Experimenter bias in the prisoner's dilemma game¹

PHILIP S. GALLO, JR., and IRINA AVERY DALE, *San Diego State College, San Diego, Calif. 92115*

Forty female Ss took part in an experiment designed to determine whether experimenter bias can influence the outcomes of a Prisoner's Dilemma game. The E attempted to influence the Ss to cooperate or compete by varying her tone of voice and facial expressions while delivering feedback. The results indicated that Ss who had been biased to cooperate produced twice the number of cooperative responses as the Ss who had been biased to compete. Furthermore, analysis of questionnaires administered at the completion of the experiment indicated that the Ss were unaware of the attempt to bias their responses.

It is characteristic of psychological research in general and of social psychological research in particular that sustained empirical investigations of a given topic area often yield confused and contradictory results. Such has been the case with research into the Prisoner's Dilemma game. This is somewhat surprising, since the experimental procedures employed in the Prisoner's Dilemma game are considerably more standardized than those commonly used in other areas of social psychological research.

The puzzling and contradictory findings that often appear in the Prisoner's Dilemma literature suggest that contaminating variables may be appearing in some of the studies. One possibility is that the results are being influenced by experimenter bias, as postulated by Rosenthal (1963). The present experiment represents an attempt to determine whether experimenter bias can influence the outcome of a Prisoner's Dilemma game and thus could possibly be responsible for some of the discrepant findings. Although Rosenthal (1963, 1966) indicates that experimenter expectancy may be a more potent variable than experimenter motivation, motivation was chosen for the present experiment on the grounds that it is a more probable locus of any biasing effects that might be found in Prisoner's Dilemma research.

METHOD

Forty female students from introductory psychology courses at San Diego State College took part in the experiment. The Ss received credit toward the fulfillment of an experimental participation requirement. All Ss were run by the junior author. Female Ss were chosen because earlier work on experimenter bias (Rosenthal et al, 1964) indicated that female experimenters were successful in biasing females but seemed to get opposite results with males.

Subjects came to the experiment in groups of two and were randomly assigned to either the cooperative or competitive bias conditions. Ss were seated in individual cubicles that prevented them from seeing each other. Although many Prisoner's Dilemma experiments have visually isolated the Ss from the E as well as from each other, it was decided to let the Ss see the E in order to provide maximum opportunity for biasing to occur.

Subjects were presented with a standard Prisoner's Dilemma response box containing two buttons for indicating choices and four outcome lights with the payoff matrix displayed upon them. The payoff values were 3,3; 4,0; 0,4; 1,1. The game was played for 50 trials and Ss were paid at the rate of 1¢ per point.

The attempted bias was introduced during the intertrial intervals. At the conclusion of each trial, the E announced the joint choices and the payoffs of each S. By varying voice

inflection, nods, and glances, the E attempted to indicate approval for cooperative responses and disapproval for competitive responses (cooperative bias condition) or approval for competitive responses and disapproval for cooperative responses (competitive bias condition). At the conclusion of the 50 trials, a five-item questionnaire was administered to determine whether the Ss were aware of the attempt to bias.

The E's motivation to bias can be assumed to have a two-fold basis: first, the theoretical desire to see the experimental hypothesis verified; second, the pragmatic desire to obtain publishable results. Although it is possible that there would also be an expectancy effect, it is clearly impossible to determine in this experimental context what the E "really" expected to happen.

RESULTS

The dyads that had been exposed to the cooperative biasing averaged 46.7% cooperation, whereas the dyads in the competitive bias condition averaged 23.1% cooperation. Analysis of variance on the dyad scores yields an $F(df = 1,18)$ of 6.43, significant at beyond the .025 level. Analysis of the questionnaire data yielded no systematic relationship between the experimental condition and the questionnaire answers.

A tetrachoric correlation was performed on the relationship of the answers to the most crucial of the five questions, "Do you think the E wanted you to push the A(X) button or the B(Y) button?", and the experimental condition of the Ss. The results yielded a coefficient of $-.038$, indicating no relationship between the S's perception of the E's intent and the actual intent.

DISCUSSION

The present study indicated that the results of a Prisoner's Dilemma game experiment can be significantly influenced by the E when (1) there is specific intent to bias, and (2) the situation is optimal for biasing to occur. These findings at least suggest the possibility that biasing may have occurred in previous experiments in which there was no intent to bias. Furthermore, the finding that Ss were unaware of even such a blatant attempt to bias suggests that Es who are inadvertently manipulating their results can expect no corrective feedback from their Ss.

Further research would seem to be indicated to determine whether experimenter bias can affect the results of more stringently controlled Prisoner's Dilemma experiments; i.e., those in which Ss are visually isolated from the E as well as each other, no verbal feedback is given, etc. In addition, at this particular stage of development of game playing theory and methodology, it might be appropriate to begin a systematic investigation of all possible sources of bias in these experiments.

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