Correlated delay of reinforcement in the instrumental conditioning of conversational behavior*

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Speaking in reply functions as a reinforcer. In an experimental conversation modeled on discrete-trials instrumental conditioning, with speed as the dependent variable, Ss learned an instrumental response reinforced by the opportunity to speak in reply. When shorter delay of the opportunity to reply was made contingent upon S's responding slowly, Ss learned to match the cutoff speed, while noncorrelated yoked controls showed an ordinary acquisition curve ($N = 80$, $p < .025$), as in conditioning studies of correlated delay of reinforcement.

Ss will learn an instrumental response, the reinforcement for which is the opportunity to speak in reply to a person of differing opinion. Latency data from six experiments show a fundamental similarity to a discrete-trials instrumental conditioning model in demonstrating replicable analogs of (a) acquisition, (b) extinction, (c) partial reinforcement effects, (d) drive effects, (e) a delay of reinforcement gradient, and (f) correlated reinforcement effects (Weiss et al, 1971a, b). The importance of studying one person's reply to another is generally acknowledged by conversation researchers, but the reinforcing function of speaking in reply had not been previously recognized. The research thus employed the general approach which Neal Miller (1959) has called "extension of liberalized S-R theory," and the logic of such an approach necessarily requires extensive tests for points of analogy and disanalogy between conditioning and conversation (e.g., Oppenheimer, 1956). The present study investigates such a point: correlated delay of reinforcement.

In Logan's (1960) correlated reinforcement procedure, reinforcement can be made contingent upon S's responding with a longer latency than a certain cutoff value. Under such a procedure, Ss learn to respond slowly, approximating the cutoff value. Studies of correlated reinforcement effects on response speed in human conditioning have been limited to the simplest condition, in which slow responses are reinforced and fast responses are not (Cairns & Proctor, 1968; Weiss et al, 1971a). In correlated delay studies, slow responses may be reinforced immediately and fast responses reinforced with delayed reinforcement. An appropriate delay value would have to be longer than the latency cutoff defining a slow response, so that fast responses would truly be penalized by effectively delayed reinforcement, while not being so long a delay as to amount to nonreinforcement. The necessary information was available from a six-point delay of reinforcement gradient obtained in a previous study of speaking in reply (Weiss et al, 1971a). Correlated reinforcement experiments typically involve a group of yoked controls, each one of which receives the same sequence of immediate and delayed reinforcements as his experimental partner but with these delays not contingent upon the control S's speed. Such a control group is, in essence, an ordinary varied-delay group and shows an ordinary learning curve, while the correlated delay group learns to respond slowly. If speaking in reply functions as a reinforcer, then the characteristic conditioning pattern of results should emerge for an instrumental response reinforced by the opportunity to speak in reply: ordinary acquisition in the yoked control group, compared with slow responding in the correlated delay of reply group.

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GENERAL METHOD

On each trial, S listened to another person's viewpoint and could then press a switch (the instrumental response), the reinforcement for which was the opportunity to speak in reply to the other person.

Deception and Masking Task

The experiment was represented to Ss as a study of opinion change. "We are interested in how your opinion may be affected by what someone else says, how your opinion may be affected by what you yourself say, and how what you say may affect the opinions of someone else." As a masking task, after each statement and reply, S indicated whether he had changed his opinion by moving a dial. Questionnaire data (Weiss et al, 1971b) showed that Ss believed this deception; the switch appeared to them as a mere incidental to the serious business of opinion change through conversation. The "other person," simulated by a tape recorder, was said to be in another room from S, and E was in fact in another room. The S addressed the "other person" and E over an intercom system and could also hear E give instructions and occasional comments ("Speak a little louder, Subject A") to the nonexistent other person.

Apparatus and Procedure

The S was seated at a table facing the control room wall, which included four one-way vision windows. Instructional signals appeared in each window upon illumination. The signals were the large printed words (1) "listen," (2) "throw switch if you wish to comment," (3) "talk," and (4) "move dial to final opinion." A panel mounted on the table top contained S's "comment" switch (a telephone toggle switch with a spring return), his intercom, and the masking-task opinion-change dial.

The S and the "other person" (addressed as S B and S A) received the deceptive rationale and the operating instructions over the intercom. It was explained that the other person had been provided with a list of topics. The other person would begin with the first topic on his list, stating the topic to S and then offering his opinion on the topic. The S would then have an opportunity to comment on the other person's statement if he wished. The S and the other person were always of the same sex.

An experimental trial began with the "listen" signal and the playing of the taped topic and opinion by the other person. When the taped message ended, E operated the control which both (a) presented the CS, the signal "throw switch if you wish to comment," and (b) started the latency timer. When S threw the comment switch, the latency timer automatically stopped, measuring latency to .01 sec. The "talk" signal followed the switch-press response and S spoke in reply. The procedure described was closely modeled on traditional discrete-trials instrumental conditioning. The reinforcement (speaking in reply) was contingent on the instrumental response (switch pressing). The dependent variable was speed (100/latency), measured from the time of the presentation of the CS

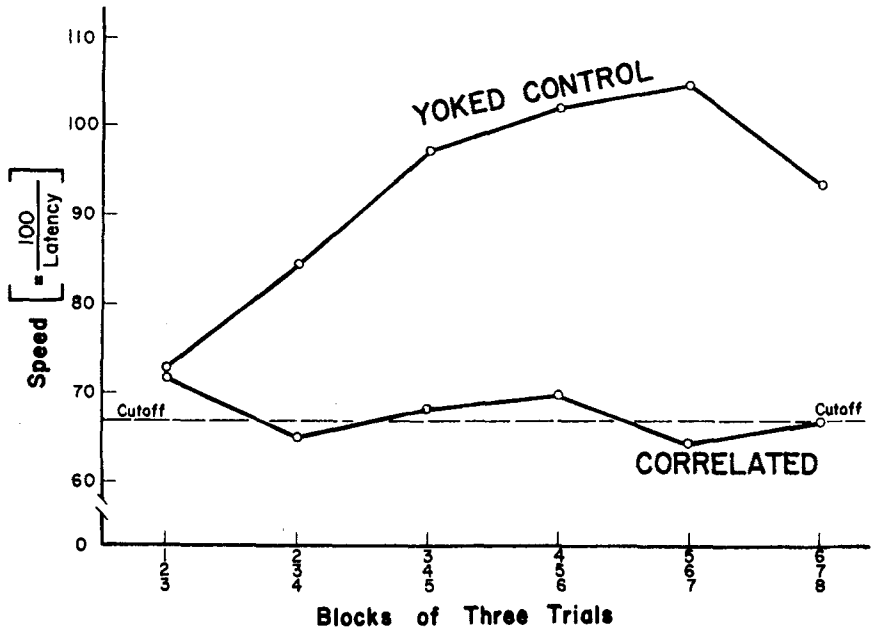

Fig. 1. Correlated delay of reinforcement: acquisition curves of mean response speed under correlated and noncorrelated delay of the opportunity to speak in reply.

(signal "press switch if you wish to comment") to the instrumental switch-pressing response.

The latency cutoff was 1.5 sec. In the correlated delay group, an interval timer turned on the "talk" signal immediately after the switch was pressed if latency was longer than 1.5 sec and automatically delayed the "talk" signal 7.5 sec if latency was shorter than 1.5 sec. During the delay interval, it might be possible for unoccupied Ss to prepare their arguments, thereby perhaps (a) reinforcing themselves covertly or (b) developing a superior reply which could also be a superior reinforcer. The successful precaution of Weiss et al (1971a) was adapted for this experiment. All Ss were informed that the entire conversation was being taped for further analysis and that E would record necessary identification material on the tape by speaking it aloud before the reply. "Subject B, please stand by. This is topic list . . . , sequence . . ." The need for such identification on only some occasions was explained by the use of topic lists of varied length with topics in randomized sequences, "as Subject A already can see from the fact that the topics on his lists are not in numerical order."

Subjects and Materials

The Ss were 80 students from the Psychology-1 pool. The experiment was counterbalanced for sex, even though previous research indicated no main or interactive effects of sex.

The opinions expressed by the "other person" were selected by means of a 120-item questionnaire administered to 100 Ss from the Psychology-1 pool. Selection criteria were that the opinions should be reasonably consistent with each other and as dissimilar as possible from the opinions of the Psychology-1 students. The "other person" spoke with a regional accent of about the same intensity as the average in-state student. Considerable care was taken to insure that the other person's opinions would be expressed with about the same degree of articulateness and sophistication as a typical S. In order to insure that the effect of trials would not be confounded with the effect of particular topics of conversation, the statements were taped on individual cassettes, presented in four randomized orders, with order completely counterbalanced within each experimental condition and yoked to the controls.

RESULTS

Figure 1 shows effects in conversation that are analogous to correlated delay of reinforcement effects in conditioning: ordinary acquisition in the yoked control group compared with slow responding in the correlated delay of reply group. The difference between the correlated and control groups, tested over a block of the last four trials, was significant in the predicted direction, $t(78) = 2.08$, $p < .025$. Yoked controls received the same sequence of immediate and delayed reinforcement as the correlated group, so that it is clear that the slow performance of the correlated group cannot be attributed to mere delay and the acquisition effect in the yoked controls cannot be attributed to mere practice; the difference in performance follows from the difference in reinforcement contingencies, noncorrelated controls vs correlated delay.

DISCUSSION

A definitive difference between the monologue of mass communications and the dialogue of personal conversation is the opportunity of each participant to reply to the other. Replying plays a fundamental role in determining the participation of each party to the conversation, rather than serving only as a mere dependent variable of each participant's behavior or as an influencer of one participant by the other. Participation in conversation may be reinforced by the opportunity to speak in reply. Speed (100/latency) data from seven experiments reveal multiple correspondences between reinforcement processes in instrumental conditioning and the reinforcing effects of speaking in reply.

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