 3.57$; $df = 2,23$; $p < .05$) and for task ($F = 33.73$; $df = 2,48$; $p < .001$). We are interested primarily in the differences due to treatments. It can be seen in Table 2 that in every instance the AR + S condition required the longest time for task completion (mean = 6.27 min), the AR-only condition required the next longest time (mean = 5.00 min), and the control condition required the least time for task completion (mean = 3.87 min). These differences are, of course, in complete agreement with expectations.

Since the accused had been instructed to support a particular solution to each task, it was possible to determine the extent to which he was able to influence the group's decision under different conditions. Significant differences were obtained only in the city ranking task; the accused had significantly ($F = 7.89$; $df = 2,18$; $p < .01$) greater influence on the group's decision in the control condition than in either of the attribution conditions.

The questionnaire data revealed no significant difference between experimental conditions.

DISCUSSION

The data presented above reveals clearly that the attribution of responsibility for a negative event to a group member influences the pattern of interaction and the effectiveness of that group. The accused member feels excluded from the group and must make an effort to be heard. The consequences of these effects are

Table 2
Mean Time (Minutes) Required for Task Completion as a Function of Attribution Treatments

Treatment		City Ranking Task	Human Relations Task	Arithmetic Task
Three-Person Groups	AR + S	5.60	9.95	4.58
	AR Only	4.17	8.18	3.68
	Control	3.35	5.85	2.55
Four-Person Groups	AR + S	4.70	9.27	3.50
	AR Only	4.50	6.65	2.75
	Control	3.65	5.33	2.48

decreased group effectiveness. It is important to note that these effects were enhanced when the accused was also sanctioned. Presumably, sanctioning increases the probability that the attribution is valid.

The precise reasons for the observed effects are not altogether clear. Since the accused was himself aware that the others knew about the attribution, it is possible that the observed effects were due to differences in the confederates' behavior under different conditions. Farina, Allen, & Saul (1968) have shown that awareness that others have information indicating that a person is stigmatized can produce differences in that person's behavior in the group. However, their Ss were naive, whereas the Ss in the present experiment were trained in their roles. They were instructed to behave in the same way regardless of the situation; observation and self-report data suggested that they were able to do so reasonably well, except for differences imposed upon them by the other group members. We believe differences among experimental conditions are due to an interaction between the confederate and others, brought about largely by the differential reaction of other group members to the confederate.

In the attribution conditions, the accused was not accepted as a member of the group, and consequently, his contributions were not acceptable. His attempts to influence the group decision served as a source of interference, thus reducing the effectiveness of the group.

The failure to find significant differences in the questionnaire data is also interesting. The naive Ss seemed to make a conscious effort to avoid making unfavorable ratings of the accused. In a postexperimental interview, they were reluctant to admit that they had noticed the accusation or that they had allowed it to influence their behavior. That the accusation did produce negative consequences for the group cannot be denied, however. Group members apparently regarded consideration of the attribution as socially unacceptable; hence, they expressed their rejection of the accused indirectly via interaction within the group.

In brief summary, the mere fact that group members knew that one of them had been accused of producing a negative outcome influenced the interaction pattern, and consequently reduced the effectiveness of the group. The accused was, at best, tolerated by the other group members. He found it difficult to participate in the group discussion, and his contributions appeared to be given less weight than in a control condition. These effects were greater when the accused had also been sanctioned for the negative event.

REFERENCES

BASS, B. M. An evaluation of the use of objective social data for training problem-solving discussants. Technical Report No. 22, Contract N7 ONR 35609, Louisiana State University, June 1960.

FARINA, A., ALLEN, J. G., & SAUL, B. B. B. The role of the stigmatized person in affecting social relationships. Journal of Personality, 1968, 36, 169-182.

GAIER, E. L., & BASS, B. M. Effects of city familiarity on size estimation. Technical Note No. 1, Contract N7 ONR 35609, Louisiana State University, 1955.

MAIER, N. R. F., & SOLEM, A. R. The contribution of a discussion leader to the quality of group thinking: The effective use of minority opinions. Human Relations, 1952, 5, 277-288.

SHAW, M. E., & BREED, G. R. Effects of attribution of responsibility for negative events on behavior in small groups. Technical Report No. 1, NSF Grant GS-1984, University of Florida, 1969.

SHAW, M. E., & SADLER, O. W. Interaction patterns in heterosexual dyads varying in degree of intimacy. Journal of Social Psychology, 1965, 66, 345-351.

WORTHY, M. M., WRIGHT, J. M., & SHAW, M. E. Effects of varying degrees of legitimacy in the attribution of responsibility for negative events. Psychonomic Science, 1964, 1, 169-170.

Discrimination of simultaneous and successive pure tones by musical and nonmusical subjects*

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Pairs of sounds, whose components were two pure tones presented simultaneously or successively, were discriminated by music and nonmusic students under same-different, matching-to-sample, and ABX modes of judgment. In contrast to the results of a previous study involving complex piano notes as components, there was no significant difference in the accuracy of discriminating simultaneous-simultaneous and successive-successive pairs or in the discrimination of simultaneous-successive and successive-simultaneous pairs.

In a previous study (Doehring, 1968), 27 Ss with a wide range of age and musical training made same-different judgments of pairs of two-component sounds, where the components were piano notes played either simultaneously or successively. Pairs of successive notes were discriminated significantly better than pairs of simultaneous notes, indicating a less-than-perfect ability of the observers to "hear out" the components of the simultaneous sounds. Discrimination of simultaneous followed by successive notes was significantly better than discrimination of successive followed by simultaneous notes, suggesting that listeners are better able to analyze than to synthesize the components of complex sounds. The relative difficulty of the discrimination tasks could have been influenced by the fact that the components were themselves complex tones, by the particular mode of judgment required, and by the amount of musical experience of the Ss. The present study also involved discrimination of pairs of two-component simultaneous and successive sounds, but with pure tones used as components and presented under three different modes of judgment to a group of music students and a nonmusic control group. The purpose was to determine if differences in relative difficulty of simultaneous and successive tonal combinations would vary as a function of complexity of component sounds, musical training, and mode of judgment.

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METHOD

The Ss were eight university music students with at least 8 years of formal musical training and eight students with no formal musical training, all with normal hearing. Tones were tape-recorded from a Johnson Intonation Trainer with a three-octave range from 139 to 988 Hz that had been modified to produce pure tones equated in loudness. Tapes were played back from a Uher 22 Special tape recorder to TDH 39 earphones. Experimental events were controlled by an automatic programming system.

A *simultaneous sound* was two pure tones played together for ½ sec. A *successive sound* was two ½-sec tones played in immediate succession, with the low note always played first. The interval between sounds, either simultaneous or successive, was always 1 sec. Three modes of judgment were used: a *same-different* judgment of two sounds, a *matching-to-sample* judgment of two sounds that followed a sample sound, and an *ABX* judgment of two sounds that preceded a sample sound. The judgments were made under four conditions: (1) *simultaneous-simultaneous*—all sounds simultaneous; (2) *successive-successive*—all sounds