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ABSTRACT

The model described in this paper for the teaching of beginning shorthand through the use of computer-assisted instruction attempted to prevent incorrect responses from occurring during the acquisition of correct responses to beginning shorthand symbols. (Author)

THE DEVELOPMENT AND EVALUATION OF A MODEL FOR THE TEACHING OF BEGINNING SHORTHAND THROUGH THE USE OF COMPUTER-ASSISTED INSTRUCTION

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The model described in this paper for the teaching of beginning shorthand through the use of computer-assisted instruction attempted to prevent incorrect responses from occurring during the acquisition of correct responses to beginning shorthand symbols. The learning theory of E. R. Guthrie, and the extensions made to his theory by Voeks and Sheffield, as well as the literature centering around retroactive and proactive inhibition indicated that incorrect responses decrease the efficiency of the learning process. The elimination of incorrect responses should, therefore, increase the efficiency of the learning process.

Research literature defining the attributes of response latencies indicated that a trend existed whereby response latencies of incorrect responses were greater than response latencies of correct responses. Based on these findings, the following instructional strategy was tested. Each subject's response latencies were continually monitored and compared to his known correct-response latency. When the subject's latency exceeded his correct response latency action was taken to prevent the subject from responding while he was shown the correct response.

To test the model, two equated sets of stimuli, each consisting of 15 shorthand symbols were programmed to appear on the cathode ray tube of the student station associated with the IBM 1500 instructional system. The two sets of stimuli were equated on the basis of each symbol's mean median correct-response latency. Each stimulus in set A, for example, was matched to a stimulus in set B which had a similar mean median correct-response latency.

Two instruction sessions were required for the acquisition of the materials. During the first session, no attempts were made to prevent the occurrence of incorrect responses. The first session was used to define each subject's median correct-response latency for each of the 15 stimuli. Three instruction methods were used during the first session. Subjects assigned to the prompting method were shown both the stimulus and correct response and asked to type the correct response. Subjects assigned to the confirmation method were shown the stimulus and asked to type the correct response. Following the subject's response, the correct response was shown to the subject. Testing trials, during which no feedback was shown to the subject, were alternated with training trials. Subjects assigned to the modified confirmation method had their responses confirmed following each response. Each subject was required to learn the correct response to each stimulus to a criterion of nine consecutive correct responses.

A median correct-response latency was calculated for each subject for each stimulus from the data obtained during the nine consecutive errorless trials. (See Figure 1) A total of 15 different median correct-response latencies were stored in the computer for each subject.

The interception method of instruction was employed during the second instruction session. Each response made by a subject assigned to the interception method, was compared to his median correct-response latency. (See Figure 2) When the subject's response latency exceeded the known response latency of a correct response by one second, the request for a response was erased and the correct response was displayed. Responses completed within the allotted amount of time were confirmed by displaying the correct response.

Analysis of the data obtained during the second instruction session indicated that subjects assigned to the interception method required more time to reach criterion than subjects assigned to the prompting, confirmation, or modified confirmation method. (See Figure 3) As anticipated, fewer incorrect responses were made by subjects assigned to the interception method than subjects assigned to one of the other three methods of instruction. (See Figure 4)

Results of the analysis of the number of correct responses recalled over four one-week intervals were inconsistent. In general, the null hypothesis that the method of instruction used for the acquisition of the correct responses would have no effect on the number of correct responses recalled following 7, 14, 21, and 28 days after the acquisition of the correct responses was retained.

The interception method of instruction served the purpose for which it was designed. Subjects learning the correct responses to the stimuli by the interception method made fewer incorrect responses than subjects assigned to the prompting, confirmation, or modified confirmation method. However, the interception method did not increase the efficiency of the learning process. Additional research is needed in the development and evaluation of the many new instructional strategies made available by the application of the computer to educational tasks.

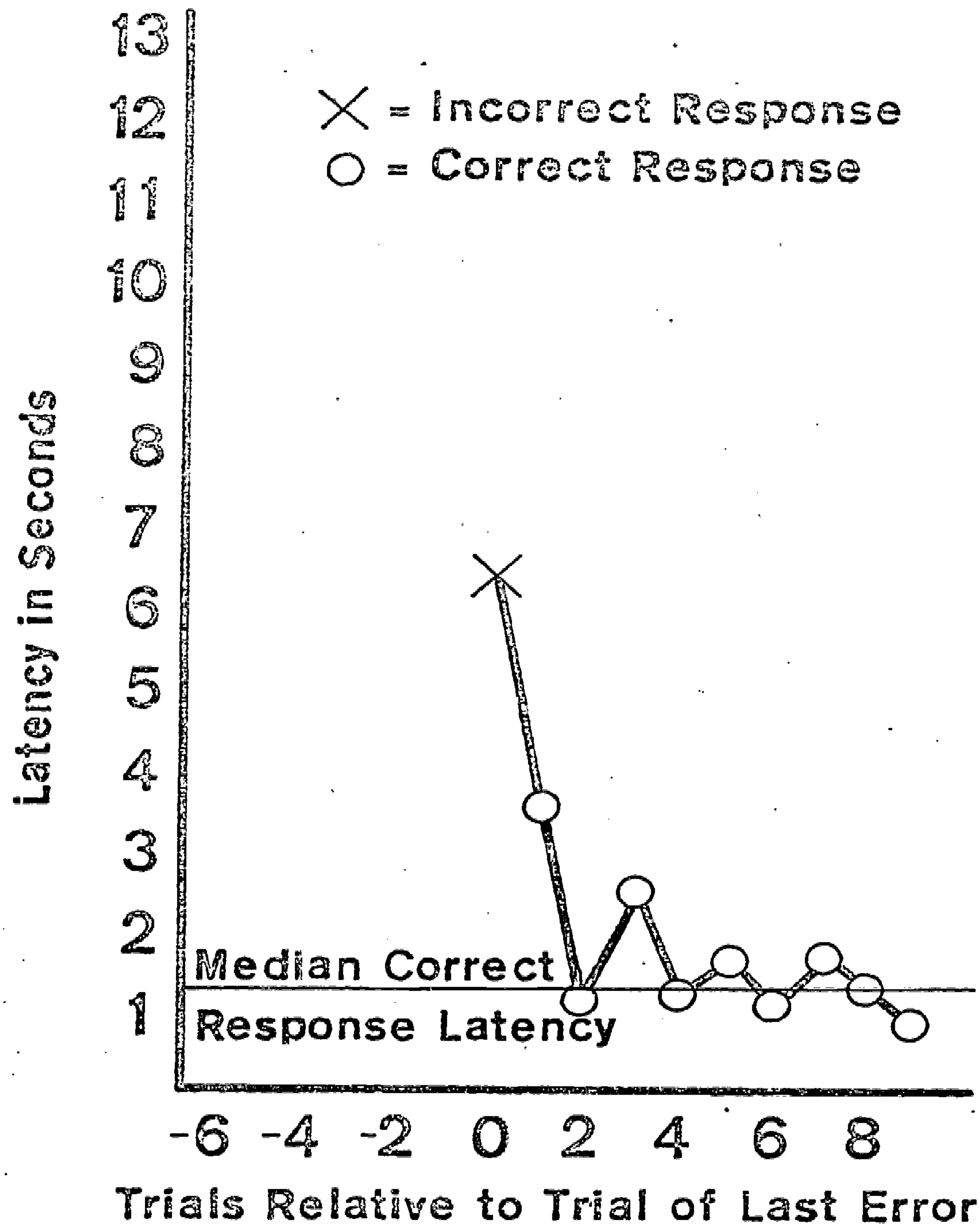

Fig. 1. Subject A's response latency profile for Item 28.

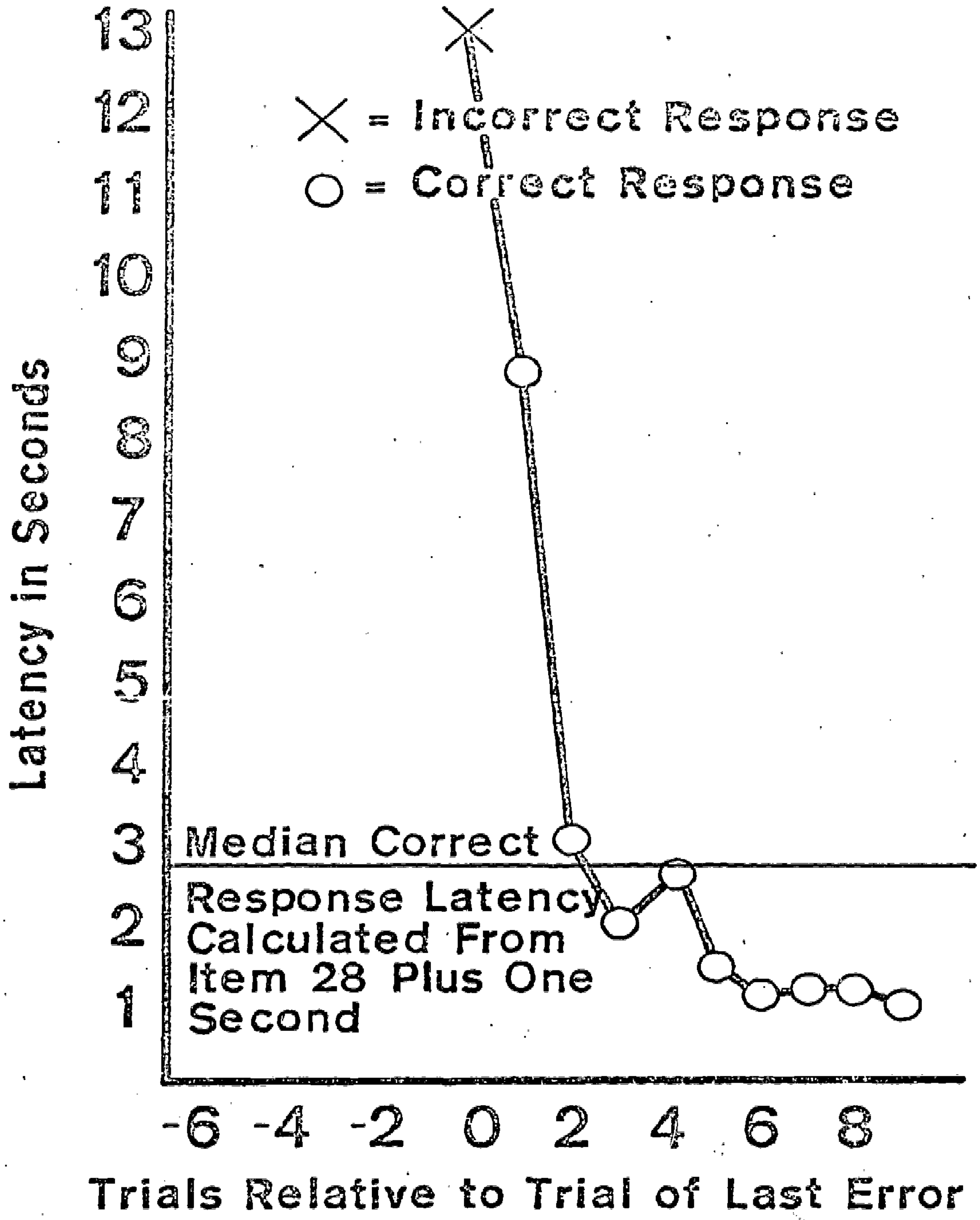

Fig. 2. Subject A's response latency profile for item 27.

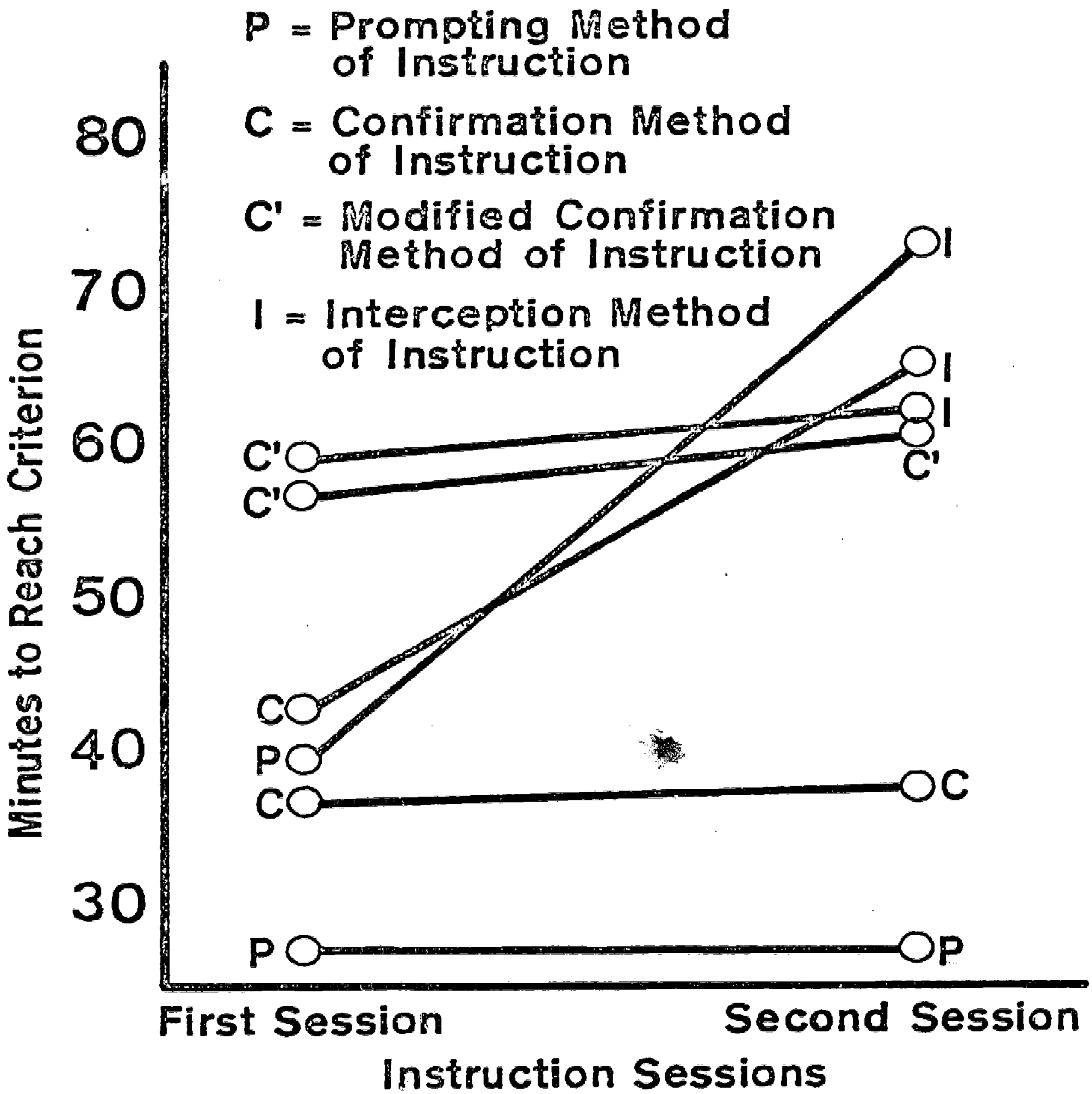

Fig. 3. Interactions between sequence of instruction methods & instruction sessions using time-to-reach-criterion as the dependent variable.

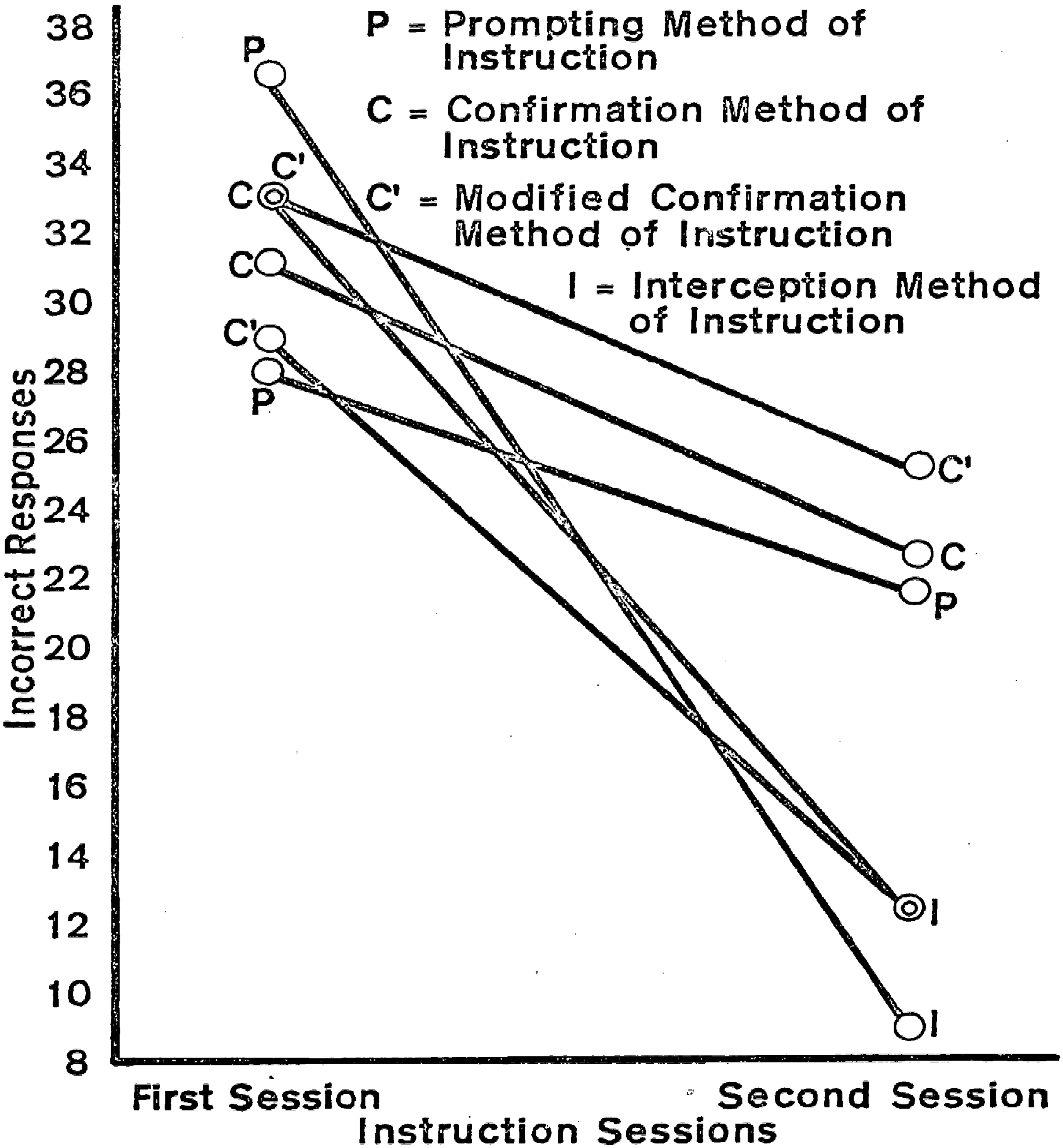

Fig. 4. Interactions between sequence of instruction methods & instruction sessions using the number of incorrect responses during acquisition as the dependent variable.