

BEHAVIOR OF INFANTS AND PRESCHOOL CHILDREN IN A NEW SITUATION

by

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# BEHAVIOR OF INFANTS AND PRESCHOOL CHILDREN IN A NEW SITUATION

## INTRODUCTION

### Background of the Study

One conception of an individual's personality is that it is made up of "traits" or specific qualities of behavior. Personality make-up, however, does not consist merely of a sum of traits but rather of traits that are organized and integrated into a pattern. The question of whether these personality patterns remain relatively unchanged from year to year as the child grows older is important from a practical as well as a theoretical viewpoint, and has received much research attention (3), (4), (5), (7), and (9). One aspect of behavioral consistency that has been studied only tangentially is the consistency with which children meet new situations. The exploration of this aspect of behavior was one of the purposes of this study.

The problem of a child's response to a new situation, such as nursery school, is basically a matter of adapting to new and strange surroundings. Upon entering a new situation children are seen to respond in varied ways. Some will come eager for the experience; others will hang back, unsure of what this means to them; still others will be hesitant but soon adjust to the situation. The one thing that is clear is that changes can and do occur, and that these changes are more frequent in very young children than in school age children or college age.

Whether or not children respond to a new situation in a particular way as a function of age is yet to be determined. The exploration of the relationship between age and response to a new situation was a second purpose of this study.

#### Purposes of the Study

In summary, the purpose of the study generally was to assess the behavior of infants and preschool children in response to a new situation. Specifically, the study enabled, (1) a comparison of the responses of children of different age levels to a new situation; (2) the identification within age levels of individual differences in response to a new situation; (3) a comparison of the consistency of the response of children to two new situations.

#### Review of Related Literature

Three studies were found which related to the behavior of children in a new situation. Heathers (6) has reported the behavior of thirty-two two-year-olds when they were taken from their home and mother by an unfamiliar woman and driven to a nursery school with other strange children. He interpreted from the study that the older two-year-olds had greater capacities to adjust to the situation than the younger children, once the children had experienced the situation and knew what to expect. His assumption that trip upset was evidence for general

social insecurity was supported by positive correlations between trip upset and measures of social insecurity in nursery school play.

Shirley (9) studied 180 children during their semi-annual visits to a center for research on children's health and development. She concluded from her findings that the adjustment assays were little influenced by age and/or sex, extrinsic features of the day or health, but, rather, by the wholesomeness of the up-bringing in the home and the security, confidence and affection given by the parents.

Arsenian (1) studied the reaction of young children to being left with or without a familiar adult in a strange play-room. Her findings show that children who were left alone displayed patterns of behavior indicative of a high degree of insecurity. Insecurity of the child decreased as the situation became familiar. A reasonably good adjustment, as defined by Arsenian, was achieved by the fifth or sixth solitary visit to the new situation. Individual difference in rate at which insecurity decreased showed no correlation with age or intelligence but appeared to be related to the characteristic difference in the independence of the child. When the mother or mother substitutes were present, the children usually were secure. The child's security in the situation decreased with the removal of the adult in a degree directly proportional to the extent of his preceding dependence on the adult. Insecurity

of the children in the strange situation diminished when a familiar adult was introduced only in cases where the children's insecurity in the alone situation was not extreme.

## DESIGN AND METHOD OF PROCEDURE

### Overview

The study aimed to describe the responses of infants and preschool children to a new situation. Thirty-two subjects took part in the study. The subjects were observed for two one-hour-observation periods. Their behavior was described in terms of rating scales. Two general types of observational procedures were used, systematic observation, using short time samples, and participant observation. A detailed description of the design and procedure of the study follows.

### Design of the Study

Thirty-two subjects took part in the study. These subjects were divided, according to age, into four groups of eight children each. The age of each group was: Group I, 10-13 months; Group II, 16-18 months; Group III, 23-25 months; Group IV, 32-34 months. Each of the four groups was divided into subgroups A and B, each subgroup containing four children. This division was done in order to ease the load of the observers and to facilitate the child's entrance into the new group situation.

The subjects were observed for two one-hour-observations in a free play situation which was unfamiliar to them. The two observations were spaced approximately two weeks apart.

Two techniques of observation were employed in the study, systematic observation, using short time samples, and participant

observation. There were two systematic observers and one participant observer for each hour's observation. All the observers used the same rating scale (see Appendix A) to assess the behavior of the subjects.

The observers rotated their roles in such a way that the person who was the participant observer for subgroup I A in the first hour's observation was the systematic observer for the same subgroup in the second hour's observation. Table I shows the rotation of observers.

TABLE I

## ROTATION OF OBSERVERS

Observers	Groups: I A,B		II A,B		III A,B		IV A,B	
	Hours: 1st	2nd	1st	2nd	1st	2nd	1st	2nd
Observer A	S*	P**	P	S	P	S	S	S
Observer B	S	S	S	P	S	S	P	S
Observer C	P	S	S	S	S	P	S	P

\*S = systematic observer

\*\*P = participant observer

Definition of a New Situation

The new situation was a group free play period held in Orchard Street Nursery School on the Oregon State College campus. The situation was considered "new" in the sense that the child was unfamiliar with the nursery school, the other three children making up the subgroup, the materials and the



participating adults.

The free play period was held in the afternoon from 3:30 to 4:30 p.m. The total group in which the children were observed included the four children making up the subgroup, their mothers and the participant and systematic observers. The participant observer acted as a "teacher" for the subgroup. The systematic observers were not in the play area, but screened off from it in a small alcove.

The two observation periods were scheduled so that they were approximately two weeks apart. This was done in order to help maintain the novelty of the situation for the second observation, although clearly the situation was not as "new" to the children on their second visit as it was on their first.

One end of the large playroom in the nursery school was screened off by wooden dividers and used for the play area. The children and their mothers were requested to stay within the limits of these barriers.

The situation was left unstructured for both the mother and the child; both were left free to do as they wished within the specified play space.

### Subjects

The thirty-two subjects in the study were selected by age alone. The names of the subjects were obtained from the application files of the nursery schools at Oregon State College.

However, most of the subjects' parents were faculty members of Oregon State College or engaged in professional or managerial types of employment. There were a few children whose parents were students at the college.

All 32 children were present for the first hour of observation but three failed to reappear for the second observation because of illness. Consequently the number of subjects in the groups at the end of the study was as follows: Group I, 7 children; Group II, 8 children; Group III, 6 children; Group IV, 8 children.

#### Method of Procedure

The cooperation of the subjects was obtained through a letter (see Appendix B) explaining the study and asking cooperation. The letter was followed by a phone call, at which time the study was more fully explained, questions answered and acceptance or refusal given.

The letter and phone call were the only contacts made with the parents before their arrival at the nursery school for the first hour of observation. At the time of arrival the arrangement of the room was explained and the assurance given that the children could play with any toy they wished in the enclosed play area. A child or his mother did not enter the enclosed area until at least two other children were present.

### The Measuring Instrument

The behavior of the subjects in the new situation was assessed by means of a rating scale. The entire scale appears in Appendix A. The scale was constructed around four dimensions of behavior, Tension, Body Movement, Outgoingness and Purposefulness. The subjects' behavior was rated on 23 variables which fell under these four headings. A list of these 23 variables appears below.

#### I. Tension

1. Extent to which the situation was tension-producing
2. Extent to which the situation was inferred to be tension-producing
3. Bodily expression of tension
4. Vocal expression of tension
5. Physical aggression expressed in positive, acceptable (non-destructive) ways toward materials which are appropriate for this expression
6. Physical aggression expressed through attack on materials
7. Expression of tension through attack on people and/or their materials
8. Expression of tension through the seeking of nurturance
9. Expression of tension through "showing off" behavior

## II. Body Movement

- 10. Speed of movement
- 11. Expansiveness of movement

## III. Outgoingness

- 12. Frequency with which a child initiates interaction with materials
- 13. Frequency with which a child initiates interaction with adults
- 14. Frequency with which a child initiates interaction with children
- 15. Proportion of adult overtures to interaction accepted by the child
- 16. Proportion of child overtures to interaction accepted by the child
- 17. Amount of time spent in interaction with materials
- 18. Amount of time spent in interaction with adults
- 19. Amount of time spent in interaction with children
- 20. Level of involvement with materials
- 21. Level of involvement with adults
- 22. Level of involvement with children

## IV. Purposefulness

The ratings were based on the nature of the child's behavior and the amount or frequency with which the behavior was displayed.

The decision as to the number of points on a scale and the

anchoring of these points was based on Symond's (10) rational analysis of the loss of scale sensitivity due to the coarseness of a scale and to Bendig's (2) experimental work with scale qualities.

The rating scales within the over-all system contained some unidimensional scales and some two-dimensional scales consisting of horizontal and vertical ratings. Examples of these scales appear in Figures 1 and 2.

For a more detailed statement of directions as to the use of the scales and the definitions of the variables within the system see Appendix A.

#### Reliability of Observation

Four observers were used in establishing reliability. The situation in which reliability was established was exactly the same as the one used for data collection. The same procedure was followed for rating the children except that the participant observer did not make a rating; thus the observers established reliability as systematic observers only. The assumption underlying this procedure was that being able to observe reliably with the scale under one set of conditions should enable one to observe reliably under similar but not identical conditions. Another factor contributing to the decision not to establish reliability for participant observation was that two persons participating in a situation would not have the opportunity to see

Extremely quick, rapid movements	Quick movements	Neither particularly quick nor particularly slow movements	Slow move- ments	Extremely slow, lethargic movements
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Figure 1. A unidimensional scale

Extreme tension						
Consider- able tension						
Some tension						
Little or no tension						
	All the time	A large propor- tion of the time (40-99%)	A con- siderable proportion of the time (26-39%)	Some propor- tion of the time (11-25%)	A small propor- tion of the time (1-10%)	None of the time

Figure 2. A two-dimensional scale

the same events and would thereby have little chance of demonstrating an adequate degree of observer agreement.

Reliability data were obtained for each of three age groups: 10-13 months, 16-18 months, and 27-28 months. It was presumed that the ability to observe 27-29 months old children reliably would apply to both of the older age groups.

The reliability data are presented in terms of the percentage of agreement between two persons observing simultaneously but independently. Percentage of agreement was found by the formula:

$$\text{percent of agreement} = \frac{\text{number of agreements}}{\text{number of agreements} + \text{disagreements}}$$

Two measures of reliability were obtained. One involved a measure based on complete agreement between observers i.e., when both observers placed a check at the same interval on the scale; the other involved a measure based on a disagreement between observers by one scale point. The above formula was used in computing both reliability scores.

The reliability data for the study appear in Tables II, III, and IV. Table II contains the data relevant to individual scale reliability. It will be noted from this table that there were several scales on which observers were unable to agree in their scoring. Rather than omit these scales from the system, or revise them and reestablish reliability, they were retained for



TABLE II  
INDIVIDUAL CATEGORY RELIABILITY

Variables	Age Groups					
	10-13 months		16-18 months		27-29 months	
	Complete agree- ment	Disag. by 1 scale value	Complete agree- ment	Disag. by 1 scale value	Complete agree- ment	Disag. by 1 scale value
1. Extreme tension	88%	96%	100%	100%	100%	100%
2. Considerable tension	88%	88%	83%	100%	79%	87%
3. Some tension	38%	58%	66%	83%	41%	75%
4. Little or no tension	38%	41%	66%	100%	58%	88%
5. Stimuli are extremely tension-producing	88%	88%	100%	100%	100%	100%
6. Stimuli are tension-producing	46%	70%	100%	100%	66%	87%
7. Stimuli are somewhat tension-producing	16%	50%	89%	100%	41%	96%
8. Stimuli are slightly if at all tension-producing	12%	41%	66%	83%	62%	66%
9. Bodily expression of tension	41%	50%	83%	83%	16%	33%
10. Vocal expression of tension	46%	71%	66%	83%	66%	87%
11. Physical aggression expressed in positive, acceptable ways towards materials which are appropriate for this expression	75%	88%	100%	100%	87%	100%
12. Physical aggression expressed through attack on materials	88%	100%	100%	100%	100%	100%
13. Aggression through attack on people or their materials	88%	100%	83%	100%	58%	75%
14. Expression of tension through seeking of nurturance	79%	83%	100%	100%	75%	87%
15. Expression of tension through "showing off" behavior	83%	79%	66%	100%	100%	100%
16. Speed of movement	50%	100%	100%	100%	46%	100%
17. Expansiveness of movement	100%	100%	61%	100%	58%	100%
18. Frequency with which a child initiates interaction with materials	37%	83%	33%	55%	71%	100%
19. Frequency with which a child initiates interaction with adults	25%	75%	77%	100%	33%	87%
20. Frequency with which a child initiates interaction with children	33%	75%	77%	100%	66%	96%
21. Proportion of adult overtures to interaction accepted by a child	79%	83%	83%	83%	50%	50%
22. Proportion of child overtures to interaction accepted by a child	58%	62%	77%	83%	79%	79%
23. Amount of time spent in interaction with materials	62%	88%	22%	66%	54%	75%
24. Amount of time spent in interaction with adults	66%	83%	38%	100%	33%	75%
25. Amount of time spent in interaction with children	50%	58%	66%	100%	41%	87%
26. Level of involvement with materials	29%	50%	38%	66%	33%	75%
27. Level of involvement with adults	41%	75%	38%	60%	25%	29%
28. Level of involvement with children	25%	38%	55%	71%	29%	38%
29. Extreme persistence	96%	96%	100%	100%	100%	100%
30. Persistence	71%	71%	100%	100%	75%	75%
31. Some persistence	66%	71%	83%	83%	56%	50%
32. Little or no persistence	88%	88%	83%	83%	46%	50%
33. Extreme frustration	91%	91%	100%	100%	100%	100%
34. Frustration	71%	71%	55%	60%	75%	75%
35. Some frustration	46%	46%	83%	83%	33%	38%



TABLE III

## INDIVIDUAL OBSERVER RELIABILITY

Observer combinations	Age Groups					
	10-13 months		16-18 months		27-29 months	
	Complete agree-ment	Disag. by 1 scale value	Complete agree-ment	Disag. by 1 scale value	Complete agree-ment	Disag. by 1 scale value
A and B	60%	80%	67%	83%	64%	79%
A and C	53%	71%	66%	83%	54%	75%
A and D	55%	71%	60%	82%	67%	87%
B and C	60%	70%	86%	95%	60%	76%
B and D	58%	69%	82%	93%	65%	77%
C and D	68%	83%	84%	93%	57%	76%

TABLE IV

## AVERAGE TOTAL OBSERVER RELIABILITY

Observers	Age Groups					
	10-13 months		16-18 months		27-29 months	
	Complete agree-ment	Disag. by 1 scale value	Complete agree-ment	Disag. by 1 scale value	Complete agree-ment	Disag. by 1 scale value
A	55%	74%	64%	83%	61%	80%
B	59%	73%	78%	91%	63%	74%
C	60%	75%	78%	90%	57%	75%
D	60%	74%	75%	87%	62%	80%

the study with the realization that the data coming from these particular scales would have questionable validity. Taken as a whole the individual scale reliabilities were low, but within the range of acceptability.

Individual observer reliabilities are presented in Table III. These data illustrate the extent to which each observer agreed in his total ratings with each of the other three observers. The average of the observer reliabilities appear in Table IV. These data illustrate the extent to which each observer agreed with the other observers as a group.

#### The Role of the Observers

The participant observer's role as a teacher was that of an adult who could aid the child if he needed and wanted her help. She assisted the mothers in working with the children if the mothers needed or asked for help. Her role as teacher was a passive one in that only when actual need for her was expressed was she involved in the situation or play. Only when materials were needed or when intervention to protect the safety of a child was needed or help was asked of her, would the teacher become involved in the situation. At all other times she held herself apart from the situation, focusing on the behavior of the individual children within the group.

The participant observer completed the rating system for each of the four children in the group immediately after the

conclusion of the hour's play period. She observed all four children during the entire observation hour but waited until after the period's completion before making her rating.

There were two systematic or non-participant observers for each hour's observation. Each of the two observers rated the behavior of two subjects. The subjects to be observed were selected randomly by the observers as they entered the play situation for the first hour's observation.

In the second hour the systematic observer would rate the behavior of the children whom she had not observed the first hour. This procedure was followed as a control for constant observer error.

The non-participant observers assessed the behavior of the children with the same rating system that the participant observer used. The non-participant observers used five minute time samples as their basis for rating. Using this procedure, a child was observed for five minutes, then rated in the next four. At the close of the four minute rating period the observer proceeded to the next child repeating the process. After rating the second child's behavior the observer would again focus on the first child and repeat the process. This procedure was followed until ratings for three five minute time samples had been made for each of the two children.

## RESULTS

The problems investigated in this study were (1) to compare the responses of children to a new situation by age levels; (2) to determine individual differences within age groups in the response of children to a new situation; and (3) to determine the consistency of response of children between two "new" situations. The data will be presented around these problems.

Before the results of the research are presented, however, the method by which the data were treated needs careful explanation. As it will be remembered, systematic and participant observers were used in the study, with three observers rotating within these two observer methods. The observers were rotated in such a way that the participant observer for a particular group for the first hour of observation became the systematic observer for that group in the second hour of observation. This method of rotation resulted in a lack of balance between method of observation and the number of observations for each observer. This lack of balance made it impossible to control statistically for observer error without first combining the participant and systematic observer's data and treating these two sets of data as one. The alternative to the combining of these two sets of data would have been the analysis of each set of data i.e., the participant and systematic observers' data, independently but

without removal of the error variance due to individual differences in observers. The decision was reached to pool the data. This decision rested upon the ability to calculate at least approximately the nature of the error being introduced to the data by combining them.

Two steps were taken in determining the nature of the error introduced to the data by combining the systematic and participant observers' data. The first involved an analysis of the three five-minute ratings made by the systematic observer in each of the observation periods to see if there were any significant differences in these ratings. The results of this analysis indicated that these ratings were consistent throughout the period of observation. This analysis appears in Table X in Appendix C. On the basis of these data the three five-minute periods of observation were averaged and treated as one score.

One further point in regard to the systematic observers' data is noteworthy. Since it was impossible to remove the influence of the observer error when working with the systematic observers' data by itself, and since the influence of observer error generally is one of reducing the sensitivity of the test of significance, it is likely that the lack of difference observed between the five-minute periods of observation was in part a function of this error.

The second step that was undertaken in identifying the source of error introduced to the data by combining was to

determine the comparability of the two sets of data before their combination. The results of this comparative analysis indicated that ten of the twenty-three variables differed significantly for methods, with nine of these ten differences being in the direction of the participating observer. These results are summarized in Table V. The complete set of data relevant to this analysis appears in Table XI in Appendix D.

On the basis of these results, it was clear that the two sets of data were not comparable, and that their combination introduced considerable error to the data. The error that was introduced, however, was one which tended to mask significant differences or trends in the data rather than lead to spuriously high trends or differences. From inspection of Table V it will be seen that the direction of the masking was toward the reduction in sensitivity of the participant observer's data. This reduction was a result of combining the non-significant data of the systematic observer with the significant data of the participant observer. This factor should be kept in mind when evaluating the results of the subsequent analyses.

Following this analysis the two sets of data were pooled and submitted to an analysis of variance, multiple classification, testing the following sources of variance: age, within age, hour, observer, and hour x observer.

Also a test for the linearity of regression of a variable on age was made whenever the means of the age groups proved to

TABLE V

MEAN SCORES AND F VALUES FOR VARIABLES WHICH DIFFERED  
SIGNIFICANTLY BETWEEN SYSTEMATIC AND PARTICIPATING OBSERVERS

Variable	Means of observers		F(1, 84)
	Systematic observer	Participating observer	
1. Extent to which the situation is tension-producing	3.950	6.397	11.460**
2. Extent to which the situation was inferred to be tension-producing	1.903	2.776	7.326**
4. Vocal expression of tension	1.731	2.457	14.608**
12. Frequency with which child initiates interaction with materials	4.603	4.181	12.091**
15. Proportion of adult overtures to interaction accepted by the child	2.881	4.466	33.413**
16. Proportion of child overtures to interaction accepted by the child	1.124	2.543	17.732**
18. Amount of time spent in interaction with adults	2.012	2.474	6.636*
19. Amount of time spent in interaction with children	1.379	1.897	27.210**
20. Level of involvement with materials	2.497	2.966	9.352**
22. Level of involvement with children	1.040	1.759	9.561**

\* significant at the .05 level

\*\* significant at the .01 level

be significantly different. In this regression analysis, three degrees of freedom due to age groups were broken down into two components, one degree of freedom due to linear regression and two degrees of freedom due to deviation from linearity. These data appear in Table XI in Appendix D.

#### Significant Variables by Age

Table VI contains those variables which differed significantly with age. Of the twenty-three variables analyzed, two variables, Bodily Expression of Tension and the Expression of Tension Through Attack on People and/or Their Materials had ratings which were statistically significant for the various age groups. The linear regression was significant for variable three. Thus, it can be seen from the table that the means of the age groups in this variable increase consistently up through age Group III and then lower for Group IV. However, this lowering in the mean score was not enough to make a significant deviation from linearity. In testing the linearity of regression by age, it was found that the deviation from linearity was significant for variable seven. This means that the means of the age groups did not increase in a straight line but rather in a curved line.

It will be noted that in Table VI that the means of the age groups for both variables increase through age Group III and then decrease for age Group IV. Of the twenty-one non-significant



TABLE VI

MEAN SCORES AND F VALUES FOR VARIABLES WHICH DIFFERED SIGNIFICANTLY  
WITH AGE, AND THE LINEARITY OF REGRESSION FOR THOSE VARIABLES

Variable	Means of groups				F(3, 25)	Linear regres- sion	Deviation from linearity
	1	2	3	4			
3. Bodily expression of tension	1.679	2.563	2.888	2.597	4.237*	6.126*	3.297
7. Expression of tension through attack on people and/or their materials	1.068	1.697	2.379	1.238	3.274*	.127	4.841*

\* significant at the .05 level

variables when analyzed by age, seven showed this same type of patterning in mean scores. See Table XII in Appendix E.

#### Individual Differences within Age Groups

Twelve of the twenty-three variables showed significant individual variations within the age groups. These twelve variables with their F values are shown in Table VII.

All of these significant variables were in the expected direction of individual variation within groups. It is noteworthy that seven of these twelve variables were significant at the .01 level. A further discussion of the individual differences will be taken up in the next chapter.

#### Variables Which Varied Significantly Between First and Second Observations

Table VIII contains those variables which varied significantly between the first and second hours of observation. With one exception, Level of Involvement with Children, the average scores for these variables were greater for the first hour than for the second. All of these variables were in the direction of expected variation, with the exception, perhaps, of purposefulness. Reasons for a higher degree of purposefulness in the first hour of observation will be discussed in a latter section.

TABLE VII  
VARIABLES WITH THEIR F VALUES WHICH DIFFERED SIGNIFICANTLY  
WITHIN AGE GROUPS

Variable	F(25-84)
1. Extent to which the situation was tension-producing	2.649*
4. Vocal expression of tension	3.639**
7. Aggression through attack on people and/or their materials	4.581**
9. Expression of tension through "showing off" behavior	1.706*
10. Speed of movement	5.432**
11. Expansiveness of movement	2.917**
12. Frequency with which a child initiates interaction with materials	2.357**
13. Frequency with which a child initiates interaction with adults	3.259**
14. Frequency with which a child initiates interaction with children	3.320**
16. Proportion of child overtures to interaction accepted by the child	1.722*
17. Amount of time spent in interaction with materials	1.806*
19. Amount of time spent in interaction with children	1.768*

\* significant at the .05 level

\*\* significant at the .01 level

TABLE VIII

MEAN SCORES AND F VALUES FOR VARIABLES WHICH VARIED  
SIGNIFICANTLY BETWEEN FIRST AND SECOND OBSERVATIONS

Variable	Hour		F(1, 84)
	1	2	
1. Extent to which the situation was tension-producing	5.919	4.428	4.258*
2. Extent to which the situation was inferred to be tension-producing	2.822	1.857	8.973**
4. Vocal expression of tension	2.302	1.886	4.787**
22. Level of involvement with children	1.153	1.645	4.466*
23. Purposefulness	2.552	1.576	8.909**

\* significant at the .05 level

\*\* significant at the .01 level

### Correlation Between Tension and Outgoingness

On inspecting the data, it appeared that the variables of tension and outgoingness followed similar patterns. An analysis was undertaken to determine this relationship more exactly. Correlation coefficients were run on these variables with the correlation being broken down into several components. These were age, within age, hour, observer, hour x observer, error and total. These correlations appear in Table IX. In this analysis, the coefficients for hour, observer, and hour x observer were always equal to +1 or -1, since their degrees of freedom were equal to zero. For this reason, these correlations do not appear in the table.

In evaluating these correlations it is important to realize that the ones listed in the column labeled error are the most important for the purposes of the present discussion. They represent the correlation between the two variables, Tension and Outgoingness, with the effects of age, within age, hour, observer, and hour x observer all removed.

Four of the seven correlations proved to be significant, and the other three correlations were in the expected direction. The implications of these will be discussed in a later section.

TABLE IX  
CORRELATION BETWEEN TENSION AND OUTGOINGNESS

Variable	Components:	Age	Within age	Error	Total
	Degrees of freedom:	2	24	83	114
1. Extent to which the situation was tension-producing and Extent to which the situation was inferred to be tension-producing		.0414	.0070	.2450*	.2937**
2. Extent to which the situation was tension-producing and Frequency with which a child initiates interaction with materials		.0103	-.1774	-.3677**	-.3296**
3. Extent to which the situation was tension-producing and Frequency with which a child initiates interaction with adults		.1497	.0851	-.0768	-.0194
4. Extent to which the situation was tension-producing and Frequency with which a child initiates interaction with children		.8991	-.0271	-.0610	.0230
5. Extent to which the situation was tension-producing and Amount of time spent in interaction with materials		-.0697	-.3167	-.4415**	-.3454**
6. Extent to which the situation was tension-producing and Amount of time spent in interaction with adults		-.0289	.4873**	.2819*	.3668**
7. Extent to which the situation was tension-producing and Amount of time spent in interaction with children		.9865*	-.1319	-.0761	.0422

\* significant at the .05 level

\*\* significant at the .01 level

## DISCUSSION

The purposes of this study were (1) to compare the responses of children of different age levels to a new situation; (2) to identify within age levels individual differences in response to a new situation; and (3) to compare the consistency of the response of children to two "new" situations. The discussion of the results will center around these purposes.

It will be recalled that only two variables varied significantly between age levels. These were Bodily Expression of Tension and The Expression of Tension Through Attack on People and/or Their Materials. There are several possible explanations for this relative lack of difference in the response of children of varying ages in a new situation. First, it may be that age simply is not a factor in the response of children to a new situation. Shirley (9) concluded from her study that her subjects' adjustment to a visit to a health center was little influenced by age. Arsenian (1) also stated that the individual adjustment of her subjects to the strange situation had no correlation with age. The findings in these two studies seem to be upheld by the results of the present study.

A second possible explanation could lie in the error introduced to the data by the inadequacies of the measuring instrument and by having to combine the systematic and participant observers' data with a consequent masking of differences in the data. The

magnitude of this error is unknown, but on the basis of the evidence for reliability and the differences found between systematic and participant observer data, the error unquestionably is sufficient to appreciably influence the results of the study.

In connection with age group differences and in contrast to the possible conclusion that age is not related to response to a new situation, there was the tendency for the mean scores of the age groups to increase in a curved line, the highest point being at the 23-25 month old group. Seven of the twenty-three variables had scores which followed this pattern. While this is only a trend, it does suggest rather strongly that age is a factor in the response of children to a new situation. Perhaps, with less error in the data these trends would have represented real differences.

The results of the analysis of individual differences within age groups may be interpreted in much the same way as the results of the analysis of differences between age groups. The fact that only twelve of the variables reflected individual differences may be taken to mean that for children of these ages individual variation with respect to certain aspects of behavior simply does not occur. A more likely interpretation would be that the error in design and measurement masks individual variations and that with more adequate instruments and design, differences would be found for the majority of these variables. It is worth noting, however, that because of the shortness and circumscribed nature



of the "new" situation, it was not a situation which maximized individual differences.

The behavior patterns in the two new situations were relatively consistent, with only five of the twenty-three variables differing significantly from the first to the second hour of observation. Because of the nature of the second "new" situation these results were expected. The key to interpreting these results probably lies in the fact that the second observation period generally was less tension producing for the children. This would account for the lessening in Vocal Expression of Tension and for the increase in the Level of Involvement with Children.

One of the results of the study which was unexpected was the greater degree of purposefulness evidenced in the first hour of observation than in the second hour. This seems to be just the opposite from that which was expected. An explanation may lie in the definition of purposefulness that was used in this study. For this study we defined purposefulness in terms of the persistence which the child showed toward a goal object in face of frustration. From this point of view, in the first hour of observation the child, because of his tension, perceived more things as being blocks to his purposes than were actually so. If this were the case he would have reacted to the supposed blocks in a way which would lead the rater to score him higher on purposefulness. Following this same line of reasoning, in

the second observation when the child was more at ease, he perceived fewer blocks and was rated for purposefulness accordingly.

One other result that is noteworthy is the negative correlation between tension and frequency of initiation of interaction with materials and the positive correlation between tension and the amount of time spent in interaction with adults. It can be seen from these results that as tension increases involvement with materials decreases. At the same time as tension increases so does the amount of time spent in interaction with adults. From these two correlations it can be seen that as the child becomes tense he spends more time with adults, in this case his mother, and less time exploring what the situation has to offer. These results have implications for those working with children entering new situations. As long as the situation is relatively free of tension, the child will be able to explore the situation rather than spend his time seeking security.

## SUMMARY AND CONCLUSIONS

Summary

The problems investigated in this study were (1) to compare the responses of children to a new situation by age levels; (2) to determine individual differences within age groups in the response of children to a new situation; and (3) to determine the consistency of children's response to two "new" situations.

Thirty-two subjects took part in the study. The thirty-two children were divided into four age groups: Group I, 10-13 months; Group II, 16-18 months; Group III, 23-25 months; Group IV, 32-34 months. Because of illness the number of subjects at the end of the study was twenty-nine, with seven children in Group I, eight children in Group II, six children in Group III, and eight children in Group IV.

The new situation was a free play period at Orchard Street Nursery School, Oregon State College, held between 3:30 - 4:30 in the afternoon. The group in each free play period consisted of four children, their mothers, one teacher and two observers who were in an alcove adjoining the area.

The subjects were observed for two one-hour observations spaced approximately two weeks apart. Behavior was measured by a rating scale consisting of twenty-three variables under the four headings: (1) Tension, (2) Body Movement, (3) Outgoingness,

and (4) Purposefulness. The ratings were based on the nature of the overt behavior exhibited and the amount of time or frequency with which the behavior was displayed.

Both systematic and participant observers were used in the study. The systematic observers during the observation hour made three five-minute ratings of the subjects while the participant observer made one rating for each subject at the end of the observation hour. Reliability of observation was demonstrated for all observers under systematic observation conditions. Observer reliability was found by computing the percent of agreement between two observers on an item-by-item comparison of ratings made simultaneously but independently.

Because of an error in rotation of observers the decision was reached to pool the systematic and participant observers' data. The combining of these data was undertaken after an analysis of the three five-minute ratings of the systematic observer showed no significant difference in these periods, and after an analysis to determine the comparability of the two sets of data was completed. Following these analyses the two sets of data were combined and submitted to an analysis of variance, multiple classification, testing the following sources of variance: age, within age, hour, observer, and hour x observer. Also a test for the linearity of regression of a variable on age was made wherever the means of the age groups proved to be significantly different.

### Conclusions

From the results of this study several conclusions seem justified:

1. Age does not seem to be a dominant factor in the responses of children to a new situation. However, because of the errors introduced into the study through the measuring instrument and design and because of some observable trends in the data the possibility of the factor of age was not completely rejected.
2. Children do vary in their individual responses to a new situation.
3. The behavior patterns in the two new situations were relatively consistent.

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## APPENDICES

APPENDIX A

Behavior Rating Scale



BEHAVIOR RATING SCALE

## I. TENSION

There are two aspects of this variable to be rated, the extent to which a child evidences tension during the course of the observation and the extent to which the situation is inferred to be tension-producing.

A. Extent to which a child evidences tension during the course of the observation

As used here tension is defined in terms of behaviors which suggest the presence of a tenseness, fearfulness, or a surplus of energy which needs to find an immediate release. Evidence for the rating of tension comes from such behaviors as typical anxiety symptoms, non-provoked attack, responses that are obviously out of proportion to their stimulation, rushing about aimlessly with much shouting and "letting off of steam", etc.

Evaluation of the level of tension is based on behavioral cues which suggest the intensity of the tension the child is experiencing. The degree to which a child evidences tension in the situation has been defined into four levels. These are:

1. Extreme tension - Evidence for this rating of this level of tension comes from such behavioral cues as rigidity of muscles; nervous mannerisms such as profuse thumb sucking, nail biting, tics; harsh, prolonged sobbing, screaming, yelling, cursing, or talking rapidly in shrill tones; forceful hitting, throwing, kicking with intent to injury or harm; intense clinging to the mother, persistent striving to sit on her lap, hiding behind the mother's skirt, or drawing self up into tightly curled position.
2. Considerable tension - Evidence for the rating of this level of tension comes from behaviors differing from those used in rating extreme tension only in their level of intensity. This decrease in the level of intensity leads to a judgement of considerable tension rather than judgement of extreme tension.
3. Some tension - Evidence for the rating of this level of tension comes from behaviors differing from those used in rating considerable tension only in their level of intensity. This decrease in the level of intensity

leads to a judgement of some tension rather than a judgement of considerable tension.

4. Little or no tension - Evidence for the rating of this level of tension comes from such behavioral cues as an apparent relaxed face and body; calm tone of voice i.e. one that is not loud, shrill, harsh, or whining; a free, easy flow of words; interaction with people and materials which shows no aggressive, destructive or attacking behavior; little seeking of nurturance, and freedom from other typical anxiety symptoms.

In judging the level of tension the rater is to consider only the intensity of the cues suggesting tension. The amount of time a child spends in evidencing a particular level of tension and number of channels a child uses to express his tension are not to be considered in judging tension level. While this is the case, it should be noted the number of channels a child uses in expressing his tension does play a part in arriving at a judgement of tension level in that the greater the number of cues observed the more adequate the basis for such judgement.

It has been observed that the level of tension a child is experiencing is closely associated with the behavior patterns he exhibits. For this reason it is necessary to assess a child's behavior at each of the levels of tension he is experiencing. For example, if a child experiences "little or no tension" for a part of an observation period but also experiences "some tension" for another part of the period, it is necessary to evaluate the child's behavior as it appears in relation to each of these levels of tension. The major difficulty in such a procedure is that the rater has to observe a child experiencing a given level of tension for a considerable period of time to get enough cues to make a behavioral assessment at a particular level of tension meaningful. In order to decide when the observer likely has enough cues to make a rating possible, a two-way classification of the tension variable involving the level of tension and the amount of time a child exhibits a particular level of tension is made. If a child experiences a given level of tension for a "considerable proportion of time" or longer (see scale values below), the child's behavior will be rated as it is evidenced at that particular level of tension. This means then that if a child experiences a particular level of tension for a "large proportion of time", another level of tension for "a considerable proportion of time", the child's behavior will be rated separately for each of these levels of tension. However, if a child evidences a particular level of tension for a "large proportion of time" but evidences another level of tension

for a "small proportion of time" or even "some of the time", the child's behavior will be rated only for the level at which the child spent a "large proportion of time".

The large range in the percentage of time under each of the scale points makes it possible to have several different combinations of scale values for any one period of observation. For example, since the scale point "a large proportion of time" has a percentage range of 40-99%, it is possible to have a child spend a large proportion of time at two levels of tension. In this way the number of possible combinations of scale values is limited only in that the total minimum percentages of time cannot exceed 100% and the total maximum percentages of time can equal 100%.

In making this two-fold rating each of the levels of tension is to be marked irrespective of whether all levels of tension are evidenced.

In summary the factors one needs to consider in making this rating are:

1. Both the level of tension and the time spent at a particular level of tension needs to be rated.
2. In judging the level of tension the rater is to consider only the intensity of the cues suggesting tension. The number of cues suggesting tension and the amount of time the child spends in evidencing this tension should not be considered in rating the level of tension.
3. In judging the length of time spent at a particular level of tension, the rater will simply estimate the period of time rather than keeping track of the time systematically.
4. In making the two-fold rating each of the levels of tension is to be marked irrespective of whether all levels of tension are evidenced.

Extreme  
tension

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Considerable  
tension

---

Some  
tension

---

Little or  
no tension

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All of the time (99-100%)	A large propor- tion of the time (40-99%)	A con- sider- able propor- tion of the time (26-39%)	Some propor- tion of the time (11-25%)	A small propor- tion of the time (1-10%)	None of the time
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B. Extent to which the situation is inferred to be  
tension-producing

As used here a situation is tension-producing when it contains elements or events which may be expected to be stressful.

Evidence for the rating of this variable comes from cues which suggest the extent to which the elements or events in a situation are capable of producing tension i.e., whether these events are potentially tension-producing, tension-producing, or extremely tension-producing. In rating this variable the manifestations of tension in the child's behavior are not to be considered. It is the potential of the situation to produce tension that is to be judged.

Evaluation of the degree to which the situation may be tension-producing is based upon the severity of the events which occur in the situation. The degree to which the situation is tension-producing has been defined into four levels. These are:

1. A situation which is extremely tension-producing is one in which there are stimuli which would ordinarily be extremely tension-producing to a child. Examples of situations of this nature are: a child working a puzzle and two other children taking some of the pieces of puzzle out and throwing them at the child; an infant playing pat-a-cake with his mother and falling off her lap; a child falling off a tricycle and receiving a severe blow on the head.

2. A situation which is tension-producing is one in which there are stimuli which would ordinarily be tension-producing but not extremely tension-producing. Examples of situations of this nature are: a child trying to work a puzzle which is above his developmental level; an infant playing pat-a-cake with his mother while a sibling tries to push the child off the mother's lap; a child riding a tricycle around the playyard and another child tries to take the tricycle away from him.
3. A situation which is somewhat tension-producing is one in which potentially disturbing or stressful stimuli occur. Potentially disturbing stimuli are defined as events which could be stressful for some children, but which would not be expected to be inevitably stressful for all children. Examples of situations of this nature are: a child working a puzzle by himself and another child trying to interfere by offering help; a child riding a tricycle around the playyard and being bumped from behind by a child on another tricycle; an infant playing pat-a-cake with his mother when an unexpected loud noise occurs.
4. A situation in which the stimuli produced little or no tension is one in which there are no apparent, unexpected or unusual events which could be thought of as stressful. Examples of situations of this nature are: a child working a puzzle which is within his developmental level; an infant playing pat-a-cake with his mother; a child riding a tricycle around the playyard.

In order to determine the relationship between the amount of time spent by a child evidencing a given level of tension and the amount of time one would predict the child to evidence a given level of tension, with the prediction being based upon the amount of time the situation is tension-producing, it is necessary to judge the amount of time which stimuli of varying levels of intensity operate during an observation period. In order to do this we have employed a two-fold classification involving the extent to which a situation is tension-producing and the amount of time which stimuli of varying levels of intensity operate. Judgment of the percentage of time a situation is tension-producing to some degree is determined strictly on the basis of time. The number of tension-producing incidents does not play a role in making the rating except in so far as it contributes to the total amount of time which is tension-producing to some degree.

The procedure the rater uses in assigning scale values for the amount of time the stimuli are tension-producing at a given

level may be found on page 41, second paragraph.

In making this two-fold rating, each of the levels of tension-producingness is to be marked irrespective of whether all levels are evidenced.

In summary, the factors one needs to consider in making this rating are:

1. Both the extent to which the situation is tension-producing and the amount of time the stimuli are tension-producing at a particular level need to be rated.
2. In judging the extent to which a situation is tension-producing, the rater is to consider only the intensity of the unexpected or unusual events which occur and not the frequency with which they occur nor the length of time which they continue.
3. The percentage of time which is tension-producing to some degree is determined strictly on the basis of time i.e., the number of tension-producing incidents does not play a role in making the ratings except in so far as they contribute to the amount of time the situation is tension-producing to some degree.
4. A rating needs to be made for all levels of tension-producingness irrespective of whether there are events in the observation which were representative of all levels of tension-producingness.



Stimuli  
are ex-  
tremely  
tension-  
producing

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Stimuli  
are  
tension-  
producing

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Stimuli  
are some-  
what  
tension-  
producing

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Stimuli  
are  
slightly  
if at all  
tension-  
producing

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All of the time (99-100%)	A large propor- tion of the time (40-99%)	A con- sider- able propor- tion of the time (26-39%)	Some of the time (11-25%)	A small propor- tion of the time (1-10%)	None of the time
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A SPECIAL PROCEDURE FOR SCORING is needed when a child spends a considerable proportion or more of the observation time at more than one level of tension. When this occurs, it becomes necessary to assess the child's behavior as it is evidenced at each of these levels of tension involved.

To facilitate this multiple recording, colored pencils are used. A plain lead pencil will be used when there are stimuli which are only slightly if at all tension-producing; a red lead pencil will be used when the stimuli are somewhat tension-producing; a blue lead pencil will be used when stimuli are tension-producing; and a green lead pencil will be used when the stimuli are extremely tension-producing. In this way it will be possible to make as many ratings as are needed on a single rating scale.

It will be recalled that if a child spends only some or a smaller proportion of the time at a given level of tension during the period of observation, a separate rating of the child's behavior as it appeared at these levels of tension is not required. This is due to the relatively short period of time the child is experiencing these particular levels of tension with the consequence being that the observer is not able to get enough cues to make a rating possible.

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## II. AVENUES USED IN THE EXPRESSION OF TENSION

This variable is defined in terms of the nature or locus of the behaviors which serve the child in the expression of tension. Seven avenues have been defined: bodily expression; vocal expression; physical aggression expressed in positive, acceptable (non-destructive) ways toward materials which are appropriate for this expression; physical aggression expressed through attack on materials; aggression through attack on people and/or their materials; expression of tension through the seeking of nurturance; expression of tension through "showing off" behavior.

In rating each of these avenues a judgement as to the extent to which the child used the avenue is needed. This has been defined into five levels: much use of the avenue; considerable use of the avenue; some use of the avenue; slight use of the avenue; no use of the avenue. When making the judgement as to the extent of use of a particular avenue the judgement is to be based upon the percentage of time a child expresses his tension through a particular avenue relative to the total amount of time this child is evidencing tension rather than the total amount of time the child is being observed. This means for example, if a child evidences tension for a total of five minutes and in this time he expresses his tension for the full five minute period through the bodily expression avenue, he expresses tension vocally for three minutes, and through physical attack on materials one minute, he would receive a rating of much use of the Bodily Avenue and the Vocal Avenue, and some use of the Physical Attack on Materials Avenue.

If a child exhibits little or no tension throughout the course of the observation, then ratings under this heading are not needed. If any tension is evidenced in the course of the observation, irrespective of the proportion of time it lasts, then all of the scales under this heading needed to be scored.



### 1. Bodily expression

Evidence for the rating of this variable comes from such behaviors as tenseness of body and facial muscles; muscular rigidity; trembling; nervous mannerisms such as thumb sucking, picking the nose, etc.

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Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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### 2. Vocal expression

Evidence for the rating of this variable comes from such behaviors as shouting, yelling, cursing, crying, loudness and rapidity of talking, etc. Any vocal expression evidencing tension, other than a vocal attack on a person, will be considered as evidence for this rating.

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Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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3. Physical aggression expressed in positive, acceptable (non-destructive) ways toward materials which are appropriate for this expression

Evidence for the rating of this variable comes from such behaviors as pounding, hitting, or any other forceful, releasing behavior that is of a non-destructive nature. Some of the materials which may be used in this non-destructive, yet forceful way are blocks, pounding clay, pounding boards, etc.

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Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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4. Physical aggression expressed through attack on materials

Evidence for the rating of this variable comes from such behaviors as hitting, throwing, kicking, or any other behavior which has as its goal the destruction or mutilation of an object.

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Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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### 5. Aggression through attack on people and/or their materials

Evidence for the rating of this variable comes from such behaviors as kicking, spitting, throwing of objects toward a person, cursing, or any other behavior, either verbal or physical, which has as its goal the hurting of people.

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Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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### 6. Expression of tension through the seeking of nurturance

Evidence for the rating of this variable comes from behaviors which suggest the seeking of care, comfort, protection, or support. Specific examples of such behaviors are crawling into the mother's lap, hanging onto the mother's skirt, holding the mother's hand, standing close to an adult, etc.

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Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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### 7. Expression of tension through "showing off" behavior

Evidence for the rating of this variable comes from behavior which goal is to purposefully attract attention. Examples of such behavior are standing on head; performing a particularly risky feat in order to command attention; making silly movements or faces, etc.

Much use of this avenue (40-100%)	Considerable use of this avenue (26-39%)	Some use of this avenue (11-25%)	Slight use of this avenue (1-10%)	No use of this avenue
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### III. BODY MOVEMENT

This variable is defined in terms of the quickness with which the child moves and the way in which he uses his body generally.

#### A. Speed of movement

Evidence for the rating of this variable comes from the general quickness with which a child moves. Hand movements, body movements, and general gait are considered here.

Extremely quick, rapid movements	Quick movements	Neither particularly quick nor particularly slow move- ments	Slow movements	Extremely slow, lethargic movements
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### B. Expansiveness of movement

Evidence for the rating of this variable comes from the way in which a child uses his body. Large, wide, free unrestrained body movements will be taken as evidence of expansiveness while smaller, more restricted, more careful, more restrained movements will be taken as evidence of restraint.

Extremely expansive movements	Expansive movements	Neither particularly expansive nor particularly restrained movements	Restrained movements	Extremely slow re- strained movements
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### IV. OUTGOINGNESS

This variable is defined in terms of a child's interaction with materials and/or people. Interaction as used in this scale may be behavioral interchange between two or more people or it may be the active directing of behavior toward one or more individuals without reciprocity, or it may be the active directing of behavior toward materials. The interaction may be verbal, motor, or visual but the interaction we are focusing upon is the interaction involved in or around the activity, people, or material toward which attention seems to be centrally focused. Attention may be pulled away from this activity periodically but as long as it is returned, the activity retains its central focus. Interaction occurring tangentially to the central focus of the activity i.e., behavior which involves looking away from the task, talking to someone outside the group, or interacting with someone outside the group motor-wise, will be considered as incidental interaction.

Outgoingness is broken down into four components, frequency with which a child initiates interaction, proportion of overtures to interaction accepted by a child, the amount of time spent in interaction, and the level of involvement in the interaction. These four components are rated with reference to interaction with materials and interaction with people with the exception of

the child's response to overtures to interaction which is rated only for interaction with people.

#### A. Frequency with which a child initiates interaction

As used here the initiation of interaction is defined in terms of undertaking or attempting to undertake an activity or conversation with materials or people. In this sense the initiation of interaction requires more than simple watching. That is, it requires an active, clear-cut verbal or physical overture to interaction. Incidental interaction, as defined above, will not be considered as an attempt to initiate interaction.

##### 1. Frequency with which a child initiates interaction with materials

Evidence for the rating of this variable comes from such behaviors as a child talking with a doll, working a puzzle, or building with blocks.

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Very frequently (7 or more initiations)	Frequently (4 to 6 initiations)	Sometimes (2 to 3 initiations)	Rarely (1 initia- tion)	Never (no initia- tions)
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##### 2. Frequency with which a child initiates interaction with people

Evidence for the rating of this variable comes from such behaviors as a child inviting another child to play with him in the doll corner, a child with a rope handing one end to another child, a child asking an adult to read a story to him or to play the piano for him.

##### a. Adults

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Very frequently (7 or more initiations)	Frequently (4 to 6 initiations)	Sometimes (2 to 3 initiations)	Rarely (1 initia- tion)	Never (no initia- tions)
--	---------------------------------------	--------------------------------------	-------------------------------	--------------------------------

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## b. Children

Very frequently (7 or more initiations)	Frequently (4 to 6 initiations)	Sometimes (2 to 3 initiations)	Rarely (1 initia- tion)	Never (no initia- tions)
--	---------------------------------------	--------------------------------------	-------------------------------	--------------------------------

## B. Proportion of overtures to interaction accepted by a child

As used here an overture to interaction is synonymous with the initiating of interaction as defined in A above. An acceptance of such an overture is defined as a response to the overture which serves to stimulate further interaction. Non-acceptance of an overture is defined as a response which tends to discourage or block interaction.

## 1. Proportion of adult overtures to interaction accepted by a child

Evidence for the rating of this variable comes from such behaviors as a child accepting an adult invitation to join in a group of children sliding on the slide, a child responds to an adult's initiation of conversation by further conversation, an infant rolls a ball back to an adult who has initiated this play.

A child responds to a large proportion of adult overtures (76-100%)	A child responds to a con- siderable proportion of adult overtures (51-75%)	A child responds to some adult overtures (26-50%)	A child responds to a small proportion of adult overtures (1-25%)	A child responds to no adult overtures
---	--	--	---	--

No adult overtures \_\_\_\_\_

## 2. Proportion of child overtures to interaction accepted by a child

Evidence for the rating of this variable comes from such behaviors as a child beginning to play in the doll corner after being invited, a child swinging after being asked, a child entering into a singing group around the piano after the adult asks him.

A child responds to a large proportion of child overtures (76-100%)	A child responds to a considerable proportion of child overtures (51-75%)	A child responds to some child overtures (26-50%)	A child responds to a small proportion of child overtures (1-25%)	A child responds to no child overtures
---	---	---	---	--

No child overtures \_\_\_\_\_

## C. Amount of time spent in interaction and level of involvement in interaction

Amount of time spent in interaction is defined in terms of the proportion of time a child spends in verbal and motor interchange with materials and/or people. In making this rating, incidental interaction, i.e., the directing of attention to something other than that which occupies the central focus of the action is not to be considered. Evidence for rating the amount of time spent in interaction comes only from the time spent in focused interaction with materials and/or people.

The level of involvement in interaction is defined in terms of the amount of incidental interaction evidenced during the course of observation. If the child's attention is never taken from the activity or task at hand, we will consider his level of involvement to be deep. If the child directs his attention very frequently to factors other than that which commands a central focus, we will consider his level of involvement to be slight.

Frequency of incidental interaction is transposed to a percentage estimate of the total interaction time. This



percentage estimate will then enable us to judge a child's level of involvement relative to the total amount of time spent in interaction. The necessity for this procedure lies in the fact that a simple frequency count of the occurrence of incidental interaction has no meaning unless the time spent in interaction is known. For example, three occurrences of incidental interaction during a total of five minutes of interaction suggests a considerably different level of involvement than three occurrences of incidental interaction in fifty minutes of interaction.

In making this two-fold rating, only one of the statements describing the amount of time spent in interaction will be checked. Consequently there will be only one rating of the level of involvement.

In summary the factors one needs to consider in making the rating are:

1. Both the amount of time spent in interaction and the level of involvement a child evidenced in this interaction are to be rated.
2. In judging the amount of time the child spends in interaction, the rater is to consider the total time spent in interaction with people or materials independent of the level of involvement of the child in his interaction.
3. In judging the level of involvement of the child in interaction, the rater is to consider the frequency with which the child engages in incidental interaction.
4. In judging the level of involvement, the rater needs to transpose the frequency of incidental interaction to a percentage estimate of total interaction time.
5. In making the two-fold rating, only one of the statements describing the time spent in interaction is to be marked.

## 1. Amount of time spent in interaction with materials

All of  
the time \_\_\_\_\_

A large  
proportion  
of the time  
(76-99%) \_\_\_\_\_

A considerable  
proportion of  
the time  
(50-75%) \_\_\_\_\_

Some of  
the time  
(26-49%) \_\_\_\_\_

A small  
proportion  
of the time  
(1-25%) \_\_\_\_\_

Deep in- volvement: A child evidences incidental interaction a <u>small</u> pro- portion of the time (1-10%)	Considerable involvement: A child evi- dences in- cidental interaction <u>some</u> of the time (11-25%)	Some in- volvement: A child evidences incidental interaction a <u>consider- able</u> propor- tion of the time (26-39%)	Slight in- volvement: A child evidences interaction a <u>large</u> pro- portion of the time (40-99%)
---	---	---	--

None of  
the time \_\_\_\_\_

## 2. Amount of time spent in interaction with people

## a. Adults

All of  
the time \_\_\_\_\_

A large  
proportion  
of the time  
(76-99%) \_\_\_\_\_

A considerable  
proportion of  
the time  
(50-75%) \_\_\_\_\_

Some of  
the time  
(26-49%) \_\_\_\_\_

A small  
proportion  
of the time  
(1-25%)

Deep in-  
volvement:  
A child  
evidences  
incidental  
interaction  
a small pro-  
portion of  
the time  
(1-10%)

Considerable  
involvement:  
A child evi-  
dences in-  
cidental  
interaction  
some of the  
time  
(11-25%)

Some in-  
volvement:  
A child  
evidences  
incidental  
interaction  
a consider-  
able propor-  
tion of the  
time  
(26-39%)

Slight in-  
volvement:  
A child  
evidences  
interaction  
a large pro-  
portion of  
the time  
(40-99%)

None of  
the time \_\_\_\_\_

## b. Children

All of  
the time \_\_\_\_\_

A large  
proportion  
of the time  
(76-99%) \_\_\_\_\_

A considerable  
proportion of  
the time  
(50-75%) \_\_\_\_\_

Some of  
the time  
(26-49%) \_\_\_\_\_

A small  
proportion  
of the time  
(1-25%)

Deep in-  
volvement:  
A child  
evidences  
incidental  
interaction  
a small pro-  
portion of  
the time  
(1-10%)

Considerable  
involvement:  
A child evi-  
dences in-  
cidental  
interaction  
some of the  
time  
(11-25%)

Some in-  
volvement:  
A child  
evidences  
incidental  
interaction  
a consider-  
able propor-  
tion of the  
time  
(26-39%)

Slight in-  
volvement:  
A child  
evidences  
interaction  
a large pro-  
portion of  
the time  
(40-99%)

None of  
the time \_\_\_\_\_

## V. PURPOSEFULNESS

As used here this variable is defined in terms of the persistence with which a child pursues his goals.

In the pursuit of his goals a child frequently encounters obstacles to the realization of these goals. When an obstacle is encountered, the behavioral response to the frustration may have about it elements of intensity, adaptive-non-adaptive qualities, and a persistence factor in striving to overcome or circumvent the barrier, etc. In rating the purposefulness of a child's behavior only the quality of persistence will be considered.

Persistence is defined in terms of the tenacity with which a child pursues his goals. Persistence has been defined into four levels with the basis of differentiation being the length of time which the child characteristically spends in response to a frustration.

1. Extreme persistence - The child characteristically spends five or more minutes in the pursuit of his frustrated goals.
2. Persistence - The child characteristically spends three to four minutes in pursuit of his frustrated goals.
3. Some persistence - The child characteristically spends one to two minutes in pursuit of his frustrated goals.
4. Little or no persistence - The child characteristically spends less than one minute in pursuit of his frustrated goals.

Evidence for the rating of persistence comes from the response of a child in the face of frustration or in the blocking of goal oriented behaviors. From this statement it is evident that the basis for making the rating will come from the observation of behavior in response to the existence of or the imposition of frustrating events or circumstances.

In order that the rating of a child's persistence be meaningful, the rating must be accompanied by a knowledge of the strength of the frustrations he was encountering. The classification of a situation as to the extent to which it is frustrating has as its basis the extent to which the situation blocks goal-oriented behavior. Blocking may involve the existence of a barrier in any form, e.g., a verbal restriction, a physical

barrier, or a task requiring a particular level of skill for its completion. The blocking may occur in any degree of completion.

The extent to which a situation is frustrating has been defined into four levels:

1. An extremely frustrating situation is one in which there are circumstances or events which completely block goal-oriented behavior or which make the continuance of goal-oriented behavior extremely difficult or risky. Examples of events or circumstances which would be considered as extremely frustrating are such physical barriers as the erection of a gate blocking off the stairs to an infant, closing and locking a door that the child cannot open; such verbal barriers as direct statements of restriction or forbidding; or barriers resulting from the level of task-difficulty which make it nearly impossible to complete the task within the child's developmental level.
2. A frustrating situation is one in which there are circumstances or events which considerably block goal-oriented behavior or which make the continuance of goal-oriented behavior considerably difficult or risky. These events or circumstances, however, can be overcome if a child exerts much effort. Examples of such situations are an infant attempting to climb up a high flight of stairs; a child asking to play with another group of children but is told, "Go away! You can't play with us!", or a child pulling a heavy wagon of blocks up an incline.
3. A somewhat frustrating situation is one in which circumstances or events block goal-oriented behavior to some degree or make the continuance of goal-oriented behavior somewhat difficult or risky. These events or circumstances can be overcome if the child exerts some exercise of effort. Examples of such situations are a child who falls off a tricycle and gets his foot caught in it; a child who is playing policeman says to another child, "You can't get by me!", and a child who tries to put on his own boots.
4. A situation in which there is little or no frustration is one in which there are few if any circumstances or events which block goal-oriented behavior or which make the continuance of goal-oriented behavior difficult. There are no barriers which the child cannot easily surmount, few

if any adult or child restrictions or demands upon the child, and all tasks are within the child's developmental level.

The relationship between extent to which the situation is tension-producing and the extent to which the situation is frustrating must be pointed out. Both are closely related; however, the extent to which the situation is frustrating differs from the tension-producing qualities of a situation in that the extent to which the situation is tension-producing is a more global rating, i.e., frustration is only one of the factors contributing to the extent to which the situation is tension-producing. For this reason, the extent to which a situation is frustrating may or may not be identical to the rating of the extent to which a situation is tension-producing.

At the end of each observation ratings will be made of the child's persistence in pursuing his frustrated goals at the various levels of frustration which occurred throughout the course of the observation. If a child were involved in nothing but situations which involved little or no frustration for the entire course of the observation, a rating of a child's persistence would be made only at the little or no frustration level. If the child were involved in situations with little or no frustration during the observation period with the exception of one somewhat frustrating situation and one extremely frustrating situation, then rating of the child's persistence at each of those separate levels would be made. If this latter description were altered to include three somewhat frustrating situations instead of just one, there would still be only three ratings, one rating each for the situations with little or no frustration, the situations which were somewhat frustrating, and the extremely frustrating situation. The difference would be that a child's persistence in the somewhat frustrating situations would be based upon a synthesis or an average of the way in which persistence was evidenced in all three somewhat frustrating situations. A major principle of scoring then is that the rating of level of frustration will represent a synthesis or an average of the child's persistence in pursuit of frustrated goals at each level of frustration during the course of the observation.

To facilitate the rating of the two variables, the scales have been combined into a two-fold table. In making this two-fold rating only the levels of frustration which occurred are scored. However, for every level of frustration that was evidenced, the persistence with which the child attempted to circumvent or overcome the barrier has to be rated.



In making this rating, it will be recalled that only the average or the characteristic amount of time spent in trying to circumvent or overcome the barriers at each of the levels of frustration will be considered.

In summary the factors one needs to consider in making this rating are:

1. Both the level of frustration and the time spent in trying to overcome or circumvent the frustration at each of these level(s) need to be rated.
2. In judging the level of frustration, the rater is to consider the extent to which the situation blocks goal-oriented behavior.
3. In making the two-fold rating, only the levels of frustration which are evidenced are to be rated.
4. In making this rating, only the average or characteristic amount of time spent in trying to circumvent or overcome the barriers at each of the levels of frustration will be considered.

Extreme  
frustration \_\_\_\_\_

Frustration \_\_\_\_\_

Some  
frustration \_\_\_\_\_

Extreme persistence in trying to overcome barrier - (5 minutes or more)	Persistence in trying to overcome barrier - (3 to 4 minutes)	Some per- sistence in trying to over- come barrier - (1 to 2 minutes)	Little or no persistence in trying to overcome barrier - (less than 1 minute)
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Little or no frustration \_\_\_\_\_



APPENDIX B

Letter Sent to Parents Asking Cooperation in Study

OREGON STATE COLLEGE  
School of Home Economics  
Corvallis, Oregon

We are planning a long-range investigation of behavior patterns shown by preschool children in unfamiliar situations, and we hope to begin by observing a selected number of infants and younger preschool children in play with others.

We plan to have 32 children in our preliminary study, ranging in age from 10 months to 34 months. The child and his mother will be asked to come to the Orchard Street nursery school for an hour's free play with three other children of the same age. There will be two such play periods spaced approximately two weeks apart.

We are writing to parents who have children registered in the application file of the Oregon State College nursery schools since we wish to observe the children again later. We would like to invite you to participate with us in this study, and hope that you may find it possible.

Two of our graduate assistants, Margaret Shea and Pat Walker, who are also assistants in the college nursery schools, are working together on this study. One of them will telephone you in the next few days and will be ready to answer questions which you may have.

If you are interested, we hope that you and your child may be able to participate in the two observation play periods.

Sincerely yours,

(Mrs.) Katherine H. Read  
Head, Department of Family Life

KHR:pw

## APPENDIX C

### Systematic Observer's Data

TABLE X

## RESULTS OF THE ANALYSIS OF VARIANCE FOR THE SYSTEMATIC OBSERVER

Variable 1. Extent to which the situation was tension-producing

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	88.289	3	29.430	.832
Within age	884.538	25	35.382	2.573
Hour	24.281	1	24.281	1.766
Period	24.218	2	12.109	.881
Hour x period	10.426	2	5.213	.379
Error	1,925.242	140	13.752	
Total	2,956.994	173		

Variable 2. Extent to which the situation was inferred to be tension-producing

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	27.672	3	9.224	.853
Within age	80.833	25	3.233	.014
Hour	19.333	1	19.333	.086
Period	6.620	2	3.310	.015
Hour x period	.874	2	4.370	.019
Error	31,545.840	140	225.327	
Total	31,681.172	173		

TABLE X (continued)

## Variable 3. Bodily expression of tension

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	18.566	3	6.189	1.528
Within age	101.273	25	4.051	.071
Hour	7.040	1	7.040	.123
Period	1.965	2	.983	.017
Hour x period	.839	2	.420	.007
Error	8,036.989	140	57.407	
Total	8,166.672	173		

## Variable 4. Vocal expression of tension

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	13.152	3	4.384	1.122
Within age	97.722	25	3.909	2.241
Hour	1.472	1	1.472	.844
Period	9.012	2	4.506	2.584
Hour x period	1.424	2	.712	.408
Error	244.092	140		
Total	366.874	173		

TABLE X (continued)

Variable 5. Physical aggression expressed in positive, acceptable (non-destructive) ways toward materials which are appropriate for this expression

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.980	3	.327	.513
Within age	15.928	25	.637	1.367
Hour	.465	1	.465	.998
Period	.494	2	.247	.530
Hour x period	.242	2	.121	.260
Error	65.299	140	.466	
Total	83.408	173		

Variable 6. Physical aggression expressed through attack on materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.250	3	.083	.497
Within age	4.175	25	.167	1.152
Hour	.207	1	.207	1.152
Period	.080	2	.040	.276
Hour x period	.448	2	.224	1.545
Error	20.265	140	.145	
Total	25.425	173		

TABLE X (continued)

Variable 7. Aggression through attack on people or their materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	19.518	3	6.506	56.086
Linear regression	.050	1	.050	.431
Deviation from linearity	19.468	2	9.734	83.914
Within age	2.907	25	.116	.075
Hour	.143	1	.143	.093
Period	2.632	2	1.316	.855
Hour x period	.150	2	.075	.049
Error	215.575	140	1.540	
Total	240.925	173		

TABLE X (continued)

Variable 8. Expression of tension through the seeking of nurturance

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	19.227	3	6.409	.740
Within age	216.532	25	8.661	4.136
Hour	.466	1	.466	.223
Period	4.173	2	2.087	.997
Hour x period	.654	2	.327	.156
Error	293.207	140	2.094	
Total	534.259	173		

Variable 9. Expression of tension through "showing off" behavior

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.026	3	.009	.818
Within age	.284	25	.011	.917
Hour	.023	1	.023	1.917
Period	.011	2	.006	.500
Hour x period	.012	2	.006	.500
Error	1.621	140	.012	
Total	1.977	173		



TABLE X (continued)

## Variable 10. Speed of movement

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	1.630	3	.543	.381
Within age	35.628	25	1.425	7.620
Hour	.070	1	.070	.374
Period	.261	2	.131	.701
Hour x period	.090	2	.045	.241
Error	26.121	140	.187	
Total	63.800	173		

## Variable 11. Expansiveness of movement

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	2.034	3	.678	2.134
Within age	8.058	25	.322	2.458
Hour	.117	1	.117	.893
Period	.181	2	.091	.695
Hour x period	.422	2	.211	1.611
Error	18.322	140	.131	
Total	29.134	173		

TABLE X (continued)

Variable 12. Frequency with which a child initiates interaction with materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	5.442	3	1.814	.748
Within age	65.857	25	2.634	3.521
Hour	.575	1	.575	.769
Period	3.598	2	1.799	2.405
Hour x period	3.459	2	1.730	2.313
Error	104.701	140	.748	
Total	183.632	173		

Variable 13. Frequency with which a child initiates interaction with adults

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.650	3	.217	.072
Within age	75.591	25	3.024	.054
Hour	.207	1	.207	.004
Period	.103	2	.052	.001
Hour x period	.724	2	.362	.007
Error	7,791.966	140	55.657	
Total	7,869.241	173		

TABLE X (continued)

Variable 14. Frequency with which a child initiates interaction with children

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	6.816	3	2.272	1.432
Within age	39.678	25	1.587	3.843
Hour	.575	1	.575	1.392
Period	.563	2	.282	.683
Hour x period	2.080	2	1.040	2.518
Error	57.782	140	.413	
Total	107.494	173		

Variable 15. Proportion of adult overtures to interaction accepted by the child

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	30.077	3	10.026	1.415
Within age	177.130	25	7.085	1.415
Hour	.760	1	.760	.151
Period	14.245	2	7.123	1.413
Hour x period	8.296	2	4.148	.823
Error	705.741	140	5.041	
Total	936.249	173		

TABLE X (continued)

Variable 16. Proportion of child overtures to interaction  
accepted by the child

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	18.185	3	6.062	.913
Within age	166.011	25	6.640	2.103
Hour	28.972	1	28.972	9.177
Period	4.184	2	2.092	.663
Hour x period	16.735	2	8.368	2.651
Error	441.942	140	3.157	
Total	676.029	173		

Variable 17. Amount of time spent in interaction with materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	5.868	3	1.956	.734
Within age	66.661	25	2.666	1.582
Hour	.092	1	.092	.055
Period	9.322	2	4.661	2.766
Hour x period	6.632	2	3.316	1.968
Error	235.954	140	1.685	
Total	324.529	173		

TABLE X (continued)

Variable 18. Amount of time spent in interaction with adults

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	1.715	3	.572	.439
Within age	32.584	25	1.303	1.178
Hour	.092	1	.092	.083
Period	.149	2	.075	.068
Hour x period	.219	2	.110	.099
Error	154.873	140	1.106	
Total	189.632	173		

Variable 19. Amount of time spent in interaction with children

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	4.390	3	1.463	3.492
Linear regression	.047	1	.047	.112
Deviation from linearity	4.343	2	2.172	5.184
Within age	10.472	25	.419	1.225
Hour	3.040	1	3.040	8.889
Period	.770	2	.385	1.126
Hour x period	3.460	2	1.730	5.058
Error	47.897	140	.342	
Total	70.029	173		

TABLE X (continued)

## Variable 20. Level of involvement with materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	19.148	3	6.383	2.651
Within age	60.208	25	2.408	1.956
Hour	1.862	1	1.862	1.513
Period	20.101	2	10.051	8.165
Hour x period	1.738	2	.869	.728
Error	172.299	140	1.231	
Total	275.356	173		

## Variable 21. Level of involvement with adults

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	9.396	3	3.132	1.332
Within age	58.765	25	2.351	.783
Hour	11.126	1	11.126	3.704
Period	7.804	2	3.902	1.299
Hour x period	3.805	2	1.903	.633
Error	420.598	140	3.004	
Total	511.494	173		

TABLE X (continued)

## Variable 22. Level of involvement with children

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	34.544	3	11.515	2.833
Within age	101.594	25	4.064	1.851
Hour	8.742	1	8.742	3.994
Period	.357	2	.179	.082
Hour x period	4.585	2	2.293	1.048
Error	306.483	140	2.189	
Total	456.305	173		

## Variable 23. Purposefulness

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	23.612	3	7.871	1.011
Within age	194.592	25	7.784	1.471
Hour	22.666	1	22.666	4.285
Period	16.316	2	8.158	1.542
Hour x period	68.130	2	34.665	6.440
Error	740.638	140	5.290	
Total	1,065.954	173		

## APPENDIX D

### Participant Observer's Data



TABLE XI

## RESULTS OF THE ANALYSIS OF VARIANCE FOR THE PARTICIPANT OBSERVER

Variable 1. Extent to which the situation was tension-producing

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	62.650	3	20.883	.520
Within age	1,003.275	25	40.131	2.649*
Hour	64.502	1	64.502	4.258*
Observer	173.583	1	173.583	11.460**
Hour x observer	16.312	1	16.312	1.077
Error	1,272.345	84	15.147	
Total	2,592.667	115		

\* significant at .05 level

\*\* significant at .01 level

Variable 2. Extent to which the situation was inferred to be tension-producing

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	17.371	3	5.790	1.478
Within age	97.932	25	3.917	1.300
Hour	27.035	1	27.035	8.973**
Observer	22.072	1	22.072	7.326**
Hour x observer	2.793	1	2.793	.927
Error	253.075	84	3.013	
Total	420.278	115		

\*\* significant at .01 level

TABLE XI (continued)

Variable 3. Bodily expression of tension

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	22.284	3	7.428	4.237*
Linear regression	10.733	1	10.733	6.126*
Deviation from linearity	11.551	2	5.776	3.297
Within age	43.818	25	1.753	.392
Hour	.251	1	.251	.056
Observer	.058	1	.058	.130
Hour x observer	2.610	1	2.610	.583
Error	376.001	84	4.476	
Total	445.022	115		

\* significant at .05 level

TABLE XI (continued)

## Variable 4. Vocal expression of tension

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	26.928	3	8.976	2.358
Within age	95.141	25	3.806	3.639**
Hour	5.007	1	5.007	4.787**
Observer	15.280	1	15.280	14.608**
Hour x observer	1.434	1	1.434	1.371
Error	87.876	84	1.046	
Total	231.666	115		

\*\* significant at .01 level

## Variable 5. Physical aggression expressed in positive, acceptable (non-destructive) ways toward materials which are appropriate for this expression

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	1.479	3	.493	1.654
Within age	7.450	25	.298	.711
Hour	.683	1	.683	.711
Observer	.031	1	.031	.074
Hour x observer	.083	1	.083	.198
Error	35.170	84	.419	
Total	44.896	115		

TABLE XI (continued)

Variable 6. Physical aggression expressed through attack on materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.877	3	.292	.832
Within age	8.776	25	.351	.340
Hour	1.434	1	1.434	1.390
Observer	.844	1	.844	.818
Hour x observer	.715	1	.715	.693
Error	86.709	84	1.032	
Total	99.355	115		

TABLE XI (continued)

Variable 7. Aggression through attack on people or their materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	26.815	3	8.938	3.274*
Linear regression	.384	1	.384	.127
Deviation from linearity	26.431	2	13.216	4.841*
Within age	68.258	25	2.730	4.581**
Hour	.281	1	.281	.471
Observer	1.966	1	1.966	3.299
Hour x observer	.045	1	.045	.076
Error	50.075	84	.596	
Total	147.440	115		

\* significant at the .05 level

\*\* significant at the .01 level

TABLE XI (continued)

Variable 8. Expression of tension through the seeking of nurturance

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	24.245	3	8.082	1.130
Within age	178.768	25	7.151	.542
Hour	.167	1	.167	.013
Observer	43.212	1	43.212	3.278
Hour x observer	.017	1	.017	.012
Error	1,107.354	84	13.183	
Total	1,353.763	115		

Variable 9. Expression of tension through "showing off" behavior

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.146	3	.049	.563
Within age	2.178	25	.087	1.706**
Hour	.049	1	.049	.961
Observer	.166	1	.166	3.255
Hour x observer	.113	1	.113	2.216
Error	4.257	84	.051	
Total	6.909	115		

\*\* significant at .01 level

TABLE XI (continued)

## Variable 10. Speed of movement

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.863	3	.288	.287
Within age	25.119	25	1.005	5.432**
Hour	.014	1	.014	.076
Observer	.242	1	.242	1.308
Hour x observer	.118	1	.118	.638
Error	15.548	84	.185	
Total	41.904	115		

\*\* significant at .01 level

## Variable 11. Expansiveness of movement

Sources of variation	Sum of square	Degrees of freedom	Mean square	F
Age	1.314	3	.438	1.138
Within age	9.635	25	.385	2.917**
Hour	.131	1	.131	.992
Observer	.011	1	.011	.083
Hour x observer	.131	1	.131	.992
Error	11.084	84	.132	
Total	22.306	115		

\*\* significant at .01 level

TABLE XI (continued)

Variable 12. Frequency with which a child initiates interaction with materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	1.982	3	.661	.655
Within age	25.234	25	1.009	2.357**
Hour	.054	1	.054	.126
Observer	5.175	1	5.175	12.091**
Hour x observer	.002	1	.002	.046
Error	35.956	84	.428	
Total	68.403	115		

\*\* significant at .01 level

Variable 13. Frequency with which a child initiates interaction with adults

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	.305	3	.102	.038
Within age	67.058	25	2.682	3.259**
Hour	.485	1	.485	.589
Observer	1.813	1	1.813	2.203
Hour x observer	.019	1	.019	.023
Error	69.120	84	.823	
Total	138.800	115		

\*\* significant at .01 level



TABLE XI (continued)

Variable 14. Frequency with which a child initiates interaction with children

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	11.008	3	3.669	1.228
Within age	74.699	25	2.988	3.320**
Hour	.138	1	.138	.153
Observer	.310	1	.310	.344
Hour x observer	3.449	1	3.449	3.832
Error	75.603	84	.900	
Total	165.207	115		

\*\* significant at .01 level

Variable 15. Proportion of adult overtures to interaction accepted by the child

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	8.750	3	2.917	1.481
Within age	49.230	25	1.970	.904
Hour	.778	1	.778	.357
Observer	72.807	1	12.807	33.413**
Hour x observer	.485	1	.485	.223
Error	182.997	84	2.179	
Total	315.047	115		

\*\* significant at .01 level

TABLE XI (continued)

Variable 16. Proportion of child overtures to interaction  
accepted by the child

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	2.236	3	.745	.131
Within age	141.746	25	5.670	1.722*
Hour	10.864	1	10.864	3.299
Observer	58.391	1	58.391	17.732**
Hour x observer	.054	1	.054	.016
Error	276.628	84	3.293	
Total	489.919	115		

\* significant at .05 level

\*\* significant at .01 level

Variable 17. Amount of time spent in interaction with materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	4.954	3	1.651	1.169
Within age	35.302	25	1.412	1.806*
Hour	1.435	1	1.435	1.835
Observer	1.666	1	1.666	2.130
Hour x observer	.565	1	.565	.722
Error	65.721	84	.782	
Total	109.643	115		

\* significant at .05 level

TABLE XI (continued)

Variable 18. Amount of time spent in interaction with adults

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	2.880	3	.960	1.029
Within age	22.244	25	.890	.954
Hour	.067	1	.067	.072
Observer	6.191	1	6.191	6.636*
Hour x observer	.001	1	.001	.001
Error	78.341	84	.933	
Total	109.724	115		

\* significant at .05 level

Variable 19. Amount of time spent in interaction with children

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	2.882	3	.961	1.998
Within age	12.027	25	.481	1.768*
Hour	1.024	1	1.024	3.765
Observer	7.401	1	7.401	27.210**
Hour x observer	.073	1	.073	.268
Error	22.819	84	.272	
Total	46.226	115		

\* significant at .05 level

\*\* significant at .01 level

TABLE XI (continued)

## Variable 20. Level of involvement with materials

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	6.886	3	2.295	2.075
Within age	27.662	25	1.106	1.622
Hour	.138	1	.138	.202
Observer	6.378	1	6.378	9.352**
Hour x observer	.551	1	.551	.808
Error	57.293	84	.682	
Total	98.908	115		

\*\* significant at .01 level

## Variable 21. Level of involvement with adults

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	19.188	3	6.396	.138
Within age	26.057	25	1.042	.505
Hour	4.325	1	4.325	2.097
Observer	6.758	1	6.758	3.277
Hour x observer	.473	1	.473	.229
Error	173.199	84	2.062	
Total	230.000	115		

TABLE XI (continued)

## Variable 22. Level of involvement with children

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	2.485	3	.828	.379
Within age	54.607	25	2.184	1.393
Hour	7.002	1	7.002	4.466*
Observer	14.991	1	14.991	9.561**
Hour x observer	.105	1	.105	.067
Error	131.740	84	1.568	
Total	210.930	115		

\* significant at .05 level

\*\* significant at .01 level

## Variable 23. Purposefulness

Sources of variation	Sum of squares	Degrees of freedom	Mean square	F
Age	16.448	3	5.483	1.232
Within age	111.225	25	4.449	1.435
Hour	27.617	1	27.617	8.909**
Observer	5.562	1	5.562	1.794
Hour x observer	1.837	1	1.837	.593
Error	260.439	84	3.100	
Total	423.128	115		

\*\* significant at .01 level

## APPENDIX E

Mean Scores and F Values for Variables  
Which Did Not Differ Significantly with Age

TABLE XII

MEAN SCORES AND F VALUES FOR VARIABLES WHICH DID NOT DIFFER SIGNIFICANTLY WITH AGE

Variable	Means of age groups				F value (3, 25)
	1	2	3	4	
1. Extent to which the situation was tension-producing	4.771	5.206	6.513	4.488	.520
2. Extent to which the situation was inferred to be tension-producing	3.021	2.181	2.275	1.950	1.478
4. Vocal expression of tension	2.857	2.178	1.700	1.638	2.358
5. Physical aggression expressed in positive, acceptable (non-destructive) ways toward materials which are appropriate for this expression	1.093	1.019	1.221	1.300	1.654
6. Physical aggression expressed through attack on materials	1.046	1.225	1.233	1.063	.832
8. Expression of tension through the seeking of nurturance	2.846	3.181	2.020	3.025	1.130
9. Expression of tension through "showing off" behavior	1.000	1.031	1.096	1.072	.563
10. Speed of movement	3.314	3.081	3.154	3.144	.287
11. Expansiveness of movement	3.218	2.928	3.042	3.009	1.138
12. Frequency with which a child initiates interaction with materials	4.607	4.359	4.375	4.250	.655
13. Frequency with which a child initiates interaction with adults	3.429	3.328	3.458	3.428	.038
14. Frequency with which a child initiates interaction with children	2.143	2.281	2.583	1.719	1.228
15. Proportion of adult overtures to interaction accepted by the child	3.650	3.447	4.192	3.531	1.481
16. Proportion of child overtures to interaction accepted by the child	1.979	1.897	1.887	1.603	.131
17. Amount of time spent in interaction with materials	4.457	4.197	4.613	4.728	1.169
18. Amount of time spent in interaction with adults	2.486	2.053	2.270	2.200	1.029
19. Amount of time spent in interaction with children	1.514	1.663	1.929	1.525	1.998
20. Level of involvement with materials	2.514	2.593	2.650	3.118	2.075
21. Level of involvement with adults	2.686	1.969	2.404	2.472	.138
22. Level of involvement with children	1.307	1.478	1.620	1.234	.379
23. Purposefulness	2.039	2.247	2.567	1.525	1.232