EXPRESSION OF TEMPERAMENT: TODDLER PLAY IN A GROUP SETTING

By

SARAH ELIZABETH PUTNAM

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Sarah Elizabeth Putnam

Oklahoma State University

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Abstract

Observational investigation of children's free play behavior was undertaken to explore individual differences in play and the dimensions of temperament that may organize play in a group setting. Naturalistic observations of the free-play of 23 infants and toddlers, 12 to 35 months of age, were coded for qualitative and quantitative aspects of exploratory play. Collected over a four-month period, these play behaviors were expected to show longitudinal, intraindividual, developmental changes and consistent, interindividual differences in style. Play behaviors were then regressed by age and certain dimensions of temperament, measured by the Toddler Temperament Scale (Fullard, McDevitt, and Carey, 1984). As expected, age accounted for much of the variation in every category of play, except number of objects handled. The temperamental dimension of persistence predicted visual behavior, while withdrawal combined with age predicted both visual and vocal behavior. Thus, with respect to persistence and withdrawal scores on the TTS, what these children were doing during play was related to how they approached the world.

Expression of Temperament: Toddler Play in a Group Setting

Play is both a medium of learning and of expression for the young child (Garvey, 1977). Play includes pleasurable, spontaneous activity, exploration, and self expression; play may be solitary or social. It is the primary activity of children in a period of life during which knowledge of the physical and social world, systems of communication, and understanding of self are rapidly and dramatically changing. It has been linked to a number of cognitive and social phenomena (Weisler & McCall, 1976; Arend, Gove, & Sroufe, 1979; Connolly & Doyle, 1984; Caruso, 1990). As a medium of expression for the child, it provides an important link to many areas of development.

Temperament is the stylistic quality of the personality (Thomas & Chess, 1977); it is a consistent pattern in how actions are performed by an individual. Interest in individual differences has sparked research using measures of temperament and relating them to various aspects of individual functioning, such as exploratory behavior (Gandour, 1989), positive emotional tone, sustained attentiveness, social approachfulness, and calmer acceptance of restraint (Matheny, Wilson, & Nuss, 1984), tempo (Wenckstern, Weizmann, & Leenaars, 1984), and play

(Field, Adler, Vega-Lahr, Scafidi, & Goldstein, 1987).

The expression of individual differences in play has been recognized as an important component of the study of play (Arend, Gove, & Sroufe, 1979). Toddlers who were more flexible, resourceful, and persistent at 2 years of age were more happy and curious while manipulating a Banta box in the laboratory at age 4 to 5 (Arend, Gove, & Sroufe, 1979). Toddlers scoring high on the threshold dimension of temperament were noted to be more vigorous in their play and to change toys more often in a structured play situation (Wenckstern, Weizmann, & Leenaars, 1984). Persistence was correlated with constructive play, and distractibility correlated with vocalizations in infants 3 to 20 months, when engaged in structured play with their mothers in a laboratory setting (Field et al, 1987).

Stability of characteristics of child play found in the literature suggests an underlying, unifying construct within the individual. Because different behaviors are sophisticated at different ages, Caruso (1990) argued that, although actual behaviors of his sample changed from time 1 to time 2, the quality of play behaviors remained stable. Children who were using more sophisticated cognitive schemes at 12 months, were also using more sophisticated cogitive schemes at 24 months. The stability of play interaction behavior reported by Rothbart (1986) suggests

that stability can be found during the first 9 months of infancy when temperament-like behaviors, such as activity level and smiling/laughter, are observed in a play interaction context. Stability in certain temperament dimensions (e.g., activity, rhythmicity, intensity, mood, and persistence) and in play interaction behaviors (looking, smiling, and vocalizing) has also been found from 3 to 20 months (Field et al, 1987). Consistency in expression of temperament was found to be moderate and significant between 12 and 18 months and increased substantially between 18 and 24 months (Matheny, Wilson, & Nuss, 1984). Intraindividual consistency was also found by Bronson (1985) in a study which showed increased stability of behavior in play sessions in the second year of life.

Infants' exploratory play is remarkably open to environmental influences (Yarrow, Rubenstein, Pedersen, & Janowski, 1972). Caruso (1984) argued that the optimal play environment is an open playroom equipped with a variety of play areas and toys and that such an environment would stimulate the child to display more and a greater variety of exploratory play behaviors. Measures of the physical environment, as well as amount of social stimulation and contingent responsiveness have been related to early cognitive and motivational development in infants (Yarrow, Rubenstein, & Pedersen, 1975). Yarrow et al.

(1975) found that social stimulation and inanimate stimulation, two dimensions of the natural environment, make substantial and distinctive contributions in the development of the young child.

Evidence for an underlying personal quality which may be measured by assessing temperament, the importance and ubiquity of play in toddlerhood, and findings of convergent validity and stability of temperament measures and free-play behavior, suggest that certain types of play behavior might be predicted from particular dimensions of temperament. However, studies in which such a link has been investigated (Caruso, 1990; Field et al., 1987) examined young children's play behaviors in restricted play episodes. The current study examined the prediction of certain types of play behavior in a free-play, group setting by particular dimensions of temperament, as measured by the Toddler Temperament Scale (Fullard, McDevitt, & Carey, 1984).

Play was coded into categories of manipulation, vocalizations, visual behavior, locomotion, number of objects handled over a 5 minute time period, and length of time in continuous play (a measure of sustained attention). Categories for coding play are described in Couchenour (1989). Since children are changing so rapidly during the period from 12 to 35 months, it was anticipated

that TTS scores for the particular dimensions of temperament would predict type of play (simple linear regression) and that TTS and age together would significantly predict measures of play (multiple regression). Persistence score was expected to predict length of time in continuous play, visual behaviors, and number of objects handled over the 5 minute time period. Withdrawal score was expected to predict amount of manipulations, vocalizations, locomotor-focused behaviors, length of time in play, and visual behavior. Distractibility was expected to predict the number of objects handled over a 5 minute time period and length of time in continuous play. Threshold of stimulation was expected to be predictive of locomotor- unfocused behavior, manipulations, vocalizations, and visual behaviors.

Method

Subjects

The sample consisted of 10 males and 13 females enrolled in the Oklahoma State University Child Development Laboratory. At the beginning of the study, the age range was 12 to 35 months, with a mean age of 24.5 months. The children were primarily middle-class Caucasians. One child was Chinese.

Procedure

Observations of play were conducted as part of a larger

study (Couchenour, 1989) at the Oklahoma State University Child Development Laboratory over the course of the fall 1988 school semester. On six days during the four month period, each child was independently observed for five minutes during the indoor free play period by each of two observers, making a total of one hour of observation for each child. Days on which data were collected were spaced throughout the four month period as follows: two observations were completed near the beginning of the fall semester (when children were newly enrolled), two near the middle of the semester, and two at the end of the fall semester. The order in which the children were observed was randomized daily.

Observations took the form of narrative descriptions of the play behavior of the target child during the five-minute period, which was broken down into twenty 15-second intervals. Intervals were timed inconspicuously for the observers through an earphone connected to a tape recorder on which the 15-second intervals were recorded. Observers were instructed to write down the behaviors of the children in as much detail as possible.

Coding

A person who had not recorded play observations and who was naive concerning the hypotheses in the study coded the data into five primary categories and two superordinate

categories of exploratory play. Data were coded for the following behaviors:

Manipulation, defined as touching or handling an object or objects as long as that activity is uninterrupted by other activities. For example, "stacking blocks" is one manipulation, as is "picks up brick block. Stacks four of them." On the other hand, "Picks up bucket. Takes dump truck." is two manipulations.

Vocal, defined as talking or making sounds with the vocal apparatus as part of or as an aspect of play. This category includes laughing, snorting, and growling, as well as "Come on", "Amy, will you play with me?", and "Choo-choo train's gone. Bye, bye choo-choo train." Examples of vocalizations which are all on the same topic and within the same 15 second interval were coded as a single instance.

Visual, defined as visually surveying an object or play area in a focused manner.

Locomotion-focused, defined as moving toward an object or moving the body as part of interacting with an object, with others, or to music.

Locomotion-unfocused, defined as aimless wandering or searching behavior.

Number of objects handled or touched in each 5 minute interval. This category describes change in activity as

well as activity level. For example, a child who tosses a block, crawls through a tunnel, climbs on large motor equipment, smashes another child's block tower, tries to grab a toy from another child's hand, and takes a book from the shelf within a 5 minute period is coded 6; whereas a child who spends 5 minutes gluing 20 beans to paper is coded 1.

Length of time in continuous play - the number of time units in which play with a specific toy or in which a specific play activity continued throughout one 15 second interval and into another time interval. The measure was designed to capture sustained attentiveness.

Reliability

A third of the data was coded by two individuals, one of whom was naive to the purposes of the study, the other being one of the observers. Reliability for the categories of play, computed by percent agreement, was as follows: manipulation .91, vocal .96, visual .92, locomotion-focused .72, locomotion-unfocused .57, number of objects .78, length of time in play .78. Because of the low reliability for the category of locomotion-unfocused, the two categories of locomotion were combined. This raised reliability for the locomotion category to .90. After collapsing the two categories of locomotion, overall reliability was .88. The remaining two-thirds of the data

was then coded by the naive individual alone. All play codes used in the analysis were those coded by the naive individual.

Toddler Temperament Scale

For this study, the questionnaire developed by Carey and his colleagues was selected because of its wide use, available norms, and the extensive research and clinical applications for which it has been used. At 12 to 36 months, the appropriate version was the Toddler Temperament Scale (TTS) (Fullard, McDevitt, & Carey, 1984).

The questionnaire includes 97 behavioral descriptions rated on a six-point scale from "almost never" to "almost always". A weighted averaging procedure is employed to obtain scores on each of the nine dimensions of temperament postulated by Thomas and Chess (1977). Reliability and validity data for the TTS are described by Fullard, McDevitt, and Carey (1984). One month test-retest reliability for the nine categories ranges from .69 to .89, with a median correlation of .81. Internal consistency for the nine categories ranges from .53 to .86, with a median correlation of .70 for 1-2 year-olds and .72 for 2-3 year -olds

For the purpose of this study, the scale, although designed to be completed by the primary caregiver, was completed by the lead teacher of the classroom.

Teacher-rated temperament scores were judged to be most appropriate since observations were made within the school setting (Worobey, 1987). Worobey (1987) argued that different settings may elicit alternate aspects of temperament from the child, and therefore the teacher is best able to assess the child's temperament within the school setting. The lead teacher who filled out the scale had known the children over at least the nine-month period that they were in the classroom, and was acquainted with age-appropriate child behavior and strategies for their observation, as well as with responding to forced-choice instruments.

Thirteen items, considered to be outside the teacher's normal sphere of interaction with the children, were removed from the version of the scale completed by the teacher, making the revised scale a total of 84 items. Removed items included "The child gets sleepy at about the same time each evening (within 1/2 hour)", "A child's initial reaction to seeing the doctor is acceptance", and questions related to television viewing, bathing, and sleeping patterns. Questions regarding the child's response to new environments, e.g. "The child accepts within 10 minutes (feels at home, at ease) new surroundings (home, store, play area)" remained in the teacher's questionnaire, since the children were taken on field trips

during which the teacher had opportunity to observe their responses to new surroundings. During the course of the nine months, the teacher became well acquainted with each child's eating and toileting habits, interactions with other children, and responses to strangers and to frustration. The Toddler Temperament Scale is included in full in Appendix C, with items which were deleted from the teacher's version marked.

Results

Analysis

Four dimensions of temperament were used in the analyses: Persistence, Approach/Withdrawal, Distractibility, and Threshold. The six categories of play used in the analyses were manipulation, vocal, visual, locomotion, number of objects, and length of time in play. Data were analyzed for the following relationships: (1) differences between males and females in amount of play by category (repeated measures ANOVA); (2) differences in amount of play by category for weeks 1 through 6 (repeated measures ANOVA); (3) correlation of week 1 to week 6 by category of play; (4) age predicts amount of play by category (regression); and (5) the main analyses, temperament scores predict amount of play by category (regression).

Table 1 lists the means and standard deviations for the

play behaviors for each 5 minute observation period.

Insert Table 1 about here

Sex Differences

As an initial check for sex differences, the scores of males and females were compared for type of play. There were no significant differences between the sexes for any of the six categories of play. Results of these analyses are shown in Table 2.

Insert Table 2 about here

The scores for females and males were then pooled for subsequent analyses.

Time-In-Program and Age Effects

Children's play changed from week to week. (See Table 2.) Play scores were averaged by category for each week of observation, the first to the sixth weeks of observation extending across a 4-month time period. Play was then analyzed by week in multiple repeated measures ANOVA. Differences between weeks in average amount of play were significant at $p<.05$ for manipulation, locomotion, number of objects handled, and length of time in play. Only visual and vocal behaviors did not differ significantly by

week.

Correlation of children's play from week 1 to week 6 by category yielded the lowest correlation for manipulation ($r=.13$, N.S.) and the highest ($r=.70$, $p<.01$) for the vocal behaviors category. Older children manipulated their toys, dressed and undressed dolls, and turned knobs, wheels, and rotors more than younger children. (See Age and Manipulation, below.) Correlations of week 1 to week 6 for the other categories of play were as follows: locomotion $r=.40$ (N.S.), visual $r=.31$ (N.S.), number of objects $r=.30$ (N.S.), and time in play $r=.37$ (N.S.).

The length of time the children had been in the program and age were not separable in the above analyses, so the influence of age in predicting amount of play by category was analyzed separately by regression. Age was found to predict differences in play for the categories of length of time in play, manipulation, and vocalization. Age was not significant in predicting visual behavior, locomotion, or number of objects.

The following predictions were significant:

Age and Length of Time in Play. Older children spent more time in play, the measure of sustained attentiveness, than did younger children. Age explained 33% of the difference in time in play between individual children (adjusted R-squared=.3325, $p<.01$).

Age and Manipulation. Older children played with puzzles and manipulated their toys (i.e., pushing buttons, stacking objects, turning and twirling them) more than did younger children. Age explained 20% of the difference in manipulation between individual children (adjusted R-squared=.20, $p<.03$).

Age and Vocalizations. Older children talked, made noises (growled and choo-chooed), laughed, and sang more than younger children. Age explained 19% of the difference in vocalizations (adjusted R-squared=.19, $p<.05$) between children.

Non-significant predictions of play by age were as follows:

Age and Visual Behavior. Younger children appeared to watch others, look about the room, and visually explore their toys more often and longer than older children, with age explaining 14% of the difference in visual behavior. However, this relationship was not significant for this sample (adjusted R-squared=.14, $p=.08$).

Age and Locomotion. Younger children appeared to move about the room more, dance, and used the large motor equipment, such as steps, tunnel, and slide more than older children. Age explained 14% of the difference in locomotion, not significant at $p=.08$.

Age and Number of Objects. All the children handled

objects in their play. There was no significant difference between older and younger children in number of objects handled (adjusted R-squared=.01, p>.64).

Temperament Measures

Age had the greatest power in predicting play by category in this study. Of the temperament dimensions used to predict play, only persistence indicated significant predictive power (of visual behavior, see below). Age interacted with approach/withdrawal to predict vocalizations and visual behaviors.

Table 3 lists the Toddler Temperament Scale mean scores. Table 4 shows each child's mean number of play behaviors by category across all observations.

Insert Table 3 about here

Insert Table 4 about here

Results of regression analyses of play by temperament were as follows:

Play and Persistence

The persistence score on the Toddler Temperament Scale was not related to how often a child stayed involved in an

activity through successive time periods, the length of time in continuous play measure (adjusted R-squared for full model=.35, age $p<.05$, persistence $p=.44$). Length of time involved in sustained activity appeared to be controlled by age (adjusted R-squared=.33, $p<.01$). Persistence score was also unrelated to the number of toys a child handled during a five minute interval of observation (adjusted R-squared for full model=.06, age $p=.43$, persistence $p=.32$). A child's persistence score on the TTS did, however, significantly predict the number of times that a child was observed visually focusing on or inspecting a toy, object, or play area (adjusted R-squared for full model=.28, age $p<.05$, persistence $p=.05$).

Play and Approach/Withdrawal

Because of the clinical purpose for which the Toddler Temperament Scale was developed, the approach/withdrawal category references the problem behavior, that of withdrawal from novel or unusual situations, objects, and people. A high score in this category indicates withdrawal. A low score in this category indicates that the child tends to approach novel or unusual situations, objects, and people.

Variation in children's scores on withdrawal on the TTS did not predict the frequency and amount that children touched and handled objects (adjusted R-squared for full

model=.21, age $p<.05$, withdrawal $p=.58$) or how often a child stayed involved in an activity through successive time periods (adjusted R-squared for full model=.34, age $p<.01$, withdrawal $p=.63$). Low withdrawal score (i.e., those children who were on the approach end of the category) did not significantly predict a child's movement about the room (locomotion category of play) (adjusted R-squared for full model= .23, age $p<.10$, withdrawal $p=.14$). All three of the play variables, manipulation, length of time in activity, and locomotion, appeared to be controlled by age (adjusted R-squared=.21 $p<.05$, adjusted R-squared=.34 $p<.01$, and adjusted R-squared=.14 $p<.10$, respectively).

Age and withdrawal tended to produce different effects with regard to visual behavior in children of different ages (adjusted R-squared for the full model=.37, age $p=.23$, withdrawal $p<.05$, age and withdrawal, when withdrawal entered into the model last, $p=.08$). Younger children who were assessed high on the withdrawal scale were more likely to visually survey toys, objects, or play areas. Older children who were assessed high on the withdrawal scale were less likely to visually inspect their toys, objects in the room, or play areas.

Age and withdrawal together predicted 58% of the variation in vocal behavior. Age and withdrawal score

together produced different effects in the category of vocal behavior in children of different ages (age $p<.01$, withdrawal $p=.14$, age and withdrawal, when withdrawal entered into the model last, $p<.05$). Older children who were low on the withdrawal scale (more approaching) talked, sang, and made more vocal sounds during play, whereas younger children who were low on the withdrawal scale (more approaching) talked and sang less, and made fewer vocal sounds during their play.

Play and Distractibility

The distractibility score on the Toddler Temperament Scale was not related to the number of toys and other objects touched and handled during the five-minute observation of play, the objects measure (adjusted R-squared=.09, N.S.). Nor did children who were assessed high in distractibility appear to spend less time in continuous play than did children who were not assessed as distractible (adjusted R-squared for full model=.36, age $p<.01$, distractibility $p=.35$).

Play and Threshold

Regression analyses examined the predictability of manipulations, vocalizations, visual activity, and locomotion. A child's score on the threshold dimension of temperament did not appear to be related to manipulation of toys and objects (adjusted R-squared=.22, N.S.), amount of

talking and other vocal activity (adjusted R-squared=.19, N.S.), looking around at others, or visually inspecting their toys (adjusted R-squared=.18, N.S.). Nor was threshold related to the amount of walking, running, and climbing the children did (adjusted R-squared=.15, N.S.). Manipulation, vocal behavior, and locomotion were predicted by age alone ($p<.10$ for each category).

Discussion

Of the relationships tested, age had the strongest effect, accounting for much of the variation in play in all areas except the number of objects handled. Given the age range of the children, it is to be expected that age is very important. Between the ages of one and three years many important changes take place, including walking and talking. Age appeared to be the most important factor in predicting play for these children.

Of the temperament variables, persistence and withdrawal demonstrated predictability of the variability in children's play. Persistence predicted visual attentiveness, such as looking around the room, at other areas of play, at other children or teachers, and visually inspecting toys. It may be that persistent children are more curious and are better able to remain organized while observing a variety of activities, so that a persistent child can observe things in the room from one vantage

point, without moving from one thing to another, and thus received a code for visual behavior, rather than locomotion, for example. Using a construct of ego-resiliency related to flexibility, resourcefulness, and persistence, Arend, Gove, and Sroufe (1979) found that ego-resilient preschoolers were more likely to remain engaged with a Banta box and demonstrated more continuity in their behavior in the face of novelty. It is this ability to respond to the environment in an organized, controlled manner that appears to be measured by the dimension of persistence.

Visual behavior was predicted by withdrawal but only in concert with age. Younger children who were withdrawn were more likely to watch others in activity and were not themselves engaged. They were more likely to watch other children at play, to watch teachers, and to spend more time looking at their toys and play materials, such as the paint on their paper, and to gaze at play areas from a distance. Older children who were assessed high on the withdrawal scale were much less likely to watch other children, teachers, or play areas, or to visually inspect their toys, and other objects in the room. Perhaps younger withdrawn children watch what is going on around them without becoming involved, while older children withdraw by engaging in quiet, solitary activity.

Conceptually and intuitively, the prediction of more vocal play by older, more approachful children makes sense. Easy temperament may interact with the development of language to predict more vocal activity as children grow from 12 to 35 months. Field, et al, (1987) found that generally easier temperament was associated with less frequent crying but more frequent vocalizing in a sample of 3- to 20-month-olds. In this study, older children who scored low on the withdrawal scale (more approaching) talked, sang, and made more vocal sounds during play, whereas younger children who were low on the withdrawal scale (more approaching) talked and sang less, and made fewer vocal sounds during play. Children become more skilled with language as they near three years of age. Approachful children, who are willing to become involved in activities and with others, may use language as a tool for engaging others and to express themselves in play. These children might also be more approachable, in the sense that they are easier to talk to, and so more likely to be engaged in conversation.

The present study is significant primarily because its focus on the construct of temperament as a patterner of experience in relationship to play departs from previous research. The argument that temperament, as a measure of individual differences, serves to organize specific play

behaviors has not previously been made.

That specific play behaviors were coded instead of rated, making them less global than the temperament ratings, may have lessened the likelihood of finding relationships. This and the small sample size may have diminished the probability of finding relationships between specific temperament dimensions and specific play behaviors. However, the convergence of the dimensions of temperament and play relationships found in this study may provide a basis for formulating further questions in this area.

Table 1

Amount of Play Behaviors Per 5 Minute Observation

Play Behavior	Means	Standard Deviations
Manipulation	16.17	8.30
Locomotion	14.95	9.82
Visual	10.25	7.39
Vocal	4.22	4.12
Objects	4.44	2.11
Time	9.90	4.85

Table 2

Gender and Time-In-Program Effects

Play Behavior	Variable	F value	p>F
Manipulation	Gender	0.15	0.70
	Week	5.84	0.00*
	Week * Gender	0.69	0.64
Locomotion	Gender	0.96	0.34
	Week	2.59	0.03*
	Week * Gender	1.22	0.31
Visual	Gender	1.30	0.27
	Week	1.27	0.28
	Week * Gender	0.64	0.67
Vocal	Gender	1.33	0.26
	Week	0.93	0.47
	Week * Gender	0.63	0.68
Objects	Gender	0.40	0.53
	Week	3.94	0.00*
	Week * Gender	1.55	0.18
Time	Gender	0.16	0.69
	Week	2.31	0.05*
	Week * Gender	0.17	0.97

* $p \leq .05$.

Table 3

Toddler Temperament Scale Mean Scores

Subject	Approach	Persistence	Distractibility	Threshold
1	5.40	2.0	4.0	3.88
2	3.89	2.9	4.8	2.50
3	5.36	1.9	3.6	3.00
4	2.46	3.1	3.6	2.00
5	5.40	2.2	2.0	2.13
6	2.18	1.8	3.4	2.38
7	2.45	3.0	3.4	2.13
8	4.27	2.9	3.4	2.63
9	2.73	1.6	2.8	2.38
10	5.82	2.0	3.6	2.38
11	3.82	3.5	4.4	2.38
12	2.00	4.4	3.0	1.50
13	3.27	2.3	3.5	2.38
14	3.73	2.1	3.4	2.38
15	5.82	2.6	3.9	3.38
16	4.91	3.5	4.0	4.50
17	2.91	4.0	3.7	1.88
20	4.18	2.3	2.5	3.13
21	2.64	3.4	4.0	2.63
22	3.64	3.0	4.0	3.13
24	4.36	2.9	4.1	2.63
25	2.18	2.1	3.6	4.00
26	3.18	2.8	3.5	3.38

Table 4

Amount of Play Behaviors Across Observations

Subject	Manipulation	Locomotion	Visual	Vocal	Objects	Time
1	16.17	16.17	10.08	2.42	4.50	8.50
2	14.00	15.33	9.42	5.58	5.08	8.92
3	25.58	7.50	9.50	2.17	3.00	14.33
4	18.42	14.33	11.67	4.33	4.42	9.08
5	18.00	10.83	12.50	1.00	3.75	10.75
6	16.67	16.42	13.83	11.75	6.42	14.83
7	19.08	10.08	6.42	8.75	4.75	10.75
8	17.00	13.75	11.00	3.58	3.75	11.08
9	15.58	15.08	8.58	5.92	4.67	10.92
10	15.92	17.17	10.67	1.17	4.17	9.75
11	18.08	17.50	7.50	8.92	4.83	12.00
12	13.83	21.83	6.58	5.00	4.58	10.08
13	21.00	9.00	7.00	5.92	4.33	14.58
14	16.00	12.25	10.08	8.00	4.50	11.83
15	15.10	12.20	14.30	4.10	4.00	8.00
16	12.42	16.75	11.75	4.17	4.25	7.83
17	17.58	15.50	11.33	2.33	5.25	7.83
20	13.08	15.50	12.50	.92	3.50	7.75
21	14.42	23.58	8.08	2.58	5.75	9.08
22	14.58	19.00	9.83	4.42	5.58	8.75
24	11.80	18.80	13.60	1.70	3.30	5.60
25	13.67	16.67	10.00	5.58	5.00	7.08
26	14.64	13.45	13.64	3.18	4.09	9.18

References

Arend, R., Gove, F. L., & Sroufe, L. A. (1979). Continuity of individual adaptation from infancy to kindergarten: A predictive study of ego-resiliency and curiosity in preschoolers. Child Development, 50, 950-959.

Bronson, W. C. (1985). Growth in the organization of behavior over the second year of life. Developmental Psychology, 21, 108-117.

Campos, J. J., Barrett, K. C., Lamb, M. E., Goldsmith, H. H., & Stenberg, C. (1983). Socioemotional development. In M. M. Haith & J. J. Campos (Eds.), P. H. Mussen (Series Ed.), Handbook of child psychology: Vol. 2. Infancy and developmental psychobiology (pp. 781-915).

Caruso, D. A. (1984). Infants' exploratory play: Implications for childcare. Young Children, 40(1), 27-30.

Caruso, D. A. (1990). Exploratory behavior, task persistence, and problem-solving ability, across the second year of life. Early Education and Development, 1(5), 354-370.

Connolly, J. A., & Doyle, A. (1984). Relation of social fantasy play to social competence in preschoolers. Developmental Psychology, 20, 797-806.

Couchenour, D. (1989). Infant and toddler exploratory play. Progress report for the Dean's Incentive Fund grant. Unpublished manuscript, Oklahoma State University, College of Home Economics, Stillwater, OK.

Field, T., Adler, S., Vega-Lahr, N., Scafidi, F., & Goldstein, S. (1987). Temperament and play interaction behavior across infancy. Infant Mental Health Journal, 8, 156-165.

Fullard, W., McDevitt, S. C., & Carey, W. B. (1984) Assessing temperament in one to three year old children. Journal of Pediatric Psychology, 9, 205-217.

Gandour, M. J. (1989). Activity level as a dimension of temperament in toddlers: Its relevance for the organismic specificity hypothesis. Child Development, 60, 1092-1098.

Garvey, C. (1977). Play. Cambridge, MA: Harvard University.

Hutt, C. (1971). Exploration and play in children. In R. E. Herron and B. Sutton-Smith (Eds.), Child's play (pp. 231-251). New York: John Wiley.

McDevitt, S. C., & Carey, W. B. (1981). Stability of ratings vs. perceptions of temperament from early infancy to 1-3 years. American Journal of Orthopsychiatry, 51, 342-345.

Matheny, A. P., Jr., Wilson, R. S., & Nuss, S. M. (1984). Toddler temperament: Stability across settings and over

ages. Child Development, 55, 1200-1211.

McCall, R. B., Eichorn, D. H., & Hogarty, P. S. (1977). Transitions in early mental development. Monographs of the Society of Research in Child Development, 42(3, Serial No. 171).

Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament In M. Lamb & A. Brown (Eds.), Advances in developmental psychology (Vol. 1). Hillsdale, NJ: Erlbaum.

Thomas, A., & Chess, S. (1977). Temperament and development. New York: Bruner/Mazel.

Thomas, A., & Chess, S. (1986). The New York longitudinal study: From infancy to adult life. In R. Plomin and J. Dunn (Eds.), The study of temperament: Changes, continuities and challenges (pp. 39-52). Hillsdale, NJ: Erlbaum.

Weisler, A., & McCall, R. B. (1976). Exploration and play: Resume and redirection. American Psychologist, 31, 492-508.

Wenckstern, S., Weizmann, F., & Leenaars A. A. (1984). Temperament and tempo of play in eight-month-old infants. Child Development, 55, 1195-1199.

Worobey, J. (1987). Temperament ratings in early childhood by parents, teachers, and students. Early Childhood Research Quarterly, 2, 169-179.

Yarrow, L. J., Rubenstein, J. L., Pedersen, F. A., & Janowski, J. (1972). Dimensions of early stimulation and their differential effects on infant development. Merrill-Palmer Quarterly, 18, 205-218.

Yarrow, L. J., Rubenstein, J. L., & Pedersen, F. A. (1975). Infant and environment: Early cognitive and motivational development. New York: Halsted Division, Wiley.

Yarrow, L. J., Morgan, G. A., Jennings, K. D., Harmon, R. J., & Gaiter, J. L. (1982). Infants' persistence at tasks: Relationships to cognitive functioning and early experience. Infant Behavior and Development, 5, 131-141.

APPENDIX A

LITERATURE REVIEW

Play

Play is at the same time the primary mode of learning and of self-expression. Attesting to its importance, play is widely acknowledged to be a key ingredient in social behavior, cognition, exploration, and a host of other factors. (See Rubin, Fein, & Vandenburg, 1983, for a full review.) Through play, young children interact with and learn about the world, their peers, and themselves. As the dominant mode of activity for the infant and toddler, play is a vehicle for both internalizing information from the environment and for the external expression of knowledge and affect.

Early observational investigations of children's preferences in free play often focused upon the formulation of social participation hierarchies. Thus, in a now classic study, Parten (1932) discovered that social participation among preschoolers increased with the child's age. Parten defined six sequential social participation categories: unoccupied behavior, solitary play, onlooker behavior, parallel play, associative play, and cooperative play. Preschoolers' modal play preference from 2 1/2 years to 3 1/2 years was parallel play, and from 3 1/2 years to 4 1/2 years was associative play.

Another major early source concerning children's play

behaviors was Piaget's (1963) classification of three successive stages of play. Sensorimotor play, the first stage, occupies the period from infancy to 24 months, when children are learning control of movements and beginning to perceive the effects of their experimenting with the sensory world and making events recur. Symbolic or representational play is the second stage. During this period children acquire the ability to encode experiences in symbols and begin imaginary play. The third stage of play is games with rules, which begins with the school years. Children begin to think objectively, to understand social concepts of cooperation and competition, and these are present in play.

Smilansky (1968) elaborated on the Piagetian categories with four types of play: (a) functional play--simple repetitive muscle movements with or without objects; (b) constructive play--manipulation of objects to construct or to "create" something; (c) dramatic play--the substitution of an imaginary situation to satisfy the child's personal wishes and needs; and (d) games-with-rules--the acceptance of prearranged rules and the adjustment to these rules. Smilansky's categories were considered to be a relatively fixed developmental sequence from infancy to concrete operations. Recent studies, however, have indicated that constructive and dramatic play develop simultaneously and

follow the same developmental course (Rubin, Fein, & Vandenberg, 1983).

Exploration theory was developed by Hutt (1970; 1971), who related the constructs of specific and diversive exploration to both curiosity and play in children. Hutt described exploration as intense examination of an object, an idea, or a skill, for the purpose of learning about it. Nunnally and Lemond (1973), building on Hutt's (1970) work on exploration, detailed a temporal sequence of exploratory behaviors. They described play, as distinguished from exploration, as the practice and extension of the skill; play is exercise for the sake of mastery. During play, children test the limits of what is known and gradually extend those limits. Exploration is where most of the initial information gathering takes place. More recently, Belsky, Goode, and Most (1980) developed twelve categories and operational definitions for a hypothesized sequence of the development of exploration and play. There appears to be a reciprocal relationship between exploration and play and a continual movement back and forth from exploratory activity to play to more exploration.

Exploration and play have been found to be related to the presence of parents, peers, teachers, and strangers (Henderson, 1984). Amount and quality of play has been related to increased performance on social and cognitive

functioning (Fein, 1981), maternal responsiveness and stimulation (Belsky, Goode, & Most, 1980; Tamis-LeMonda & Bornstein, 1989), social class (Rubin, Maioni, & Hornung, 1976), adult support (Henderson, 1984), mastery motivation (Jennings, Harmon, Morgan, Gaiter, & Yarrow, 1979), creativity (Vandenberg, 1980), social competence (Connolly & Doyle, 1984; Rubin, 1980), ego-resiliency (Arend, Gove, & Sroufe, 1979), and many other factors.

As an experimental construct, play has proven extremely difficult to define operationally. Play has been defined in many different ways, related to such concepts as curiosity, creativity, novelty, language, games, fantasy, and smiling. See Weisler and McCall (1976) for a review of the many definitions. They concluded that, while the many subjective definitions have proven unsatisfactory, objective definitions of play may not capture the quintessential processes and attributes of play that make it fascinating for many scholars. The present study will follow Nunnally and Lemond (1973) in defining play with the addition of qualitative measures, following Jennings, Harmon, Morgan, Gaiter, and Yarrow (1979).

The continuity of relationships found in the literature between child play and behavior suggests an underlying, unifying construct within the individual. It is thought that that underlying personal quality may be measured by

assessing temperament.

Temperament

According to Thomas and Chess (1986), temperament refers to the how of behavior, as distinguished from the what of behavior (abilities) or the why of behavior (motivation). So, for example, two children may ride a bicycle with the same dexterity and have the same motives for doing so, have similar learning ability and academic goals, or have the same reason for being friends. Yet these two children may differ significantly in the quickness with which they move, the ease with which they approach a new situation or task, and the effort required to distract them when they are involved in an activity. In other words, their abilities and motivations may be the same, but their temperaments may be different. Or their temperaments may be similar and their abilities and motivations may differ.

Bates (1987) reviewed definitions of temperament formulated by Thomas and Chess, Buss and Plomin, Rothbart and Derryberry, and Goldsmith and Campos. Thomas and Chess defined temperament as consistent patterns in how actions are performed and operationalized it by means of nine dimensions of behavior that can be seen in infants: (1) Approach or withdrawal: the nature of the initial response to a new stimulus, be it a new food, new toy, or

new person. Approach responses are positive and withdrawal reactions negative, whether displayed by mood expression or motor activity.

(2) Adaptability: rather than the nature of the initial response, this category is concerned with the ease with which the response is modified in the desired direction.

(3) Quality of mood: the amount of pleasant, joyful, and friendly behavior, as contrasted with unpleasant, crying, and unfriendly behavior.

(4) Intensity of emotional reaction: the energy level of response regardless of its quality or direction.

(5) Rhythmicity (regularity): the predictability or unpredictability in time of any biological function.

(6) Persistence in the face of environmental counterforces: this category includes the related concepts, attention span and persistence. Attention span concerns the length of time the child pursues a particular activity; persistence refers to the continuation of an activity direction in the face of obstacles.

(7) Distractibility: the effectiveness of extraneous environmental stimuli in interfering with or altering the direction of the ongoing behavior.

(8) Activity level: the motor component of the child's functioning.

(9) Threshold of responsiveness: the intensity level of

stimulation necessary for a response.

Three temperamental groups have been defined from analysis of patterns of these categories in the data of Thomas and Chess (1986). These groups are called the "difficult child", the "easy child", and the "slow-to-warm-up child." The child with difficult temperament shows irregular biological function, negative withdrawal responses to new stimuli, nonadaptability or slow adaptability to change, and intense mood expressions that are frequently negative. On the opposite end of the temperamental spectrum is the "easy child" group. This group is characterized by regularity, positive approach responses to new stimuli, high adaptability to change, and mildly or moderately intense mood that is preponderantly positive. The third temperamental group is marked by a combination of negative responses of mild intensity to new stimuli, with slow adaptability after repeated contact. Not all children fit into one of these temperamental groups, and children who fit one of these three patterns may differ widely in how it is made evident.

Temperament is likely to affect personality outcomes by affecting the social relationships that produce personality. Thomas and Chess (Goldsmith et al, 1987) place emphasis on the content of the behavior, rather than the style, or tempo.

Buss and Plomin (Goldsmith et al, 1987) place greater emphasis on biological influences, especially genetic influences, which indirectly shape behavioral responses to the environment. They define temperament using three concepts: (1) emotionality, defined as an autonomic nervous system predisposition to negative arousal response to events; (2) activity, defined as the preferred activity level or energy expenditure; and (3) sociability, defined as the level of preference for the rewards of being with other people. A fourth factor which Buss and Plomin use in discussing temperament is impulsivity, defined as a combination of inhibitory control and excitement seeking.

In the theory of Rothbart and Derryberry (Bates, 1987), the basic processes of temperament are reactivity and self-regulation. These are constitutional tendencies to show particular patterns of basic psychobiological processes which form the core of affective functioning and motivation. Acting in concert with environmental and maturational variables, they contribute to traits of affect, cognition, and action, which, in turn, are the core of the child's developing personality.

The most radically behavioral of the major definitions of temperament is that of Goldsmith and Campos (Goldsmith et al, 1987). They also limit their definition to infancy. Temperament is described as structures that

organize the expression of emotion. These structures consist of intensity and time parameters of affect expression which organize a predictable pattern of responses to which the caregiver can accommodate. Social and cognitive processes are explicitly excluded.

Thus, while the general consensus is that temperament refers to individual behavioral differences, no universally accepted definition has emerged. Given the diversity of definitional criteria and lack of agreement on a definition, the common practice is to define this trait operationally, based on the instruments used to assess temperament.

A wide variety of instruments are available to assess temperament in infancy and childhood. Twenty-six of these have been reviewed by Hubert, Wachs, Peters-Martin, and Gandour (1982), with special attention given to construct validity. Although no single measure of temperament appears to be entirely satisfactory, the Toddler Temperament Scale was rated among the highest in test-retest reliability (median correlation of .81 reported by Fullard, McDevitt, & Carey, 1984), acceptable internal consistency with median alphas of .70 and .72 (Fullard, McDevitt, & Carey, 1984), and moderate stability. Evidence on validity is sparse, although Fullard, McDevitt, and Carey (1984) report significant correlations for 16 out of

18 TTS categories with maternal general impressions, ranging from .09 to .55 (median r = .31). In a study of predictive validity, McDevitt and Carey (1981) found longitudinal stability for all nine categories (range .24 - .58, median = .38, all $p < .001$) in a comparison of ITQ assessments of 115 infants, rated on the TTS an average of 17 months later.

Age Effects

Age affects the way children play. As children grow, their play becomes more focused, more physically active, and more complex. For example, as fine muscle coordination develops, it is seen in play; as are large motor control, fine muscle coordination, vocal behavior, social sophistication, etc.

Age, theoretically, does not affect temperament, however, it appears to affect the expression of temperament. Although instruments for the assessment of temperament have been constructed for children from 4 months to 12 years of age (Fullard, McDevitt, & Carey, 1984), little is known about long-term stability of these characteristics. A temperament dimension may be expressed in different ways at different times in development. For example, persistence in a 1 or 2-year-old may be expressed in repeatedly stacking and restacking a tower of blocks, whereas in an older child, persistence may be expressed in

hours of practice throwing a ball. Rothbart and Derryberry (1981) have argued that temperament is a psychobiological concept, attuned to the linkages between the nervous system and behavior. This constitutional basis for temperament may be affected by maturational changes that influence reference behaviors. However, some degree of continuity is expected. Matheny, Wilson, and Nuss (1984) found that longitudinal stabilities were moderate and significant ($p<.05$) between 12 and 18 months and increased substantially between 18 and 24 months in a comparison of laboratory and TTS assessments of temperament. The authors stated that the evidence indicated that the ordering of individual differences became more clearly defined during the 18 to 24 month interval. They also found consistency in expression of temperament across home and laboratory settings.

Several studies indicate that intraindividual consistency becomes increasingly more coherent and stable from infancy through the second year of life. In a comparing 3- and 20-month temperament ratings (ITQ) and play behaviors, Field, Adler, Vega-Lahr, Scafidi, and Goldstein, (1987) found stability in the temperament dimensions of activity ($r = .39$, $p < .05$), rhythmicity ($r = .51$, $p < .01$), intensity ($r = .39$, $p < .05$), mood ($r = .53$, $p < 01$), and persistence ($r = .57$, $p < .01$) and in play

behaviors of smiling ($r = .52$, $p < .01$), and vocalizing ($r = .49$, $p < .01$). Coherence of individual differences across situations and time was found by Bronson (1985) to increase in play sessions recorded throughout the second year. Matheny, Wilson, and Nuss (1984) found evidence of stability in the temperament dimensions mood, adaptability, approach, intensity, and activity across 6-month intervals during the second year.

Temperament has been related to many factors. There is some evidence for linking temperament to cognitive growth (Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). For instance, persistence has predicted IQ and grades in school. In addition McCall, Eichorn, and Hogarty (1977) and Yarrow, Rubenstein, and Pedersen (1975) have found correlations between cognitive competence and the infant's alertness, attentiveness to objects, persistence on tasks, and goal-directed behaviors. Temperament has been related to other areas of individual functioning, such as exploratory behavior (Gandour, 1989), positive emotional tone, sustained attentiveness, social approachfulness, and calmer acceptance of restraint (Matheny, Wilson, & Nuss, 1984), tempo (Wenckstern, Weizmann, & Leenaars, 1984), and play (Field et al, 1987).

The expression of individual differences in play has been recognized as an important component of the study of

play (Arend, Gove, & Sroufe, 1979). Toddlers who were more flexible, resourceful, and persistent at 2 years of age were more happy and curious while manipulating a Banta box in the laboratory at age 4 to 5 (Arend, Gove, & Sroufe, 1979). Toddlers scoring high on the threshold dimension of temperament were noted to be more vigorous in their play and to change toys more often (Wenckstern, Weizmann, & Leenaars, 1984). Persistence was correlated with constructive play, and distractibility correlated with vocalizations in infants 3 to 20 months (Field et al, 1987).

Stability of characteristics of child play found in the literature suggests an underlying, unifying construct within the individual. The stability of play interaction behavior reported by Rothbart (1986) suggests that stability can be found during the first 9 months of infancy when temperament-like behaviors, such as activity level and smiling/laughter, are observed in a play interaction context. Stability in certain temperament dimensions (e.g., activity, rhythmicity, intensity, mood, and persistence) and in play interaction behaviors (looking, smiling, and vocalizing) has also been found from 3 to 20 months (Field et al, 1987). Consistency in expression of temperament was found to be moderate and significant between 12 and 18 months and increased substantially

between 18 and 24 months (Matheny, Wilson, & Nuss, 1984). Intraindividual consistency was also found by Bronson (1985) in a study which showed increased stability of behavior in play sessions in the second year of life.

Evidence for an underlying personal quality which may be measured by assessing temperament, the importance and ubiquity of play in toddlerhood, and findings of convergent validity and stability of temperament measures and play behavior, suggest that particular dimensions of temperament might be predicted from certain types of play behavior.

References

Arend, R., Gove, F. L., & Sroufe, L. A. (1979). Continuity of individual adaptation from infancy to kindergarten: A predictive study of ego-resiliency and curiosity in preschoolers. Child Development, 50, 950-959.

Bates, J. E. (1987). Temperament in infancy. In J. D. Osofsky (Ed.), Handbook of Infant Development (2nd ed.). New York: John Wiley & Sons.

Belsky, J., Goode, M. K., & Most, R. K. (1980). Maternal stimulation and infant exploratory competence: Cross-sectional, correlational, and experimental analyses. Child Development, 51, 1163-1178.

Belsky, J., & Most, R. K. (1981). From exploration to play: A cross-sectional study of infant free play behavior. Developmental Psychology, 17, 630-639.

Bronson, W. C. (1985). Growth in the organization of behavior over the second year of life. Developmental Psychology, 21, 108-117.

Campos, J. J., Barrett, K. C., Lamb, M. E., Goldsmith, H. H., & Stenberg, C. (1983). Socioemotional development. In M. M. Haith & J. J. Campos (Eds.), P. H. Mussen (Series Ed.), Handbook of child psychology: Vol. 2. Infancy and developmental psychobiology (pp. 781-915).

Connolly, J. A., & Doyle, A. B. (1984). Relation of social

fantasy play to social competence in preschoolers. Developmental Psychology, 20, 797-806.

Fein, G. G. (1981). Pretend play: An integrative review. Child Development, 52, 1095-1118.

Field, T., Adler, S., Vega-Lahr, N., Scafidi, F., & Goldstein, S. (1987). Temperament and play interaction behavior across infancy. Infant Mental Health Journal, 8, 156-165.

Fullard, W., McDevitt, S. C., & Carey, W. B. (1984). Assessing temperament in one- to three-year-old children. Journal of Pediatric Psychology, 9, 205-217.

Gandour, M. J. (1989). Activity level as a dimension of temperament in toddlers: Its relevance for the organismic specificity hypothesis. Child Development, 60, 1092-1098.

Garvey, C. (1977). Play. Cambridge, MA: Harvard University.

Goldsmith, H. H., Buss, A. H., Plomin, R., Rothbard, M. K., Thomas, A., Chess, S., Hinde, R. A., & McCall, R. B. (1987). Roundtable: What is temperament? Four approaches. Child Development, 58, 505-529.

Henderson, B. B. (1984). Parents and exploration: The effect of context on individual differences in exploratory behavior. Child Development, 55, 1237-1245.

Henderson, B. B. (1984). Social support and exploration. Child Development, 55, 1246-1251.

Hubert, N. C., Wachs, T. D., Peters-Martin, P., & Gandour, M. J. (1982). The study of early temperament: Measurement and conceptual issues. Child Development, 53, 571-600.

Hutt, C. (1970). Specific and diversive exploration. In H. W. Reese (Ed.), Advances in Child Development and Behavior (Vol. 5, pp. 119-180). New York: Academic.

Jennings, K. D., Harmon, R. J., Morgan, G. A., Gaiter, J. L., & Yarrow, L. J. (1979). Exploratory play as an index of mastery motivation: Relationships to persistence, cognitive functioning, and environmental measures. Developmental Psychology, 15, 386-394.

McCall, R. B., Eichorn, D. H., & Hogarty, P. S. (1977). Transitions in early mental development. Monographs of the Society of Research in Child Development, 42(3, Serial No. 171).

Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament In M. Lamb & A. Brown (Eds.), Advances in developmental psychology (Vol. 1). Hillsdale, NJ: Erlbaum.

Rubin, K. H., Fein, G. G., & Vandenberg, B. (1983). Play. In P. H. Mussen (Ed.), E. M. Hetherington (Volume Ed.), Handbook of child psychology, volume IV, socialization, personality, and social development, pp. 693-774. New York: John Wiley and Sons.

Weisler, A., & McCall, R. B. (1976). Exploration and play: Resume and redirection. American Psychologist, 31, 492-508.

McDevitt, S. C., & Carey, W. B. (1981). Stability of ratings vs. perceptions of temperament from early infancy to 1-3 years. American Journal of Orthopsychiatry, 51, 342-345.

Matheny, A. P., Jr., Wilson, R. S., & Nuss, S. M. (1984). Toddler temperament: Stability across settings and over ages. Child Development, 55, 1200-1211.

Matheny, A. P., Jr., Wilson, R. S., & Thoben, A. S. (1989). Home and mother: Relations with infant temperament. In S. Chess, A. Thomas, & M. E. Hertzig (Eds.), Annual Progress in Child Psychiatry and Child Development 1988. New York: Brunner/Mazel.

Nunnally, J. C., & Lemond, L. C. (1973). Exploratory behavior and human development. In H. W. Reese (Ed.), Advances in Child Development and Behavior (Vol. 8, pp. 59-109). New York: Academic.

Parten, M. B. (1932). Social participation among pre-school children. Journal of Abnormal and Social Psychology, 27, 243-269.

Piaget, J. (1962). Play, dreams, and imitation in childhood. New York: Norton.

Rothbart, M. K. (1986). Longitudinal observation of infant

temperament. Developmental Psychology, 22, 356-365.

Rubin, K. H. (1980). Fantasy play: Its role in the development of social skills and social cognition. In W. Damon & K. H. Rubin (Eds.), New Directions for Child Development: No. 9, Children's Play (pp. 69-84). San Francisco: Jossey-Bass.

Rubin, K. H., Maioni, T. L., & Hornung, M. (1976). Free play behaviors in middle- and lower-class preschoolers: Parten and Piaget revisited. Child Development, 47, 414-419.

Rubin, K. H., Watson, K. S., & Jambor, T. W. (1978). Free-play behaviors in preschool and kindergarten children. Child Development, 49, 534-536.

Smilansky, S. (1968). The effects of sociodramatic play on disadvantaged children: Preschool children. New York: Wiley.

Sponseller, D. (Ed.). (1974). Play as a learning medium. Washington, D.C.: National Association for the Education of Young Children.

Sutton-Smith, B. (1980). Children's play: Some sources of play theorizing. In W. Damon & K. H. Rubin (Eds.), New Directions for Child Development: No. 9, Children's Play (pp. 1-16). San Francisco: Jossey-Bass.

Tamis-LeMonda, C. S., & Bornstein, M. H. (1989). Habituation and maternal encouragement in attention in

infancy as predictors of toddler language, play, and representational competence. Child Development, 60, 738-751.

Thomas, A., & Chess, S. (1977). Temperament and development. New York: Brunner/Mazel.

Vandenberg, B. (1980). Play, problem-solving, and creativity. In W. Damon & K. H. Rubin (Eds.), New Directions for Child Development: No. 9, Children's Play (pp. 49-68). San Francisco: Jossey-Bass.

Vaughn, B. E., & Lefever, G. B. (1989). Attachment behavior, attachment security, and temperament during infancy. Child Development, 60, 728-737.

Voss, H. G., & Keller, H. (1983). Curiosity and Exploration: Theories and Results. New York: Academic.

Wenckstern, S., Weizmann, F., & Leenaars A. A. (1984). Temperament and tempo of play in eight-month-old infants. Child Development, 55, 1195-1199.

Yarrow, L. J., Rubenstein, J. L., & Pedersen, F. A. (1975). Infant and environment: Early cognitive and motivational development. New York: Halsted Press.

APPENDIX B

TODDLER TEMPERAMENT SCALE

Fullard, W., McDevitt, S. C., & Carey, W. B. (1984). Assessing temperament in one- to three-year-old children. Journal of Pediatric Psychology, 9, 205-217.

* Items not completed by teacher.

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

---

* 1. The child gets sleepy at about the same time each evening (within 1/2 hour).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

2. The child fidgets during quiet activities (story telling, looking at pictures).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

3. The child takes feedings quietly with mild expression of likes and dislikes.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

4. The child is pleasant (smiles, laughs) when first arriving in unfamiliar places.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 5. A child's initial reaction to seeing the doctor is acceptance.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

6. The child pays attention to game with parent for only a minute or so.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

7. The child's bowel movements come at different times from day to day (over one hour difference).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 8. The child is fussy on waking up (frowns, complains, cries).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

9. The child's initial reaction to a new baby sitter is rejection (crying, clinging to mother, etc.)

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

10. The child reacts to a disliked food even if it is mixed with a preferred one.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

11. The child accepts delays (for several minutes) for desired objects or activities (snacks, treats, gifts).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

---

12. The child moves little (stays still) when being dressed.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

13. The child continues an activity in spite of noises in the same room.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

14. The child shows strong reactions (cries, stamps feet) to failure.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

15. The child plays continuously for more than 10 minutes at a time with a favorite toy.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

16. The child ignores the temperature of food, whether hot or cold.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 17. The child varies from day to day in wanting a bottle or snack before bedtime at night.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

18. The child sits still while waiting for food.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

19. The child is easily excited by praise (laughs, yells, jumps).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

20. The child cries after a fall or bump.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

21. The child approaches and plays with unfamiliar pets (small dogs, cats).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

22. The child stops eating and looks up when a person walks by.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

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23. The child seems unaware of differences in taste of familiar liquids (type of milk, different juices).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

24. The child moves about actively when he/she explores new places (runs, climbs, or jumps).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

25. The child fusses or whines when bottom cleaned after bowel movement.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

26. The child smiles when played with by unfamiliar adults.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

27. The child looks up from play when mother enters the room.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

28. The child spends over an hour reading a book or looking at the pictures.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

29. The child responds intensely (screams, yells) to frustration.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

30. The child eats about the same amount of solid food at meals from day to day.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

31. The child remains pleasant when hungry and waiting for food to be prepared.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

32. The child allows face washing without protest (squirming, turning away).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

33. The amount of milk or juice the child takes at mealtime is unpredictable from meal to meal (over 2 oz. difference).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

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34. The child practices physical activities (climbing, jumping, pushing objects) for under 5 minutes.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

35. The child vigorously resists additional food or milk when full (spits out, clamps mouth closed, bats at spoon, etc.)

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

36. The child plays actively (bangs, throws, runs) with toys indoors.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

37. The child ignores voices when playing with a favorite toy.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

38. The child approaches (moves toward) new visitors at home.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

39. The child plays outside on hot or cold days without seeming to notice differences in temperature.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

40. The child continues playing with other children for under five minutes and then goes elsewhere.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

41. The child continues to look at a picture book in spite of distracting noises (car horns, doorbell).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

42. The child wants a snack at a different time each day (over one hour difference).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 43. The child is pleasant (smiles) when put down for nap or at night.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

44. The child takes several days to get used to (show

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

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usual behavior in) new situations away from parent (play group, day care center, sitter.)

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

45. The child speaks (or vocalizes) right away to unfamiliar adults.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

46. The child reacts strongly (cries or screams) when unable to complete a play activity.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

47. The child enjoys games with running and jumping over games done sitting down.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

48. The child notices wet clothing, and wants to be changed right away.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

49. The child is fussy or moody throughout a cold or an intestinal virus.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 50. The child ignores parent's first call while watching a favorite T.V. program.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

51. A child loses interest in a new toy or game within an hour.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

52. The child runs to get where he/she wants to go.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

53. For the first few minutes in a new place (store, home or vacation place) the child is wary (clings to mother, holds back).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 54. The child takes daytime naps at differing times (over 1/2 hour difference) from day to day.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

---

55. The child reacts mildly (frown or smile) when his/her play is interrupted by parent.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

56. The child accepts being dressed and undressed without protest.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

57. The child is outgoing with adult strangers outside the home.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

58. The child runs ahead when walking with the parent.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

59. The child's period of greatest physical activity comes at same time of day.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

60. The child can be coaxed out of a forbidden activity.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

61. The child stops play and watches when someone walks by.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

62. The child goes back to the same activity after brief interruption (snack, trip to toilet).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

63. The child laughs or smiles when meeting other children.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

64. The child sits still while watching TV or listening to music.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

65. The child will avoid repetition of misbehavior if punished firmly once or twice.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

66. The child continues to play with a toy in spite of sudden noises from outdoors (car horn, siren, etc.).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

67. The child ignores dirt on himself/herself.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 68. The child's time of waking in the morning varies greatly (by 1 hour or more) from day to day.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

69. The child has moody or "off" days when he/she is fussy all day.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

70. The child reacts mildly (frown or smile) when another child takes his/her toy.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

71. the child stays with a routine task (dressing, picking up toys) for 5 minutes or more.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

72. The child stops eating and looks when he/she hears an unusual noise (telephone, doorbell).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 73. The child sits still (moves little) during procedures like hair brushing or nail cutting.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

74. The child shows much bodily movement (stomps, writhes, swings arms) when upset or crying.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

75. The child is pleasant (smiles, laughs) during face washing.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 76. The child's initial reaction at home to approach by strangers is acceptance (looks at, reaches out).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

---

77. The child is hungry at dinner time.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

78. The child continues to get into forbidden areas or objects in spite of parents' repeated warnings.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

79. The child stops to examine new objects thoroughly (5 minutes or more).
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

80. The child ignores odors (cooking, smoke, perfume) whether pleasant or not.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

81. The child looks up from an activity when he/she hears the sounds of children playing.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 82. The child falls asleep at about the same length of time after being put to bed.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

83. The child greets babysitter loudly with much expression of feeling whether positive or negative.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

84. The child is moody for more than a few minutes when corrected or disciplined.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

85. The child sits still (little squirming) while traveling in car or stroller.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 86. The child watches TV for under 10 minutes, then turns to another activity.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

87. The child is shy (turns away or clings to mother) on meeting another child for the first time.
almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

USING THE SCALE SHOWN BELOW, PLEASE MARK AN "X" IN THE SPACE THAT TELLS HOW OFTEN THE CHILD'S RECENT AND CURRENT BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED BY EACH ITEM.

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always
1	2	3	4	5	6

---

88. The child is still wary of strangers after 15 minutes.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

89. The child frets or cries when first learning a new task (dressing self, picking up toys).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 90. The child sits quietly in the bath.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

91. The child practices a new skill (throwing, piling, drawing) for 10 minutes or more.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

92. The child ignores differences in taste or consistency of familiar foods.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 93. The child sleeps poorly (restless, wakeful) in new places for first 2 or 3 times.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

* 94. Child is fearful of being put down in an unfamiliar place (supermarket cart, new stroller, playpen) with parent present.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

95. The child frowns or complains when left to play by self.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

96. The child accepts within 10 minutes (feels at home, at ease) new surroundings (home, store, play area).

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

97. The child looks up from play when the telephone or doorbell rings.

almost___:___:___:___:___:___almost
never 1 2 3 4 5 6 always

APPENDIX C

RAW DATA

Variable Codes - Play Data

Variable Labels

Subject	Subject number
Date	Date of observation
Manipula	Manipulation play behaviors
Locfocus	Locomotion focused play behaviors
Locunfoc	Locomotion unfocused play behaviors
Visual	Visual play behaviors
Vocal	Vocalizations
Objects	Number of objects handled
Time	Length of time in continuous play
Observer	Observer
Coder	Coder
Week	Week of observation
Totalloc	Combined locomotion focused and locomotion unfocused

Value Labels

Observer	1 = Observer 1, 2 = Observer 2
Coder	1 = Coder 1, 2 = Coder 2

Variable Codes - Temperament Data

Variable Labels

Subject	Subject Number
Gender	Gender of subject
Birthday	Date of birth
Approach	Approach score
Adaptabl	Adaptability score
Persist	Persistence score
Distract	Distractibility score
Threshol	Threshold score
Ageweekl	Age at initial observation

Value Labels

Gender	1 = Male, 2 = Female

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
1	880916	9	17	1	1	1	8	6	1	2	1	18
1	880916	14	18	2	17	0	4	13	2	2	1	20
1	880919	14	2	0	5	2	1	10	1	1	2	2
1	880926	23	22	1	18	0	3	14	2	2	2	23
1	881014	12	18	2	3	2	7	6	1	2	3	20
1	881014	14	13	2	20	0	3	6	2	2	3	15
1	881031	8	2	0	19	2	3	3	1	2	4	2
1	881019	14	39	3	12	1	4	9	2	2	4	42
1	881115	11	16	1	4	4	5	4	1	2	5	17
1	881205	34	5	0	10	7	4	19	2	2	5	5
1	881205	14	7	3	2	7	6	5	1	2	6	10
1	881207	25	21	0	11	3	6	5	2	2	6	21
2	881003	13	3	1	4	1	5	13	1	2	1	4
2	880916	10	18	5	20	0	6	6	2	2	1	23
2	880922	11	9	3	1	4	6	15	1	1	2	12
2	880926	11	6	0	26	3	4	4	2	2	2	6
2	881013	25	3	0	3	5	4	14	1	2	3	3
2	881017	8	22	2	18	8	4	3	2	2	3	24
2	881018	22	10	0	5	6	6	11	1	2	4	10
2	881029	16	22	0	13	5	5	5	2	2	4	22
2	881129	2	5	0	4	14	4	11	1	2	5	5
2	881202	17	31	0	6	11	8	12	2	2	5	31
2	881209	6	16	3	6	6	5	7	1	2	6	19
2	881206	23	26	1	7	4	5	9	2	2	6	27
3	880916	18	8	0	7	2	4	8	1	2	1	8
3	880915	18	0	0	13	2	1	16	2	2	1	0
3	880919	22	11	0	0	0	7	19	1	1	2	11
3	880920	28	7	0	24	3	1	19	2	2	2	7
3	881012	23	3	0	2	0	4	13	1	2	3	3
3	881014	18	13	0	16	2	5	8	2	2	3	13
3	881018	44	1	0	1	4	3	19	1	2	4	1
3	881029	28	16	0	13	4	3	16	2	2	4	16
3	881128	21	0	0	5	3	3	15	1	2	5	0
3	881205	33	11	0	18	2	4	13	2	2	5	11
3	881205	11	15	0	5	2	2	12	1	2	6	15
3	881207	35	10	0	10	2	1	16	2	2	6	10
4	880913	4	20	0	7	2	6	8	1	2	1	20
4	880926	18	9	3	22	1	4	6	2	2	1	12

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
4	880922	27	1	2	2	0	4	17	1	1	2	3
4	881006	17	28	0	13	2	2	10	2	2	2	28
4	881012	2	1	2	22	0	1	0	1	2	3	3
4	881014	33	10	2	16	5	6	13	2	2	3	12
4	881017	30	5	0	5	2	11	10	1	2	4	5
4	881019	18	9	0	24	9	4	13	2	2	4	9
4	881128	16	16	0	2	8	4	4	1	2	5	16
4	881130	9	43	1	12	12	4	8	2	2	5	44
4	881206	27	5	0	0	4	3	13	1	2	6	5
4	881205	20	16	0	15	7	5	7	2	2	6	16
5	880916	10	13	4	6	0	6	8	1	2	1	17
5	880915	12	0	0	27	0	1	3	2	2	1	0
5	880920	23	1	0	1	1	1	19	1	1	2	1
5	880926	18	19	1	14	4	5	11	2	2	2	20
5	881014	33	3	0	7	1	2	18	1	2	3	3
5	881014	20	11	0	22	0	6	7	2	2	3	11
5	881017	16	2	3	6	0	5	9	1	2	4	5
5	881019	28	4	0	16	0	4	13	2	2	4	4
5	881129	25	4	1	7	0	7	10	1	2	5	5
5	881130	3	40	6	14	3	3	11	2	2	5	46
5	881205	16	4	0	7	0	3	11	1	2	6	4
5	881207	12	13	1	23	3	2	9	2	2	6	14
6	881003	20	1	0	6	5	2	13	1	2	1	1
6	880916	5	6	0	25	5	2	10	2	2	1	6
6	881004	16	14	0	5	10	4	11	1	1	2	14
6	880926	7	6	0	19	8	2	15	2	2	2	6
6	881013	50	0	0	1	1	3	19	1	2	3	0
6	881017	17	20	0	16	3	5	11	2	2	3	20
6	881018	16	13	1	3	9	6	6	1	2	4	14
6	881029	22	15	0	10	5	8	8	2	2	4	15
6	881128	19	10	0	4	0	4	10	1	2	5	10
6	881202	11	16	2	11	4	7	4	2	2	5	18
6	881209	3	21	0	8	7	3	9	1	2	6	21
6	881206	16	26	0	13	4	5	12	2	2	6	26
7	880913	13	9	1	5	9	3	8	1	2	1	10
7	880915	22	3	0	5	24	1	15	2	2	1	3
7	880919	14	1	0	1	12	8	14	1	1	2	1
7	880926	22	11	1	8	4	5	9	2	2	2	12

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
7	881012	21	1	0	2	4	2	12	1	2	3	1
7	881029	16	20	1	12	2	9	6	2	2	3	21
7	881031	10	9	0	6	1	4	10	1	2	4	9
7	881101	26	15	0	9	10	6	17	2	2	4	15
7	881115	17	5	1	2	8	5	13	1	2	5	6
7	881202	21	17	2	12	7	8	7	2	2	5	19
7	881205	25	12	0	0	7	7	11	1	2	6	12
7	881206	21	12	0	15	16	3	12	2	2	6	12
8	880916	19	11	0	0	2	3	15	1	2	1	11
8	880915	2	28	1	10	10	4	15	2	2	1	29
8	880919	12	5	7	4	1	5	7	1	1	2	12
8	880921	16	20	1	18	9	4	13	2	2	2	21
8	881013	31	4	0	5	6	2	13	1	2	3	4
8	881014	6	16	1	19	2	3	3	2	2	3	17
8	881017	33	0	0	7	0	6	14	1	2	4	0
8	881019	23	4	0	14	9	3	12	2	2	4	4
8	881115	17	3	0	13	1	5	9	1	2	5	3
8	881130	10	15	11	18	0	3	6	2	2	5	26
8	881206	27	5	0	4	3	3	15	1	2	6	5
8	881205	10	30	0	20	0	3	12	2	2	6	30
9	880916	7	9	4	3	8	4	9	1	2	1	13
9	880916	7	10	4	9	2	2	0	2	2	1	14
9	880919	18	4	2	1	8	4	14	1	1	2	6
9	880919	16	12	1	19	2	5	11	2	2	2	13
9	881012	2	28	0	1	12	4	15	1	2	3	28
9	881029	18	13	0	15	7	5	6	2	2	3	13
9	881018	16	8	1	3	7	7	16	1	2	4	9
9	881101	27	10	0	20	3	5	14	2	2	4	10
9	881128	22	5	0	5	2	7	13	1	2	5	5
9	881202	21	37	0	9	5	5	16	2	2	5	37
9	881205	19	5	0	3	9	3	12	1	2	6	5
9	881207	13	23	4	16	6	5	5	2	2	6	27
10	880916	24	7	0	2	0	3	14	1	2	1	7
10	880915	3	46	0	13	0	2	18	2	2	1	46
10	880919	13	17	3	3	0	8	8	1	1	2	20
10	880926	5	7	4	17	0	2	2	2	2	2	11
10	881012	17	4	5	5	3	4	11	1	2	3	9
10	881029	18	12	4	19	1	3	3	2	2	3	16

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALOC
10	881031	11	6	0	2	2	7	7	1	2	4	6
10	881101	33	5	0	23	0	3	19	2	2	4	5
10	881115	21	8	4	2	1	10	5	1	2	5	12
10	881202	18	20	0	17	7	2	13	2	2	5	20
10	881206	3	25	2	5	0	4	9	1	2	6	27
10	881206	23	22	0	20	0	4	8	2	2	6	22
11	880913	7	6	0	3	2	4	6	1	2	1	6
11	880915	15	12	8	13	19	6	9	2	2	1	20
11	880920	19	19	0	0	3	7	14	1	1	2	19
11	880921	16	26	0	13	9	4	14	2	2	2	26
11	881012	14	20	2	2	7	6	11	1	2	3	22
11	881017	14	38	0	6	26	5	10	2	2	3	38
11	881031	12	13	2	2	5	4	11	1	2	4	15
11	881029	17	17	0	12	8	2	18	2	2	4	17
11	881129	42	1	0	2	4	3	17	1	2	5	1
11	881130	26	3	0	26	4	1	19	2	2	5	3
11	881205	19	16	0	0	10	10	8	1	2	6	16
11	881206	16	27	1	11	10	5	9	2	2	6	28
12	880919	1	28	0	1	0	3	15	1	2	1	28
12	880914	10	20	0	8	4	6	9	2	2	1	20
12	880920	15	7	0	3	0	5	16	1	1	2	7
12	880929	14	15	2	11	11	5	7	2	2	2	17
12	881013	11	35	0	1	5	4	14	1	2	3	35
12	881026	5	17	2	21	4	3	1	2	2	3	19
12	881020	8	13	8	5	1	4	5	1	2	4	21
12	881101	18	18	6	12	3	7	6	2	2	4	24
12	881128	27	9	0	1	5	4	15	1	2	5	9
12	881129	16	31	1	8	11	4	13	2	2	5	32
12	881205	21	12	0	1	11	5	15	1	2	6	12
12	881208	19	33	0	8	5	5	9	2	2	6	33
13	880916	20	3	0	3	3	5	13	1	2	1	3
13	880920	21	4	0	17	10	3	12	2	2	1	4
13	880920	20	3	0	2	4	4	13	1	1	2	3
13	880921	13	21	0	12	4	1	18	2	2	2	21
13	881012	23	6	0	0	5	4	11	1	2	3	6
13	881014	27	2	0	12	14	5	17	2	2	3	2
13	881031	19	7	0	2	4	6	18	1	2	4	7
13	881019	26	15	0	10	3	5	16	2	2	4	15

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
13	881128	23	0	0	5	1	7	15	1	2	5	0
13	881130	17	24	0	16	10	2	13	2	2	5	24
13	881205	22	5	0	2	7	3	14	1	2	6	5
13	881205	20	17	0	3	6	7	13	2	2	6	17
14	880913	12	4	0	8	9	2	13	1	2	1	4
14	880915	16	1	0	19	12	3	12	2	2	1	1
14	880919	13	0	0	4	6	2	19	1	1	2	0
14	880921	13	7	0	18	10	2	13	2	2	2	7
14	881012	21	3	0	6	12	3	17	1	2	3	3
14	881014	30	25	0	8	4	10	12	2	2	3	25
14	881018	13	18	0	6	8	3	13	1	2	4	18
14	881019	10	31	0	15	7	6	7	2	2	4	31
14	881115	31	2	0	2	6	6	19	1	2	5	2
14	881130	10	16	6	17	0	8	3	2	2	5	22
14	881205	9	9	0	3	18	4	14	1	2	6	9
14	881206	10	24	1	15	4	5	6	2	2	6	25
15	881005	12	5	0	8	3	2	10	1	2	1	5
15	881005	19	7	4	22	1	0	0	2	2	1	11
15	881005	19	7	4	22	1	5	7	2	2	1	11
15	880919	.	.	.	.	.	.	.	1	1	2	.
15	880921	.	.	.	.	.	.	.	2	2	2	.
15	881013	18	8	1	5	1	5	9	1	2	3	9
15	881014	3	3	1	31	2	1	0	2	2	3	4
15	881017	9	6	0	14	3	5	6	1	2	4	6
15	881019	33	6	0	24	10	3	12	2	2	4	6
15	881205	20	20	0	1	5	3	13	1	2	5	20
15	881130	10	8	0	18	5	3	12	2	2	5	8
15	881209	15	16	0	7	5	8	7	1	2	6	16
15	881207	12	37	0	13	6	5	4	2	2	6	37
16	880916	6	11	0	7	5	3	8	1	2	1	11
16	880914	3	21	5	23	3	3	1	2	2	1	26
16	880922	15	18	0	1	0	2	19	1	1	2	18
16	880929	14	14	5	17	0	3	6	2	2	2	19
16	881013	2	8	11	14	2	3	0	1	2	3	19
16	881014	19	8	2	23	6	3	10	2	2	3	10
16	881017	12	14	0	5	6	9	5	1	2	4	14
16	881018	26	9	4	17	8	5	12	2	2	4	13
16	881205	5	16	5	3	5	6	5	1	2	5	21

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
16	881129	20	12	0	15	5	4	13	2	2	5	12
16	881208	14	22	1	3	5	4	12	1	2	6	23
16	881206	17	11	4	13	5	7	5	2	2	6	15
17	880916	10	13	0	8	2	6	7	1	2	1	13
17	880914	18	6	5	12	2	4	9	2	2	1	11
17	880928	4	5	2	15	0	2	1	1	1	2	7
17	880929	21	8	0	16	2	1	13	2	2	2	8
17	881013	22	14	2	2	0	5	10	1	2	3	16
17	881014	14	32	0	17	6	6	5	2	2	3	32
17	881017	24	5	0	7	4	2	18	1	2	4	5
17	881018	25	10	2	22	1	6	9	2	2	4	12
17	881205	16	15	2	2	6	7	7	1	2	5	17
17	881201	19	20	1	18	2	6	6	2	2	5	21
17	881208	16	9	3	6	1	9	6	1	2	6	12
17	881206	22	26	5	12	1	8	4	2	2	6	31
20	880919	3	20	1	7	0	2	9	1	2	1	21
20	880914	10	10	1	24	0	2	2	2	2	1	11
20	880922	2	6	3	10	3	1	0	1	1	2	9
20	880929	21	9	2	20	1	5	10	2	2	2	11
20	881013	1	14	4	9	1	3	7	1	2	3	18
20	881014	4	21	16	19	1	3	0	2	2	3	37
20	881017	18	9	2	7	1	4	8	1	2	4	11
20	881018	18	5	5	19	2	3	7	2	2	4	10
20	881128	27	2	0	4	0	1	18	1	2	5	2
20	881130	20	23	0	13	0	3	17	2	2	5	23
20	881206	13	11	10	5	1	8	5	1	2	6	21
20	881206	20	12	0	14	1	5	10	2	2	6	12
21	880916	4	35	0	3	3	3	13	1	2	1	35
21	880914	0	30	0	12	2	1	19	2	2	1	30
21	880922	8	24	0	2	2	6	7	1	1	2	24
21	880929	12	14	0	21	3	5	5	2	2	2	14
21	881013	26	17	0	2	5	5	12	1	2	3	17
21	881014	31	17	0	9	5	7	7	2	2	3	17
21	881020	13	16	2	3	0	8	13	1	2	4	18
21	881018	22	29	0	18	4	10	6	2	2	4	29
21	881128	16	24	0	0	1	5	12	1	2	5	24
21	881129	14	28	3	13	4	7	8	2	2	5	31
21	881208	6	12	10	1	2	7	4	1	2	6	22

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
21	881206	20	18	7	13	0	6	5	2	2	6	25
22	880919	12	24	0	2	1	3	15	1	2	1	24
22	880914	18	25	2	12	1	5	13	2	2	1	27
22	880920	14	9	0	5	2	7	6	1	1	2	9
22	880929	14	17	4	14	13	5	12	2	2	2	21
22	881013	8	9	8	5	1	4	4	1	2	3	17
22	881014	10	10	8	18	11	5	5	2	2	3	18
22	881017	29	10	0	1	0	7	16	1	2	4	10
22	881018	4	16	9	23	0	3	4	2	2	4	25
22	881114	16	11	3	5	6	8	8	1	2	5	14
22	881129	22	12	1	14	8	6	11	2	2	5	13
22	881206	16	15	4	2	4	9	7	1	2	6	19
22	881206	11	28	2	17	7	7	4	2	2	6	30
24	880919	6	9	2	8	0	2	8	1	2	1	11
24	880914	13	8	4	17	1	2	5	2	2	1	12
24	880922	8	7	0	4	1	1	5	1	1	2	7
24	880929	6	24	4	23	0	3	3	2	2	2	28
24	881026	19	4	0	26	0	1	8	2	2	3	4
24	881101	12	31	4	19	0	4	7	2	2	4	35
24	881128	9	16	6	7	2	6	7	1	2	5	22
24	881129	10	26	3	15	3	3	6	2	2	5	29
24	881205	15	13	0	1	7	7	8	1	2	6	13
24	881207	18	22	5	14	3	4	3	2	2	6	27
25	880919	6	16	2	2	0	5	8	1	2	1	18
25	880914	5	35	0	16	10	4	13	2	2	1	35
25	880920	7	7	1	5	4	4	7	1	1	2	8
25	880929	7	5	8	21	3	3	3	2	2	2	13
25	881017	11	7	0	4	4	5	6	1	2	3	7
25	881014	12	19	6	12	12	5	0	2	2	3	25
25	881018	33	4	1	5	6	7	13	1	2	4	5
25	881018	27	5	0	18	7	4	15	2	2	4	5
25	881114	16	9	3	8	7	3	11	1	2	5	12
25	881129	8	15	10	16	1	8	0	2	2	5	25
25	881205	9	14	3	1	5	4	5	1	2	6	17
25	881206	23	20	6	12	8	8	8	2	2	6	26
26	880919	24	5	0	2	0	2	16	1	2	1	5
26	881005	3	15	12	25	1	3	2	2	2	1	27
26	880922	11	13	0	4	2	5	13	1	1	2	13

SUBJECT	DATE	MANIPULA	LOCFOCUS	LOCUNFOC	VISUAL	VOCAL	OBJECTS	TIME	OBSERVER	CODER	WEEK	TOTALLOC
26	881013	25	8	1	3	3	7	12	1	2	3	9
26	881014	28	4	0	25	2	4	16	2	2	3	4
26	881020	16	9	3	8	6	2	9	1	2	4	12
26	881019	16	20	1	17	5	6	2	2	2	4	21
26	881205	8	19	0	15	0	3	19	1	2	5	19
26	881201	2	10	0	26	0	1	7	2	2	5	10
26	881208	8	3	0	11	5	3	7	1	2	6	3
26	881206	17	21	5	14	11	10	2	2	2	6	26

SUBJECT	GENDER	BIRTHDAY	APPROACH	ADAPTABL	PERSIST	DISTRACT	THRESHOL	AGEWEEK
1	1	860212	5.40	3.86	2.0	4.0	3.88	31
2	1	861031	3.89	4.00	2.9	4.8	2.50	35
3	2	860807	5.36	2.25	1.9	3.6	3.00	25
4	2	860607	2.46	2.00	3.1	3.6	2.00	28
5	2	860518	5.40	2.67	2.2	2.0	2.13	28
6	2	860403	2.18	1.75	1.8	3.4	2.38	30
7	2	860723	2.45	3.13	3.0	3.4	2.13	26
8	1	860825	4.27	3.50	2.9	3.4	2.63	25
9	2	861221	2.73	1.10	1.6	2.8	2.38	33
10	2	860618	5.82	2.25	2.0	3.6	2.38	27
11	1	851101	3.82	5.25	3.5	4.4	2.38	34
12	1	860922	2.00	3.38	4.4	3.0	1.50	24
13	1	861220	3.27	3.75	2.3	3.5	2.38	33
14	1	860711	3.73	3.63	2.1	3.4	2.38	26
15	1	870407	5.82	3.00	2.6	3.9	3.38	18
16	1	870402	4.91	3.75	3.5	4.0	4.50	17
17	1	861202	2.91	3.25	4.0	3.7	1.88	21
20	2	861209	4.18	2.25	2.3	2.5	3.13	21
21	2	870915	2.64	5.00	3.4	4.0	2.63	12
22	2	870405	3.64	3.50	3.0	4.0	3.13	17
24	2	870707	4.36	2.50	2.9	4.1	2.63	14
25	2	861123	2.18	2.13	2.1	3.6	4.00	22
26	2	870410	3.18	3.00	2.8	3.5	3.38	17

VITA

Sarah E. Putnam

Candidate for the Degree of

Master of Science

Thesis: EXPRESSION OF TEMPERAMENT: TODDLER PLAY IN A GROUP SETTING

Major Field: Family Relations and Child Development

Biographical:

Personal Data: Born in Shawnee, Oklahoma, February 25, 1951, the daughter of Arval A. and Anna H. Putnam.

Education: Graduated from Shawnee High School, Shawnee, Oklahoma, in June, 1969; received Bachelor of Arts in Anthropology and Linguistics from The University of Oklahoma, Norman, Oklahoma in July, 1979; completed requirements for the Master of Science degree at Oklahoma State University in December, 1991.

Professional Experience: Program Coordinator, Early Intervention Training Institute, Oklahoma State University, Stillwater, June-July, 1989. Teaching Assistant, Department of Family Relations and Child Development, Oklahoma State University, September, 1988, to May, 1989. Research Assistant to John C. McCullers, Department of Family Relations and Child Development, Oklahoma State University, September, 1987, to May, 1988.