A DEVELOPMENTAL STUDY OF MOTIVATION AND REACTIONS TO FRUSTRATION

by

Leah Brooks McDonough

AN ABSTRACT

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ABSTRACT

The present study was designed to investigate possible age and sex differences in strength of reaction to frustration as related to motivational level. Specifically, it was hypothesized that (1) frustration would result in increased performance; (2) older children would respond more strongly than younger children to frustration in a competitive task; (3) boys would respond more strongly than girls in a competitive task; (4) response to frustration in a non-competitive, tangible reward task would remain relatively constant in all age groups; (5 and 6) strength of response to frustration in either the reward or the competitive task would be related to the relative strength of that motive for the particular child as shown in his daily life, according to mothers' ratings of the child.

The subjects were 100 children in five different age levels: 3-4, 4½-5, 6-6½, 7½-8, 9-9½. In each age group five boys and five girls were given a marble board task under competitive conditions ("to find out who in your class can fill the board the most times"), and five boys and five girls performed the same task for a tangible reward (a small toy) rather than peer competition. After every trial the subjects hit a plunger on the apparatus.

Following two successful trials the subjects were arbitrarily frustrated (prevented from completing the task) without their realizing the arbitrariness of the situation. They were led to believe that they had exceeded the time

limit. Frustrated trials were continued until a specified criterion was reached. Then two more successful trials were given. Speed of performance and force with which the subjects hit a plunger were recorded for every trial. Response to frustration was measured by the change in speed of performance and force of response immediately after introduction of frustration (post frustration latency, post frustration amplitude). In addition, any cumulative effects of repeated frustration were measured by the average speed and amplitude for frustrated trials as compared with the pre-frustration trials (cumulative latency, cumulative amplitude). A fifth measure of response to frustration was the number of trials the subject performed before reaching the criterion (persistence).

Mothers' responses on a rating scale resulted in the child's being classified as relatively more reward-oriented or competition-oriented in his daily life.

The initial hypothesis was not confirmed and neither were the subsequent ones, with the exception of 4. These generally negative results were due in part to the fact that hypotheses 2,3,5, and 6 were dependent on the initial hypothesis. Measures of response to frustration were based on the assumption that increased performance would follow frustration. Actually, although there were some indications of motivational differences between groups in terms of initial performance, they did not show in our

measures of response to frustration. Some subjects increased their performance following frustration, some showed a decrement, and others changed not at all. However a general inhibitory effect of frustration was suggested.

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INTRODUCTION

Frustration

The increasing recognition of the importance of frustration in the understanding of behavior is apparent in the amount of research in this area in recent years. Searching for antecedents and effects of frustration has occupied the time of educators, child psychologists, personality theorists and learning theorists and has led to some generally accepted as well as widely divergent views.

The term frustration has been used to refer to numerous different types of events and conditions, and this has resulted in a variety of approaches to its study. Marx (49) has recently delineated four independent usages of the term: (1) Frustration as an independent variable involving complete or partial blocking of either the consummatory response or some part of a series of instrumental responses. In this usage, frustration is almost indistinguishable from the extinction situation except that the goal object is usually presented, but unattainable; (2) Frustration as an intervening construct, the assumption here being that frustration is an "internal state or condition" produced by thwarting or depriving the individual and thus "has the status of an irrelevant drive with the usual drive-stimulus properties;" (3) Frustration as a dependent variable, the result of antecedent conditions; (4) Frustration as a phenomenon, "the kind of human experience...commonly identi-

fied as 'feelings of frustration'."

A brief review of some definitions of frustration will offer some examples of the above uses of the term and further emphasize the different approaches to research in the area. Brown and Farber (13) use the term to refer to a "hypothetical state or condition of an organism...to be distinguished, therefore, from a frustrating event." Another definition in terms of the organism has been supplied by Zander (81). In this case frustration means "that condition which exists when a response toward a goal believed important and attainable by a given person suffers interference, resulting in a change in behavior characteristic for that person and situation."

Sherman (72) and Maslow and Mittelman (52) stress the threat to the personality and the individual's self-concept and status as a necessary component of or condition for frustration. According to Dollard et. al. (21) "operationally defined, frustration may be said to exist if the organism could have been expected to perform certain acts and if these acts have been prevented from occuring." For Child and Waterhouse (15) frustration refers to "prevention of a person's direct progress toward a goal." In many studies the term is used interchangeably to refer to the internal organismic factors and the external events which are the antecedent conditions of those factors, and sometimes also to the behavioral consequents from which frustration is inferred.

The events that have been manipulated to produce frustration or the conditions which have been assumed to result in it include: arbitrary failure (by means of unsolvable problems, impossible time limits, or false reporting of failure to the subject), delay of reward, interference or blocking, non-reward (including extinction procedures), punishment (verbal or physical), and withdrawal from pleasant surroundings to less pleasant. Actually, the various theories of frustration and methods of manipulating it have led to many ingenious studies which are consistent with each other despite wide divergence in interpretation.

Among the earliest to formulate a theoretical statement on frustration were Barker, Dembo and Lewin (9) who in 1937 published results of their studies of preschool children. After playing with superior toys, the children were returned to their previous collection of less attractive toys with the more appealing ones still in view but behind a barrier. The authors found that "regression" occurred in the level of constructiveness of the play with the older toys. The frustration-regression hypothesis which arose from this study gained favor and was subjected to further experimentation (12).

The frustration-aggression hypothesis postulated by Dollard, et al (21) stated that frustration always leads to some form of aggression, although its expression may be inhibited or displaced. These investigators claim that

"the strength of instigation to aggression varies directly with the amount of frustration" which, in turn, is dependent on three factors: (1) the strength of instigation to the frustrated response, (2) the degree of interference with the frustrated response, and (3) the number of frustrated response-sequences. R. Sears (67) attempted further to explain why aggression may or may not actually occur. He claimed that its occurrence depends on the strength of instigation to it, the amount of inhibition of it (which is a result of previous experience such as non-reward or counter-aggression) and anticipation of reward by aggression (which also is learned, if the aggression in the past has successfully overcome the frustration). In another attempt at clarification of the frustration-aggression hypothesis, Miller (56) stated that it was possible for frustration, in terms of previous learning of the organism, to lead to other forms of behavior than aggression. However, these are not necessarily frustration-reducing, and successive responses of non-aggression are extinguished by continued frustration. Then the probability becomes greater that aggression will become dominant and an aggressive act will occur.

The frustration-aggression hypothesis has aroused heated controversy and stimulated research in numerous areas including social psychology, child-rearing practices, and personality study. Among the dissenters was Lewin (44)

who stated, " it would be scientifically meaningless to make the attempt...of linking the intensity of frustration lawfully with any specific effect (such as aggression); for one would have to know the type of frustration and the detailed setting in order to make any definite derivations."

While frustration is assumed to vary as a function of drive intensity, it in turn has the status of an irrelevant drive (13). Thus, the strength of drive determines the amount of frustration, which in turn in its role as irrelevant drive increases the general motivational level and strengthens any existing response tendency. This is in accord with Hullian theory whereby level of performance is increased by an internal state of emotion (or frustration) and the total effective drive operative at a given time consists of the relevant drive plus any co-existing irrelevant drives.

Marx (49) has recently attempted a clarification of what he calls "two-factor" theories of frustration. These see frustration as a "blocking operation [with] one or both of two basic products: (a) an increment in drive and (b) unique stimulus-response relations, either learned or unlearned, which may or may not be related to the drive product."

Elicitation theory stresses the second of these. Maatsch (46) and Denny and Adelman (20) state that the type of reaction to frustration varies with the type of

situation. On the basis of their experiments, Adelman and Maatsch (1) suggested that resistance to extinction is a function of the type of response elicited by frustration, since those animals permitted to perform a response compatible with the running response (jumping to a ledge) resisted extinction whereas the other frustrated animals (by non-reward) extinguished.

Marx (49) elaborates the learned-unlearned dimension of drive as a reaction to frustration whereby the increase in drive may be considered a natural, unlearned response to blocking or perhaps may be a learned response. The latter hypothesis, that increased drive is learned, is based on the notion that most organisms are conditioned to make vigorous responses as a kind of generalized reaction to frustrating situations. Some of Marx's experiments tend to substantiate this hypothesis. He reports, for example, that animals when trained from an early age can learn to make a less vigorous response after frustration, and concludes: "it is possible that both differential learning... and a natural unlearned tendency towards stronger responses occur." R. Sears' above mentioned views, although they seem more strongly to favor the "natural" aspect of aggression after frustration, also concur in this stress upon learning as a factor in the type and strength of response made to frustration. Marx discusses the "relevant-irrelevant" dimension of drive increment following frustration

and suggests the need for a direct test of both these drive factors within the same experimental setting rather than simply continuing the assumption of irrelevant drive increment.

A review of the literature reveals the following major effects of frustration: (1) an increase in drive or performance level; (2) decrease in performance; (3) elicitation of characteristic responses (attack, escape, avoidance, tangential behavior). The last category relates to the nature of the specific situation, and an individual's make-up, and determines whether (1) or (2) prevails. What Marx refers to as "two-factor" theories of frustration would seem to encompass (1) and (3), whereas elicitation theory includes only (3).

Studies in frustration leading to increase in performance

The energizing effect of frustration had been noted before it was even labeled as such. It has been reported in both human and animal studies.

Experiments with animals

Skinner (73) found that rats pushed a bar harder on early extinction trials than during reinforced training; Marzocco (51) obtained similar results, and Hilgard and Marquis (30) comment on the increase in frequency of response of bar-pushing during early extinction trials. Finch's chimpanzees pressed a spigot with increased energy after the usual water supply was turned off. Sheffield (71)

in studying massed vs. distributed extinction trials concludes that "frustration generated by the omission of reinforcement during extinction has a motivational effect, which shows up as an increased vigor in performing whatever response the subject has a tendency to perform."

Amsel and Roussel (5) and Amsel and Ward (6) similarly remark on the motivating properties of frustration. Bernstein's (10) results lend further support to the frustration-produced drive theory but he also attributes his results to "the mediation of increased or continued vigor of goal-directed responses which become associated with internal stimulus components accompanying the frustration state." Brown and Farber (13) state that "responses elicited at the time frustration is aroused, or shortly thereafter, should be more intense than those elicited when frustration is absent." Davis (18) found increased performance in terms of both latency and amplitude of push on initial extinction trials. Holder et al (32) report increased response strength (in terms of latency) after delay of reward. However, since this increase did not occur immediately, but grew over the trials, they state that their data do not fit the irrelevant-drive hypothesis which would predict an immediate increment in response strength.

Several studies have been concerned with Hull's goal-gradient hypothesis as it relates to frustration. According to Hull, blocking of response closer to the goal

should result in more frustration than blocking further from the goal, since drive is supposedly stronger the closer the organism is to its goal. Lambert and Solomon (39) found that those animals extinguished close to the goal box showed more "excitement" or "frustration-produced drive" (as measured by general activity at the block point) and resisted extinction longer than those animals extinguished further from the goal.

Experiments with humans

The goal gradient hypothesis has been investigated with human subjects also. Lambert et al (38) found resistance to extinction greater in children blocked closer to the goal in a response sequence than those blocked earlier in the sequence. Adelman and Rosenbaum (2) found resistance to extinction greater in those college students blocked closer to the completion of a response sequence than in those blocked farther from the goal, although latency was not differentially affected by the distance of the blocking from the goal. Haner and Brown (29) reported that school children frustrated close to the goal exhibited stronger aggressive responses (as measured by force of push on a plunger) than did children frustrated farther from the goal. Holton's (33) experiment with school children suggested that frustration closer to the goal resulted in greater persistence and greater increase in amplitude of response than frustration more remote from the goal. She

found also that the greater the number of reinforced trials prior to frustration, the greater the increase in amplitude of response post frustration. Performance level continued to increase with successive frustration trials suggesting that its effect was not transient, but up to some point, cumulative. Holton felt that both habit strength and frustration-produced drive might explain her results.

Other studies with humans support the post frustration increment hypothesis. Alessi (3) found the facilitative effects of failure greater than the facilitative effects of success on arithmetic tests. Spence (74) reports the facilitative effects of failure on recognition threshold, rather than the inhibiting effect expected. Screven (65) found increase in response rate with a crank-turning apparatus following delayed reward. Grosslight and Child's (28) results indicated that persistence was a function of previous experience of failure followed by success. Those subjects who were non-rewarded once or twice during the first ten lever-pulling trials extinguished more slowly than those who were rewarded on all of the first ten trials. On the basis of investigations with college students, Child and Whiting (16) conclude that the effect of frustration, generally, is to produce "increased striving" toward the goal in question. Hurlock (34) found both praise and reproof initially facilitating in school children's performance, but prolonged reproof resulted in dec-

rement in performance.

Marquis (48) and Sears and Sears (68) in their studies with infants found that strength of drive (manipulated by withholding the bottle at various times during the feeding period) was related to strength of frustration-reaction, in terms of latency. The hungrier the infant was, the sooner he cried after withdrawal of the bottle.

In a study on the consistency of stress tolerance in college men Stopol (75) found that failure resulted in an increment in performance on a digit symbol task whereas distraction led to a decrement in performance, and concludes that tolerance for the two types of stress (failure and distraction) are independent. The results of an extensive investigation by Waterhouse and Child (79) are somewhat more difficult to evaluate. They propose that "frustration decreases the quality of on-going performance to the extent that frustration evokes other conflicting responses." College students reported in a questionnaire about their habits of response to frustration. Different types of motor and intellectual tasks were given to these students under frustrating (told "doing poorly") or non-frustrating conditions. In general, frustration produced improvement on the tasks although for the group who indicated "high interference" types of reaction to frustration, some slight decrement was found after frustration.

The learned aspect of the increase in performance

after frustration is stressed by Champion (14) who states that the increment may be due "not to a sheer change in level of motivation but to the present stimulus situation eliciting a stronger response as a result of past experience." Olson (59) found that both schizophrenics and normals improved their performance on a digit symbol task after failure instructions (told they were doing poorly), whereas only the schizophrenics improved with praise.

Predicting that "other than aggressive responses would decrease in strength and/or number during prolonged or repeated frustration, whereas dominant-aggressive responses, being frustration-reducing, would increase in number and/or strength" Otis and McCandless (60) studied dominant-aggressive and complaisant-submissive behavior in repeated frustration situations. Their hypotheses included that aggression responses would increase, and submission responses decrease over frustration periods; that children rated high in power-dominance by their teachers would show more aggression and less submission than children rated low and that they would increase more in aggressive behavior than children ranked low; and that children's ratings in affection needs would be positively related to submission scores and negatively related to aggression scores during the whole frustration sequence. Their hypotheses were confirmed in general. The results seem to indicate that although past learning and individual personality needs may

influence initial response to frustration, prolonged frustration results in aggressive responses the strength of which overcomes learned or habitual reaction tendencies.

Studies in frustration leading to decrease in performance

The Barker, Dembo and Lewin studies (9) indicated regression in level of constructiveness of play following frustration. McClelland and Apicella (53) found that college students subjected to experimentally induced failure took longer to learn a card sorting task than did students learning under neutral conditions and concluded that "failure produced conflicts in responding which lowered performance below the true level of learning."

Seashore and Bavelas (70) reported a decrement in performance on the Draw-a-Man Test under repeated instructions to "draw a better one", but there were wide individual differences in time expended on each drawing, amount of verbal aggression and persistence in the task. The observation that frustrated subjects had a higher threshold for all words, not just aggressive ones, than did the control subjects, led Zuckerman (82) to conclude that in general stress impairs performance on tasks requiring complex discrimination and coordination.

Marquart (47) using unsolvable problems and strong shock with adult human subjects concluded that frustration resulted in poorer performance, but since her criteria of frustration were "slow learning, quitting behavior, aggres-

sion, regression or stereoptypy of remark, her argument seems circular; there is no allowance made for possible beneficial effects of frustration, nor perhaps could any be expected in view of the extreme difficulty of the task and intensity of the shock.

Studies in frustration emphasizing the results as dependent upon the specific situation and the individual's personality and reaction tendencies

Zander (81) found that frustration led to a change in the behavior of the children in his study, but that no one form of behavior was typical. The individual differences in reaction were qualitative, quantitative or both. The differences "appeared to be the result of (1) individualized habits of meeting frustration, and (2) varied potency of this situation in threatening the personality of different subjects." The children who received inferior ratings on a group of personality measurements showed regressive or inattentive behavior or both, whereas the superior personality group showed aggressive or attentive behavior or both. Zander concluded that aggression seems to be a normal, healthy form of adjustment. Sex differences appeared, boys showing more non-adjustive behavior and girls more cooperative behavior.

The above mentioned study by Waterhouse and Child (79), while it suggested a predominantly facilitating effect of frustration also pointed up the individualistic

nature of reaction to frustration. Similarly, while Otis and McCandless' (60) work indicated that prolonged frustration resulted in aggression, it also showed that personality needs affect at least the early response to frustration.

Sears et al (69), in a study of pre-school children and their mothers, concluded that the type and amount of frustration and punishment experienced by the child are major determinants of the properties of both dependency and aggression drives. Studying the interactive effects of anxiety and failure Lucas (45) found that the final error score of low-anxious subjects varied inversely with the number of prior failures during training, whereas the high-anxious subjects did more poorly the more failures they had experienced. Two different types of reaction to experimental frustration in a group of Navy men were reported by McKinney, et al (54): "(1) an increase in speed and errors with relative inefficiency and (2) stable performance and efficiency with little increase in speed and errors."

Davitz (19) trained two groups of children in a playroom situation, one rewarded for aggression, one for constructive behavior. Following a frustrating experience (simultaneous removal from a movie in progress and withdrawal of a partially consumed candy bar) those children aggressively trained showed aggression and those constructively trained showed constructive behavior to a signifi-

cant degree. The author concluded that "under the conditions specified in the present experiment, previous training in situations similar to that in which frustration is encountered is a significant determinant of the organism's postfrustration behavior. These results are in contrast with past studies of frustration which have interpreted postfrustration behavior primarily in terms of the frustrating situation itself." Davitz emphasized, however, that not all of the children reacted in accord with their training sessions and this indicated to him that "while the experimental training was a significant factor in terms of the behavior of the group, the total past history of the individual must be considered in predicting and understanding his behavior after frustration."

In a study by Taylor and Farber (77) submissive and ascendant children were found to differ in their post frustration formboard performance, the former group showing a decrement in performance and increase in variability while the latter improved after frustration. Block and Martin (12) rated children as over-controlling or under-controlling in terms of ego-control capacity, and in a replication of the Barker, Dembo, Lewin experiment found that the under-controlling children showed greater decrement in their post frustration level of play constructiveness and made more direct attacks on the barrier than did over-controlling children. They emphasized that overt behavior as

the measure of strength of frustration may be misleading, since the over-controlling child may experience subjectively the same degree of frustration but may differ in his mode of expressing the frustration.

Farber (22) has observed that post frustration increase in drive may affect behavior either favorably or adversely, depending on the specific type of task and the experimental conditions involved. In a critique on reaction to frustration Sargent (64) has stressed "the interoperation of past experience and the present situation in determining the form and content of resulting overt behavior," stating that aggression is not a necessary component of the compensatory or other substitutive behavior. Himmelweit (31), in a review of experimental work in this area concluded that frustration has a different, perhaps even a unique, meaning for different persons, that it must be considered in a physical and social context, and that its quality and intensity depend on each individual's self-concept. Reporting on a number of experiments they conducted, Lazarus *et al* (40) stressed the interaction of motivation, cognitive controls and experimental conditions, stating that "important results may be obscured if only the main effects of conditions are sought, and if personality differences among subjects are not taken into account." According to these writers, the effect of frustration on different individuals may be in opposite directions, depending

on cognitive control characteristics of the subjects. In another study on the effect of psychological stress upon performance Lazarus et al (42) emphasized the importance of considering the type of motivation, the individual's personality and past experience, the conditions of the situation and the type of stress involved (failure, distraction, etc.). Individual differences in reaction to frustration were again emphasized in another study by Lazarus and Eriksen (41) and also in those by Mohsin (57) and Neff (58). Pottharst (62) reported that among a group of college students low n-achievement subjects improved more after experimentally-induced failure than did high n-achievement subjects.

Pastore (61) and Cohn (17) both found that non-arbitrariness in the frustrating situation resulted in less aggression than did an arbitrary setting, with Cohn reporting that an authority figure as the frustrating agent elicited less aggression than a peer. These responses, however, referred to the subject's statements of how he would respond in the described situation, not to how he would actually feel. Junken (36) found that academically retarded and academically advanced children differed in their reactions to peer frustration and adult frustration on the Rosenzweig Picture Frustration Test.

Rosenzweig (63) has emphasized the individual differences shown in reaction to frustration, depending on the

subject's personality needs. For example, the need-persistent individual will center his attention and efforts upon the frustrated need in what might be termed goal-oriented behavior, whereas the ego-defensive individual will be primarily concerned with the maintenance of self-esteem and may actually cease or reduce his efforts in order to save face by the excuse that he wasn't really trying.

Mensh and Mason (55) found that pupils in a progressive school differed from those in a traditional school in their reactions to frustration as measured by the Rosenzweig Test, the latter group showing over-conformity. The effect of early training on later expression and direction of aggression was well illustrated in a comparative study of Finnish and American children on Rosenzweig's Picture Frustration Test, with clear differences shown between the two groups at each age level (76).

Thus it seems that although several studies suggest a decrement in performance following frustration the majority of the investigations on reaction to frustration indicate an increase in response in terms of speed, amplitude, persistence or aggression. However, there is a growing body of evidence to support the importance of considering the entire situation in which the frustration occurs; the nature of the frustration, the type of task, the type of response possible, the situation itself, the individual's personality needs, training, and customary manner

of response and his level of motivation or degree of involvement in the task.

Motivation

The experimental and theoretical work on frustration has necessarily been intertwined with the study of motivation, and most writers have stressed the importance of the organism's involvement in the situation in order for frustration to occur. That is, if the task or situation is not viewed as important or meaningful to the individual the supposedly frustrating event does not really threaten or disturb him sufficiently for him to react in any strong degree. The work on animals has manipulated strength of drive (e.g., food and water deprivation) in establishing the relationship between motivation and response to frustration. Klee's (37) frustration experiments with rats led him to conclude that the greater the degree of "involvement," the greater the effect the frustrating situation is likely to have and the frustrating situation need not be as severe when the involvement is greater.

In experiments with humans, degree of ego-involvement has usually been considered the major determinant of motivation and consequently of the degree of response to frustration. Allport (4) stated that frustration responses are more or less intense as a greater or less amount of the ego is involved. Maslow and Mittelmann (52) limit frustration to those thwartings which involve the total

personality to such an extent that the ego's prestige is threatened.

In most of the studies, ego-involvement was assumed to be identical to self-esteem or to the individual's standing within the group; i.e., a competitive feeling. It seems questionable, however, to equate the importance of ego-involvement or self-esteem across all groups. Instructions which may be ego-involving for one subject may not evoke an equal amount of involvement in another subject. Whereas one subject may be highly motivated by being told that his results will determine his standing within the group or that he is competing with his peers, another subject whose needs are different may be relatively uninvolved by these instructions. Although there has been some fleeting acknowledgement of this it is a relatively unexplored area.

Development of motives

It is generally agreed that the infant does not perceive himself and his environment as two separate entities, but that the process of differentiating his ego from his surroundings, of establishing a self-identity, is gradual (7,23). Only as he differentiates himself from his surroundings can he compare himself with others. Only as he perceives himself as separate from his environment can his self-esteem be dependent on his standing within his group. The infantile omnipotent-ego stage, during which the infant perceives the world and himself as

one, gives way gradually to an awareness of his own identity and leads to the realization that others' opinions of him serve to bolster or deflate his feelings of self-esteem and worth. F. Sears (66) considers self-esteem to be social, related to "the ego-needs as contrasted with the traditional Freudian libidinal needs." While this distinction may be questioned by some, there is general agreement on the gradual development of the competitive factor and the awareness of differences in hierarchy and prestige. Gesell and Ilg (25), Greenberg (27), Leuba (43), and Wolf (80) all maintain that this appears at around the fourth or fifth year.

However, the need to excel is not equally strong in all children and it has been suggested that an inverse relationship might exist between feelings of security or basic worth and a strong need for approval and esteem by others (7). Substantiation for this view may be found in a study by Ausubel et al (8) concerning perceived parental attitudes as determinants of children's ego structure. The authors differentiated between intrinsic valuation and extrinsic valuation, the former implying an acceptance of the individual for himself, apart from consideration of relative competence and ability. Extrinsic valuation, on the other hand, entails more effort on the part of the individual, since he is valued in terms of what he can achieve and of how well he can compete and perform in relation to

others. The authors found intrinsic valuation and parental acceptance highly correlated. In this same study children who perceived themselves as extrinsically valued by their parents showed greater evidence of goal tenacity following cumulative, experimentally induced failure in stylus maze performance. Thus we have reason to assume that self-esteem for one individual may entail his successful competition with his peers whereas for another no such contest and eventual success is required, his self-esteem being independent of his relative achievement.

Sex differences

In addition to possible developmental changes in the strength of a self-esteem motive, there is reason to believe that sex differences also play an important role. Among others, Fenichel (23), Ausubel (7) and Gilbert (26) have stressed the different roles which our culture impresses on boys and girls. Ausubel (7) states "it is generally expected in our culture that adult males will acquire the major portion of their status on the basis of relative competence and performance ability" whereas females are valued simply for themselves apart from considerations of relative competence and ability. These attitudinal differences are apparently communicated at an early age. The girls in the study by Ausubel et al (8) perceived themselves as more accepted and intrinsically valued than did the boys. Tuddenham's (78) study indicated that girls enjoyed more favorable status in the eyes of their class-

mates than did boys.

In a study of persistence in kindergarten children under neutral, competitive, and praise conditions Wolf (80) found a larger percentage of boys among the high competitors. She states that one factor accounting for this might be that in our society little girls are more likely to be coddled than little boys. She also concludes from the family reports on the high competitors, that "these children learn to compete from their social experiences." Her results suggested to her that "while persisting behavior may be somewhat consistent from one situation to another, it is nevertheless highly dependent upon several variables...the kind of task, the specific conditions of the incentive situations, and broad personality characteristics that affect the subject's attitudes toward the various situations." She concludes, "persisting behavior and motivation (in the form of incentives) are, in part at least, learning problems."

Sears, et al (69) in their study of child-rearing antecedents of aggression and dependency conclude that the radical differences in the processes by which these motives are developed are "probably a function of the differential identifications of boys and girls with their mothers" and that "there are deep and pervasive differences in maternal treatment of boys and girls after the first year of life."

Thus it would seem that the need to enhance or maintain self-esteem in a competitive situation develops at around the age of five; that it is likely to be stronger in boys than in girls; and that these sex differences will be more apparent among older children than among the younger ones who have not yet learned their differentiated social roles.

Iverson and Reuder (35) in discussing ego-involvement as an experimental variable concede that it is possible that all human behavior in one way or another is ego-involving. "Nonetheless it is reasonable to conceive of a continuum of ego-involvement such that different degrees of involvement are related to differences in response. At the same time different stimulus situations may consistently evoke different degrees of ego-involvement and consequently different responses."

We may speculate, therefore, that whereas one child may be highly motivated in a task in which he is competing with his peers, another child, less involved in this particular situation, might be more strongly motivated in a non-competitive, individually performed task with a tangible reward.

It would seem also that a child would be relatively consistent in his behavior. For example, if he is reported by his mother to react more strongly in a competitive situation than in a situation where he is seeking a tangible goal, he might be expected to demonstrate this in an experi-

mental setting as well. The child who is reported by his mother to respond more strongly to frustration in tangible reward situations would be expected to show stronger response in a tangible reward experiment than would the child for whom competitive striving is more important.

The preceding survey of the literature suggests that frustration is in general energizing and leads to increased performance whether in terms of latency, amplitude of response, persistence, aggression, and irrelevant and relevant drive accompaniments. However, the wide individual differences reported, especially in the work with human subjects, seems to indicate that in any particular situation frustration does not elicit equally strong responses from all subjects. Assuming that motives are differentially important for different children, and that there may be age differences as well as sex differences in the strength of these motives, experimental manipulation of these motives in a frustration situation may reveal meaningful trends and furnish us with further insights into human motivation.

In this study frustration is operationally defined as prevention of attainment of a goal. It is, therefore, equivalent to what Marx terms "frustration as an independent variable." Response to frustration refers to the performance of the individual following this frustration operation.

Hypotheses

The general hypothesis proposed is that children respond with different degrees of vigor to the frustration of different motives, depending on the strength of the motive for the particular child.

Specifically, we propose to test the following hypotheses:

1. Frustration will lead to increase in performance (as measured by latency and amplitude of response).
2. Response to frustration in a competitive task will increase with age.
3. Response to frustration in a competitive task will be stronger in boys than in girls.
4. Response to frustration in a non-competitive, tangible reward situation will remain relatively constant in all age groups.
5. Among children in the experimental competitive situation those children rated by their mothers as competition-oriented (in terms of responsiveness to frustration in this area) in their daily lives, will respond more strongly than those children rated by their mothers as predominantly reward-oriented.
6. Conversely, among children in the experimental

tangible reward situation, those rated by their mothers as reward-oriented (in terms of responsiveness to frustration in this area) will respond more strongly than those rated by their mothers as predominantly competition-oriented.

METHODOLOGY

Subjects

The subjects included in this study were 100 children divided as follows:

Group 1.	10 boys, 10 girls	age 3 - 4
2.	10 boys, 10 girls	4½ - 5
3.	10 boys, 10 girls	6 - 6½
4.	10 boys, 10 girls	7½ - 8
5.	10 boys, 10 girls	9 - 9½

Among each of these groups five boys and five girls were given the reward-oriented task and five boys and five girls were given the competitive task.

Group 1 consisted of 18 pupils attending a cooperative nursery school for children of students at a large state university, while the remaining two were pupils at the cooperative nursery school for children of faculty at the university. Among the children in Group 2 four were pupils at the nursery school for university students' children, and 16 were in kindergarten in a public elementary school. The great majority of children in this school are from families connected with the university either as faculty or students. The children in Groups 3, 4, and 5 were all pupils at the public elementary school. All of the children in Group 3 were in the first grade; among the children in Group 4, 17 were in the second grade and three were

in the third grade; all the children in Group 5 were in the fourth grade.

The original design of the study called for five age groups, each one to include children within six months of the same age. However, the 3 - 3½ year old group proved difficult to obtain, for two reasons. First, there were fewer of this age children available to begin with, and second, a number of these children were unable to continue the task long enough for a scorable record to be obtained. After only a few trials they would indicate that they wanted to stop. For this reason, the age range was broadened to 3 - 4 years, and 20 scorable records thereby obtained.

However, this problem raised some doubt concerning whether the children were responding to frustration or were simply unable to attend to the task for the length of time entailed. In order to clarify this point five 3 year old girls were tested under the competitive condition but never frustrated. That is, they were allowed to succeed on every trial. These children did show somewhat greater ability to continue the task than did the comparable experimental group. The fact that 35 three year olds were tested in order to obtain 20 scorable records must of course attenuate any findings for this group.

In general the first 10 boys and 10 girls on the school lists falling within the appropriate age range were selected as subjects. However, if it was known that one of

these children was going to be absent for several days, the next child on the list was chosen. The only other selective factor was that the child had to be of white American parents. It was felt that sufficient evidence and theory pointed to the importance of cultural differences in responsiveness to frustration to warrant limiting the sample on this factor.

Apparatus

A task appropriate for all age groups and for both reward and non-reward (competitive) conditions was sought. An adaptation of a task devised by Haner and Brown (29) was eventually decided upon, since certain criteria which seemed important to them and to the present study were met by their apparatus. First, since both motivation and cooperation on the part of the child were necessary, the task and the apparatus were designed as a game. In addition, it was felt by Haner and Brown that the "game" should have a clearly defined starting point, a definite goal, and a procedure which allowed a continuous response to be made by the subject. Third, the task had to permit the experimenter to frustrate the subjects at any distance from the goal and yet not allow the subject to realize the arbitrary nature of the thwarting.

The apparatus (Figures 1 and 2) consisted of two hollow boxes placed one on top of the other. The base box was 12 by 20 by 2½ inches high at the front, rising to a height of 4-3/4 inches at the back. The smaller box, 8 by

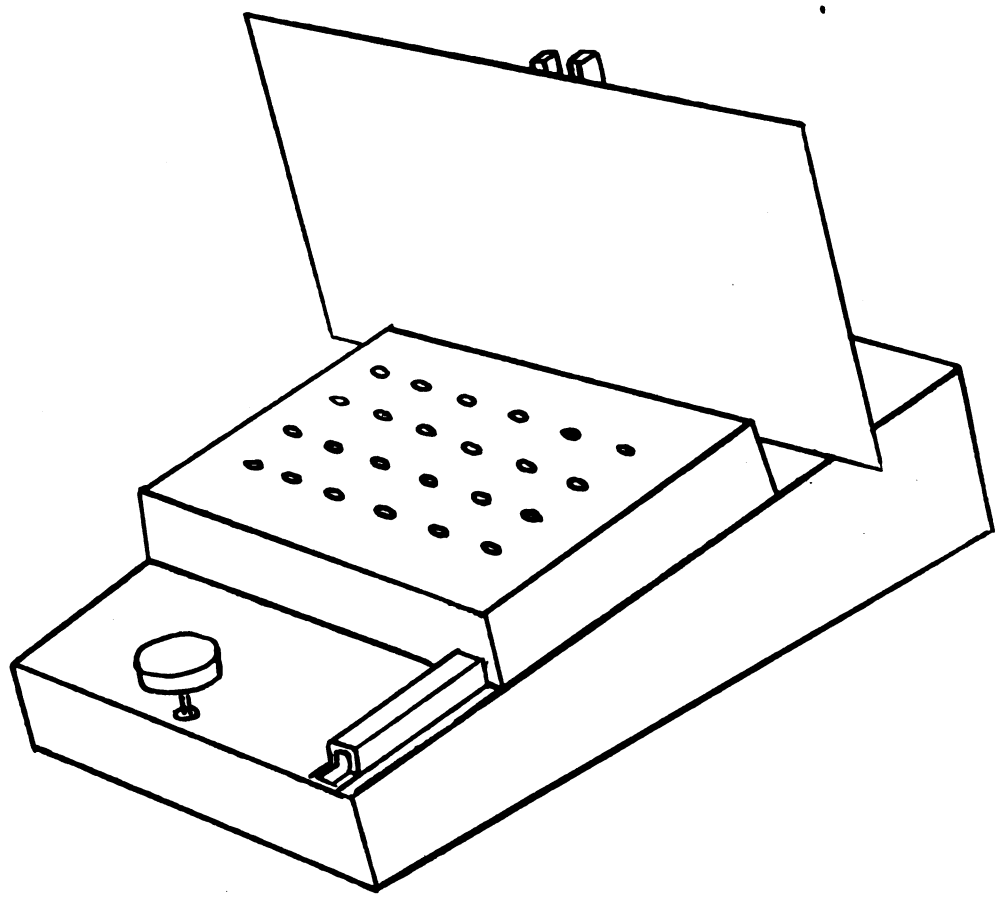

FIGURE 1. APPARATUS

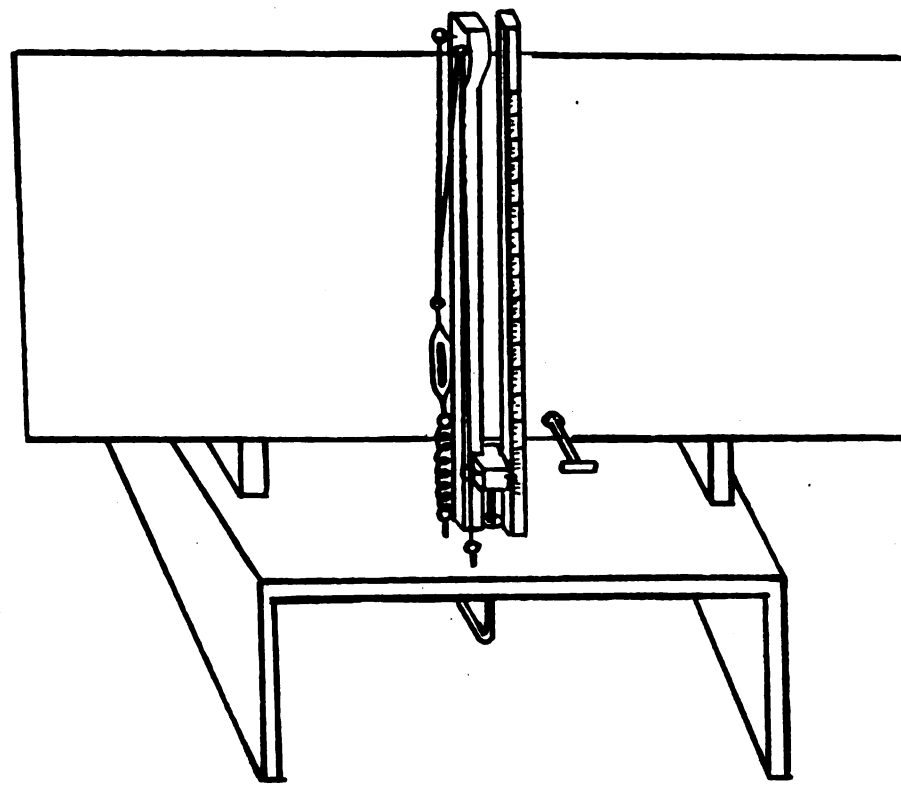

FIGURE 2. APPARATUS

11 by 2-3/4 inches, was mounted exactly in the center of the larger box with its long side (i.e., 11 inches) perpendicular to the long side of the base box. Four rows of six holes each were drilled in the top of the smaller box. Each hole was slightly larger than the ½ inch, clear glass, different colored marbles used in the experiment. Inside the top box was a sliding frame with four strips of wood, 1/8 inch wide, running rowlike directly under the holes, and supporting the marbles placed there. Attached to the wooden frame was a handle which protruded from the rear of the apparatus. When the frame was pulled by the experimenter, the wooden strips and the holes were no longer in juxtaposition and the marbles simultaneously fell into the box. The frame was then returned to its original position by the experimenter for the next trial. In addition to the general slope of the base box, the floor of the marble box was also slanted in a manner which caused the marbles to roll toward the front right corner (i.e., the corner nearest the subject and to his right). A hole in the front of the box permitted the marbles to roll down a tunnel to a small tray, just large enough to contain a single marble. Only when the subject picked up the marble did another become available by rolling into the tray.

Centered directly in front of the subject on the base box, and 4-3/4 inches from the marble box, was a circular wooden plunger, one inch thick and 2-3/4 inches in

diameter. A covering of ¼ inch white foam rubber enclosed this plunger on the top and sides. The plunger was set on a 5/16 inch steel rod which extended down through a hole cut in the top of the base box and then bent at a 90 degree angle to run 15½ inches through the length of the box. At this point it was again angled to vertical position and extended upward through a hole in the box where it activated the recording device (see below). Directly under the plunger, between it and the top of the base box, a distance of two inches, a wire spring encircled the steel bar thereby providing resistance when the plunger was hit. A fulcrum, centered inside and athwart the base box, supported the metal rod connecting the plunger with the recorder. Thus each time the foam rubber plunger was hit by the subject, the rod was depressed in the front and elevated in the back of the box, directly beneath the recording device. This recorder consisted of two wooden columns, 3/4 inch square and 14¼ inches high, placed on either side of the hole from which the steel rod emerged a distance of one inch above the top of the base box. Resting on the end of the rod was a wooden block 3/4 by 1½ by 2 inches, grooved on both sides so that it could "ride" up and down between the two columns. Each time that the subject hit the plunger the block was propelled upward by the push from the steel bar. It was necessary for purposes of recording the height of the block, that it remain elevated after the subject's blow. This was

accomplished by creating tension between the two columns and the wooden block. Tension was produced by stretching a nylon thread in the following manner. A hook was set in the top of the base box directly in front of the column to the experimenter's left. The thread was tied to this hook, then passed upward through an "eye" on the side of the block, and on to the top of the column, going through another eye at this point. From here it ran down until it reached the top eye of a turnbuckle screw, finally returning to the top of the column again where it was secured to another eye. The lower hook of the turnbuckle screw was attached to a vertical two inch light weight spring, stretched to a length of three inches. The bottom of this spring was anchored to another eye set in the top of the base box. It should be mentioned that adjusting the amount of tension on the thread was not entirely satisfactory through use of the turnbuckle. It was found that by removing the thread from the front eye at the top of the column, and either screwing it in or out, variations in the degree of tension could better be achieved. On the face of the column to the right of the experimenter, was pasted a common cloth tape measure, 12 inches long. Measurements of the force of the blow were read directly from this tape. A nail, protruding from the wooden block which rode up between the two columns, pointed to the tape measure and indicated the force of the blow at the maximum

height attained. The block was returned to base position manually by the experimenter after each trial. The particular type of apparatus described was designed in order that the force of the child's initial impact on the plunger might be measured rather than prolonged exerted pressure, since it was felt that this might be a better indicator of immediate reaction to frustration.

In order to determine whether this scale could be considered linear, three different weights were dropped 20 times each on the center of the plunger, through long narrow cardboard tubes. Pointer elevation was recorded for each varying weight. The relationship between weight and elevation proved to be essentially linear. Because it was felt that prolonged use of the instrument (and possibly changes in atmospheric conditions) might affect the sensitivity of the recording device, the following procedure was performed every day prior to testing. First, the experimenter hit the plunger 10 times, returning the pointer to the base each time. Next, a light weight ball was dropped through the tube and on to the plunger and 10 measurements made. Following this, a heavier cylinder was dropped, and a similar number of measurements made. The mean of these trials for each day was computed for each of the two weights. Mean elevation scores (in terms of inches) for the 27 days of testing ranged, for the heavier weight from 2.86 to 3.59, with a total mean of 3.23 and standard

deviation of .12. For the lighter weight, mean elevation ranged from .61 to .85 with a total mean of .69 and a standard deviation of .06. Day to day variations in means were so slight as to be considered negligible, with the exception of three days. On one of these days, the apparatus was adjusted (by tension on thread) prior to testing. On two days however, it was impossible to readjust the apparatus before testing was begun. It was decided, therefore, that the amplitude scores for the 10 children tested on those days should be adjusted. Since the means attained for the experimenter's testing of the apparatus on the two days in question were approximately 10 per cent lower than the mean for all days, 10 per cent of the child's amplitude score was added to his recorded amplitude score, and this increased figure was considered his score.

A plywood board 12 by 20 inches extended across the back of the marble box concealing from the subject everything except the marble board, the container and the plunger to be hit. In order to enhance the "game" element of the task, the apparatus was painted in vivid colors, such as are used in children's toys, the upper box yellow, the lower one blue. The plywood panel was shellacked in a natural finish.

The apparatus was placed on a low table before which the child was seated. The experimenter sat across the table manipulating the wooden frame, timing the trials,

recording the elevation of the pointer and returning it to base position.

The selection of the items used as rewards was influenced by an article by Bijou (11). He reported that the small trinkets available in vending machines seemed to have an almost universal appeal for children. For this study it was felt that these toys would be eminently suitable since they seemed attractive to both boys and girls of all ages. The items used included: an alligator "snapper"; a wooden Indian head; a small plastic whistle; a brightly decorated tin whistle; plastic soldiers and horses (given only to the boys); and rings (given only to the girls).

Procedure

In the elementary school the experimenter went to the child's classroom and invited him to come with her to play a marble game. In the nursery schools the experimenter spent some time in the play rooms with the group, in order that she not seem a total stranger, and invited the child to play the game only when the child was not too absorbed in another activity. In both of the nursery schools, since the mothers of the children take turns teaching, the children are accustomed to a variety of women within the school setting.

Within each age group an attempt was made to take all the children who were to be tested under the competi-

tive condition first, and then take the children who were to be tested under the reward condition. This was done in order that the children under the competitive condition would not enter the situation having seen other children return to the classroom with prizes. It was felt that if this latter situation occurred, the child, in spite of directions, might expect a prize at the end, or that he might feel resentful at the fact that he was not to obtain any prizes, whereas the other children had. As it worked out, in the elementary school it was possible to maintain the same condition (competitive or reward) for each separate class. That is, all the children from every class who were tested were subjected to the same condition. Since the children are randomly assigned to different classes within the same grade level, not according to intellectual ability or any other specific factor, it was felt that this procedure did not result in a biased sample.

The children who were being tested under the competitive condition were given the following directions: "Look at this board with holes in it. The idea is to take one of these marbles (experimenter pointing to the container with the marble), put it in a hole, then take another marble, put it in a hole -- until you get the whole board filled with marbles. We want to find out who in your class can fill the board the most times. Any time you don't get the board filled fast enough, within the time allowed, all

the marbles will drop through the holes. Every time the marbles drop through the holes you hit this"(experimenter pointing to the plunger). Experimenter gestured with her fist over the plunger as if to hit it and then told the subject to hit it once before starting to see how it worked. If the child seemed at all unsure the directions were repeated.

For the children being tested under the reward condition the following directions were given: "Look at this board with holes in it. The idea is to take one of these marbles (experimenter pointing to the container with marble in it), put it in a hole, then take another marble, put it in a hole--- until you get the whole board filled with marbles. Every time you get the whole board filled with marbles you get a little prize that you can take home with you. Every time you don't get the board filled fast enough ....." and so on as above.

For the three year old group the instructions were the same except for the time element which was stated as follows: "Any time you don't get the board filled fast enough, if you don't get all the marbles in by the time this clock goes around, the marbles will drop through the holes." During the experiment the stop watch was held in the experimenter's left hand and the child could not actually see the position of the watch hand.

During the experiment if the subject dropped a

marble he was told to let it go and that there were plenty of marbles in the box.

The experiment proceeded as follows: the subject was allowed to complete two trials. For the reward group at the end of each of these two trials the experimenter took one of the toys from a box concealed under the table and placed it on the table to the right side of the apparatus. After trial 1 the experimenter said "We'll leave all the prizes you win here and then you can take them all with you when you leave." On trial 3, after marble 21 was placed the experimenter said, "Time is up," clicking the stop watch ostentatiously and dropping the marbles. On succeeding trials the experimenter dropped the marbles after marble 20,21,22 or 23 was placed, in random order, always clicking the stopwatch and looking at it intently. This emphasis on the watch was to prevent the subject's realizing the arbitrariness of the situation and was intended to lead him to feel he could complete the task if he worked fast enough. The children were frustrated close to the goal (i.e., after at least 20 marbles had been placed) because Haner and Brown (29) found greater response to frustration the closer the subjects were to completion of the task.

Each trial was timed until the subject had finished placing marble 20. The elapsed time is referred to as the latency measure. The force with which he hit the

plunger (as measured by elevation of the pointer) was recorded for each trial. This is our amplitude measure.

The subject was allowed to continue attempting to fill the board until on two successive trials he was slower than he was on trial 2 or 3, whichever was faster. Since it was felt that every child should finish the experiment with a feeling of success he was then allowed to complete two trials and the experiment was over. Some subjects, before reaching this criterion stated that they wanted to stop. They were urged to try again and were allowed to succeed. After this successful trial most of the children immediately began another trial which they were allowed to complete and the experiment was then terminated. If the subject did not finish this final trial by himself he was urged to try "once again" and allowed to complete it. Seven children (six 3 year olds, one 4½ year old) refused this final trial. In other words, every child (except for the seven who had only one successful final trial) finished the experiment with two successful trials and considerable praise from the experimenter. There was no encouragement or urging throughout the entire procedure other than that mentioned above.

Some children never completed any trial (to marble 20) as fast as they had done trial 2 or 3. However these subjects were not allowed to succeed after only two of these slow trials but continued the task for six successive fail-

ure trials then allowed to succeed twice. In other words, every child had at least ten trials, four of which were successful. These children were arbitrarily kept at the task this long in order that any cumulative effects of frustration would be available for all children. There were three exceptions; three children who refused to continue for the six failure trials.

The number of trials between trial 7 and the first of the two successive trials slower than trial 2 (or 3) is our persistence score. Thus a child who slowed down immediately after trial 2, but was kept at the task for six successive trials received a persistence score of zero. The three children who refused to continue for this many trials received negative scores. If the child, prior to reaching the criterion of two successively slower trials stated that he wanted to stop, the number of trials from trial 7 to the final two successful ones was his persistence score.

It was decided that a time limit of one hour be set for each child. If at the end of an hour he was still working faster than he had on trial 2 or 3 he was arbitrarily given the two final successful trials. In our sample of 100 children three persisted for the full hour allowed.

For every child, then, we have three major measures of response to frustration:

1. Post frustration latency: the time for trial 3 minus the time for trial 4.

2. Post frustration amplitude: the height of the pointer on trial 3 minus the height of the pointer on trial 2.

3. Persistence: the number of trials between trial 7 and the first of the two criterion trials, or between trial 7 and the trial after which the subject stated his desire to stop.

In addition, in order to assess any cumulative effects of frustration the following scores were computed for each child:

1a. Cumulative latency: the time for trial 2 or 3 (whichever was shorter) minus the average time for trials 4 - 9.

2a. Cumulative amplitude: the average height of the pointer on trials 3 - 8, minus the average height of the pointer on trials 1 and 2.

It might be well here to elaborate on what we intended to measure by our amplitude score. If the frustration-aggression hypothesis were valid, a situation such as this, where hitting an object were permissible and even encouraged, might reveal any increase in aggression immediately after frustration, and/or after any cumulative effects of frustration had built up. Therefore it was intended as a measure of aggression. In addition, the theoretical arguments concerning frustration-induced drive increment as a result of irrelevant drive could possibly by clarified some-

what by a comparison of responses to an irrelevant task and a relevant task within the same experiment. This had been suggested by Marx (49). Hitting the plunger served no real purpose for our subjects. They were simply told they were to hit it every time the marbles dropped. A few of them questioned the reason and were told "It's just part of the game." Thus this measure might be termed a test of irrelevant drive and the latency score a test of relevant drive, since the subject was led to believe that if he worked fast enough he could succeed.

In addition to the above measures a rating on the child's responsiveness to frustration of different motives in his daily life was obtained from his mother. A letter and a rating scale (Appendix 1 and 2) were sent to the mother of each child. The rating scale contained twenty sentences. Ten of them referred to the child's usual degree of responsiveness to frustration in attainment of a tangible reward. Ten referred to his responsiveness to frustration in a more competitive area or where his self-esteem might depend on others' opinions of him. Each item was to be scored from one to four, one indicating no response in this type of situation, four indicating violent response. Thus for each child two scores were obtained, each of which could range from ten to forty.

Of the 100 children included in the study mothers' ratings were obtained for 86. Some of the mothers did not

return the forms, even after a follow-up telephone call, and some responded in such a way as to make them unscorable. Each child was rated as reward-oriented or competition-oriented depending on which of the two scores was higher. Where both scores were the same, no rating was given and the child was not included in the section of the study concerned with mothers' ratings.

RESULTS

Response to frustration in terms of the measures described in the preceding chapter was calculated for each of the four groups, Female Competitive, Female Reward, Male Competitive and Male Reward (hereafter referred to as FC, FR, MC, MR), within each of the five age levels. Immediate response to frustration in terms of mean latency and amplitude changes is shown in Tables I and II. Median changes in latency and amplitude are graphically represented in Figs. 3 and 4 respectively. Cumulative effects of frustration in terms of latency and amplitude are shown in Tables III and IV. Negative latency scores indicate that the subject performed more slowly following frustration than preceeding it. Negative amplitude scores resulted when the subject hit the plunger less hard following frustration than he had previous to frustration. Mean persistence scores are shown in Table V while median persistence scores are presented in Fig. 5.

The least extreme differences in variance occurred in the cumulative amplitude scores, shown in Table IV. Hartley's F max test for homogeneity of variance applied to these data resulted in a chi square of 9.69. For df 5, 19, this is significant at the .01 level. The extreme heterogeneity of variance for each of these measures rendered the data unsuitable for analysis by parametric statistics. Analysis of variance by non-parametric methods was also

TABLE I

POST FRUSTRATION LATENCY MEAN SCORES

	Age Level				
Group	3	4½	6	7½	9
FC	-12.6	6.8	.8	..6	1.2
FR	4.8	-0.2	-.6	1.0	1.2
MC	5.8	-1.6	-.6	-.2	1.0
MR	-5.0	4.8	2.4	.4	-1.8
Means	-1.75	2.45	.50	.45	.40
Variance	655.39	38.25	16.25	5.75	4.14

TABLE II

POST FRUSTRATION AMPLITUDE MEAN SCORES

	Age Level				
Group	3	4½	6	7½	9
FC	-.18	.78	-.23	-.35	.15
FR	-.15	-.07	-.10	.35	-.42
MC	-.32	-.01	-.45	.37	-1.05
MR	-.12	-.56	-.17	-.35	-1.00
Means	-.19	.03	-.24	.006	-.58
Variance	.23	2.05	.52	1.13	3.07

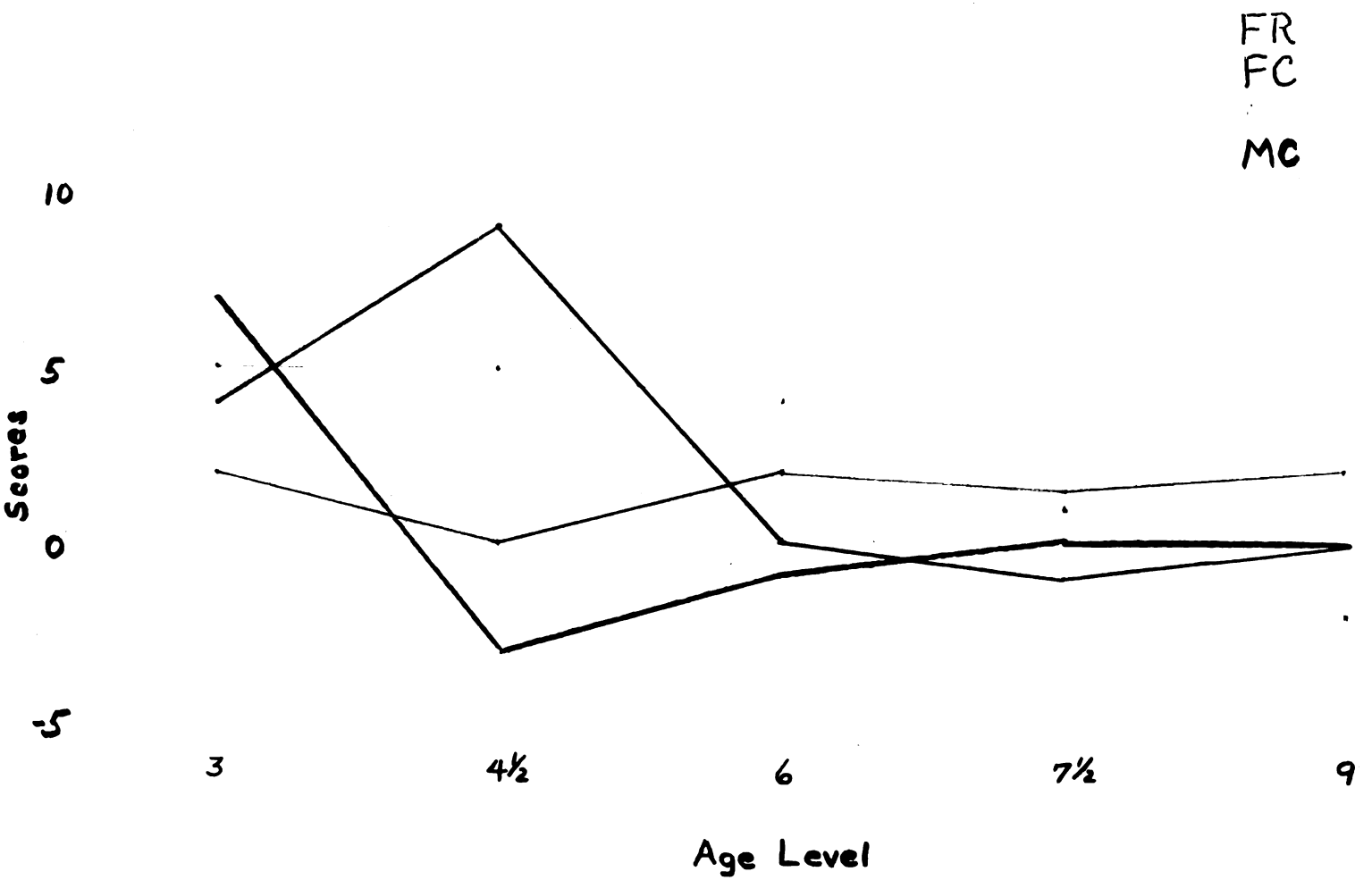

FIGURE 3. MEDIAN POST FRUSTRATION LATENCY SCORES

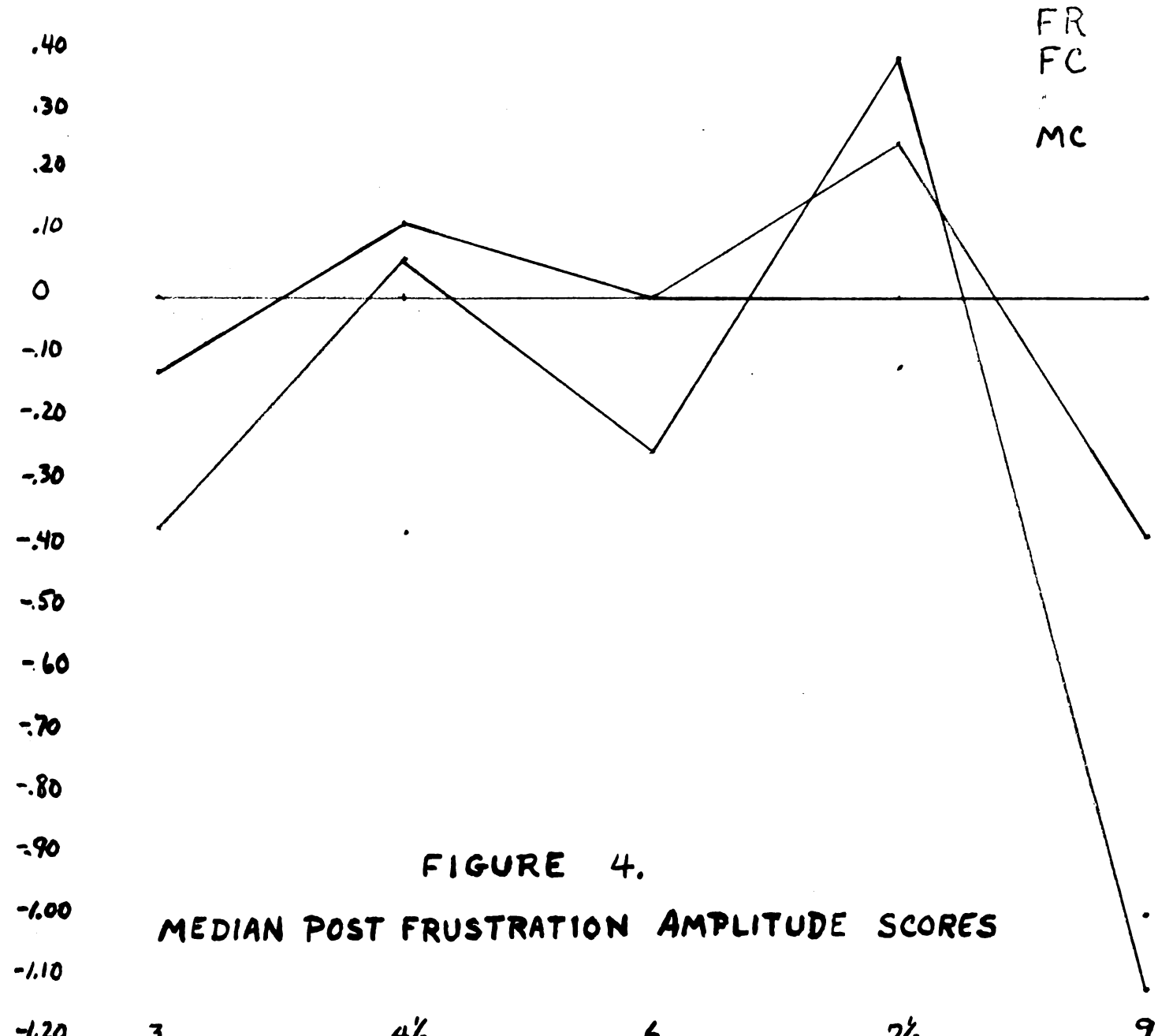

FIGURE 4.

MEDIAN POST FRUSTRATION AMPLITUDE SCORES

TABLE III

CUMULATIVE LATENCY MEAN SCORES

	Age Level				
Group	3	4½	6	7½	9
FC	-16.06	-3.18	-1.38	-.30	.02
FR	-2.14	.48	-2.04	-.10	-.40
MC	-15.62	-2.32	-1.38	-.36	-.14
MR	-7.20	-.72	-.02	-1.22	-.36
Means	-10.36	-1.44	-1.21	-.50	-.22
Variance	234.81	24.14	5.78	4.07	1.87

TABLE IV

CUMULATIVE AMPLITUDE MEAN SCORES

	Age Level				
Group	3	4½	6	7½	9
FC	-.29	.60	-.20	-.21	-.26
FR	.09	.01	-.03	-.30	-.02
MC	.21	.86	-.92	-.17	-.04
MR	-.04	-.07	.17	-.50	-1.97
Means	-.01	.35	-.24	-.30	-.57
Variance	.26	.63	.63	.52	2.52
F max	9.69**	df	5,19		

** significant at the .01 level

TABLE V

MEAN PERSISTENCE SCORES

	Age Level				
Group	3	4½	6	7½	9
FC	-.2	4.8	9.2	13.0	12.5
FR	1.6	9.8	14.2	21.4	3.2
MC	.6	1.6	5.4	16.4	7.6
MR	2.8	4.0	6.0	10.4	33.2
Means	1.20	5.05	8.70	15.30	14.10
Variance	3.96	61.85	236.11	443.41	568.99

TABLE VI

POST FRUSTRATION LATENCY IMPROVEMENT

	+	not +	Totals
Observed frequencies	53	47	100
Expected frequencies	50	50	100
	Chi square .25		
	Not significant		

FIGURE 5. MEDIAN PERSISTENCE SCORES

unsuitable for these data because ranking the scores would have resulted in any subject who showed no change (either increase or decrease after frustration) being ranked higher than a subject who showed a marked decrease following frustration. To consider the former subject more responsive to frustration than the subject who markedly decreased his performance following frustration would distort the meaning of our findings.

Although chi square was a less sensitive test than might be desired, it was felt to be the most appropriate statistic by which to test our hypotheses. It was used as a two-tailed test in every instance.

Hypothesis 1. Frustration will lead to increase in performance (as measured by latency and amplitude of response).

Immediate response to frustration as measured by increase in performance (i.e., decreased latency) is shown in Table VI. Those subjects who performed faster on the trial immediately following frustration were entered in the + cell; those who slowed down or showed no change were entered in the not + cell. The resulting chi square value of .25 is not significant (all chi square values in this study were corrected for continuity).

Immediate response to frustration in terms of increased amplitude (i.e., hitting the plunger harder following the trial in which frustration was introduced, as compared to amplitude on the trial immediately preceding it)

is shown in Table VII. Those subjects who hit harder were entered in the + cell, and those who hit less vigorously or with the same force on both trials were entered in the not + cell. The chi square value of 6.25 is significant at the .02 level, but the results are in the opposite direction from those expected. That is, there was a decrease in amplitude of response immediately following frustration.

Cumulative effects of frustration on latency are shown in Table VIII. The chi square value of 3.61 is not significant, but there is some indication of a tendency for the subjects to slow down rather than speed up.

Cumulative effects of frustration on amplitude are shown in Table IX. The chi square value of 7.29 is significant at the .01 level, but again in the opposite direction from that predicted. The subjects hit less vigorously with repeated frustration.

Therefore, hypothesis 1 is not confirmed. It can be said in this experiment that frustration did not lead to increase in performance (either immediately or after pro - longed thwarting) in terms of latency or amplitude. In fact, the results suggest the opposite trend.

Hypothesis 2. Response to frustration in a competitive task will increase with age.

Since the competitive motive is supposed to become manifest at around five years of age the 50 subjects who performed under the competitive conditions were di-

TABLE VII

POST FRUSTRATION AMPLITUDE INCREASE

	+	not+	Totals
Observed frequencies	37	63	100
Expected frequencies	50	50	100
	Chi square 6.25 $p < .02$		

TABLE VIII

CUMULATIVE LATENCY IMPROVEMENT

	+	not+	Totals
Observed frequencies	40	60	100
Expected frequencies	50	50	100
	Chi square 3.61 Not significant		

TABLE IX

CUMULATIVE AMPLITUDE INCREASE

	+	not +	Totals
Observed frequencies	36	64	100
Expected frequencies	50	50	100
	Chi square 7.29 $p < .01$		

TABLE X

COMPARISON OF OLDER AND YOUNGER CHILDREN
IN POST FRUSTRATION LATENCY IN THE COMPETITIVE TASK

	Age Levels 3,4½	6,7½,9	Totals
+	14	11	25
not +	6	19	25
Totals	20	30	50
	Chi square 4.08 $p < .05$		

chotomized into two groups: the 3 and 4½ year old subjects, and the 6, 7½, and 9 year old subjects. Also on the basis of performance on the first three trials (pre-frustration) the 6 year olds seemed more similar to the older children than to the younger children. The results on post frustration latency and amplitude, cumulative latency and amplitude and persistence are shown in Tables X, XI, XII, XIII, and XIV. Table X indicates that although chi square is significant at the .05 level the results are in the opposite direction than predicted, the younger children showing greater speed-up and the older children slowing down immediately following frustration.

No significant difference between the older and younger children was shown in post frustration amplitude (Table XI). There was also no significant difference between the younger and older children in the cumulative effects of frustration on latency (Table XII). However, the cumulative effects of frustration on amplitude (Table XIII) were significantly different for the older and younger children, again in the opposite direction than predicted. Younger children in the competitive situation tended to increase the force with which they hit the plunger over repeated frustration trials, while the older children hit less vigorously with repeated frustration.

The persistence scores were dichotomized into those above and below the combined median for all subjects

TABLE XI

COMPARISON OF OLDER AND YOUNGER CHILDREN
IN POST FRUSTRATION AMPLITUDE IN THE COMPETITIVE TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	10	12	22
not +	10	18	28
Totals	20	30	50

Chi square .17
Not significant

TABLE XII

COMPARISON OF OLDER AND YOUNGER CHILDREN
IN CUMULATIVE LATENCY IN THE COMPETITIVE TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	6	12	18
not +	14	18	32
Totals	20	30	50

Chi square .18
Not significant

TABLE XIII

COMPARISON OF OLDER AND YOUNGER CHILDREN IN CUMULATIVE AMPLITUDE IN THE COMPETITIVE TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	13	9	22
not +	7	21	28
Totals	20	30	50

Chi square 4.63
$p < .05$

TABLE XIV

COMPARISON OF OLDER AND YOUNGER CHILDREN IN PERSISTENCE IN THE COMPETITIVE TASK

	Age Levels		Totals
	3,4½	6,7½,9	
Above combined Mdn.	2	16	18
Below combined Mdn	18	14	32
Totals	20	30	50

Chi square 7.99
$p < .01$

in the competitive task (Table XIV). Although the results are significant at the .01 level in the predicted direction they are in a sense an artifact of the statistics, since inspection of Table V reveals that the younger children were generally less persistent than older ones, no matter under which condition they performed, or even if never frustrated at the 3 year level (see page 30).

Therefore, hypothesis 2 was not confirmed in terms of our measures of frustration. However, cumulative amplitude did show a significant change in the direction opposite to that predicted.

> Hypothesis 3. Response to frustration in a competitive task will be stronger in boys than in girls.

For the children who performed under the competitive condition response to frustration in terms of post frustration latency and amplitude, cumulative latency and amplitude, and persistence are shown in Tables XV, XVI, XVII, XVIII AND XIX. None of them approached significance, hence hypothesis 3 was not confirmed.

> Hypothesis 4. Response to frustration in a non-competitive, tangible reward situation will remain relatively constant in all age groups.

Because of small expected frequencies in the contingency tables when each age comprised a separate cell several age categories were combined. The children who performed under the reward condition were dichotomized into

TABLE XV

COMPARISON OF BOYS AND GIRLS
IN POST FRUSTRATION LATENCY IN THE COMPETITIVE TASK

	Boys	Girls	Totals
+	11	14	25
not +	14	11	25
Totals	25	25	50

Chi square .32
Not significant

TABLE XVI

COMPARISON OF BOYS AND GIRLS
IN POST FRUSTRATION AMPLITUDE IN THE COMPETITIVE TASK

	Boys	Girls	Totals
+	12	10	22
not +	13	15	28
Totals	25	25	50

Chi square .08
Not significant

TABLE XVII

COMPARISON OF BOYS AND GIRLS
IN CUMULATIVE LATENCY IN THE COMPETITIVE TASK

	Boys	Girls	Totals
+	10	8	18
not +	15	17	32
Totals	25	25	50

Chi square .09
Not significant

TABLE XVIII

COMPARISON OF BOYS AND GIRLS
IN CUMULATIVE AMPLITUDE IN THE COMPETITIVE TASK

	Boys	Girls	Totals
+	11	11	22
not +	14	14	28
Totals	25	25	50

Chi square .08
Not significant

TABLE XIX

COMPARISON OF BOYS AND GIRLS
IN PERSISTENCE IN THE COMPETITIVE TASK

	Boys	Girls	Totals
Above combined Mdn	8	10	18
Below combined Mdn	17	15	32
Totals	25	25	50

Chi square .09
Not significant

TABLE XX

COMPARISON OF OLDER AND YOUNGER CHILDREN
IN POST FRUSTRATION LATENCY IN THE REWARD TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	12	16	28
not +	8	14	22
Totals	20	30	50

Chi square .03
Not significant

two age groups: 3 and 4½ year olds, and 6, 7½ and 9 year olds. Results are shown in Tables XX, XXI, XXII, XXIII and XXIV. Neither the latency measures, the amplitude measures, nor the persistence measure resulted in any significant differences in response to frustration between the age groups. Hence hypothesis 4 is tenable.

> Hypothesis 5. Among children in the experimental competitive situation those children rated by their mothers as competition-oriented (in terms of responsiveness to frustration in this area) in their daily lives, will respond more strongly than those children rated by their mothers as predominantly reward-oriented.

Results for the children who performed in the competitive situation are shown in Tables XXV, XXVI, XXVII, XXVIII and XXIX. There were no significant differences between the children rated as reward-oriented and those rated competition-oriented by their mothers for any of our measures. Therefore hypothesis 5 was not confirmed.

> Hypothesis 6. Among children in the experimental reward situation those children rated by their mothers as reward-oriented (in terms of responsiveness to frustration in this area) will respond more strongly than those children rated by their mothers as predominantly competition-oriented.

The results for all the children who performed in the reward situation are shown in Tables XXX, XXXI, XXXII, XXXIII and XXXIV. None of our measures of response to frustration revealed any difference between the two groups. Hypothesis 6 was not confirmed.

TABLE XXI

COMPARISON OF OLDER AND YOUNGER CHILDREN
IN POST FRUSTRATION AMPLITUDE IN THE REWARD TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	4	11	15
not +	16	19	35
Totals	20	30	50

Chi square .89
Not significant

TABLE XXII

COMPARISON OF OLDER AND YOUNGER CHILDREN
IN CUMULATIVE LATENCY IN THE REWARD TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	8	14	22
not +	12	16	28
Totals	20	30	50

Chi square .03
Not significant

TABLE XXIII

COMPARISON OF OLDER AND YOUNGER CHILDREN IN CUMULATIVE AMPLITUDE IN THE REWARD TASK

	Age Levels		Totals
	3,4½	6,7½,9	
+	5	9	14
not +	15	21	36
Totals	20	30	50

Chi square .004
Not significant

TABLE XXIV

COMPARISON OF OLDER AND YOUNGER CHILDREN IN PERSISTENCE IN THE REWARD TASK

	Age Levels		Totals
	3,4½	6,7½,9	
Above combined Mdn	8	14	22
Below combined Mdn	12	16	28
	20	30	50

Chi square .03
Not significant

TABLE XXV

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN POST FRUSTRATION LATENCY IN THE COMPETITIVE TASK

	Mother's Rating		Totals
	Reward	Competition	
+	9	10	19
not +	6	16	22
Totals	15	26	41

Chi square 1.01
Not significant

TABLE XXVI

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN POST FRUSTRATION AMPLITUDE IN THE COMPETITIVE TASK

	Mother's Rating		Totals
	Reward	Competition	
+	7	11	18
not +	8	15	23
Totals	15	26	41

Chi square .003
Not significant

TABLE XXVII

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN CUMULATIVE LATENCY IN THE COMPETITIVE TASK

	Mother's Rating		Totals
	Reward	Competition	
+	5	11	16
not +	10	15	25
Totals	15	26	41

Chi square .06
Not significant

TABLE XXVIII

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN CUMULATIVE AMPLITUDE IN THE COMPETITIVE TASK

	Mother's Rating		Totals
	Reward	Competition	
+	8	10	18
not +	7	16	23
Totals	15	26	41

Chi square .36
Not significant

TABLE XXIX

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN PERSISTENCE IN THE COMPETITIVE TASK

	Mother's Rating		Totals
	Reward	Competition	
Above combined Mdn	4	12	16
Below combined Mdn	11	14	25
Totals	15	26	41

Chi square .81
Not significant

TABLE XXX

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN POST FRUSTRATION LATENCY IN THE REWARD TASK

	Mother's Rating		Totals
	Reward	Competition	
+	7	15	22
not +	5	9	14
Totals	12	24	36

Chi square .01
Not significant

TABLE XXXI

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN POST FRUSTRATION AMPLITUDE IN THE REWARD TASK

	Mother's Rating		Totals
	Reward	Competition	
+	5	7	12
not +	7	17	24
Totals	12	24	36

Chi square .14
Not significant

TABLE XXXII

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN CUMULATIVE LATENCY IN THE REWARD TASK

	Mother's Rating		Totals
	Reward	Competition	
+	6	11	17
not +	6	13	19
Totals	12	24	36

Chi square .01
Not significant

TABLE XXXIII

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN CUMULATIVE AMPLITUDE IN THE REWARD TASK

	Mother's Rating		Totals
	Reward	Competition	
+	3	7	10
not +	9	17	26
Totals	12	24	36

Chi square .02
Not significant

TABLE XXXIV

COMPARISON OF REWARD- AND COMPETITION-ORIENTED CHILDREN IN PERSISTENCE IN THE REWARD TASK

	Mother's Rating		Totals
	Reward	Competition	
Above combined Mdn	5	13	18
Below combined Mdn	7	11	18
	12	24	36

Chi square .12
Not significant

Motivational level.

Our major hypothesis was concerned with motivational differences related to age and sex. In order to determine the performance level for each group, aside from frustration effects, the average time for the first three trials was computed. The results are shown in Table XXXVI. With the exception of the 7½ year olds the FR group was fastest in every case. At every age the FR group exceeded the FC group.

Additional findings.

Although most of the hypotheses were not confirmed, an examination of the data revealed some interesting findings. It can be seen that the variance is related to age for some of our measures. The younger children showed extreme variability in both latency measures (Tables I and III), whereas the older children showed considerably less. The opposite trend is apparent in the persistence scores (Table V). The younger children varied little; none of them persisted beyond seven trials, whereas among the 9 year olds persistence scores ranged from 0 to 97.

For every subject the strongest force with which he hit the plunger on any frustrated trial was determined. The averages of these peak responses are shown in Table XXXV. It is apparent that the force of the response was related to age in the case of the boys, the older boys hitting harder than the younger ones. This might be expec-

TABLE XXXV

PEAK AMPLITUDE MEAN SCORES

	Age Level				
Group	3	4½	6	7½	9
FC	1.22	3.78	1.92	2.65	2.17
FR	2.43	1.65	2.21	2.70	3.70
MC	2.63	3.72	3.62	4.93	7.92
MR	1.25	2.80	3.08	4.33	5.55
Means	1.88	2.99	2.71	3.66	4.84
Variance	2.18	3.74	3.50	4.87	9.66

TABLE XXXVI

MEAN LATENCY ON FIRST 3 TRIALS

	Age Level				
Group	3	4½	6	7½	9
FC	91.8	57.8	39.7	36.68	33.1
FR	72.3	52.4	37.9	36.66	28.8
MC	73.8	58.2	49.3	33.8	33.3
MR	87.0	64.2	44.0	35.6	33.0
Means	81.24	58.21	42.76	35.70	32.09
Variance	378.64	132.26	72.35	15.61	10.58

ted on the basis of muscular development. However, this trend is not apparent in the girls. The three hardest hitting girls were a 9 year old, a 4½ year old and a 3 year old. Among the 3 and 4½ year old groups none of the boys hit as hard as the hardest hitting girls, nor did any of the older girls (with the exception of the one 9 year old).

It seemed that a certain pattern of responding to frustration might be typical for each child; whereas one child might be "energized" by frustration and work faster and hit harder another child might work more slowly and hit less hard following frustration. In order to determine any relationships between the measures correlation coefficients were obtained, shown in Table XXXVII. A positive correlation ($r = .234$) significant at the .05 level was found between cumulative latency and persistence. None of the other measures were significantly correlated.

It seemed possible that some of the effects of frustration were being camouflaged by the presence of both positive and negative scores. Therefore, in order to determine whether any groups showed stronger response to frustration, no matter in which direction, post frustration latency and post frustration amplitude scores were computed disregarding sign. At every age level the MC group showed least response to frustration in terms of post frustration latency. There was no consistent pattern in the post frustration amplitude scores.

TABLE XXXVII

CORRELATIONS BETWEEN MEASURES OF RESPONSE TO FRUSTRATION

Measures	r
Post frustration latency and persistence	.037
Post frustration latency and post frustration amplitude	.013
Cumulative latency and persistence	.234 *
Cumulative latency and cumulative amplitude	-.086
Persistence and post frustration amplitude	.049
Persistence and cumulative amplitude	-.133

* $p < .05$

TABLE XXXVIII

LATENCY IMPROVEMENT FOLLOWING SUCCESS

	+	not +	Totals
Observed frequencies	71	22	93
Expected frequencies	46.5	46.5	93
	Chi square	24.76	
	$p < .001$		

Observation of performance on the final successful trials revealed an interesting finding. As has been stated, the first of these two trials was given after the subject was slower on two successive trials than he had been on trial 2 or 3, or after he had stated his desire to stop. Seven subjects refused to continue after this first final success trial. Of the 93 subjects who completed both of the final success trials 71 worked faster after the introduction of success; that is, the final trial was performed more quickly than the previous one. The results are shown in Table XXXVIII. The chi square of 24.76 is significant at the .001 level. Here again there is evidence that the frustration, in general, inhibited speed of performance.

The mothers' ratings of the children's relative responsiveness to frustration in reward and competition situations were analyzed for age and sex differences. The results are shown in Tables XXXIX and XL. There was no significant difference between boys and girls. However, the older children were rated as significantly more competition-oriented than reward-oriented.

TABLE XXXIX

COMPARISON OF OLDER AND YOUNGER CHILDREN AS RATED BY THEIR MOTHERS

Mother's Rating	Age Levels 3,4½	6,7½,9	Totals
Competition-oriented	15	35	50
Reward-oriented	17	9	26
Totals	32	44	76
	Chi square $p < .01$	7.39	

TABLE XL

COMPARISON OF BOYS AND GIRLS AS RATED BY THEIR MOTHERS

Mother's Rating	Boys	Girls	Totals
Competition-oriented	24	26	50
Reward-oriented	16	10	26
Totals	40	36	76
	Chi square .77 Not significant		

DISCUSSION

The results of this investigation failed to support some generally accepted beliefs concerning the effects of frustration. In this study frustration did not result in increased performance, the most common finding reported by others. In fact there was a trend toward decreased performance. Perhaps the most striking impression from these results and best explanantion of them is that individuals differ in their manner of response to frustration. Some children slowed down markedly following frustration, some speeded up and some showed no change at all. Some hit much less strongly following frustration, some did not change at all from one trial to another, and some hit with intense vigor following frustration. One boy, for example, went into a flurry of beating upon the plunger with both fists. However, even this interpretation is mitigated by the fact that absolute change independent of direction was related only to the mean post frustration latency score and only to the extent that the MC group showed least change at each age level.

Frustration-produced drive increment was certainly not evident in this study. Neither relevant drive (speed of performance) nor irrelevant drive (amplitude of response in plunger-hitting) factors showed any consistent increase, but actually a decrease as mentioned above. A possible

explanation of this inhibition may be related to the experimenter's observation of the children's behavior somewhere around the 20th marble placement. After repeated frustration some children showed what might be termed avoidance behavior toward the end of each trial. Whereas they had been placing the marbles at a fairly even pace they now hesitated before placing the marbles, would approach the empty hole with the marble then withdraw their hand without dropping the marble into the hole, then return to it, occasionally looking anxiously at the experimenter, and finally very gingerly drop the marble into place. This behavior would continue until the marbles were dropped by the experimenter. Avoidance behavior following frustration by non-reward has been stressed in previously mentioned articles and is the main effect of frustration as posited by the elicitation framework (1, 20, 46).

The frustration aggression hypothesis suggests that frustration would elicit instigation to aggression. Hitting the plunger was assumed to provide an opportunity for release of aggression and the situation not only permitted this response but specifically called for it. It was therefore expected that in general there would be an immediate increase in amplitude of response following frustration, since the response was so acceptable within the situation. It was expected also that for any children who did not act out this aggression immediately the cumulative

effects of repeated frustration would eventually result in heightened strength of response via the plunger. The results showed that frustration did not lead to increased force of hitting either immediately after the introduction of frustration or over a more prolonged period of frustration. There was instead a tendency to hit the plunger less vigorously.

One explanation may be that hitting the plunger was an unpleasant experience for the children. Although the plunger was covered completely with foam rubber a few of the children indicated that hitting it hard hurt their hand. Only a few children mentioned this but it is possible that it was a more common reaction than was actually reported by them. Another explanation may be the previous learning experience of the child. One finding in our study suggests that the degree to which magnitude of response is an outlet of aggression is learned in our culture. It may be remembered that although older boys hit harder than young ones the reverse was true of the girls. Among the 3 and 4½ year olds the hardest hitters were girls, and with one exception none of the older girls matched these young ones in amplitude of their peak response. It seems possible that girls learn not to respond vigorously or demonstrate overt aggression, even though this was a natural response for them in their early years. This would be in accord with the notion of the differentiated sex roles im-

posed on children by the society. Whereas it is acceptable for boys to respond vigorously and aggressively girls are gradually trained to respond otherwise.

In line with this is the fact that although the female reward group could perhaps be called the most highly motivated one, in terms of their speed of performance on the first three trials, they did not demonstrate the strongest response to frustration as indicated by our measures. This brings us to the major criticism of our study. Age and sex differences in motivation were investigated. However, the differences were assessed primarily in terms of strength of response to frustration and specifically in terms of increased performance following frustration. Using increase in performance as the measure did not allow for the marked individuality in manner of responding. Although the correlation coefficients did not show that decreased performance was a typical performance for one child whereas increased output was the response pattern for another, some allowance for individual tendencies should be incorporated into the design of further experiments.

An incidental but revealing finding was the improved performance on the final successful trial. All subjects had slowed down in their performance speed prior to this trial with the exception of ten who had stated their desire to stop (but even these subjects were not speeding up by this point). One might postulate reactive inhibition

(either temporary or conditioned) for their slowdown. However, with no interpolated rest period, but merely one successful completion of the task, 76 per cent of the subjects improved their performance (decreased latency). Whereas a number of studies indicated that failure is more facilitating than success our results are clearly contradictory to these. Although response to failure did not result in significant improvement of performance, success in the present study did have a facilitative effect. One contributing factor may be practice effect. Whereas initial failure occurred after only 3 trials, there had been a varying but considerable number of trials prior to these final successful ones. It may be that success removed the effects of inhibition and permitted the effects of practice to become manifest.

There was no significant relationship between the child's response in the experimental situation and the mother's rating of the child's relative responsiveness to frustration in a tangible reward or competition situation. However, the mothers' ratings did indicate that in their daily lives the older children were more concerned with self-esteem based upon successful competition or high valuation by others than they were concerned with possession of tangible objects.

Suggestions for further research

Any attempt to measure response to frustration in an experimental situation would be more meaningful perhaps if there were some measure of the individual's usual manner of responding to frustration. If it could be ascertained that withdrawal, regression, aggression, or increased striving was the usual form of response it would then be easier to assess his response in the experiment, or to infer his degree of involvement in the particular task. In the present study only the degree, rather than the manner of response was obtained from the mothers.

Another fruitful though difficult avenue for research would be an assessment of the parents' handling of aggression in a particular child. Since the present investigation suggests sex differences in reaction among the older children (a finding not apparent among the younger ones) it would be worthwhile investigating the parents' differential handling of siblings, especially of different sexes, and relating this to the experimental behavior.

Still another area to be explored is the degree of self-confidence, ego-strength or the self-concept of the child and the relation of this to the experimental behavior. It was the general impression of the experimenter from observation of the children in this study that a possible curvilinear relationship may exist between self-confidence and persistence. It seemed that the children who appeared

most self-confident worked hard after frustration but only for a limited time. That is, after increased effort remained unrewarded they tended to give up. Among the children who appeared less self-confident two different extreme forms of response seemed typical. One was an immediate giving up, sometimes with statements about their inability to perform the task and its difficulty. The other was prolonged persistence in spite of repeated failure. It may be that this latter group viewed the experimenter as an authority figure and was responding to the supposed demands of this authority rather than to the task itself.

The marked differences between the 7½ and 9 year old groups in terms of post frustration amplitude and persistence (Figures 4 and 5) seem to merit further investigation. Using larger samples and extending the study to older children might reveal meaningful trends.

Another factor which might be studied is a comparison of latency in the first half of the task with latency in the second half. This is suggested in view of the marked slowness associated with the avoidance behavior noted toward the end of the trials.

SUMMARY

The present study was designed to investigate possible age and sex differences in strength of reaction to frustration as related to motivational level. Specifically, it was hypothesized that (1) frustration would result in increased performance; (2) older children would respond more strongly than younger children to frustration in a competitive task; (3) boys would respond more strongly than girls in a competitive task; (4) response to frustration in a non-competitive, tangible reward task would remain relatively constant in all age groups; (5 and 6) strength of response to frustration in either the reward or competitive task would be related to the relative strength of that motive for the particular child as shown in his daily life, according to mothers' ratings of the child.

The subjects were 100 children in five different age levels: 3 - 4, 4½ - 5, 6 - 6½, 7½ - 8, 9 - 9½. In each age group five boys and five girls were given a marble board task under competitive conditions, and five boys and five girls performed the same task for a tangible reward rather than peer competition.

After two successful trials the subjects were arbitrarily frustrated (prevented from completing the task) without their realizing the arbitrariness of the situation. Frustrated trials were continued until a specified criterion

was reached. Then two more successful trials were given. Speed of performance and force with which the subjects hit a plunger were recorded for every trial. Response to frustration was measured by the change in speed of performance and force of response immediately after introduction of frustration (post frustration latency, post frustration amplitude). In addition any cumulative effects of repeated frustration were measured by the average speed and amplitude for frustrated trials as compared with the pre-frustration trials (cumulative latency, cumulative amplitude). A fifth measure of response to frustration was the number of trials the subject performed before reaching the criterion (persistence).

Mothers' responses on a rating scale resulted in the child's being classified as relatively more reward-oriented or competition-oriented in his daily life.

The initial hypothesis was not confirmed and neither were the subsequent ones, with the exception of 4. These generally negative results were due in part to the fact that hypotheses 2, 3, 5, and 6 were dependent on the initial hypothesis. Measures of response to frustration were based on the assumption that increased performance would follow frustration. Actually, although there were some indications of motivational differences between groups

in terms of initial performance they did not show in our measures of response to frustration. Some subjects increased their performance following frustration, some showed a decrement, and others changed not at all. However, a general inhibitory effect of frustration was suggested.

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APPENDIX I

1204 I University Village
East Lansing, Mich.

Dear Mrs. _____ ,

Your child, _____, has been selected to participate in a study of motivation in school children, which is being conducted at Red Cedar School.

We are interested in obtaining information from you concerning his typical responsiveness in various situations, which you might observe in his daily activities. Your child will remain anonymous in the study. However, his name is written on this questionnaire in order that his behavior (as reported by you) can be paired with his performance in the study.

It would be greatly appreciated if you would fill out the enclosed questionnaire and return it in the enclosed envelope at your earliest convenience.

Thank you for your cooperation.

Sincerely,

Leah B. McDonough

APPENDIX II

Please check how strongly_____ usually responds to the following situations by checking the appropriate number. If it is difficult to be specific in some item because you have never observed him in such a situation please check the answer which describes how you think he would respond.

1. responds not at all 2. responds mildly
3. responds strongly 4. responds violently

1.	Another child takes his toy.	1( ) 2( ) 3( ) 4( )
2.	He is told he cannot have a piece of candy or a cookie which he wants.	1( ) 2( ) 3( ) 4( )
3.	A group of playmates makes fun of him.	1( ) 2( ) 3( ) 4( )
4.	A toy of his gets broken.	1( ) 2( ) 3( ) 4( )
5.	The other children will not play with him.	1( ) 2( ) 3( ) 4( )
6.	He is unable to do as well as his playmates in a particular activity.	1( ) 2( ) 3( ) 4( )
7.	The older children will not allow him to join their activities, telling him he is too young.	1( ) 2( ) 3( ) 4( )
8.	He loses a possession of his.	1( ) 2( ) 3( ) 4( )
9.	Another child leaves a toy at his house by mistake, and he is told he may not keep it for his own but must return it.	1( ) 2( ) 3( ) 4( )
10.	Another child monopolizes a piece of play equipment.	1( ) 2( ) 3( ) 4( )
11.	One of his friends suddenly prefers another child's company.	1( ) 2( ) 3( ) 4( )

12. He loses in a competitive game (with no prize involved). 1( ) 2( ) 3( ) 4( )

13. He loses in a game he is playing for a prize. 1( ) 2( ) 3( ) 4( )

14. Another child appears with a bigger or better toy than he has. 1( ) 2( ) 3( ) 4( )

15. He is not allowed to take home with him a book belonging to a friend. 1( ) 2( ) 3( ) 4( )

16. He is not allowed by his parents to join his friends in play. 1( ) 2( ) 3( ) 4( )

17. He asks a friend to play with him and the child refuses. 1( ) 2( ) 3( ) 4( )

18. He is not allowed to have a penny to use in a gum machine. 1( ) 2( ) 3( ) 4( )

19. His parents tell him he's acting like a baby. 1( ) 2( ) 3( ) 4( )

20. His parents do not allow him to participate in an activity in which some friends are engaged because it is too dangerous. 1( ) 2( ) 3( ) 4( )

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Exhibit 116