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Child Aggression as a Function of Task Inteference

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Abstract

Aggression was produced as a consequence of interference with a reinforced task. Four ten-year-old subjects were reinforced with dimes for completing two stacks of bottle stoppers during twenty-trial sessions. Following these sessions E vibrated the Ss table, thus precluding the completion of the previously rewarded task. The S's aggressive responding was defined as button presses which instructions had indicated would vibrate another child's table. Aggression was found to increase as a function of introduction of disrupting vibrations.

Introduction

Reviewing a decade of literature, one can observe persistent conflicts in the treatment of psychological phenomena. The discrepancies in approach concern not only semantic and methodological differences, but more basically, the question of "where to look" for causative variables producing and maintaining an individual's behavior.

Many assume the existence of internal states and consequently reduce the utility of the observation of behavior to description of superficial symptoms. Classifying these indirect manifestations facilitates investigation of the "real" phenomena. Those who propose such an approach do not entirely disregard environmental influences, but identify its effects in the "psyche" or "self" which in turn occasions behavior.

In contradiction with the foregoing, many experimental psychologists have conducted research under the prior assumption that behavior itself is a sufficiently lawful phenomena, and that it can be dealt with in a more direct fashion. Internal, underlying causes are not acceptable as explanations of human conduct to an approach that considers only observables in the search for causal relationships. Many behavioral scientists consider the external environment and resultant behavior as the primary subject matter, not as interesting supplementary material.

In the study of human aggression for instance, one finds this conflict clearly evident. The term aggression has been used as an intermediate or direct causative agent within an individual which produces a variety of overt symptoms. Typically studies proceeding from this type of assumption and definition are of a correlational nature, attempting to establish a relationship between these behaviors and other response measures. Often inventory data is accumulated from such tests as the Siegel Manifest Hostility Scale or the Buss-Hostility Scale; scores, indicating the "level" of aggression are then compared with such measures as academic achievement and sex differences. Similar research, again using aggression as an internal phenomena, has been conducted to establish correlations between this and other constructs. For instance Ford and Sempert, (1962) investigated the relationship between hostility, need aggression, and anxiety, defining the three in terms of test responses presumably indicative of the existence of these conditions within the organism.

Studies examining the relationship between response measures are useful as descriptive and predictive information in laboratory and clinical settings. Noting that two responses consistently covary enables an experimenter to predict the occurance of one from the presence of the other. The difficulty lies in the fact that the distinction between a causative and correlational relationship is too frequently confused. It must be remembered that there is a marked difference between two variables occuring together and one produced as a function of the other.

A related shortcoming concerns some obvious circularities frequently encountered in the definition of the phenomena. Aggression is treated as 1) a dependent variable, 2) an independent variable, 3) or both, either alternatively or concurrently within the same context. It is not uncommon for aggression to be cited as a cause of behavior, as well as the behavior itself.

This approach and methodology precludes formulation of generalized principles of aggression since the phenomena is treated relative to each individual. It is questionable whether judgements of "high hostility" or "low hostility" are acceptable as descriptive much less explanatory data. The major criticism of diagnostic tests, including projective techniques, rating scales, and questionaries has as yet largely ignored the manipulations which produce the responses described, nor have they related test scores to public responding independent of the testing situation.

Certain criticisms can be leveled at a correlational approach when the additional assumption of hypothetical states within the organism is identified with such test scores. The troublesome aspect of feelings or tendencies of aggression as "intermediary" causes is that as independent variables they occupy a rather dubious position. The imposition of such states, inferred from behavioral observation, seems at once to obviate a search for legitimate causal variables while retaining all the deficiences of "effect to effect" predictive accounts.

Not all studies involving test responses are purely correlational

in nature. Attempts have been made to relate test behavior with independent changes in the environment. For instance Sears, Hovland, and Miller (1940) compared the effects of various degrees of sleep deprivation on aggressive responding. A similar research technique is that of ex post facto studies in which the relationship between a factor in a subject's past history, for example parental discipline, and a current measurement of aggression is investigated. Here, no manipulations are attempted, but an advancement is made when experimenters avoid an overemphasis on internal states and direct attention to antecedent conditions producing a response.

Further refinement is encountered when the independent variable is current and the behavior to be predicted is synonymous with that measured, rather than a sample such as a test score. Naturalistic, ethological investigations exemplify this procedure, when used as a scientific method.

The natural setting however, has some limitations. The precise features of the independent variables which are "necessary and sufficient" to produce changes in behavior are difficult to abstract from a situation which does not allow arbitrary alteration of the nature of the variable. It is in a word, too subject to accidents of history. Significant progress has been achieved by controlling variables in a laboratory setting, manipulating the indèpendent variables in a laboratory setting, and noting the consequent changes in the response measure. In this case, the phenomena is defined in terms of specific behaviors, and

the operations producing these behaviors. Animal experimentation has shown this alternative to be highly productive in yielding reliable data. Proceding from initial naturalistic observations, Ulrich and Azrin (1962), for instance, administered electric shock to pairs of animals and confirmed by experimental evidence that pain causes aggression. It could not have been stated with assurance that the behavior of aggression to pain was not specific to certain features of the natural setting until the use of electric shock could be shown to produce aggression.

Representative of an advancement in controlled methodologies with humans is a study by Ulrich (1965) in which pairs of children were placed into an empty room and the effect on the subjects of punishment, such as withdrawal of positive reinforcement, was measured. The criterion for aggression included a variety of behaviors and the responses were observed and rated by an experimenter. Under similar controlled conditions, Brown and Elliott (1965) studied the removal of positive secondary reinforcement as the occasion for aggressive acts and its presentation for cooperative gestures to increase frequency of occurance of the latter responses. The above two experiments encountered a similar difficulty in terms of scientific efficacy. Due to widely variant past histories, subjects exhibit divergent behaviors as a function of experimental manipulations. Through unique shaping an aggressive response can take on any topography. Can an experimenter report no aggression when the subject has been pinching his own hand contingent upon the removal

of a toy? Likewise, using catagories as "pushes", "pulls", "holds", and "teases" leave associated behaviors open to a myriad of interpretations. On what basis is an experimenter to discriminate between aggressive teasing and playful teasing without confounding the results with personal bias? A partial remedy has been to restrict the dependent variable to a single response and establish experimental manipulations that would produce or alter that behavior. For instance Parton (1964) arranged a game for seven year-olds in which the subject manipulated a doll that could knock down another doll controlled by the experimenter. Various treatment conditions, for example number of hits by the experimenters doll, were used as discriminative stimuli for aggressive responding. Frequency of trigger squeezes controlling the subject's own doll were recorded as the dependent variable. Cowan and Walters (1963) have investigated reinforcement of aggression measured in hits on a Bobo doll. In addition, a single response measure that has been used with a variety of experimental manipulations such as removal of positive reinforcement (Staples and Walters, 1964) and prior presentation of aggressive audio-visual aids (Walters and Thomas, 1963), has been the frequency and intensity of shock that the subject delivers to another subject performing a trial and error task.

The present study, "Child Aggression as a Function of Task Interference" is proposed as an attempt to contribute to the progression toward tightly controlled experimental techniques. A single, arbitrary motor response, button pressing thought to shake another child's

table, was used to define aggression, rather than the typical responses of fighting, etc., which exhibit highly variable topographies and are open to numerous interpretations. Consequently, the response measured could be objectively recorded and quantified without the possible bias of a judges rating. In addition, each subject's data was analyzed individually rather than as a compilation of all of the participant's response rates in a single graph. Combining data tends to conceal individual variance which can indicate inadequate controls.

Subjects

One female and three male ten year-old subjects were selected randomly from a list submitted from a local grade school. Minimal information provided the Ss and parents indicated only that the study involved a comparison of performance on a single motor task, enabling the Ss to earn a maximum of $2.00 per daily session.

Apparatus

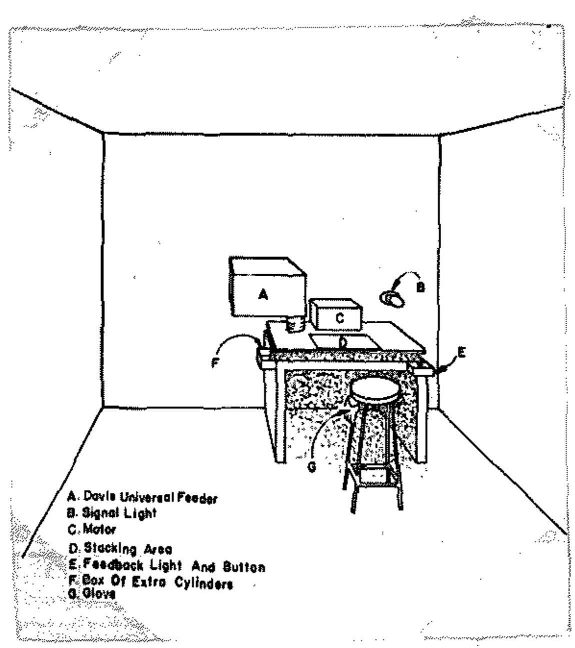
As shown in figure 1., a booth (8 ft. x 4 ft.) was contained in a larger (17 ft. x 10 ft.) room. One side of the booth was open and allowed unrestricted observation of the Ss from behind a one way vision mirror located at the end of the experimental room. A multi-conductor cable extended from the chanber to the control room and allowed for remote control of the stimulus conditions. The experimenters manually operated a Davis Universal Feeder positioned above and in front of the S, as well as a vibration motor. Three four-

digit Sodeco response counters and a Grason Stadler cumulative session timer were among the components of the control apparatus which were operated automatically.

The 30" high table at which the subject performed the task consisted of a sheet of plywood (2 ft. x 3 ft.) mounted on four low extension springs. Centered at the rear of the piece of plywood was a synchronous motor. A piece of bent brass tubing enveloping an off-balance weight was fixed to the armature shaft of the motor, which when operated by the experimenter caused the table top to vibrate. Rubber bottle stoppers one inch in length were available in a box attached to the left side of the table. A small panel housing a momentary contact response button and a three watt feedback light was mounted to the right of the S. Positioned in front of the table was a metal stool, to which was attached a left hand glove. A 100 watt signal light indicated the start of the task.

Figure 1.

Apparatus



Procedure

The Ss were initially given four previbration sessions during which baseline rate of button pressing was measured. Ten experimental periods each composed of twenty trials followed. At the beginning of the first baseline period every child was given instructions to sit on the stool with his left hand in the attached glove. After the light flashed he was to line up the ten cylinders on the white circles adjacent to the stacking area. Immediately after removing his hand for one second, he could begin to stack one stopper at a time on designated circles into two stacks of five. Three seconds after completion of the task and removal of the hand, a dime was delivered into a glass jar, ending the trial. The S then had to wait until a signal light flashed indicating that he should unstack and reline the stoppers. Each S was told not to hold onto the table or try to prevent the stoppers from falling.

In addition, the Ss were instructed that the button attached to the table could be used to shake a child's table in a hypothetical adjoining room if repeatedly pressed and that this "other child" also had a button by which he could shake the experimental child's table. The S's repeated the procedure throughout the experiment. After the fourth baseline session, table vibrations of four second duration, were introduced at intermittent intervals. The experimenters had arranged five possible sequences of vibrations. A sequence is defined by the frequency of vibrations for each session as well as when the vibrations occur within a trial. Within any one sequence,

vibrations were randomly placed over the twenty trials and at various stages of progress in the individual's stacking. When the blocks fell either accidently or by design, no reinforcement was given. With no accidental failures $1.60 (Sequence I); the minimum, $.80 (Sequence V).

These five sequences were in turn arranged into schedules for the ten experimental sessions. Due to the random selection, each S received different schedules. The length of each session was contingent upon the rapidity with which the S completed the twenty trials of stacking. Each child participated once a day for three weeks. At the conclusion of the study, one of the experimenters whom the Ss had never met conducted an interview with each S.

Results

The results indicate that the dependent variable of aggressive behavior, in the form of button presses, increased in frequency as a function of disruptive vibrations.

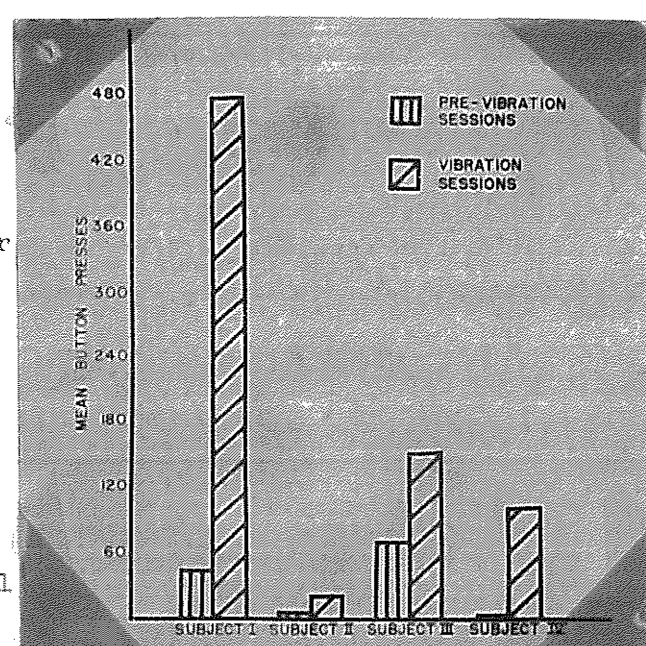


Figure 2. Means of total button presses for pre-vibration and vibration sessions indicated for each S.

The histogram in Figure 2 shows mean number of button presses for each S under the pre-vibration and vibration conditions. The variability between Ss in total number of responses is evident, however it can be noted that in every case one finds an increase in aggressive responding during the experimental vibration sessions in which vibrations were introduced.

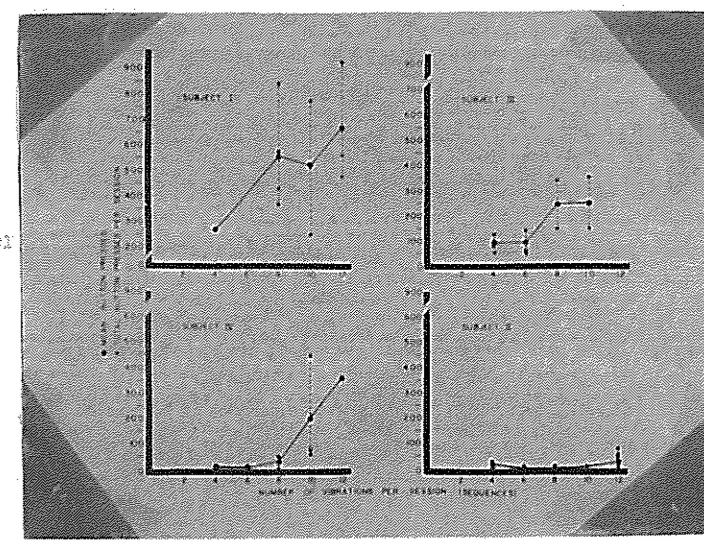


Figure 3. Mean and total number of button presses as a function of the number of vibrations per session. Vibrations were delivered according to prearranged sequences, random in respect to response units (see text).

Sequential effects are shown in Figure 3 which represents mean and total button presses as a function of the five sequences indicating the number of vibrations presented per session. Each S's graph shows a different number of sessions utilizing the five possible vibration sequences since the sequences were randomly presented. Ss I and IV exhibit steady increases in response rates as a function of the increased frequency of disruptive vibrations. With S III, one finds marked discontinuity in the function, with a sharp increase in responding between 6 and 8 vibrations, reaching a high rate under the 10 vibration condition. The effect for the second S is somewhat obscured. It should be noted that this individual was given three sessions under the 12 vibration sequence,

two of which demonstrated the highest button press rates emitted during the experimental procedure.

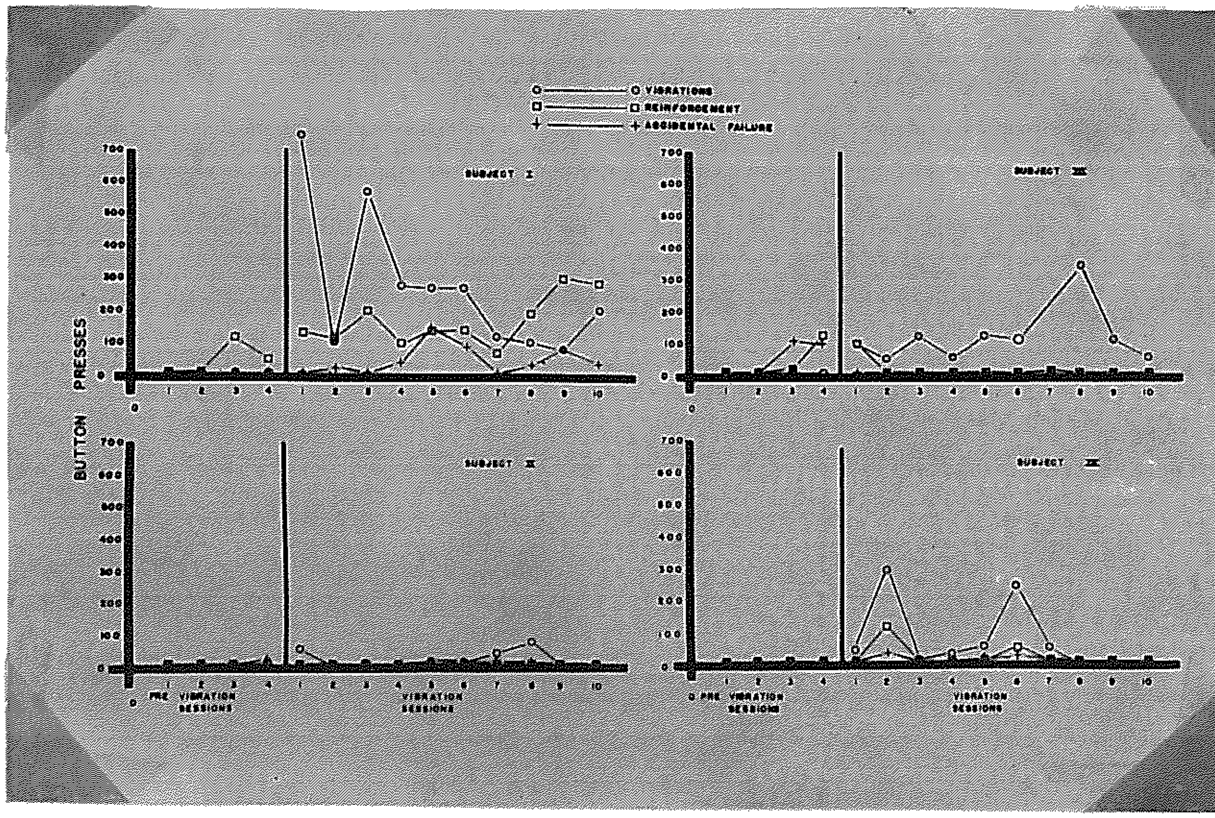


Figure 4. Button presses as a function of the three stimulus events: vibration, reinforcement, and accidental failure. Button presses were considered functionally related to one of the three when emitted following the event until the occurance of the next event. Pre-vibration and vibration sessions are shown.

A more refined analysis is represented in Figure 4. In this graph, total pre-vibration and vibration sessions have been divided into button presses occuring as a function of the three stimulus events: vibration, reinforcement, and accidental failure. S III indicates the most significant increase of pressing in response to

table vibrations as opposed to either of the other possible events. Less dramatically, both Ss I and IV exhibit a higher response rate to vibrations in all but four of the sessions, these showing interacting frequencies as a function of reinforcement and accidental failure as well as vibrations. The three stimulus events occasion minimal differences in responding for S II, with the exception of sessions 1, 7, and 8.

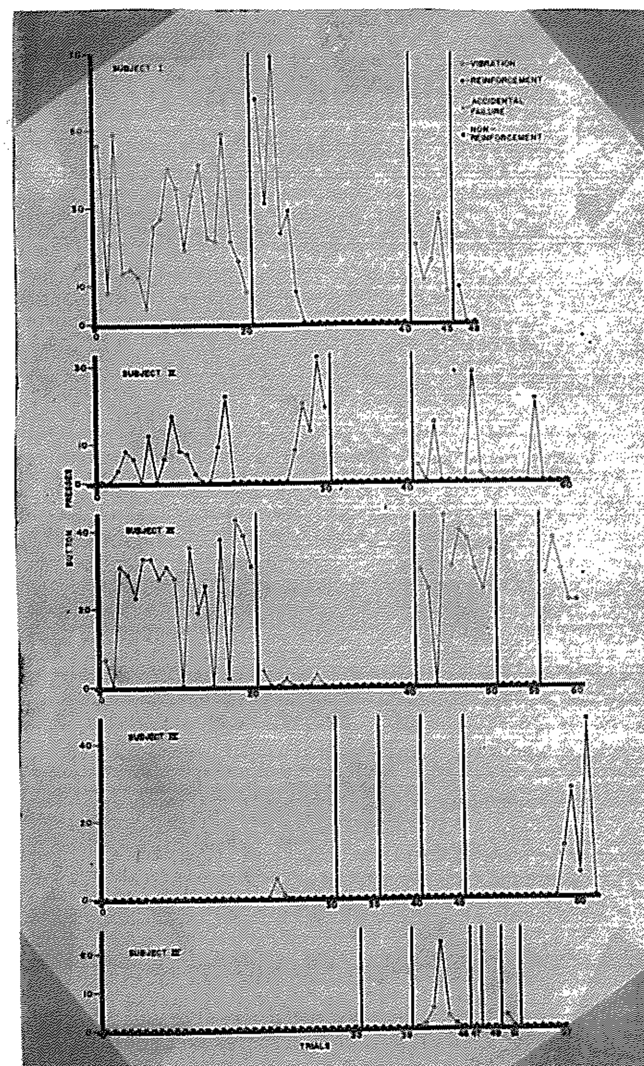


Figure 5. Representative sessions for each of the Ss during random variation of three experimental conditions. (Two sessions are shown for S IV.) The condition of "non-reinforcement" was added during certain of the trials. This varied procedure was in effect during four sessions for each S and followed the ten vibration sessions depicted in Figure 4. Vertical lines indicate a change of experimental conditions.

Following the ten vibration sessions, the experimenter randomly varied the experimental conditions within each of four daily sessions. The results, given in Figure 5, present rather conclusive evidence of the high degree of control over the behavior of button pressing labeled aggressive. With the exception of Subject IV, pressing rate increased markedly when the Ss were subjected to continuous vibrations, returning almost immediately to zero in response to stacking which was intermittently reinforced throughout each session. The data for S IV shows that the few presses that did occur were a function of vibrations. Non-reinforcement after completion of the task did not produce the same increase in button press rate.

Discussion

This experiment substantiates the observation that termination of a favorable set of circumstances is sufficiently aversive to occasion aggressive responding.

After the initial instructions were given, the feedback light attached to the response button was the only indication that pressing disrupted the "other child's" stacking. It can thus be seen that button presses thought to shake the other child's table were produced and maintained despite the fact that no functional consequences (other than operating the feedback light) accompanied this activity. Although the children assumed that another subject did cause their table to shake, retaliatory button presses were in no way instrumental in decreasing or terminating disruptive vibrations.

In addition to the marked difference between frequency of responding as a function of vibrations as opposed to either reinforcement or accidental failure, anecdotal observations and the information acquired through interviews provided the experimenter with clear justification for labeling the button press response as aggressive.

If one accepts the author's definition, the implications of this data may be far-reaching. The extensive use of aversive control in social situations may well require re-evaluation. This and other current data suggest that the intended result of such control may be disrupted by the simultaneous occurrence of aggression. If it can be assumed that man aspires to positive effects as a consequence of any technique utilized, alternative procedures must be investigated to teach and maintain desireable behavior.

Of interest, too, are the procedural refinements attempted. It is hoped that this study contributes to the unequivocal demonstration that human behavior can be operationally defined and altered through isolation and manipulation of a specific environmental condition, leading ultimately to the establishment of generalized principles necessary to the advancement of any science.

Appendix

The experimenter is currently conducting a replication to increase control over the aggressive behavior of button pressing by exploring additional relevant variables which were noted in anecdotal form in the first study. Baseline data of rate of button pressing, number of reinforcements received and session length were initially recorded until two naive Ss had stabilized on each of the criterion as opposed to the single measure of rate of button pressing used in the preceding study.

Instructions were identical in respect to the purpose of the button and the operation of the apparatus. In this replication, however, the S was required to stack two stacks of five white stoppers, reline those, and complete two identical stacks of silver stoppers which were arranged on the left side of the stacking area. Contingent upon successful completion of the four stacks, a nickel was delivered into the glass container. Thirty trials, each terminated by either delivery of reinforcement, occurrence of accidental failure, or a disruptive vibration constituted one experimental session. By increasing the number of trials and the length of time required for each task completion, the total session was lengthened to approximately 50 minutes. This revision was instituted to examine the frequency of button pressing as a function of time the S was exposed to the series of disruptions, as well as a measure of the increase in the number of vibrations per session. By decreasing

the size of each reinforcement from a dime to a nickle, an attempt was made to minimize an accumulation of money, thus maintaining its effectiveness as a reinforcer and insuring that disruption of its attainment remained sufficiently aversive.

In addition, the experimenter noted that the occurrence of vibrations only during stacking was an artificial arrangement which could provide a cue that another S was not participating. Consequently, a variable interval timer was wired to control the vibration mechanism and table shakes were delivered on alternating variable intervals of either 1.5 or 2 minutes. Table vibrations which occured during periods when the subject was relining stoppers or waiting for the signal light following reinforcement were not considered disruptive of the task and therefore not considered as discrete trials. Results of this replication are as yet not complete, however this ongoing data suggests a similar effect reported under results of the initial study.

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