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Aggressive response strength as a function of interference with goal-oriented responses near to and far from their goal.

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Boston University
AGGRESSIVE RESPONSE STRENGTH AS A FUNCTION OF INTERFERENCE WITH GOAL-ORIENTED RESPONSES NEAR TO AND FAR FROM THEIR GOAL

by

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CHAPTER I

HISTORY AND STATEMENT OF THE PROBLEM

Introduction

Much human energy is expended in activity or behavior devoted to reaching goals or rewards. Empirical observation and theory indicate that behavior or responses leading to a goal get stronger as the goal is approached and terminate when it is reached. (Hull, 1932) Goal-oriented behavior is frequently interfered with before the goal has been attained. Interference may occur at any point after embarking toward a goal and before reaching it. Although frustration of goal-oriented behavior has several consequences, one highly probable consequence is some form of aggressive response, or the tendency to inflict injury. (Dollard, Doob, Miller, Mowrer, and Sears, 1939) If the amount and frequency of interference is held constant, the strength of the aggressive response varies positively with the strength of the goal-oriented response interfered with.

This study is designed to answer the question: Does the strength of the aggressive response increase when interference with goal-oriented behavior occurs closer to the goal rather than farther from the goal? Implicit in this question are two assumptions: that goal-oriented behavior gets stronger as the goal is approached; and that the
stronger the goal-oriented behavior that is interfered with, the greater is the amount of frustration and consequent strength of the aggressive response. These two assumptions are more usually called the Goal-Gradient Hypothesis (Hull, 1932) and the Frustration-Aggression Hypothesis. (Dollard et al., 1939)

The independent variable to be manipulated in this study is the degree of closeness to the goal at which interference with goal-oriented behavior occurs. The dependent variable is the strength of the aggressive response following interference with the goal-oriented behavior.

**History of the Problem**

The two assumptions or hypotheses above which are central to the present study have a common ancestor in the stimulus-response, drive reduction reinforcement learning theory of Hull and his fellow workers. The Goal-Gradient Hypothesis was a central empirical and theoretical problem for Hull in the 1930's and 1940's. The Frustration-Aggression Hypothesis was one of the major theoretical and empirical landmarks of the 1940's and 1950's. The authors of *Frustration and Aggression* acknowledge a debt to Hull, with whom they were associated at Yale, and to Freud and others who had made important initial statements from which the Frustration-Aggression Hypothesis was derived.
The authors of "Frustration and Aggression," members of the "Yale Group," employ a simplified version of Hullian learning theory. This practice is followed in the present study.

The following review of the literature focuses on the theory and empirical evidence relevant to the Goal-Gradient Hypothesis and the Frustration-Aggression Hypothesis.

The following review of the literature first presents the learning theory model underlying the Goal-Gradient Hypothesis and then the relevant empirical evidence. The presentation of the Frustration-Aggression Hypothesis follows this format. Particular attention is devoted to the concept of the strength of response, both goal-oriented and aggressive, that has been used undefined in this introductory section. The final section of the chapter attempts to integrate the two main bodies of theory before stating the hypothesis.

**Review of the Literature**

Learning, according to the "Yale Group" theorists, involves connecting a cue or a stimulus to a response. For a response to occur there must be drive or instigation. Cues may have drive features that instigate activity. Cues also function as guides or directors of response toward a goal-response, or reinforcement. Responses may act as cues for other responses. Responses not leading to reinforcement
tend to disappear, while those responses that are reinforced are strengthened. Reinforcement involves reducing the drive that initially instigated the response, or responses, that led to the reinforcement. Continued reinforcement leads to satiation of the drive, or instigation to respond, and leads to cessation of the response leading to the reinforcement.

Response strength — the probability of occurrence, the speed, the duration, and the force of a response — is a function of the strength of the drive, or instigation to respond, the amount of the reward or reinforcement, and the immediacy of reinforcement.

The immediacy of reward is critical in explaining the increases in response strength upon approaching a goal found in goal-gradient studies. In any series of responses leading to a goal or reward, those occurring immediately before the goal is reached are more strongly reinforced, while responses occurring farther from the goal are less strongly reinforced.

According to Spence (1947) the responses and cues on the path to the goal are reinforced in two ways. The less important way involves a temporal delay of reward gradient, which is very brief, (Perin, 1943 a, 1943 b, Wolfe, 1934) not lasting more than a few seconds. The other more important way depends on secondary reinforcement, the process through which cues, initially non-reinforcing, acquire
reinforcement value by being associated with the goal-response. A bell ringing immediately before the presentation of food to a hungry animal acquires secondary reinforcement value in its own right.

What is the empirical evidence to support the assumption that response strength increases upon closer approach to a goal? Spence (1932) reported that the entrance of blind alleys was eliminated more rapidly in a maze leading to a food reward close to the goal, and more slowly eliminated as the distance from the goal increased. The correct maze responses near the goal were more immediately reinforced, leading to greater efficiency of learning the maze close to the goal than farther from the goal.

The speed of locomotion down a straight runway, another indicator of response strength, increased upon closer approach to the goal. (Hull, 1934)

Brown (1942, 1948) demonstrated that rats pulled harder against a harness when arrested close to a goal than when arrested far from a goal. This result held both for approach-to-the-goal responses, and avoidance-of-a-negative-goal responses. The strength of the pulling response was also related to the strength of the hunger drive when the distance from the goal was held constant.

The number of unreinforced trials needed to extinguish or eliminate a previously established response is a
measure of the durability or persistence of a response. Lambert and Solomon (1952) measured the number of trials necessary to extinguish goal-oriented responses of four different experimental groups of rats, each blocked at a different distance from a food goal. The rats blocked farthest from the goal took the fewest trials to extinguish, while the rats blocked closest to the goal took the most trials. The two middle distance groups extinguished equally rapidly.

Excitability, measured by the number of jumping back and forth responses at the block point, was also related to the closeness to the goal when blocked. (Lambert et al., 1952) This was attributed by Lambert and Solomon to "frustration induced drive".

In a second experiment reported in the same article, Lambert and Solomon found that rats, blocked just outside the goal box where formerly they had been fed, took fewer trials to stop responding than rats admitted to the goal box, but not fed.

Adelman and Rosenbaum (1954) conducted an extinction study using college students. The experimenters obtained similar results to those of Lambert and Solomon. The greater resistance to extinction by the students frustrated close to the goal was, however, confounded with a greater number of previous "success" trials. In this study the
authors suggested that subjects, instructed to "race against time", could be motivated to perform a goal-oriented task, and could be reinforced by "success" on the task.

Haner and Brown (1955) blocked children at five different distances from a goal on a game-like task. The subjects were instructed to "race against time" on the task. They were blocked when they had finished a predetermined amount of the task at which time an unpleasant sounding buzzer rang. The subjects had been instructed to push a lever to turn the buzzer off, and to set the game up for another trial. The force with which the children pushed the lever was related to the closeness to the goal of the blocking procedure. The authors stated that the lever pushing force was a measure of the strength of the aggressive response. It is possible that Lambert's and Solomon's "excitation" due to "frustration induced drive" fits the findings equally well. The goal-response of lever pushing in Haner and Brown's study did not inflict damage on any object, so that they were not justified in stating that this response was aggressive. It is relevant to note that a goal-gradient effect was induced using a "race" as an instigator to and "success" as a reinforcer of goal-oriented responses.

The findings so far support the assumption that response strength increases as a function of the closeness
of approach to a goal both with animals and human subjects.

The same learning theory principles underlie the Frustration-Aggression Hypothesis.

Interference with or prevention of a goal-response, or the goal-oriented responses preceding the goal response, is a frustration. Frustration is an instigator to aggressive responses. The goal-response of aggressive instigation, or the instigation to inflict injury, reduces only the secondary, frustration-produced instigation to respond aggressively, and does not reduce the initial instigated behavior or responses that were interfered with.

Dollard et al. (1939, p. 28) posited that the strength of the aggressive response varies with the strength of the response interfered with. Sears and Sears (Dollard et al., p. 29) tested this sub-hypothesis of the Frustration-Aggression Hypothesis. They permitted an infant to drink varying amounts of milk before withdrawing the bottle from its mouth. The latency, or delay in the occurrence of the crying response grew longer as a function of the amount of milk consumed. The experimenters assumed that the more milk consumed, the lower the instigation to drink milk, and assumed that crying was a frustration-induced aggressive response.

Miller (Dollard et al., p. 35) using similar reasoning, found on a questionnaire that subjects reported more annoyance
following a snub by a friend than by an acquaintance, and even less annoyance following a snub by a stranger. Doing poorly in a favorite sport was more annoying to the subjects than doing poorly in a less favored sport.

According to Dollard et al., the amount and frequency of interference with goal-oriented responses affects the strength of the aggressive response. In the present study these variables are held constant; therefore these variables are not further discussed.

The punishment of overt aggressive responses leads to their inhibition. Covert acts of aggression, such as aim-inhibited gestures, thoughts, and fantasies, are more likely to occur when punishment is anticipated than are overt acts of aggression. Covert aggressive response are less observed, therefore less punished. Punishment of overt aggressive responses leaves the initial instigation to aggression undiminished, and in fact may increase it, since it constitutes a further interference with a goal-oriented response. Chasdi and Lawrence (1955) found that punishing children's aggressive responses in doll play sessions significantly reduced the number of aggressive responses in a following session, when compared with an unpunished control group. The inhibitory effects of punishment dissipated in a following session, and there were no differences between the punished experimental
group and the unpunished control group.

Doob and Sears (Dollard et al., p. 35) in a questionnaire study found a negative relation between the strength of anticipated punishment and the expression of overt aggression.

Lesser (1957) found that parental approval of overt aggressive responses was associated with a high rate of occurrence, as opposed to parental disapproval which was related to a low rate of overt aggressive responses.

There is some evidence that covert forms of aggression such as fantasy may be present when overt forms are absent (Bach, 1945) and that overt and covert forms may both be present. (Mussen and Naylor, 1954)

The more powerful or able to retaliate the object of an aggressive response is the more probable the displacement of the response to another, weaker object. Miller and Davis (Dollard et al., p. 42) found that fighting rats displaced aggressive responses to a plastic doll when one of the rats was removed. Miller and Bugelski (Dollard et al., p. 42) found displacement of aggression from frustrating camp counselors to unfavorable questionnaire ratings of Japanese and Mexicans. Other studies of prejudice (Lindzey, 1950, Stagner and Congdon, 1955) however, do not provide support for the displacement principle.
Objects that interfere with goal-oriented responses are usually the target of the resultant aggressive responses. (Dollard et al., p. 48) The inhibition or self-control of an aggressive response is an interference by the self, so that the self becomes a target of aggressive responses.

The inhibition and displacement of aggression are particularly important when the problems of measuring the strength of aggressive responses are considered. Most tests and measures of this variable depend on the assumption that displacement does occur. Child subjects whose goal-oriented responses are interfered with in the presence of an adult experimenter probably inhibit their overt aggressive responses. This implies that covert measures, which are less susceptible to inhibition, should be used. Measures of possible inhibition-produced self-aggression should be included. Considerations of social appropriateness in the American society lead to the conclusion that extremely hostile fantasy is liable to be inhibited in children. Fantasy and attitude measures of aggression then probably register differences of frequency, but not intensity, of response.

There is the possibility that aggressive motoric responses may vary in force with the strength of instigation to respond aggressively.
Statement of the Problem

Goal-Gradient Hypothesis theory and empirical evidence support the assumption that the instigation to respond toward a goal, or goal-oriented response strength, varies positively with closeness to the goal.

Frustration-Aggression theory and empirical evidence support the assumption that the instigation to aggression following interference, or aggressive response strength, varies positively with the strength of the goal-oriented response interfered with. This study is designed to answer the question: Does interference with goal-oriented responses close to their goal produce stronger aggressive responses than interference with goal-oriented responses far from their goal? The hypothesis of this study follows from the assumptions stated above, and the above question.

Hypothesis

If it is assumed that the strength of goal-oriented responses varies positively with closeness of approach to the goal, and if it is assumed that interference with goal-oriented responses constitutes a frustration leading to some form of the aggressive response, then it can be hypothesized that:

Interference with goal-oriented responses close to their goal constitutes a greater amount of frustration and therefore produces stronger aggressive responses than interference with goal-oriented responses far from their goal.
CHAPTER II

METHOD AND PROCEDURE

Method

The Induction of a Goal-Gradient of Response Strength

Tasks operationally suitable for inducing a goal-gradient of response strength require that a series of responses must occur before the goal-response is made, or the goal reached. The goal-gradient model also implies that the goal-oriented responses are motivated, and that reaching the goal or making the goal-response is reinforcing or rewarding. Instructions that a task is "a race against time" appear to impel subjects to perform goal-oriented responses. (Adelman & Rosenbaum, 1954, Haner & Brown, 1955) "Success" in the "race" and praise by the experimenter should serve as a reinforcer of the goal-response, and in order of precedence, reinforce the preceding goal-oriented responses.

Induction of Interference with Goal-Oriented Responses

Operationally, interference with goal-oriented responses requires the prevention of the occurrence of further goal-oriented responses and of the goal-response. The amount and frequency of interference must be held constant to avoid confounding with the predicted greater strength of
the aggressive response following interference close to the goal and far from the goal. To test the hypothesis, interference must occur at least at two different distances from the goal.

A toy pinball machine met the requirements of the theoretically derived operations for establishing a goal-gradient of response strength and interfering with the goal-oriented responses described above. The goal-response of the pinball task was to score 100 points in as short a time as possible. The goal-oriented responses leading to the goal of scoring 100 points involved the manipulation of a lever and plunger to propel a steel ball at scoring posts mounted on an inclined board. Each "hit" constituted a score that registered on a visible score board. Scores earned were an approximate measure of the number of goal-oriented responses that had been made. The more scores earned, the less the distance to the goal. A tilt light, operated by the experimenter through a concealed foot lever, prevented the subjects from acquiring further scores toward the goal of scoring 100 by turning off the scoreboard circuit, with its associated scoring light and bell, and turning on the tilt light circuit. The tilt light was mounted at approximately eye level. It was a bright red light with "tilt" printed on it. The subjects were told that it would go on if they played too roughly with the
game or joggled it. They were told its going on meant that they had lost the game. In this study the group interfered with close to the goal was allowed to score 90 points before the tilt light interference, while the group interfered with far from the goal was allowed to score 20 points before the tilt light interference.

Theoretical Considerations in the Measurement of Aggressive Response Strength

Overt aggressive responses following the tilt light interference of the pinball task were not expected. Children tend to inhibit overt aggressive responses in the presence of adult authorities because they anticipate punishment. Covert aggressive responses, such as projective-test-fantasy and indirect attitude questionnaire responses, are less likely to be inhibited because they have not been punished in the past. If the self is the aggression-producing interfering object, or if overt aggressive responses are inhibited, the self is a probable target of aggressive responses. Aggressive responses may generalize, or displace, onto the various objects of the aggressive response available in tests. On tests involving verbal aggressive behavior the frequency rather than the force or intensity dimension should increase following interference because intense verbal aggressiveness is frequently punished in our society. Motoric measures of aggressive response strength probably increase in force
following interference without much inhibition assuming that the aggressive motoric response has occurred at all. Aggressive responses may also be directed toward the pinball machine as the interfering object.

The Fantasy Aggression Measure

The Rosenzweig Picture-Frustration Study, (P-F) Child Form (Rosenzweig, 1948) is a "projective" test designed to measure responses to frustration. It has 24 cartoonlike situations in which one person is frustrating or pointing out a frustration to another person. The subject taking the test is instructed to provide the verbal response of the frustrated person in the cartoon. The assumption of the test, common to all projective tests, is that the subject "identifies" with the frustrated cartoon figure and tends to respond as he himself would respond to similar frustrating situations. The P-F yields two types of codable aggressive responses relevant to the present study. Extrapunitive responses (E) show annoyance, irritation or blame of others for a frustration. Intropunitive responses (I) show annoyance, irritation or blame of self for a frustration.

Lindzey and Goldwyn (1954) tested an imprisoned group of delinquents and a control group with the P-F (Child Form) and found the delinquents had a lower frequency of aggressive
response. This was attributed to the environmental influences of the prison which discouraged aggressive behavior, leading to the inhibition of aggressive responses on the test. The delinquents rated poorly-adjusted had significantly higher Extrapunitive (E) scores than a well-adjusted delinquent group. The poorly-adjusted subjects were presumed to have responded less adaptively to the social forces discouraging aggressive responses. The P-F (Child Form) correlated significantly with behavioral ratings by observers, $r = .42$, but did not correlate positively with other projective tests, diagnostic council ratings, or self ratings. The test, according to Lindzey and Goldwyn, measures a behavioral, but not necessarily conscious, level of aggressive responses. The Intropunitive (I) scores were negatively related to Thematic Apperception Test signs that related to overt behavior ratings.

Smith (1958) found that it helped to have his child subjects read the P-F items aloud. Spache (1954) suggested that the children dictate their responses to the experimenter. In the present study some of the children were in a slow section so these procedures were adopted for all. Some additional instructions (Appendix E) aided the children in performing the test.

Inter-rater reliability in the present study yielded 92 per cent agreement between two raters, the author and a
co-worker, who independently scored the test protocols. Test-retest reliability of the Child Form was reported to vary between $r = .80$ and $.84$. (Cox, 1957)

The Punitive Questionnaire

Lyle and Leavitt (1955) developed a 14-item questionnaire to measure punitiveness. Punitive responses were defined by the authors as physical or verbal abuse, deprivation of food or play, and coercion.

The questionnaire was included in the present study as a measure of aggressive response strength even though punitiveness as reflected in the items seemed to measure attitudes toward transgressions rather than aggressive response strength. Each Punitive Questionnaire item had six choices: three punitive and three non-punitive. Lyle and Leavitt's students' mean score on this was 4.36, and the standard deviation was 2.30. The split-half reliability coefficient was $r = .63$. This test correlated $r = .076$ and $r = -.097$ with the P-F, R and I scores respectively.

The lack of correlation between the Punitive Questionnaire and the P-F scores is partly determined by the low reliability coefficient of the questionnaire. An inspection of the items of the two tests indicated that they measure somewhat different variables. Although neither instrument has demonstrated high predictive
validity, both may reflect increases in the strength of the aggressive response following frustration.

The Motoric Measure of Aggressive Response Strength

The force of a motoric response is a measure of aggressive response strength if the goal of the motoric response is damage or injury to an object. A motoric measure of aggressive response strength was developed in which the subjects threw darts at pictures of planes stenciled on a pad of paper. The goal response of the task was to "shoot down" the "enemy planes" with the darts or make-believe "rockets". The force of this motoric-aggressive response was measured by the number of pages penetrated by the darts. The measure has an odd-even reliability coefficient of $r = 0.95$ when corrected by the Spearman-Brown prophecy formula. (Guilford, 1954) The force of the dart throwing response in a similar task increased following frustration according to Keach.

The Game Preference Measure

An interfering object usually is the target of an aggressive response. (Dollard et al., p. 48) Those subjects who were prevented from making the goal response of scoring 100 on the pinball machine should be instigated

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1The design of this measure followed from a suggestion by Charles Keach who had developed a similar measure using darts.
to aggress toward the pinball machine more than those who have made the goal response of scoring 100.

Assuming that the dart measure of the strength of the aggressive response permits aggressive responses, the frustrated subjects should prefer it more than the unfrustrated control group. The simultaneous operation of the two variables above should increase the preference of the frustrated groups, depending on the amount of frustration, for the dart task, and decrease it for the pinball game, as compared with the unfrustrated control group.

Interruption theory would predict greater preference for the pinball machine among the subjects that suffered interference than for the ones that did not. This situation is different from the interruption and resumption of tasks studied by Ovsiankina, (1928) in which the interrupted tasks are resumed more frequently than those completed. In the present study there is no opportunity for resumption, and the experimental procedure involved interference or prevention rather than merely interruption.

The Subjects

Ninety fourth-grade children ranging in age from eight to ten years were used as the subjects for this study. Children of this age group enjoy game-like tasks and are less able than adults to conceal aggressive responses. They are less "test wise" than adults and less able to dissemble
on tests. The fourth grade was felt to be the lower limit on writing, reading and motor skills necessary to perform the task and tests involved in the present study. Both girls and boys were included in the study. The experimental groups had approximately equal numbers of boys and girls.

The Experimental Design

A minimum of two experimental groups was necessary to test the hypothesis that subjects frustrated close to a goal become more aggressive than subjects frustrated far from a goal. One of the experimental groups was frustrated after scoring 20 out of a possible 100 points on the pinball machine and the other group was frustrated after scoring 90 out of a possible 100 points. In that order they constituted the group frustrated far from the goal and the group frustrated close to the goal.

A third group, a control, was added to test for the possibility that the experimental task itself constituted an interference. If this occurred the amount of the task performed, or closeness of approach to the goal, would be related to the strength of the aggressive response, even without external interference by the tilt light. Each goal-oriented response would constitute an additional amount of interference which would be confounded with the effects of the tilt light interference with the goal-oriented task. If the task induced aggression, severe doubts would be cast
on whether it was truly a goal-oriented task.

The control group, unlike the experimental groups, was allowed to complete, or succeed on the experimental trial on the pinball machine. This group may have served to counter the possible impression among the experimental subjects that they were all failing the task. It is an important condition of the Frustration-Aggression Hypothesis that the goal-response must have been expected to occur before the interference. If the subjects all failed, this would have been difficult to induce.

A pre- and post-test design was used with the two experimental and one control groups to increase the precision of measurement of the dependent variable, aggression. All subjects took the various aggression measures before and after the experimental procedures on the pinball machine. This design controlled statistically and experimentally for individual subject variation on the tests.

The Method of Matching Subjects in the Experimental and Control Groups

The matching of subjects insured equivalence of the experimental and control groups. The subjects were rank ordered on the pre-test Extrapunitive scores of the Rosenzweig P-F. The three subjects scoring highest were assigned to one of the three groups with the aid of a random numbers table (Arkin, H. and Colton, R. R., 1950).
The first subject was assigned to group number #1, #2, or #3, whichever of these numbers appeared first, upon going down the columns of the random numbers table. (Arkin & Colton, 1950) The second and third highest subjects were similarly assigned to the other two remaining groups. The procedure was repeated for the next three highest subjects, and so on, until all ninety subjects were assigned to one of the three groups.

Procedures

The children were tested only during class room hours.

The Pre-Test Procedures

Children were individually brought to the experimental room. The children were told, as part of the rationale for the study, that the experimenter was conducting a study of games children liked and enjoyed. Questions were asked about favorite outdoor and indoor games and hobbies. Some demographic information was collected that is not relevant to the present study.

The child was then given his or her copy of the Rosenzweig P-F and the experimenter read the standard instructions aloud (See Appendix E) and instructed the child to read the stimulus items aloud, and to dictate the answers to the experimenter.
Table 1. **Outline of Experimental Procedures and Design**

<table>
<thead>
<tr>
<th>Pre-Test</th>
<th>Experimental Induction</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two months (approximately) before experimental induction</td>
<td>1. All children have an initial successful experience on the pinball game and are praised by the experimenter.</td>
<td>1. Dart throwing strength measure is administered.</td>
</tr>
<tr>
<td>1. Question children about favorite games and hobbies to provide a rationale for study.</td>
<td>2. Group #1 is thwarted after scoring 90 points out of a possible hundred. (Frustrated close to goal group.)</td>
<td>2. Rosenzweig P-F is administered.</td>
</tr>
<tr>
<td>2. Rosenzweig Picture-Frustration Study is administered.</td>
<td>Group #2 is allowed to complete the game successfully. (Unfrustrated control group.)</td>
<td>3. Punitive Questionnaire is administered.</td>
</tr>
<tr>
<td>3. The Punitive Questionnaire is administered.</td>
<td>Group #3 is frustrated after scoring 20 points out of a possible hundred. (Frustrated far from goal group.)</td>
<td>4. Game preference measure is administered.</td>
</tr>
<tr>
<td>Immediately before the experimental induction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Dart throwing strength measure is administered.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other Procedures**

1. After all Pre-tests are completed and before the experimental session all children are given cookies and told about further session in which they are to play some games.

2. The subjects are assigned to experimental and control groups after being matched into "Triads" on the Rosenzweig P-F Extrapunitive Scores.
The experimenter recorded the answers on a special form (see Appendix B). Any skipped items were pointed out and usually filled in immediately. On balked or refused items the experimenter encouraged the subject to answer, or waited until all the other items were filled in before returning to them.

The experimenter next read the standard instructions for the 14-item multiple choice Punitive Questionnaire. (see Appendix F). The experimenter also gave simpler instructions to the effect that each item "presents a situation in which someone has done something. Circle the letter to the left of one of the six answers which you think should be done back to the person." On this test the children read the items silently, working at a table. When they finished the questionnaire the experimenter scanned it for omissions, and the child was sent back to the classroom. The first part of the pre-test session took place before Christmas. To increase rapport the experimenter gave cookies to all the children in the study at Christmas time. At this time the children told about the forthcoming second session in which they were to play some games.

The dart throwing strength pre-test, the experimental frustration of the pinball game, and the various post-tests were conducted in a second session. The children were tested in the same order as in the first session to maintain
a constant time between testings.

On the dart throwing force measure the children were instructed to stand behind a line ten feet away from the newsprint pad with the planes stenciled on it. To make the task aggressive they were told to pretend that the darts were "rockets" with which they were to shoot down the "enemy planes". Shots that missed the pad were taken over again. After the subject had thrown his ten darts the experimenter and the subject counted up the hits. The experimenter always congratulated the subject on doing well on a difficult task irrespective of the number of hits actually made.

Pinball Machine and Interference Procedures

After the dart pre-test the experimenter explained the operation of the pinball machine. The subject was allowed "free play" on the machine until he mastered the use of the plunger, extra-play flipper, and ball return. As the subject played, the experimenter explained the scoreboard and the scoring light and bell associated with it.

Just before the subjects started the initial successful play with the machine, they were told that the tilt light would go on if the game was jogged or played with too roughly. In that event, they were told, the scoring light and bell would go dead, the scoreboard would stop registering scores, and they would have lost the game.

The game or experimental task was structured as a
"race against time" in which they were to try to score 100 points as quickly as possible. The experimenter served as timekeeper holding a large noisy watch at an angle so that the subjects could not see the actual time. The subjects were started by saying "On your mark, get set, go."

If the subject ignored the scoreboard during play the experimenter read off the scores as earned. This was intended to get the subject to pay attention to his distance from the goal as represented by the score. When the subject scored 100 he was congratulated and told that he had "completed the game in four minutes which is excellent time." The actual time usually varied between 3½ - 4½ minutes.

After the initial successful trial the subjects were asked, "Now that you have had more practice don't you think you could beat your own time?" The subjects started the experimental trial in the same fashion as the previous success trial.

The tilt light was activated after scoring 20 or 90 points respectively for the two experimental groups while the control group had another successful run. The experimental group interfered with far from the goal took 1 - 1½ minutes to score 20 points. The group interfered with close to the goal took 3 - 3½ minutes to score 90 points, while the control group took 3½ or a few seconds longer to complete the game again.
The experimental groups were asked to throw 10 or more darts immediately after the tilt light went on, while the control groups, upon completion, were congratulated, told that they had bettered their own initial time by one half a minute, and then asked to throw 10 more darts. No explanation was given as to why they were to throw 10 more darts because the subjects did not seem curious about this, possibly because they had played two times with the pinball game. It was considered desirable to avoid extraneous distractions after interference and before the measurement of its consequences.

Post-test Procedures

All of the tests given before the experimental session with the pinball game were given again, introduced as "similar to the tests you took before."

As the children were about to leave the room the experimenter asked them, casually "By the way, which of the games, the darts or the pinball, did you like better?" This constituted the game preference measure. The choice was recorded after they left the room. For further information see Appendix H.

Statistical Analysis

An analysis of variance design that took into account the matching of subjects across the experimental and control
groups and the repeated measures (pre- and post-test) features of the experimental procedures was employed for the Rosenzweig P-F (Child Form) Extrapunitive (E) and Intrapunitive (I) data. The E and I scores were correlated \[ r = -0.22 < 0.05. \] This type of design is frequently called a split-plot randomized-block design. (Cochran and Cox 1957, pp. 293-305)

A split-plot randomized group design was used for the dart throwing force measure and the Punitive Questionnaire because they were uncorrelated with the P-F E scores, the subject matching variable. It was assumed that under these conditions the subject matching variable could be ignored.

Frequency distribution graphs indicated that all scores were skewed (Appendix D). The Freeman-Tukey transformation was employed to normalize the distribution. (Freeman and Tukey, 1950, Mostellar and Bush, in Lindzey, 1954, p. 327) Appropriate sub-analyses were employed when significance of the appropriated statistical terms permitted.

A \( \chi^2 \) test of significance was employed for the game preference measure.

**Statistical Prediction**

The group interfered with close to the goal will show a greater increase in the number or amount of aggressive response from pre-test to post-test when compared to the
group interfered with far from the goal. The uninterfered with control group will show no increase in the number or amount of aggressive responses from pre-test to post-test.

In the analysis of variance designs outlined above this should lead to a significant interaction effect involving the experimental and control groups over the two test trials or "conditions", with the groups falling in the predicted order. Further analysis of the significant interaction effect should find the interaction means of the three groups to be significantly different from each other.
CHAPTER III

RESULTS OF THE DATA ANALYSIS

Rosenzweig P-F (Child Form) Extrapunitive Score Data Analysis

The hypothesis that interference with goal-oriented responses close to the goal produces more Extrapunitive responses than interference with goal-oriented responses far from the goal was not supported. (Table II.) The interaction term, "Groups x Conditions" which measures the possible differential amounts of aggressive response change of the groups over test sessions, was not significant when tested by the triple interaction "Triads x Groups x Conditions".

The lack of results following from the analysis of the Extrapunitive data suggested employing an analysis of covariance in which the Impunitive scores were regressed on the Extrapunitive scores. The Impunitive score is a residual category of all items of the Rosenzweig P-F that have not been scored either Intrapunitive or Extrapunitive.

An inspection of Appendix A, in which the mean scores of the Rosenzweig P-F (Child Form) Intrapunitive and Extrapunitive scores are tabled, indicated that two-thirds of the test scores were not scored as aggressive. This raised the question of what effect this amount of
TABLE II

SUMMARY OF THE ANALYSIS OF VARIANCE OF THE ROSENZWEIG P-F EXTRAPUNITIVE SCORES

<table>
<thead>
<tr>
<th>Source:</th>
<th>SS</th>
<th>d.f.</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups:</td>
<td>.7103</td>
<td>2</td>
<td>.3552</td>
<td>n.s.</td>
</tr>
<tr>
<td>Conditions:</td>
<td>.3345</td>
<td>1</td>
<td>.3345</td>
<td>n.s.</td>
</tr>
<tr>
<td>Groups x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions:</td>
<td>1.4156</td>
<td>2</td>
<td>.7078</td>
<td>1.51</td>
</tr>
<tr>
<td>Triads:</td>
<td>200.2070</td>
<td>29</td>
<td>6.9037</td>
<td>14.76</td>
</tr>
<tr>
<td>Triads x</td>
<td>29.1586</td>
<td>58</td>
<td>.5027</td>
<td>1.07</td>
</tr>
<tr>
<td>Groups x</td>
<td>38.2977</td>
<td>29</td>
<td>1.3206</td>
<td>2.8</td>
</tr>
<tr>
<td>Conditions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triads x</td>
<td>27.1324</td>
<td>58</td>
<td>.4678</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>297.2561</td>
<td>179</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
uncontrolled variance found in the non-aggressive, or Impunitive scores, had upon the Extrapunitive difference scores with which they were correlated \( r = -0.84 \). The question was answered by employing analysis of covariance. To simplify the analysis, difference scores of the pre-test scores subtracted from the post-test scores were used. The signs of the Impunitive difference scores were reversed to produce a positive correlation, which were then analyzed using the model for the analysis of covariance of Edwards. (1950, pp. 342-346) Graphs of the frequency distribution (Appendix J) of difference scores indicated that they were normal, meeting the mathematical assumptions for an analysis of covariance. Scatter plot diagrams of the Extrapunitive and the Intrapunitive difference scores and their relation to the Impunitive difference scores are also in Appendix J.

An analysis of variance of the Extrapunitive difference score data confirms the results of the previous analysis of variance of the Extrapunitive scores above. (Table III.) There were no significant differences between groups.

A separate analysis of variance of the Impunitive difference score data (Table IV) indicated that the "Between Groups" term is significant, possibly reflecting the converse of the Intrapunitive scores which are also significant. The summary table of the analysis is outlined. (Table V.)
## TABLE III

**EXTRAPUNITIVE DIFFERENCE SCORE ANALYSIS SUMMARY**

(y Variable)

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S.</th>
<th>M.S.</th>
<th>d.f.</th>
<th>F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups:</td>
<td>12.60</td>
<td>6.30</td>
<td>2</td>
<td>1.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>Within Groups:</td>
<td>457.50</td>
<td>5.26</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>470.10</td>
<td></td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>
TABLE IV

IMPUNITIVE DIFFERENCE SCORE ANALYSIS SUMMARY
(x Variable)

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S.</th>
<th>M.S.</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>63.02</td>
<td>31.51</td>
<td>2</td>
<td>4.51</td>
</tr>
<tr>
<td>Within Groups</td>
<td>607.60</td>
<td>6.98</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>670.62</td>
<td></td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>
TABLE V

**xy SUMMARY TABLE**

<table>
<thead>
<tr>
<th>Source</th>
<th>xy</th>
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</thead>
<tbody>
<tr>
<td>Between Groups:</td>
<td>23</td>
</tr>
<tr>
<td>Within Groups:</td>
<td>440.80</td>
</tr>
<tr>
<td>Total</td>
<td>463.80</td>
</tr>
</tbody>
</table>
The adjusted term "Between Groups" is statistically nonsignificant. (Table VI.)

**Analysis of the Rosenzweig P-F (Child Form) Intrapunitive Data**

The analysis of the Intrapunitive data did not support the hypothesis. (Table VII.) The "Groups x Conditions" interaction term was significant when tested in an F ratio by the Triple interaction "Triads x Groups x Conditions". The term "Triads" was also significant, probably indicating the effects of the matching of subjects across groups.

The significance of the "Groups x Conditions" interaction term permitted further analysis of the components of this interaction. Tukey's procedures for comparing individual means was employed to test the significance of the gap between the interaction means of the two experimental groups and the one control group. (Edwards, 1954, p. 330-331) The interaction mean for each group is computed by subtracting the pre-test mean from the post-test mean for each group. The table attached to Table VII of the analysis of the Intrapunitive scores indicated that the uninterfered with control group interaction mean was significantly less than that of the two experimental groups. The two experimental group interaction means were not significantly different from each other. Analysis of the boys and girls data separately showed no differences from the combined data analysis reported below.
<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>88</td>
<td>320.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within:</td>
<td>86</td>
<td>319.79</td>
<td>3.71</td>
<td></td>
</tr>
<tr>
<td>Adj. means</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups:</td>
<td>2</td>
<td>.97</td>
<td>.48</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

**TABLE VI**

**COVARIANCE ANALYSIS SUMMARY**
TABLE VII

SUMMARY OF THE ANALYSIS OF VARIANCE OF P-F INTRAPUNITIVE SCORES AND TUKEY'S TEST FOR THE SIGNIFICANCE OF DIFFERENCES BETWEEN INDIVIDUAL MEANS

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S.</th>
<th>d.f.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups:</td>
<td>1.1866</td>
<td>2</td>
<td>.5933</td>
<td>n.s.</td>
</tr>
<tr>
<td>Conditions:</td>
<td>.0010</td>
<td>1</td>
<td>.0010</td>
<td>n.s.</td>
</tr>
<tr>
<td>Groups x Conditions</td>
<td>5.9320</td>
<td>2</td>
<td>2.9660</td>
<td>5.98 p &lt; .01</td>
</tr>
<tr>
<td>Triads:</td>
<td>72.1042</td>
<td>29</td>
<td>2.4864</td>
<td>5.01 p &lt; .01</td>
</tr>
<tr>
<td>Triads x Groups:</td>
<td>83.2811</td>
<td>58</td>
<td>1.4359</td>
<td>2.89 p &lt; .001</td>
</tr>
<tr>
<td>Triads x Conditions</td>
<td>11.5196</td>
<td>29</td>
<td>.3972</td>
<td>n.s.</td>
</tr>
<tr>
<td>Triads x Groups x Conditions:</td>
<td>28.7841</td>
<td>58</td>
<td>.4963</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>202.8086</td>
<td>179</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tukey's test for the significance of differences between individual means:

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Group 1 (control)</th>
<th>Group 2 (Frustrated close to goal)</th>
<th>Group 3 (Frustrated far from goal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 2</td>
<td>-.478</td>
<td>+.178</td>
<td>+.314</td>
</tr>
<tr>
<td>Group 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

sig. gap = (.36) (.36) (\sqrt{2}) (\bar{x}) = (1.97) (1.41) (.13) = .36
Separate analyses of variance (Table VIII) of the significance of the mean differences between the pre-test and post-test means for each group indicated that the un-interfered with control group shifted significantly downward over test sessions, while the other groups shifted upward slightly, but not significantly.

The possibility that each group is regressing back to their common mean and that this accounted for the significance of the "Groups x Conditions" interaction effect was not supported by an analysis of variance test of the significance of the differences of the pre-test means. (Table IX.) The group means was not significantly different from each other, indicating that the differences between groups were primarily due to the experimental treatments.

A tabular representation of the Rosenzweig P-F Extrapunitive and Intrapunitive responses, depicted in Appendix K, indicated that there was considerable stability of response from pre-test to post-test of both Extrapunitive and Intrapunitive responses for each item. The scores for each Extrapunitive and Intrapunitive item across groups also appeared reasonably stable. No trend effects, or position responses, showed up in this Table. The varying numbers of subjects who responded to each item Extrapunively or Intrapunively was primarily due to the different
<table>
<thead>
<tr>
<th>Source</th>
<th>S.S.</th>
<th>d.f.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among gp. 1:</td>
<td>57.0879</td>
<td>29</td>
<td>1.9685</td>
<td>1.81 p &lt; .01</td>
</tr>
<tr>
<td>Conditions:</td>
<td>1.1052</td>
<td>1</td>
<td>1.1052</td>
<td>2.689 n.s.</td>
</tr>
<tr>
<td>Conditions x Subjects:</td>
<td>11.8769</td>
<td>29</td>
<td>.4096</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>70.0727</td>
<td>59</td>
<td></td>
<td></td>
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<table>
<thead>
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<th>d.f.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among gp. 2:</td>
<td>35.9818</td>
<td>29</td>
<td>1.2408</td>
<td>3.48 p &lt; .01</td>
</tr>
<tr>
<td>Conditions:</td>
<td>3.6100</td>
<td>1</td>
<td>3.6100</td>
<td>10.12 p &lt; .01</td>
</tr>
<tr>
<td>Conditions x Subjects:</td>
<td>10.3470</td>
<td>29</td>
<td>.3568</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>49.9388</td>
<td>59</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
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<th>d.f.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among gp. 3:</td>
<td>62.9354</td>
<td>29</td>
<td>2.1701</td>
<td>3.66 p &lt; .01</td>
</tr>
<tr>
<td>Conditions:</td>
<td>1.4789</td>
<td>1</td>
<td>1.4789</td>
<td>2.49 n.s.</td>
</tr>
<tr>
<td>Conditions x Subjects:</td>
<td>17.1961</td>
<td>29</td>
<td>.5930</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>81.6104</td>
<td>59</td>
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</tr>
</tbody>
</table>
TABLE IX

SUMMARY OF THE ANALYSIS OF VARIANCE
OF THE PRE-TEST P-F INTRAPUNITIVE SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S.</th>
<th>d.f.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups:</td>
<td>5.4664</td>
<td>2</td>
<td>2.733</td>
<td>2.755 n.s.</td>
</tr>
<tr>
<td>Triads:</td>
<td>27.4025</td>
<td>29</td>
<td>945</td>
<td>n.s.</td>
</tr>
<tr>
<td>Residual:</td>
<td>57.5537</td>
<td>58</td>
<td>.992</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>90.4226</td>
<td>89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
stimulus values of each item, and not to the experimental inductions. In general those items that elicited Extrapunitive responses did not elicit Intrapunitive responses.

**Analysis of the Punitive Questionnaire Data**

The analysis of this body of data produced no statistically significant results, and did not support the hypothesis. (Table X.)

A graph of the scores in Appendix L for each item for each group separately on both the pre- and post-test sessions did not indicate any trend effect that might implicate the hypothesis. The scores appear stable across groups and sessions.

**Analysis of the Dart Throwing Force Data**

The results of the dart throwing force measure analysis indicated that the interference procedures did not have a differential effect on the experimental groups, since the "Groups x Conditions" Interaction term was not significant. (Table XI.) There was a significant tendency for all groups to throw darts harder on the post-test session than in the pre-test session, seen in the significant "Conditions" effect.

The lack of results following from the analysis of the dart throwing force measure of aggressive responses suggested analyzing the effects of the experimental inter-
<table>
<thead>
<tr>
<th>Source</th>
<th>S.S.</th>
<th>d.f.</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups:</td>
<td>9.1594</td>
<td>2</td>
<td>4.5797</td>
<td>2.03</td>
</tr>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>in the same group:</td>
<td>196.2908</td>
<td>87</td>
<td>2.2562</td>
<td></td>
</tr>
<tr>
<td>(Error term)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions:</td>
<td>.3735</td>
<td>1</td>
<td>.3735</td>
<td></td>
</tr>
<tr>
<td>Groups x Conditions:</td>
<td>.1105</td>
<td>2</td>
<td>.0552</td>
<td>n.s.</td>
</tr>
<tr>
<td>Pooled Subjects x Conditions:</td>
<td>43.7777</td>
<td>87</td>
<td>.5039</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>249.7119</td>
<td>179</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>S.S.</td>
<td>d.f.</td>
<td>M.S.</td>
<td>F</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Groups:</td>
<td>61.78</td>
<td>2</td>
<td>30.89</td>
<td>n.s.</td>
</tr>
<tr>
<td>Among S's in the same group:</td>
<td>5784.12</td>
<td>87</td>
<td>66.48</td>
<td></td>
</tr>
<tr>
<td>Conditions:</td>
<td>13.74</td>
<td>1</td>
<td>13.74</td>
<td>6.27 p</td>
</tr>
<tr>
<td>Groups x Conditions:</td>
<td>7.42</td>
<td>2</td>
<td>3.71</td>
<td>1.69</td>
</tr>
<tr>
<td>Pooled Subjects x Conditions:</td>
<td>190.11</td>
<td>87</td>
<td>2.19</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6058.18</td>
<td>179</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ference on the accuracy of dart throwing. (Table XII.) A dart was considered to have hit a plane if the hole left by the dart was touching or within the stenciled line constituting the boundary of the plane. The extremely low mean accuracy scores indicated the difficulty of the task, and did not suggest any differential effects attributable to the experimental inductions.

A graph (Appendix M) of the sum of dart scores for each group on each dart throw for both pre- and post-sessions indicated that there was no trend or pattern of force of throwing that differentiated the groups. There were few differences of dart throwing force on the post-test session when compared to the pre-test session.

Analysis of the Game Preference Measure Data

The $\chi^2$ significance test of the number of subjects in each group who preferred the darts over the pinball game did not support the hypothesis that interference with responses of the pinball task close to the goal led to greater preference of the dart throwing strength measure than frustration of the pinball game far from the goal, or that either group was different from the control group in any significant fashion. (Table XIII.) It did show that the subjects in all groups preferred the pinball game over the darts.
TABLE XII

PRE- AND POST-TEST MEANS OF THE NUMBER OF PLANES HIT IN THE DART THROWING FORCE MEASURE BY THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Session</th>
<th>Group 1 (Frustrated close to goal)</th>
<th>Group 2 (control)</th>
<th>Group 3 (Frustrated far from goal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-</td>
<td>.11</td>
<td>.11</td>
<td>.116</td>
</tr>
<tr>
<td>Post-</td>
<td>.133</td>
<td>.123</td>
<td>.126</td>
</tr>
</tbody>
</table>
TABLE XIII

FREQUENCY OF PREFERENCE FOR THE PINBALL GAME VERSUS DART THROWING

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (Frustrated preference close to goal)</th>
<th>Group 3 (Frustrated far from goal)</th>
<th>Group 2 (control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dart</td>
<td>7</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Pinball</td>
<td>23</td>
<td>27</td>
<td>24</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.97 \text{ d.f.} = 2 \quad p > .50 \]
CHAPTER IV

DISCUSSION OF THE RESULTS

The hypothesis of the present study followed from the theoretical assumptions of the Goal-Gradient Hypothesis that the strength of goal-oriented responses increases as a function of the closeness to the goal and from the theoretical assumptions of the Frustration-Aggression Hypothesis that the stronger the goal-oriented responses interfered with, the stronger will be the resultant aggressive responses. The hypothesis stated that:

If a goal-oriented behavior is interfered with close to a goal, stronger aggressive responses will occur than if a goal-oriented behavior is interfered with far from a goal.

There were no results in this study which supported the hypothesis.

The statistical predictions stated that — the group interfered with close to the goal will show a greater increase in the number or amount of aggressive responses from pre- to post-test than the group interfered with far from the goal. The uninterfered with control group will show no increase in the number or amount of aggressive responses from pre- to post-test. In the analysis of variance designs this would have led to a significant interaction effect involving the two experimental groups and the control group.
over the two test trials or "Conditions" with the groups falling in the predicted order. Further analysis would have indicated that the interaction means of the groups were significantly different from each other.

In the instance of the game preference measure it had been predicted that the experimental group interfered with close to the goal would show the greatest frequency of preference for the dart throwing, the group interfered with far from the goal a lesser frequency of preference for the dart throwing, and the uninterfered with control group the least frequency of preference for the dart throwing. The $\chi^2$ significance test failed to show any difference between the frequencies of choice of the two interfered with experimental groups, or between the experimental groups and the control group. All groups strongly preferred the pinball game, possibly because of its flashing lights, ringing bell, and numerous levers and plungers.

The Punitive Questionnaire also failed to support the hypothesis or to meet the requirements of the statistical predictions for the analysis of variance designs, since it produced no statistically significant results. This may have occurred because it has a low reliability coefficient of $r = .63$ which limits its possible validity. An inspection of the terms indicated that most of them were concerned with adult and peer group norms violation,
not with the consequences of interference or frustration. The instructions were unclear to the subjects and had to be supplemented with simpler ones more appropriate for the age group studied.

The dart throwing force measure similarly failed to support the hypothesis. It had been predicted that the subjects interfered with close to the goal of scoring 100 points on the pinball machine would show a greater increase in dart throwing force as measured by the number of pages of the dart pad penetrated, from pre- to post-test, than the group interfered with far from the goal. The control group would show no increase in dart throwing force. The results indicated that all groups tended to throw harder in the post-test than in the pre-test. The highly controlled performance required by this test, attempting to hit small pictures of planes on a fairly distant target, may have prevented frustration-induced invigoration effects from showing up. An unskilled aggressive motoric task, for example punching a button or shoving a lever, may have been less subject to control than dart throwing, a fine muscle task. The analysis of the dart accuracy scores, another measured interference with a complex motor activity, failed to show any results. No trend effects were observed.

The Rosenzweig P-F (Child Form) data did not support the hypothesis tested in this study but did produce results
that supported the Frustration-Aggression Hypothesis, as it related to the effects of inhibition on the nature of the aggressive response. It had been predicted that interference close to the goal would produce greater increases in the number of Extrapunitive and Intrapunitive responses than interference far from the goal. The control group would show no increase in Extrapunitive or Intrapunitive responses.

The analysis of the Intrapunitive data, a measure of self-aggressive responses, indicated that interference with the pinball game by the tilt light produced more aggressive responses than non-interference, supporting the Frustration-Aggression Hypothesis. This implied that aggression was successfully induced by interference, even though the effects of the distance from the goal of the interference had no effect. This casts doubt on the validity of the goal-gradient hypothesis. The failure of the Extrapunitive data, a measure of outwardly-directed fantasy aggressive responses, to support the results of the Intrapunitive data analysis implied that the P-F is not immune to the effects of aggressive response inhibition. The fact that it was the Intrapunitive responses that were sensitive to the interference procedures conforms to the Frustration-Aggression Hypothesis corollary discussed earlier, namely that inhibited overt aggression produces aggressive responses to the self. Having the subjects dictate their P-F responses to the experimenter, an
adult authority, may also have induced inhibition. Self-aggression, might have been produced by the instructions on the operation of the tilt light, since the subjects had been told that the tilt light would go on if they joggled the board or played too roughly with the pinball game, implying that they were at fault for the operation of the tilt light.

With the exception of the P-F E and I score data, which correlated $r = -0.22$, $p < 0.05$, none of the other measures bore any relationship to each other, indicating that the tests were not measuring a common variable. Most of the measures were either inappropriate for measuring the self-aggressive responses induced, or generally inappropriate for measuring the strength of aggressive responses, because of low reliability or validity. The addition of a projective measure, better able to bypass the effects of aggression inhibition, is suggested by these results.

While the results of this study support the Frustration-Aggression Hypothesis and some of its correlates, it fails to support the Goal-Gradient Hypothesis, because no differential effects of interference near to and far from the goal were observed.

There is the possibility that the subjects in this study were responding not only to the positive goal of
scoring 100 on the pinball machine, but also to the negative goal of scoring 0 or failing on the pinball machine, thus forming both an approach gradient and an avoidance gradient respectively. If this occurred, interference with the pinball game by the tilt light after scoring 20 (a point far from the positive goal yet close to the negative goal) as opposed to interference after scoring 90 (a point close to the positive goal but far from the negative goal) would have produced aggressive responses of approximately equal strength, since the interfered with goal-approaching and goal-avoiding responses would also have been of equal strength.

The operation of grading systems in schools is perfectly designed to induce this "whip" and "carrot" effect. Students are punished for failure and rewarded for success. The generalization of this training to the pinball game is a reasonable possibility. Individual differences may operate in that some people are primarily responding to avoidance of punishment of failure, while others are responding to the approach of success and its associated rewards. Appropriate knowledge of the previous training of the individual child in responding to these two types of stimulation could lead to a better test of the present hypothesis and the goal-gradient theory underlying it, by experimentally controlling for this variable.
Several conclusions can be drawn from the discussion of the results. One underlying assumption of the hypothesis tested in this study, that response strength increases as a function of the closeness to the goal, was not supported, casting doubt on the validity of the Goal-Gradient Hypothesis. The other underlying assumption of the present hypothesis, that interference with goal-oriented responses produces some form of the aggressive response, was upheld, providing further support for the Frustration-Aggression Hypothesis. Fear of punishment in the subjects probably led to the inhibition of overt forms of the aggressive response. The inhibition of aggressive responses, and the self-blame inducing directions on the operation of the tilt light interference, led to a covert form of the aggressive response directed toward the self as measured by the P-F Intrapunitive data. These results support certain correlates of the Frustration-Aggression Hypothesis relevant to inhibited forms of the aggressive response. The other measures of aggressive response strength failed to measure this type of response because they were either unreliable, invalid, or not designed to measure the self-aggression induced in this study.
CHAPTER V

SUMMARY

The hypothesis of this study was derived from the Goal-Gradient Hypothesis of Hull, which states, that goal-oriented responses strengthen as the goal is approached, and the Frustration-Aggression Hypothesis of Dollard and Doob, et al., which states that interference with a goal-oriented response constitutes a frustration, leading to aggressive responses. The hypothesis of the present study stated that frustration of a goal-oriented behavior close to the goal leads to stronger aggressive responses than frustration of a goal-oriented behavior far from its goal.

A previous study by Haner and Brown supported this hypothesis to the degree that their measure of the aggressive response, strength of lever pushing, was truly a measure of a frustration-induced aggressive response, as opposed to a frustration-induced invigoration of response.

The present study included fantasy, attitude, motor, and preference measures of aggressive response strength. All measures of aggressive response strength were given before and after the experimental frustration to increase
the precision of measurement.

The goal-oriented task selected for the present study was a toy pinball machine which scored from 0 to 100 points. All subjects were given a success trial in which they were permitted to score 100. On the experimental trial one group was frustrated after scoring 90 points, another group was frustrated after scoring 20 points. The former constituted the group frustrated close to the goal, the latter the group frustrated far from the goal. An unfrustrated control group was allowed to succeed on its second trial. Frustration was accomplished with a concealed, experimenter-operated tilt light which the subjects were led to believe operated if they played too roughly with the game. The subjects lost the game of "racing time" to score 100 if the tilt light went on.

The three groups of subjects employed in this study were fourth graders, of which there were 30 to a group. The subjects were matched on the pre-test Extrapunitive scores of the Rosenzweig Picture-Frustration Study.

The subjects were tested individually in two sessions, the first occurring some months before the second, experimental frustration session. In the first session the subjects were questioned about favorite games and hobbies to establish that the study was concerned with play and games. The Rosenzweig P-F and the Punitive
Questionnaire were also administered in this session. In the second session the Pre-Test Dart Throwing Force measure was administered immediately before the experimental trials on the pinball machine. All tests were readministered immediately after the experimental session. An additional "after-only" measure was also administered in which the children were asked which game they liked better, the darts or the pinball machine. Frustration of the pinball game was predicted to lower the subjects' preference for it.

Frequency distribution graphs of all the tests except the game preference measure showed considerable positive skewness. To meet the assumptions of analysis of variance statistics, the Freeman-Tukey transformation was employed.

Two analyses of variance designs were employed to test the hypothesis. One of them, which took into account the matching of subjects across the experimental and control groups, was used for the Rosenzweig P-F Extrapunitive and Intrapunitive data. The Punitive Questionnaire and the Dart Throwing Force measures showed no relation to the Extrapunitive matching variable, so a design not involving matching was used for them.

The results of the study did not support the hypothesis. In no instance did the experimental group frustrated close to the goal become more aggressive than the group
frustrated far from the goal. On the Intrapunitive data the experimental groups became significantly more aggressive than the control group.

It was concluded that self-blame was induced by the failure on the pinball task. The three group means of the Pre-test Intrapunitive scores were not found to be significantly different from each other, reducing the possibility that the groups were statistically regressing to a common mean, and thereby producing the above results.

The analysis of the Punitive Questionnaire data implied that it was irrelevant as a measure of aggression induced by the present experimental procedures.

The Dart Throwing Force data also produced no relevant significant results. It was possible that the complex, controlled performance required on this task may have interfered with any frustration-induced tendency to throw the darts harder following frustration. The possibility that the experimental frustration interfered with the accuracy of dart throwing was not supported.

The game preference measure indicated an overwhelming preference for the pinball game over the dart throwing, but no differential preferences attributable to the experimental frustration were found.

That frustration far from and close to the goal failed to operate may be due to failure in the induction.
It was also suggested that the subjects might be responding to two goals, one positive and the other negative, thus forming two gradients. Interference near the beginning, or negative goal, would have the same consequences as interference near the positive goal, or completion of the task.

Implications for further research are inherent in the abovementioned formulation.

The results of this study, indicated that the Goal-Gradient Hypothesis was not supported under the present experimental conditions with the particular sample of subjects used. The operation of the Goal-Gradient Hypothesis is assumed by several theoretical models. Failure of the Goal-Gradient Hypothesis to operate in this study implies that further research should be performed to determine the conditions under which it validly applies to human behavior.

The results of this study support the Frustration-Aggression Hypothesis, and some of its correlaries pertaining to inhibited covert, forms of the aggressive response. The fact that the children were working in the presence of an adult, a person of greater power, probably led to inhibition of overt aggressive responses. The directions on the operation of the tilt light probably produced self-aggression as measured by the P-F Intrapunitive scores,
rather than any other form of aggression. Analysis of the other measures of aggression indicated that they were not valid measures of the form of aggression induced in this study. The covert nature of the variables induced implied that a projective test measure, better able to bypass inhibition, would have been a desirable addition to the test battery used.
APPENDICES
APPENDIX A

Means and Standard Deviations of the Three Groups, Pre- and Post-test, for all Tests Transformed and Raw Data
Appendix A

MEANS AND STANDARD DEVIATIONS, TRANSFORMED DATA
PUNITIVE QUESTIONNAIRE

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>T₂</td>
<td>T₁</td>
</tr>
<tr>
<td>X</td>
<td>4.23</td>
<td>4.60</td>
</tr>
<tr>
<td>σX</td>
<td>3.86</td>
<td>3.88</td>
</tr>
</tbody>
</table>

Dart Throwing Force

| X       | 43.44   | 43.49   | 44.46   | 45.03   | 44.14   | 45.19   |
| σX      | 43.30   | 43.31   | 44.28   | 44.77   | 44.12   | 45.21   |

Rosenzweig P-F Intrapunitive

| X       | 3.05    | 3.22    | 3.44    | 2.97    | 2.85    | 3.17    |
| σX      | 2.70    | 2.91    | 3.00    | 2.61    | 2.55    | 2.89    |

Rosenzweig P-F Extrapunitive

| X       | 3.75    | 4.09    | 3.88    | 3.81    | 3.77    | 3.77    |
| σX      | 3.50    | 3.80    | 3.60    | 3.44    | 3.42    | 3.50    |

N = 30 for all groups
T₁ = Pre-test
T₂ = Post-test

Group 1 - group frustrated close to goal
" 2 - unfrustrated control group
" 3 - group frustrated far from goal

X = mean
σX = standard deviation
Appendix A

MEANS AND STANDARD DEVIATIONS, RAW DATA
PUNITIVE QUESTIONNAIRE

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>T2</td>
<td>T1</td>
</tr>
<tr>
<td>( \bar{x} )</td>
<td>4.30</td>
<td>4.33</td>
</tr>
<tr>
<td>( s_x )</td>
<td>11.93</td>
<td>14.31</td>
</tr>
</tbody>
</table>

Dart Throwing Force

| \( \bar{x} \) | 479.17 | 479.3 | 500.70 | 511.83 | 497.13 | 521.73 |
| \( s_x \)  | 731.46 | 655.87| 674.27 | 596.62 | 828.69 | 993.90 |

Rosenzweig P-F Intrapunitive

| \( \bar{x} \) | 2.33   | 2.47   | 2.63   | 2.00   | 1.90   | 2.5    |
| \( s_x \)  | 8.33   | 8.69   | 7.55   | 7.08   | 8.41   | 9.67   |

Rosenzweig P-F Extrapunitive

| \( \bar{x} \) | 3.57   | 4.17   | 3.73   | 3.43   | 3.40   | 3.53   |
| \( s_x \)  | 14.12  | 14.43  | 14.07  | 11.20  | 10.45  | 14.05  |
APPENDIX B

$\chi^2$ of Sex Ratios of Groups
Appendix B

$\chi^2$ OF SEX RATIOS OF GROUPS

To test for the possibility that the experimental results, or lack of them is due to differential numbers of boys and girls in the various groups, a $\chi^2$ analysis of the sex ratios in the 2 experimental and 1 control group is tabled below. A sign test for group 2, which seems to have the greatest discrepancy of boys to girls, also shows no significant results even at $p < .25$.

Numbers of Boys and Girls in Each of the Groups

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of Subjects</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>F</td>
<td>15</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>41</td>
<td>90</td>
</tr>
</tbody>
</table>

$$\chi^2 = .63 \text{ df. 2} \quad p > .70 - .80$$

Group 1 = frustrated close to goal
Group 2 = unfrustrated control
Group 3 = frustrated far from goal

$M$ = Males
$F$ = Females

Sign Test of Group 2 - Not significant at $p < .25$
APPENDIX C

Intercorrelations and Reliabilities of Test Instruments
Appendix C

INTERCORRELATIONS AND RELIABILITIES
OF TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Extrapunitive</th>
<th>Intrapunitive</th>
<th>Pun. Q.</th>
<th>Darts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Retest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extr. Punitive Extra. Reliability¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r = .82 - .84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extr. + Intra.</td>
<td>r = .076²</td>
<td></td>
<td>r = .02²</td>
<td></td>
</tr>
<tr>
<td>Intra- Inter-rater Punitive Agreement² Same as Extr-a- r = .097²</td>
<td></td>
<td>r = .0175²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>92%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punitive Questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split-Half Reliability³</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r = .0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r = .63</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darts</td>
<td></td>
<td></td>
<td>Odd-Even</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reliability²</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>r = .95</td>
<td></td>
</tr>
</tbody>
</table>

¹F. N. Cox, "The Rosenzweig Picture-Frustration Study (Child Form)," Austral. J. Psychol., 1957, 9, 141-148.

²Present Study.

APPENDIX D

Raw Score Frequency Distribution Graphs
APPENDIX D
DART THROWING FORCE MEASURE (RIGHT)
PUNITIVE QUESTIONNAIRE (LEFT)
FREQUENCY DISTRIBUTION OF SCORES

- PRE-TEST DISTRIBUTION
- POST-TEST DISTRIBUTION

SCORES

(INTERVALS OF 100)
Appendix D

Rosenzweig Pf Study Extrapunitive Score (Left)
" " " Intrapunitive " " (Right)

- Pre Test Distribution
- Post Test Distribution

FREQUENCY OF RESPONSE

1 2 3 4 5 6 7 8 9 10 11 12 13 14
APPENDIX E

1. Rosenzweig P-F Study
   (Form for Children)

2. Additional Instructions

3. P-F Answer Sheet
Name__________________________ Age______Birthday____________
Address________________________ Grade________________________
Institution_______________________ Present Date_________________

ROSENZWEIG P-F STUDY

(Form for Children)

Instructions

We are going to play a game. Here are some pictures of people doing and saying different things. Look at the pictures one at a time. One person is always shown talking. Read what that person is saying. Then write in the empty space what you think the boy or girl in the picture would answer. The answer you give should be the first thing you think of. Work as fast as you can.

Copyright, 1948, by Saul Rosenzweig
I gave the last one to your brother.

Give back my scooter.

I didn't mean to tell on you.

I'm sorry I cannot fix your truck.
If I were a rich man I could buy that doll for you.

You are a bad child.
You picked my flowers.

You are too little to play with us.

You broke my best doll.
I won the game. These are mine.

I'm sorry I had to send you to bed.

Be quiet!
Mother wants to sleep.

You are a sissy.
I caught you at it this time.

What are you doing?

Did you hurt yourself?

The baby should not have taken your ball.
We are going out. Go to sleep.

Your bed is wet again. You are more of a baby than your little brother.

I'm not going to ask you to my birthday party.

I'm sorry. I pushed your marble by mistake.
I’m going to keep the swing all afternoon.

It’s too bad that the soup is cold.

You are late for school.

Your hands are not clean. You must wash them before you take a book.
ADDITIONAL INSTRUCTIONS

Read aloud what this person says (experimenter pointing at frustrating figure in cartoon) and tell me what this person says back (pointing at frustrated figure).
P-F Answer Sheet.

1. I gave the last one to your brother.

2. Give back my scooter.

3. I didn't mean to tell on you.

4. I'm sorry I cannot fix your truck.

5. If I were a rich man I could buy that doll for you.
6. You are too little to play with us.

7. You are a bad child. You picked my flowers.

8. You broke my best doll.

9. I won the game. These are mine.

10. I'm sorry I had to send you to bed.
12. Be quiet! Mother wants to sleep.

13. You are a sissy.

14. I caught you at it this time.

15. What are you doing?

16. Did you hurt yourself?
16. The baby should not have taken your ball.

17. We are going out. Go to sleep.

18. I'm not going to ask you to my birthday party.

19. Your bed is wet again. You are more of a baby than your little brother.
20. I'm sorry, I pushed your marble by mistake.

21. I'm going to keep the swing all afternoon.

22. You are late for school.

23. It's too bad the soup is cold.

24. Your hands are not clean. You must wash them before you take a book.
APPENDIX F

1. Punitive Questionnaire
2. Additional Instructions
This is an opinion test in which you are asked to tell what should be done about certain situations. On the following pages you will find fourteen (14) situations described. At the end of each description there is a question which you are to answer in the following way: below each description are six (6) possible answers. Choose the one which you think is best and draw a circle around the letter to the left of that answer. Choose only one answer for each situation. Be sure to circle a letter for each situation. There are no right or wrong answers to this test. What is wanted is your personal opinion.

1. Betty is sent to the store by her mother and told to come home immediately. On the way home, she meets a friend and they play together for almost an hour. What should Betty's mother do when Betty gets home?
   
   a. Send Betty and her friend together, and play together at Betty's house.
   b. Give her a spanking.
   c. She should talk to her about it and tell her to come right home and then go play with her friends.
   d. Betty's mother should give her a good talking to.
   e. She should be put to bed without any dinner.
   f. Explain to Betty that she should learn to follow directions.

2. Mary used to help her mother with the dishes every night. Lately, however, she makes all kinds of excuses to get out of helping. What should Mary's mother do?
   
   a. Ask Mary why she doesn't like to do the dishes.
   b. Give her a spanking.
   c. Her mother shouldn't let her do some things she wants to do.
   d. I think that it's her life, and if she didn't want to help, all right.
   e. She should ask her where she is going.
   f. She cannot leave her house until she does the dishes.

3. Ralph's father has told him that he must not play with the boy next door. But when his father is not home, Ralph disobeys him and plays with this boy. One day, his father comes home early and catches him playing with the boy. What should the father do?

   a. Scold him and put him to bed.
   b. Spank him for disobeying.
   c. He should make Ralph stay in his own yard.
   d. Tell him not to do it again.
   e. Tell him to play with other neighbors.
   f. Ask him why he disobeyed.
4. Jack and Jim are fighting on the playground. The teacher comes out and stops the fight. What should she do next?
   a. She should find out why the fight started.
   b. Send them in and make them do a subject they don't like.
   c. Do nothing.
   d. Make them stay in all noon hours for a week.
   e. Scold them and send them to the room.
   f. Tell them not to do it again.

5. Marjorie's mother is trying to teach her to be neat around the house. In spite of what her mother says, Marjorie goes on throwing her clothes on the floor and making a mess with her toys. What should Marjorie's mother do?
   a. Take all her toys away from her.
   b. Take away a privilege.
   c. Make her pick them up and put them away.
   d. Tell her to pick up her toys until she gets tired of hearing it.
   e. Her mother should punish her.
   f. Do nothing.

6. Sandra is sitting at home in the living room playing with her paper dolls. Her little sister runs over and grabs one of the dresses for her paper doll and tears it into pieces. Sandra cries and runs to tell her mother what has happened. What should Sandra's mother do?
   a. Scold her sister.
   b. Send the sister to her room and make her stay there.
   c. Give Sandra's little sister some paper dolls.
   d. Give her a whipping and tell her not to do it anymore.
   e. Play where the little sister can't reach the doll.
   f. Explain to Sandra that her sister didn't know because she is just young.

7. Wilfred who is in the third grade has pretended to kick his teacher as she walked down the stairs. His friends laugh at this but the teacher does not see him. Mr. Green, the principal, does see him. What should Mr. Green do?
   a. Do nothing.
   b. Give him a spanking.
   c. Give him a good talking to.
   d. Tell the teacher that he is pretending to kick her.
   e. Make him stay in for recess.
   f. Tell him not to do that.
8. Jane is very good at games, but she never wants to play unless she can be the leader. The other children want her to play, but don't like the idea of her being leader all the time. What should they do?

a. They should explain to her that they like to be the leader just as well as she does so they should take turns.
b. Tell the teacher to try to suggest something to help them.
c. They shouldn't let her play with them at all unless she doesn't want to be leader.
d. They should ask her to take turns.
e. Make her play the game without being leader.
f. Don't play with her.

9. John, twelve years old, has a brother, Jimmie, who is two years younger. One day while returning from school he sees a neighbor boy who is two years older than his brother run up and hit his younger brother. What should John do?

a. Go over and tell him to quit it or he would sock him one.
b. Hit him back.
c. Give him a spanking.
d. Go tell his mother.
e. Break it up.
f. Find out why the neighbor boy did it.

10. Jimmie, who is seven-years-old is sitting on the floor building a tower out of blocks when his younger brother knocks the tower down. What should Jimmie do?

a. Don't pay any attention.
b. Give him a spanking.
c. He should let his younger brother play with the blocks too.
d. Jimmie should knock something down of his brother's and see how he likes it.
e. Play someplace else.
f. Tell his mother to scold him.

11. Buddy, a six-year-old boy, had a nickel and a penny in his hand. His parents felt sure that the six cents had been taken from his mother's purse. What should they do?

a. Talk to Buddy.
b. Ask him if it was taken from his mother's purse.
c. Not let him have any money to spend.
d. They should spank him.
e. They should take the money away from him.
f. Ask him where he got the nickel and the penny.
8. Jane is very good at games, but she never wants to play unless she can be the leader. The other children want her to play, but don't like the idea of her being leader all the time. What should they do?

a. They should explain to her that they like to be the leader just as well as she does so they should take turns.
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c. Not let him have any money to spend.
d. They should spank him.
e. They should take the money away from him.
f. Ask him where he got the nickel and the penny.
12. Shirley tells the teacher that her pencil-box is missing, and that she thinks someone has stolen it. What should the teacher do?
   a. Find out who took it and punish them.
   b. Keep the class after school.
   c. Make the class pay for the pencil box.
   d. Search all the desks.
   e. See if anyone has it.
   f. Try to find out what happened to it.

13. Billy has had a fight with another boy in school. His clothes are torn and his face has blood on it. He runs home to his mother. What should she do?
   a. Ask him what happened.
   b. Clean him up.
   c. Don't let him wear more clothes for a while.
   d. She should not let Billy play with the boy any more.
   e. She should scold him for fighting.
   f. Tell him to make up with the other boy.

14. Sandra is always trying to be "teacher's pet." She always volunteers for jobs that the teacher wants done, and tries very hard to make the teacher like her. What should be done about Sandra?
   a. The children should make fun of Sandra.
   b. The teacher should call on someone else besides Sandra.
   c. Don't let her have the job all the time.
   d. Choose her sometimes, but not always, treat her like other children.
   e. The teacher should give Sandra a lot of dirty jobs to do.
   f. The teacher should scold Sandra so she shouldn't want to be teacher's pet.

PLEASE NOTE: This page is ditto copy with faint type. Filmed as received.

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ADDITIONAL INSTRUCTIONS

Up here is a situation in which someone has done something. Down here are six possible answers as to what should be done about the situation. Circle the letter to the left of the answer that you think is best, that should be done back to the person.
APPENDIX G

Dart Throwing Strength Measure
Instructions
DART THROWING STRENGTH MEASURE INSTRUCTIONS

This is a game called "Rockets and Planes." Pretend that these (darts) are rockets that you are shooting at those enemy planes. You shoot these in the order 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, from behind this line. If you miss the pad completely you can take the shot over again.
APPENDIX H

Game Preference Measure
GAME PREFERENCE QUESTION

Which of the two games, the pinball or the darts, did you like better?
APPENDIX I

Pinball Game Instructions
PINBALL GAME INSTRUCTIONS

1. "Free Play" Period. (Demonstration and Explanation)

You crank the ball through here (ball return) and put it up here with this lever (ball positioner). Pull the plunger and it shoots up on the board. Each time it hits one of those posts the ball rings, this light goes on and it scores up here. This replay flipper allows you to score more without having to crank the ball through, flip it up, and use the plunger again. (The Subjects then practice using the machine.)

2. Success Trial. (Started when the subjects seemed to be skillful at playing the game.)

Would you like to play a game now? Let me explain one more thing. This is a tilt light, just like on the big machines. It goes on if the game is joggled or played with too roughly. If it goes on, the scoring light and bell go off and the score board won't operate, and you lose the game. The purpose of this game is to get to 100 as quickly as possible. It is a race against time. I'll be the timekeeper. Are you ready? On your mark, get set, go.

3. After completing the game.

Very good. You made it in about four minutes which is excellent time. Now that you have had more practise don't you think you could beat your own time? Are you ready? On your mark, get set, go.

4. Experimental Group instructions after tilt light is activated with the concealed foot lever.

The tilt light is on. Why don't you throw 10 more darts?

5. Control group instructions after finishing the second game.

Very good. You made it in 3 1/2 minutes which is excellent time. You took 1/2 a minute off your old time. Why don't you throw 10 more darts?
APPENDIX J

1. Scatter Plot Diagram of the Extrapunitive and Impunitive Difference Scores.

APPENDIX J
SCATTER-Plot Diagram of Extrapunitive and Impunitive Difference Scores

1 = Score of group frustrated close to goal
0 = Score of unfrustrated control group
x = Score of group frustrated far from goal
Appendix J

Frequency Distributions of Extrapunitive Difference Scores (Right) and Impunitive Difference Scores (Left)
APPENDIX K

Rosenzweig P-F Study Extrapunitive and Intrapunitive Responses on Items 1-24 Pre- and Post-Test
### Number of Responses to Each Extrapunitive (E) and Intrapunitive (I) Item of the Rosenzweig P-F for Pre-test (1) and Post-test (2)

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APPENDIX L

Graphs of Number of Punitive Questionnaire Responses on Items 1-14 Pre- and Post-Test
Appendix L.

Group frustrated far from the goal (3) • Punitive Questionnaire • Graph of frequency of response on items 1-14, Pre-and Post-Test
Appendix L.

Group frustrated close to the goal (I) • Punitive Questionnaire • Graph of frequency of response on items 1-14, Pre- and Post-Test.
Appendix L.

Unfrustrated Control Group (2) • Punitive Questionnaire • Graph of frequency of response on items 1-14, Pre- and Post- Test

PRE-TEST

POST-TEST
APPENDIX M

Graphs of Dart Force Scores for Groups 1, 2, 3, Pre- and Post-Tests for each of the 10 Trials within Each of the Test Sessions
Appendix M

Dart Throwing Force Measure Scores Pre- and Post-test Trials 1-10.
Group frustrated close to the goal (1)
Appendix M

Dart Throwing Forces Measure Scores, Pre- and Post-test, Trials 1-10. Unfrustrated Control-group (2)
Appendix M

Dart Throwing Force Measure Scores, Pre- and Post-Test Trials 1-10
Group frustrated far from the goal (3)
REFERENCES
REFERENCES


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Rosenzweig, S. The Rosenzweig Picture-Frustration Study (P-F) Child Form, 1948.


ABSTRACT
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This study was designed to test the hypothesis that interference with a goal-oriented behavior close to the goal leads to stronger aggressive responses than interference with a goal-oriented behavior far from the goal. The hypothesis was derived from the Goal-Gradient Hypothesis, which states that goal-oriented responses strengthen as the goal is approached, and the Frustration-Aggression Hypothesis, which states that interference with a goal-oriented behavior is a frustration that leads to some form of aggressive response.

The task used in this study was a toy pinball machine. The goal was to score 100 as rapidly as possible. Interference with this goal-oriented activity was accomplished with a concealed, experimenter operated control that turned on a "tilt" light. When the "tilt" light went on, the game was lost. All subjects were given an initial successful trial. On the second trial one group was interfered with close to the goal, after scoring 90 points, another group was interfered with far from the goal, after scoring 20 points. A control group was permitted to succeed a second time.

Eight to ten year old fourth-grade subjects were matched on the Rosenzweig P-F (Child Form) Study Extra-
punitive scores and then randomly assigned to one of the three groups. There were 30 subjects to a group.

In addition to the P-F Study, a projective or fantasy measure, two other measures of aggressive response strength were used: 1) a questionnaire measuring the strength of punishing attitudes, and 2) a dart throwing task designed to measure the force of aggressive motoric responses. The dart throwing force was measured by the depth of penetration of the target.

The P-F Study and the punitive attitude measure were individually administered two months before the experimental session, while the dart throwing force measure was given immediately before the experimental session. All measures were given again after the experimental inductions. The children were also asked which game they liked better, the darts or the pinball. It had been predicted that the frustration experience with the pinball machine would result in preference for the darts.

None of the results of the analysis supported the hypothesis that interference close to a goal produces more or stronger aggressive responses than interference far from a goal. The analysis of the P-F Study Intrapunitive data indicated that the two experimentally frustrated groups became more aggressive toward themselves than the unfrustrated control group.

The results were seen as supporting the Frustration-
Aggression Hypothesis and not supporting the Goal-Gradient Hypothesis. It was reasoned that self-blame, or Intrapunitiveness, probably was a consequence of 1) the subjects perceiving themselves as the cause of losing the pinball game, and 2) the inhibition of overt aggressive responses in the presence of an adult experimenter. Some difficulties of applying the Goal-Gradient Hypothesis to human behavior in its complexity were discussed.
I was born March 30th, 1930, in Boston, Massachusetts. I am the second of three children of Richard A. and Ruth D. Cutter. I attended school in the Boston area and in Washington, D.C. I graduated in 1948 from Noble and Greenough School in Dedham, Massachusetts.

In the fall of 1948 I entered Harvard College, and graduated in 1952 with an A.B. degree.

The following year I worked for an oil company, and a cotton broker.

In the fall of 1953 I studied psychology at Boston University as a special student.

In the fall of 1954 I entered the Graduate School of Boston University. I received my Master's degree in Psychology in 1956.

In the summer of 1956 and in 1957 I worked for the Special Youth Program in Roxbury, Massachusetts as research assistant on a study of the aggressive behavior of teen age street corner groups.

Since the summer of 1957 I have been a psychology trainee at the Veterans Administration Hospital in Brockton, Massachusetts.

I was married in May, 1960 to Constance Gates.