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The role of anxiety in the stimulus preference and play patterns

Betty R. Rutherford

University of Nebraska at Omaha

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THE ROLE OF ANXIETY IN THE STIMULUS PREFERENCE
AND PLAY PATTERNS OF CHILDREN

A Thesis

Presented to the
Department of Psychology
and the
Faculty of the Graduate College
University of Nebraska at Omaha

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by

Betty R. Rutherford

August 1972

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Accepted for the faculty of The Graduate College of the
University of Nebraska at Omaha, in partial fulfillment of the
requirements for the degree Master of Arts.

Graduate Committee

Henry J. Lussen Psychology
Name Department

Norman A. Hamm Psychology

Carol R. Angle Pediatrics

Joseph P. Lavoie
Chairman

August 7, 1972
Date

5276/102

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Abstract

The play patterns and stimulus preference of 20 preschool children were observed during low and high stress conditions. The stress manipulation was contingent upon the child's preparation for a medical appointment. Heart rate recordings and a questionnaire were used as indices of stress. Children manifested a preference toward creative-constructive play under conditions of increased stress, with a resultant decrease in manipulative and imaginative play. Play with relevant or irrelevant toys did not change significantly during the increased stress condition. Pencil-paper measures of stress used in previous studies were significantly related to the physiological measure of stress. No sex differences were found for play patterns, stimulus preference or for stress.

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THE ROLE OF ANXIETY IN THE STIMULUS PREFERENCE
AND PLAY PATTERNS OF CHILDREN

Betty R. Rutherford

University of Nebraska at Omaha

The functions which play serve for the developing child has attracted the interest of cognitive and psychoanalytic theorists for years. Clinical diagnosis and therapy for disturbed children is often based largely upon the content of the child's play, yet relatively little empirical data have been collected to substantiate the theories regarding the nature of play. This observational study has been designed to provide some basic information on children's use of play to cope with stress by exploring two aspects of children's play patterns, toy preference and play constructiveness, under conditions of low and high stress. For the purposes of this study, play has been defined as any self-directed behavior, manipulative, imaginative, or creative-constructive in nature which serves to occupy the child's attention, whether it be performed for the purpose of diversion from reality, problem solving, practicing skills, or mere pleasure.

Psychoanalytic theory has emphasized the cathartic function of play. Freud believed that although the child can distinguish play from reality, he alters objects taken from his environment at will in order to reproduce a pleasurable event. In this manner, exciting events, unpleasant experiences, or conflicts are repeated in the fantasy of play, and through repetition the excitement aroused by

the original event is reduced. By actively recreating the event, the child also attains mastery of it rather than passively experiencing it as a helpless spectator (Millar, 1968). However, the child's obsession for, and limited awareness of, the nature of the themes which he symbolically plays out, occasionally force him into revealing thoughts and attitudes which become too threatening for him. Such instances, according to Erikson (1963), lead to play disruption. Therefore the child's inability to cope with crises in his private world may be indicated by interruptions of play.

Cognitive theorists have considered play to be the product of a stage of thinking, paralleling intellectual development, through which the child must pass (Gilmore, 1965). Play, defined as assimilative behavior performed for functional pleasure, results in mastery and greater understanding of the child's environment (Piaget, 1962). Between the ages of two- and eight-years, children's play is characteristic of the representative stage in which the achievements of the earlier sensory-motor stage are repeated on a symbolic and verbal plane (Millar, 1968). Piaget (1962) considered the beginning of this stage as characterized by the child's application of schema to inadequate objects for the evocation of pleasure. Assimilation and consolidation of the child's emotional experiences are the primary functions of the make-believe play characteristic of this stage. The occurrence of any novel event is somewhat distorted in its play reproduction, until the child, through active repetition and experimentation, achieves an understanding of it which may be assimilated. As the child matures, play becomes more adapted to reality until at

last it ceases to be play altogether (Millar, 1968). Play also serves a cathartic function in that objects once feared may become the object of play until the child has been freed of the strong affect associated with them (Gilmore, 1965).

Learning theorists have considered play behavior as too diverse and interrelated with other behaviors (i.e. curiosity) to be studied as a separate entity. However, some interesting parallels may be drawn between Dollard and Miller's (1950) explanation of adult anxiety reduction through reasoning and Piaget's and Erikson's cathartic conceptions of children's play. Sources of anxiety are learned early in life as is the awareness that one must respond to cues with appropriate instrumental and emotional responses. For example, the response may be ridicule if one shows unreasonable fear in a situation labeled safe by one's elders. Dollard and Miller (1950) have proposed that one learns to use verbal reasoning in such a manner that the instrumental responses elicited via the cue-producing system become stronger than the direct responses to internal drives of fear or anxiety and external cues perceived as threatening. Although still incapable of complex verbal reasoning, one might expect a child to produce responses through play which the mature adult would produce through the verbal reasoning process explained by Dollard and Miller (1950). If this is the case, play behavior should reflect the present conflicts in a child's life just as the verbalizations of adults reflect their present conflicts. In both instances, the adult or child must have the ability to inhibit internal cues in order to allow the process to occur. If the anxiety is too intense the adult cannot inhibit

the internal cues and the process fails to work. Similarly, the child at this point may experience play disruption.

In support of the hypothesis that play reflects the child's present conflict, Gilmore (1966) has shown that elementary school children will respond differentially to toys under stressful conditions. He found that hospitalized children awaiting tonsillectomies showed a preference for medically relevant toys. Two later studies by Gilmore (1966) produced equivocal results in that one group of children preferred toys relevant to their source of stress but the other group, in a similar situation, chose the nonrelevant toy. Gilmore (1966) concluded that the latter group appeared to be more fearful. Thus, their unexpected behavior might be explained by the theory of play disruption. He proposed that one might find that play is phobic in quality when children are more than moderately stressed, but when children are less stressed play is counterphobic in quality (Gilmore, 1965).

Gilmore (1966) also found an unanticipated positive relationship between stress and the child's preference for complex toys. Further research (Gilmore, Best & Eakins, 1971) substantiated the earlier results and provided evidence that intelligence and n achievement are also strong determinants in the child's choice of play materials under stressful conditions. The data showed that high n achievers with high IQ's preferred simple stimuli when not stressed and complex stimuli when highly stressed. The authors have suggested that in actuality high n achievement, high IQ children always prefer complex stimuli. However, an apparently simple stimulus (i.e. a blade of

grass) may be perceived as quite complex to the calm knowledge-seeking child. Under stress, however, he may be, like his less intelligent peers, oblivious to the subtle complexity of the stimulus so he seeks more obviously complex stimuli. This assumption tends to support Piaget's conception of children's play functioning as a means for understanding the environment.

Amen and Renison (1954) emphasize the cathartic function of play. They found that play constructiveness and higher anxiety scores were positively correlated with IQ in preschool children. As play, measured on a three-point constructiveness scale, became more constructive, anxiety scores derived from the Amen Anxiety Pictures Scale tended to increase. Consequently it was assumed that the choice of constructive-creative play patterns by the high IQ, highly anxious child provided evidence for a realistic problem-solving component of play. Through constructive-creative play the child used facts to solve present problems in order to reduce anxiety. Differences between the children were attributed to the high IQ group's greater awareness of reality versus fantasy in both identification of fearful experiences and in their use of problem solving.

The present study had a two fold purpose: First, to provide a further test of Gilmore's (1966) theory regarding the counterphobic quality of play when children are moderately stressed. An ordinal scale of stress based on questionnaire responses and a physiological measure of stress, based on heart rate recordings, were used to make a more reliable comparison between choice of relevant toys and degree of arousal.

Secondly, this study was an attempt to replicate Amen and Renison's (1954) findings concerning the positive relationship between degree of stress and constructiveness of play in high IQ subjects. Confirmation of this relationship with a situational stress measure would provide an alternative explanation for Gilmore's findings on high IQ subjects. Assuming that complex toys are most conducive to creative-constructive play, the subjects may be expressing a need to reduce stress through the problem-solving process in constructive-creative play rather than a raised threshold for discrimination of stimulus anxiety.

The previous discussion suggests the following predictions:

- (1) More constructive-creative play behavior occurs under conditions of stress;
- (2) Children who are highly stressed choose to play with toys relevant to the source of stress.

Method

Subjects

The Ss consisted of 20 four- to five-year old children (7 girls and 13 boys) who were scheduled to visit their pediatrician for either a routine physical examination or immunizations. Children visiting a physician for the first time were excluded as were children who had experienced considerable trauma relative to medical care (e.g., an accident requiring surgery). The children were healthy with no past history of extensive medical care.

Each S was administered the Slossen Intelligence Test and only those Ss who attained an intelligence quotient of 115 or more were used. Limitation of Ss to the high average and superior ranges of

intelligence was based upon the groupings used by Gilmore et al. (1971). The Ss were drawn largely from the homes of professional parents due to the clinic's clientele. Socioeconomic status was generally middle to upper-middle class. An acceptance rate of 80% was obtained from those families who were contacted to participate in the study.

Equipment

Four sets of toys (two sets at each interview) were presented in a randomly assigned order to each of the Ss. Each set contained two medically relevant toys and two nonrelevant toys of equal attractiveness. The attractiveness of toys was determined in pilot studies with 24 four- and five-year old preschool children. In the pilot studies, the children were individually presented with the available toys and asked to choose the toy with which they would most like to play. As each toy was selected, it was eliminated from the group and the child again chose the most attractive toy present. Toys chosen more frequently by either the boys or girls were eliminated. The remaining toys were grouped into sets based upon their frequency of selection in the order of preference. The toys used were:

Set I--an ambulance, a doctor's kit, a Pinocchio platform push toy, and a Goofy trapeze toy; Set II--a book, Going to the Hospital, a Sherman doctor puppet, a bag of deemie bobbers, and a flexible man; Set III--another doctor's kit, a Ken doll dressed as a physician, a kaleidoscope, and a pair of binoculars; Set IV--a Lil Nuffin's doctor office kit, a Sherman nurse puppet, a friction racing car, and a squeeze man.

The heart rate recordings were registered with a two channel Offner type dynography assembly which recorded on paper tape. The kinograph and paper tape were clearly visible to the subjects during the recording procedure. A stop watch was used for recording all timed responses.

Stress Manipulation

The procedure used for manipulating stress was adapted from studies of play behavior in medical settings conducted by Gilmore (1965) and Gilmore and Richardson (1971). Stress was operationally defined as the children's emotional state during preparation for a medical appointment. No direct evidence has been reported which would substantiate the assumption that this type of context produces stress. In order to insure that stress would occur at the time of the medical appointment, each child was first observed in his home within a period of one to two weeks prior to his appointment. Under such circumstances, it was expected that the children, unaware of pending medical care, would demonstrate a level of stress which would be representative of their general state of arousal. A baseline measure of stress was determined by the child's heart rate recording over two three-minute periods during the first interview. The first baseline period was preceded by the administration of the Slossen Intelligence Test which required 15 to 20 minutes. A second three-minute measure of stress followed 12 minutes of play with two sets of toys randomly selected from the four sets used.

The dynograph recording assembly for recording the heart rate was introduced to the child as the "astronaut machine." The child

first observed the recording of the E's heart rate while E explained how he could see the drawing of his heart rate. Electrodes attached to the machine were fastened to the child's wrists during the three-minute recording periods. The children responded to the machine with awe and generally with enthusiasm. Only one child was excluded from the study because he was reluctant to participate. Conversation during the period was kept neutral in content in an effort to prevent arousal due to the procedure. The E's observations of the children during the one hour interviews supported the assumption that the children were at ease in the home environment.

For the second interviews, half of the children were seen in their home prior to departure for the clinic, and the other half were seen after their arrival at the clinic, but prior to seeing the pediatrician. The children's base rate scores were compared with their scores obtained during the second interview. This procedure was used to demonstrate that the increase in stress was a result of the preparation for the appointment rather than the clinic setting, thus providing a control for contextual confounding.

Design

A within-subjects design, where each S served as his own control, was used. This design permitted analyses of two play contexts-- Home-Home (HH) or Home-Clinic (HC). The HH group was interviewed twice in their homes. The HC group was interviewed first in their homes and on the second occasion at the clinic. Ss were randomly assigned to one of the two groups.

The second factor under investigation, level of stress, was based upon heart rate recordings. The heart rate recordings reflected the average variance of heart rate during the interview. The method resembles Lacey's method of tallying cardiac "bursts" (Lacey & Lacey, 1958), and the mean cyclic maxima method devised by Malstrom, Opton, and Lazarus (1965). The mean frequency of heart rate peaks was determined for the first and second interview. A heart rate peak was defined as any cardiachometer reading of a heart rate faster than the reading immediately preceding and succeeding it. Subjects were assigned to the high or low stress group on the basis of a median split of differences between their heart rate recordings. Random assignment to play context and random assignment of toy set presentations was predetermined for each S.

The response measures consisted of: play patterns--creative-constructive, manipulative, or imaginative; toy preference--medically relevant or irrelevant as defined by duration of touch; emotional behaviors during play, and diversions from play. An additional measure of stress was provided by the Subscales of Fear and Stress (see Appendix C) developed by Gilmore and Richardson (1971).

Procedure

Parents of four- and five-year old children, scheduled to visit the clinic were contacted by mail. The letter, briefly explaining the purpose and procedure of the study, was followed by a telephone call during which details of the visit were arranged and the parents' questions answered. Children with unusual medical histories were identified and eliminated from the study at that time. Mothers were

instructed to tell the children on the morning of the interview that a lady with some toys would be coming to play with them in their home.

First visit. The first visit for each S occurred in the home. The sequence of events during the visit consisted of administration of the Slossen Intelligence Scale; three minutes of heart rate recording; six minutes of play with each of two randomly selected sets of toys; and three additional minutes of heart rate recording. The one hour interview for each child was conducted in the kitchen or dining room where the child was seated at the table. Family members continued their activities in adjoining rooms in an effort to minimize distractions, and to prevent the child from feeling isolated.

Second visit. In order to maintain some consistency in the amount of preparation given to Ss, the parents were instructed at the end of the first visit to give the children a minimum of preparation for their forthcoming medical appointment. Parents of the HH group were requested to have the child dressed in preparation for their visit with the doctor prior to the second interview. To insure that the child was aware of his medical appointment, the E told the HH child at the beginning of the second interview, "You are dressed so nicely today. Are you going somewhere?" If the child did not respond with acknowledgement of his medical appointment, the E would remind him, "Mother tells me you will be going to see Dr. _____ today."

The HC group arrived at the clinic 30 to 40 minutes prior to their medical appointment. As soon as the family was settled in the waiting room, the E greeted the child and conducted him to an

examining room. The child was asked, "Whom did you come to visit today?" All responded with acknowledgement that they were to see the doctor. The sequence for the HH and HC groups involved three minutes of heart rate recording, six minutes of play with each of the remaining two sets of toys, and another three minutes of heart rate recording. Mothers were asked to complete the Mothers' Questionnaire while the child played. During the interviews each child's play behavior was again scored by the E using the play scales. To control for maternal bias, the E also completed the Mothers' Questionnaire based upon her observations of the children during the interview.

Play Scales

Scoring the play scales occurred during the play period for each visit. The S was given a set of four toys--two relevant and two irrelevant, and invited to play with the toys while the E completed some necessary work. The E seated herself at a distance away from the child where she was still able to observe the play and to hear the verbalizations of the child. At the end of six minutes, the E removed the set of toys and presented another set. A friendly but nonparticipative attitude was conveyed to the child. The permissive attitude communicated to the child was reflected in occasional removal of a toy to the floor for play. One E, a female in her early twenties, conducted all the interviews and recorded the responses. The descriptions of the scales and scoring procedures can be found in Appendix A.

Play constructiveness was recorded at 15 second intervals. At the end of each interval, the E recorded the type of play most

representative of that period. The frequencies of creative-constructive, imaginative, and manipulative play were determined for the 48 intervals during the twelve minutes of play with two sets of toys. The play categories used were mutually exclusive.

Durations of relevant and irrelevant play were recorded as the duration of time (seconds) spent touching medically relevant or irrelevant toys. Pilot tests, involving preschool children, showed that the toys were identifiable as relevant to a medical setting for four- and five-year old children. No provision was made for frequent usage of a non-relevant toy in a relevant context or a relevant toy in a non-relevant context. The child's toy preference for the specific interview was defined as the proportion of time spent at play with relevant toys to total time spent with all toys at each interview.

The frequency of emotional play and diversions from play were recorded at 15 second intervals. Display of these behaviors during any portion of an interval resulted in a recording of the response. Recordings of diversions were categorized according to four types: (1) The child engages in activities with E trying to help her, play with her, or converse with her; (2) Island behaviors, play with nonsignificant additional materials, are exhibited; (3) The child spends time looking or wandering about; (4) the child's attention is continually directed toward outside noises and distractions. Two types of emotional behavior were recorded: (1) The child displays whimpering, whining, or other restless actions; (2) A strong emotional component to play behavior is noticeable.

Inter-rater Reliability

Prior to initiating the study, a second rater was used to establish inter-rater reliability on the play scales. Reliability was determined in pilot studies using 12 four- and five-year old children enrolled in preschool. The raters agreed on .89 of their recordings for play constructiveness; .91 of their recordings for duration of play; and 1.00 of their recordings for diversions and emotional play.

Results

The mean heart rate recordings for first and second interviews, the mean recordings for each three minute period, and the individual recordings for each of the twelve minutes were analyzed by separate repeated measures analyses of variance. High and low frequency of heart rate variance, based on a median split, was used as the between S's factor, and the first or second interview was used as the within S's factor.

Stress Manipulation

As expected, Ss demonstrated strong evidence of increased stress between the first and second interview. The mean score for Ss' heart rate variance during the first interview was 7.57 compared to 12.83 for the second interview. This difference was statistically significant ($F_{1,16} = 62.51, p < .01$). Figure 1 presents the mean scores for Ss' heart rate recording during the first and second interviews. The difference between increases for the HH and HC groups was not significant ($F_{1,16} = .31, p > .05$). It can, therefore, be concluded that the HC group experienced no greater increase in stress than the HH Ss who were interviewed in their homes prior to departure

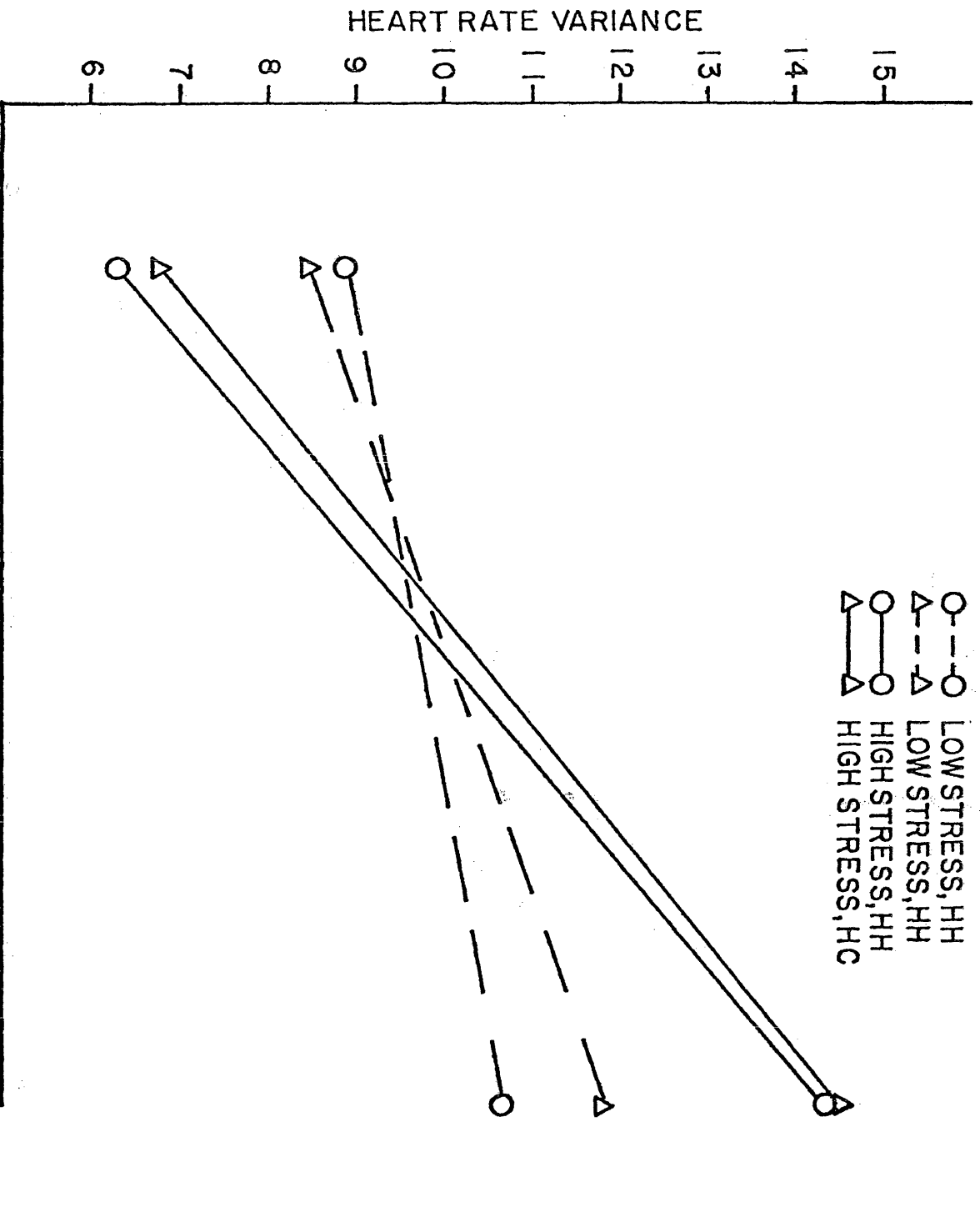


FIG. 1 MEAN SCORES FOR SUBJECTS HEART RATE VARIANCES DURING THE FIRST AND SECOND INTERVIEWS

for the clinic. Although experimental conditions were the same during the first interview, the HC group was slightly more aroused than the HH group, but the difference was not significant.

Other indices recorded for validation of the heart rate recording as a measure of stress included the Subscales of Fear and Stress as well as the recorded frequencies of emotional behaviors and divergences. No scores were obtained on the Physician's Subscale of Fear and Stress indicating that the children were not so stressed as to interfere with the examination. No score on the Mother's Questionnaire exceeded two for any child. Therefore all subjects would be assigned to level one or two on Gilmore and Richardson's (1971) four level fear scale. Seventy-five per cent of all the cases in their standardization sample were within levels one and two. A significant relationship (Phi-coefficient .48) was found between the S's scores on the Mother's Questionnaire and their scores on the heart rate measure. This correlation was much higher (Phi-coefficient .80) when the S's scores on the Mother's Questionnaire completed by the E, following her interviews with the children, were used.

Due to the limited number of Ss demonstrating emotional behaviors, the analysis for the measure was not significant. Although divergencies in play behavior consisted almost exclusively of interaction with the E, all categories were demonstrated. A nonsignificant increase in divergences was noted during the second interviews. Sex differences were not found for level of stress.

An unequal n factorial analysis of variance, with level of stress during first and second interview and play context (HH-HC) as factors,

was used to analyze each of the following play measures: frequency of occurrence of the three play patterns, duration (seconds) of relevant and irrelevant play, frequency of diversions, and frequency of emotional play.

Play Patterns

Differential play patterns were demonstrated during the two interviews. Creative-constructive play increased significantly ($F_{-1,16} = 24.133, p < .01$) from the first to the second interview for all Ss. Subjects in the high stress group demonstrated a significantly greater increase in time engaged in creative-constructive play during the second interview than the low stress group ($F_{-1,16} = 6.65, p < .01$).

The play patterns exhibited by the Ss during the first and second interviews are presented in Figures 2 and 3. Forty-eight intervals of play were recorded for each S. Due to the mutually exclusive method of scoring, decreases in manipulative play and imaginative play had to accompany the increase in creative-constructive play. A significant decrease in imaginative play was shown ($F_{-1,16} = 18.78, p < .01$) with the high stress group demonstrating less fantasy play than the low stress group ($F_{-1,16} = 3.67, p < .10$). The decrease in manipulative play from first to second interview was less marked, but significant for all Ss ($F_{-1,16} = 5.70, p < .05$).

Play contexts, HH and HC, did not interact significantly with any measure. Main effects for play context were significant only for the decrease in imaginative play. The HC group displayed less fantasy play ($F_{-1,16} = 9.98, p < .01$). However, Figure 3 suggests the

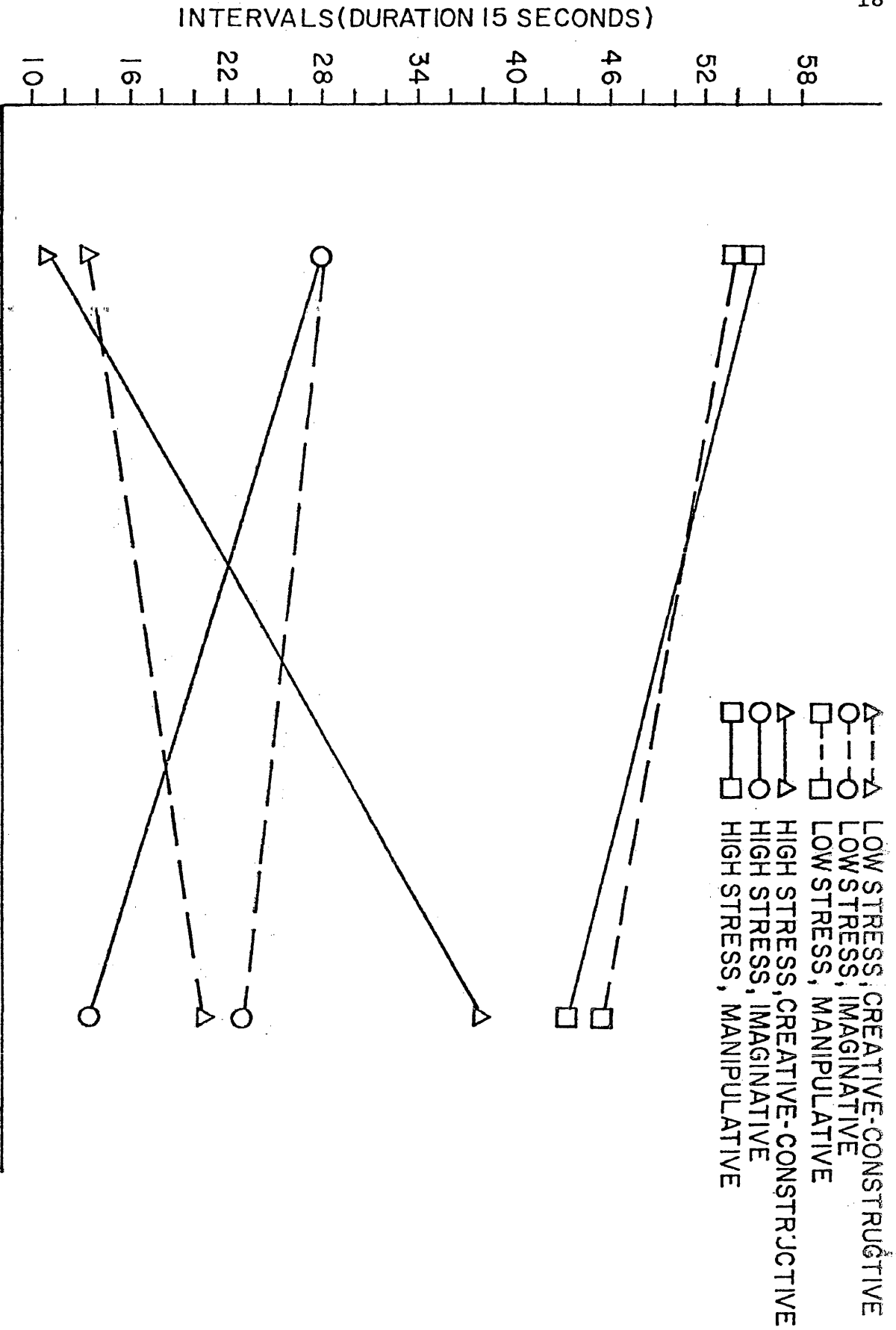


FIG. 2 INTERACTION OF PLAY PATTERNS WITH HIGH AND LOW STRESS FOR FIRST AND SECOND VISIT.

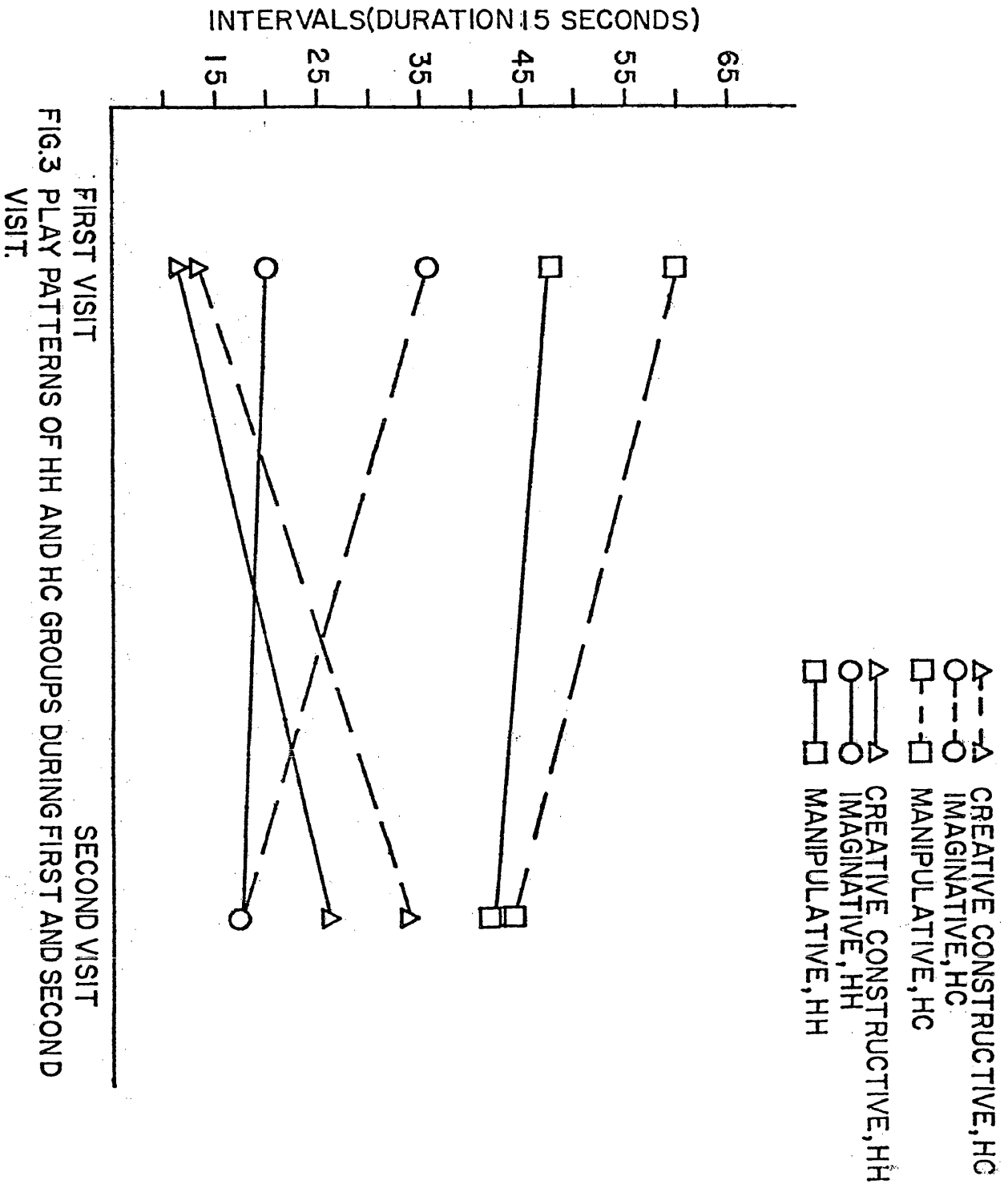


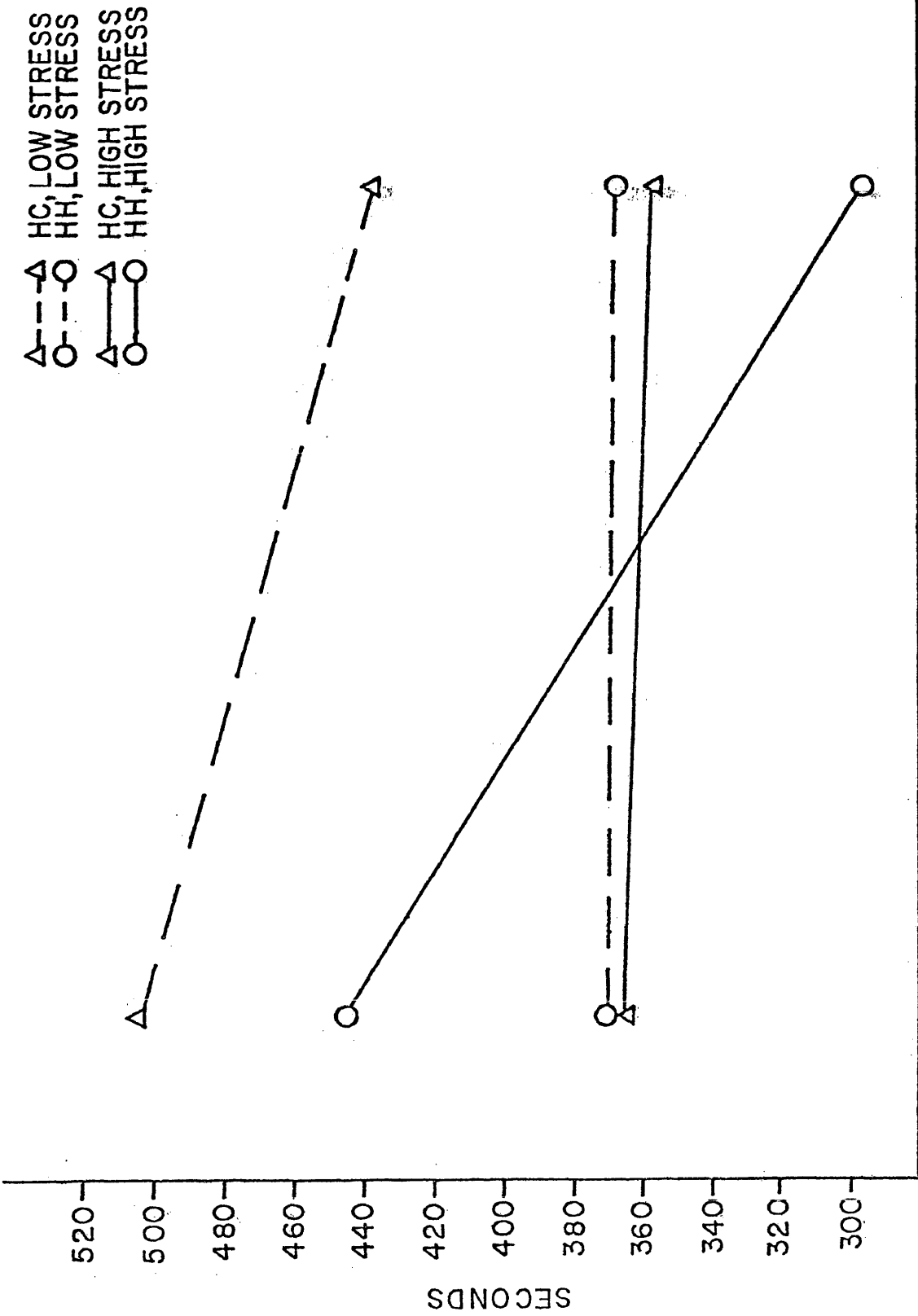
FIG.3 PLAY PATTERNS OF HH AND HC GROUPS DURING FIRST AND SECOND VISIT.

difference was due to the HC group's higher incidence of imaginative play during the first interview as compared to the HH group, rather than a lower incidence during the second interview. Although the HC group demonstrated more intervals of creative-constructive play during the second interview than the HH group, the difference proved to be nonsignificant ($F = .84, p > .05$). No sex differences were found in regard to play patterns.

Toy Preference

Toy preference, relevant or irrelevant, was defined by duration of time spent touching the relevant or irrelevant toys. The hypothesized interaction between experimentally induced stress and preference for relevant toys was not demonstrated. Rather, as shown in Figure 4, the Ss played less with the relevant toys on the second visit. However, the difference in relevant play was not significant ($F = 1.91, p > .05$). Subjects in the high stress group manifested a greater decrease in relevant play from the first visit to the second visit than the low stress group. The play context (HH or HC) interaction with toy preference was also nonsignificant ($F = .20, p > .05$). No sex difference was found for toy preference.

The Ss' heart rate scores prior to play were compared with their heart rate scores following play to determine the possible effects of stimulus preference (i.e. play with relevant and irrelevant toys) upon stress. The analysis of the first interview (i.e. the assumed low stress condition) indicated that 13 of 20 Ss showed a preference for the relevant toys and 8 of the 13 (.62) recorded a decrease in arousal after play. Of the 7 Ss who chose



FIRST VISIT SECOND VISIT
 FIG. 4 DURATION OF RELEVANT PLAY FOR HIGH AND LOW STRESS GROUPS FOR THE FIRST AND THE SECOND INTERVIEW EXPRESSED IN SECONDS.

to play with the irrelevant toys .77 of these Ss recorded an increase in stress immediately after the play period. In contrast, of the 7 Ss who chose to play with the relevant toys, .57 experienced a decrease in stress. Application of a binomial distribution to the results revealed all the probabilities of occurrence to be greater than .05.

The mean heart rate recording for each minute was analyzed for the HH and HC groups using a repeated measure analysis of variance. Changes in heart rate within the two six-minute periods were found to be nonsignificant. Figure 5 illustrates the pattern of recordings for the two groups during the first and second interviews.

Discussion

As predicted, middle-class children of above average intelligence demonstrated more creative-constructive play behavior under the condition of high stress. In addition, those children who showed a greater increase in stress also exhibited a greater increase in creative-constructive play. However, as creative play increased imaginative play decreased. These findings conflict with the psychoanalytic assumptions concerning the cathartic effect of imaginative play relevant to a threatening event. It would seem that prior to facing a stress situation the children preferred to build objects in play or to work with materials conducive to creative applications than to play imaginatively with materials relevant to the source of stress. The results support Gilmore et al.'s (1971) observations that stressed Ss prefer more complex stimuli. Gilmore et al. (1971) found that high n achievement, high IQ subjects demonstrated an

HEART RATE VARIANCE

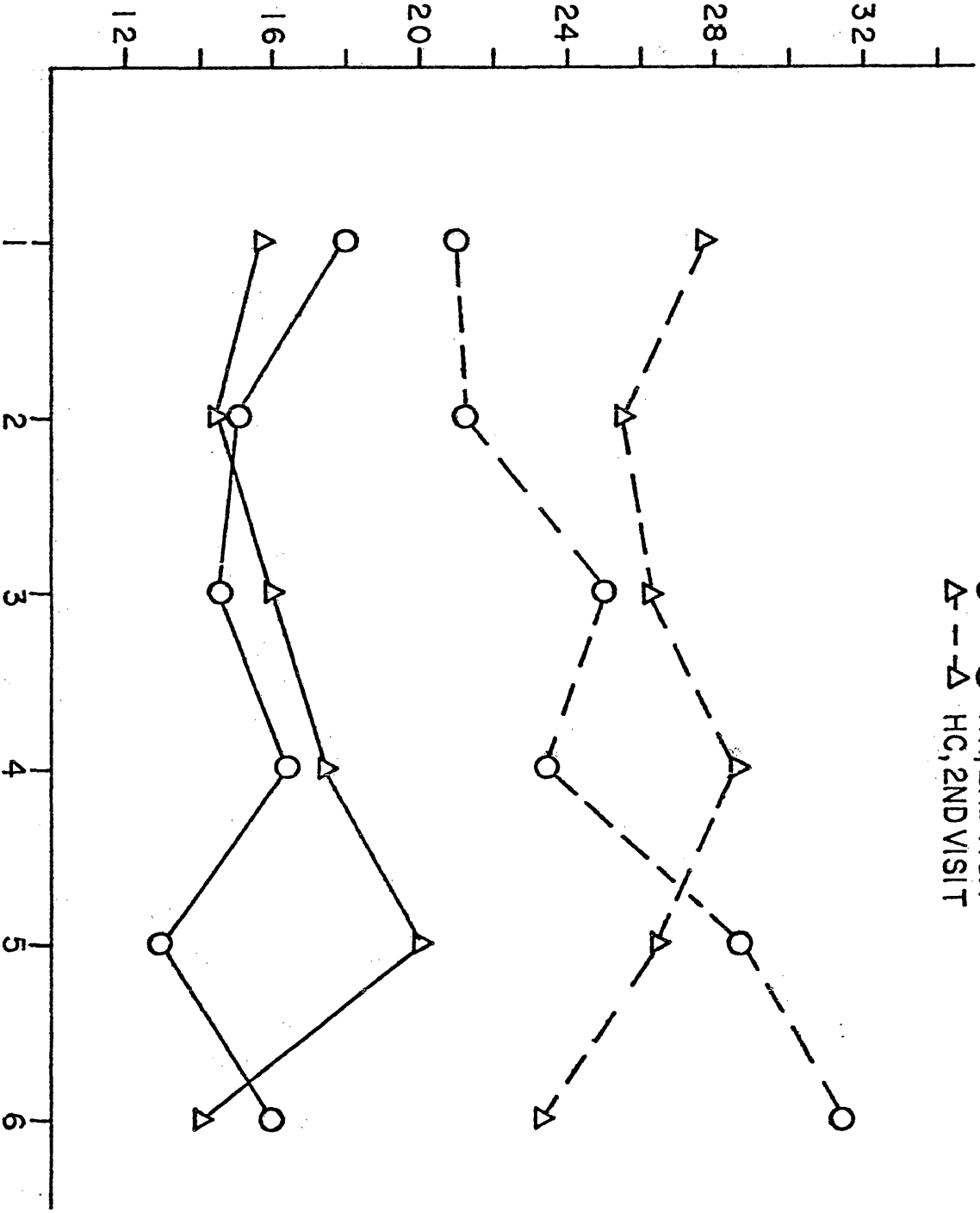


FIG.5 HEART RATE RECORDING FOR HH AND HC GROUPS DURING SIX MINUTES OF RECORDING ON FIRST AND SECOND INTERVIEW.

increased preference for complex play materials with increased stress. In the present study with restriction of subjects to above average IQ children from middle-class homes, the greater preference for creative-constructive play with increased stress appears to have similar connotations. Further investigations exploring more varied populations may establish that the utilization of constructive-creative play when stressed is a phenomenon limited to children from middle-class homes where development of impulse control is encouraged. The choice of creative-constructive play may be due to a desire to divert one's attention and energies from their feelings of stress to an interesting and demanding activity rather than an increased discrimination for complexity as postulated by Gilmore.

Contrary to Gilmore and Richardson's (1971b) findings with Ss awaiting dental treatment, play disruption did not occur with high stress in the present study. Although diversions from play occurred more frequently during the high stress condition, the increase was not significant. Due to the higher levels of stress reported by Gilmore et al., based upon subject scores on the Subscales of Fear and Stress, it would seem that the subjects in the present study did not experience stress great enough to disrupt play.

The predicted relationship between stress and stimulus preference was not demonstrated in this investigation. Sixty-five per cent of the children preferred medically relevant toys during the low stress condition. In contrast only 35% preferred relevant toys under the conditions of increased stress. Presence of the dynograph machine during the first interview may have provided a medical set

for the subjects which would explain the interest in medical toys. However, such a contextual influence was not observed with the HC group during the second interview. Presence at the clinic in an examining room did not result in more or less relevant play for the HC subjects than that manifested by the HH group. This finding also fails to support the assumption regarding the cathartic effect of relevant play. However, one cannot assume that four- and five-year old children will select the stimulus or the play pattern that is most conducive to stress reduction. A further examination of the cathartic nature of play should involve forced-choice play where the stimulus available can be experimentally manipulated to be relevant or irrelevant. This would enable observations of the changes in physiological indices of stress before and after the play period.

The assumption that preparation for a visit to the pediatrician is a stress situation was supported by increased heart rate during the second interview. But the children's stress was rarely great enough to produce scoreable responses on the questionnaires, Subscales of Fear and Stress, completed by the pediatrician and mothers. As suggested by Gilmore et al. (1971b), mothers may be hesitant to report their child's anxious behaviors. Experimenter recordings on the Mother's Questionnaire included two additional high stress children who also exhibited high stress on their heart rate recordings. One child demonstrated high stress during the interview when he became tearful and withdrew temporarily from the activities. The second child demonstrated emotional play such as repeatedly striking the physician doll and throwing the toy syringe. With the exception

of these two subjects, the experimenter's observations corresponded to those made by the mothers. Addition of the two children resulted in a highly significant association between the Subscales and the heart rate measure. This highly significant relationship between high and low heart rate recordings and scores or no scores on the questionnaires provide further validity for the latter measure. As a pencil-paper measure of children's situational stress, the Subscales of Fear and Stress appear to have utility if the problem of rater bias can be corrected. A greater degree of agreement between mothers' reports and the experimenter's observations may be obtained when the Subscale is used in a personal interview with the mothers as it was used by Gilmore et al. (1971b).

Support for the assumption that arousal due to stress is related to constructive-creative play requires further experimental studies in which conditions for arousal are differentiated. The experimental design should involve specific conditions during which arousal and play patterns are recorded, such as, a non-stressful home visit, a stressful clinic visit, and a visit prior to a pleasant, non-stressful experience (i.e. a trip to the zoo). The measurement of arousal reflecting heart rate variance would be expected to increase with both clinic and zoo conditions, but if stress is the major factor, creative-constructive play would not be expected to increase with the pleasant, but non-stressful zoo condition.

The findings suggest that adults could be helpful to middle-class children of above average intelligence, who are facing stress, if the adults provided materials conducive to creative-constructive play.

Since relevant and imaginary play may not be important factors, the practice of providing the child being prepared for surgery with the "shot" doll, as well as therapy in which the child is urged to doll play the approaching stressful event (e.g., mother leaving home temporarily), can be questioned. These techniques may be useful in providing the child information about the event but cannot be expected to be preferred by the child as a means of reducing arousal.

Due to children's attractions to toys, pediatricians, dentists, and other professionals working with children may be advised to provide toys in the waiting room conducive to creative-constructive play (i.e. building blocks). However, further experimental studies are needed before one can assume that the stressed child's preference for diversion is the best means of alleviating his arousal. The knowledge that moderately stressed children respond well to creative-constructive play is also useful to educators. Perhaps substitutions of the expected quiz with new learning materials would result in enthusiastic efforts toward learning.

The assumption that play functions for the child as a means of reducing stress remains unquestioned. However, the supposition that children use fantasy relevant to their conflicts as a means of communicating their frustrations and of gaining mastery of their world is not supported by the findings. The evidence suggests rather that the child is concerned with using play as a means of diverting his attention from his internal arousal. As suggested by Dollard and Miller (1950), the individual, when capable of producing stronger external responses than those direct responses to his internal

arousal and external stress-producing cues, reduces his stress. It would appear that at the age of four- and five-years children have learned that the discomforts of stress can be alleviated by selectively attending to interesting and challenging responses.

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Appendix A

Play Scales

Appendix B

Definitions of Behavior Responses

Definitions of Behavior Responses

Play Constructiveness

I--Manipulative play: The child superficially examines a toy, picking it up, turning it around, looking at it. He handles or explores the toy through one of his senses. The manipulation of the toy is without observable purpose.

II--Imaginative play: The child is absorbed in make-believe play. He is pretending or acting "as if," including assigning animate roles to lifeless objects.

III--Constructive-creative play: The child uses facts to solve present or future problems. He produces and develops ideas showing more than usual originality. He plays with an observable goal or purpose; he seeks perfection in his activity.

Emotional Behavior

- (a) The child displays whimpering, whining, or other restless actions.
- (b) A strong emotional component to play behavior is noticeable.

Diversions

- (c) The child engages in activities with E, trying to help her, play with her, or converse with her.
- (d) The child engages in island behaviors such as playing with non-significant additional materials (e.g., the child's clothing, the table, etc.).
- (e) The child spends time looking or wandering about.
- (f) The child's attention is continually directed toward outside noises and distractions.

Note: The play constructiveness categories were taken from Amen and Renison (1954), while the emotional and diversion behaviors are largely taken from the literature of Barker, Dembo & Lewin (1943).

Appendix C

Subscales of Child Anxiety

Mother's Questionnaire

1. When did your child learn that he/she had the appointment with the pediatrician today?
2. What did he/she say when you told him/her of the appointment?
3. How did he/she feel about coming, could you tell?
4. Has there been any suggestion that he/she was either looking forward or not looking forward to the visit?
5. Do you know what he/she was expecting to have done today at the clinic?
6. Did he/she seem any more quiet than usual today?
7. Has he/she seemed to stay nearer to you today than sometimes?
8. Has he/she seemed to want a bit of comforting today?
9. During the past hour have you seen any sign that he/she was:
 - a) amused _____
 - b) anxious _____
 - c) concerned _____
 - d) bored _____
 - e) afraid _____
 - f) happy _____
 - g) worried _____
10. What if any measures did you take to prepare your child for this visit?
11. Is this the first child you have taken to this clinic?

Pediatrician's Subscale of Fear and Stress

1. Did the child whimper or cry at any time? Yes _____ No _____
2. Was he/she difficult to treat, in the first two minutes? Yes _____ No _____
3. Did he/she perspire noticeably at any time during the session? Yes _____ No _____
4. Did the child ask for anyone (i.e. Mother, Father, etc.) and/or did he/she make excuses to require stopping of work (e.g., "Wait, I have to go to the restroom") and/or did he/she request you to delay work? Yes _____ No _____
5. Did the child scream? Yes _____ No _____
6. What was your general impression concerning how difficult this child was to work with?
 - (a) extremely difficult _____
 - (b) moderately difficult _____
 - (c) easy _____

Note: The subscales were taken from Gilmore and Richardson (1971).

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