

# Inhibition in Toddlerhood and the Dynamics of the Child's Interaction with an Unfamiliar Peer at Age Five

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KOCHANSKA, GRAZYNA, and RADKE-YARROW, MARIAN. *Inhibition in Toddlerhood and the Dynamics of the Child's Interaction with an Unfamiliar Peer at Age Five*. CHILD DEVELOPMENT, 1992, 63, 325-335. Measures of inhibition to social and nonsocial unfamiliar events, obtained in toddlerhood, were studied as predictors of social behaviors during an interaction with an unfamiliar peer in 100 5-year-old children. Social inhibition predicted a highly shy and inhibited behavioral pattern with peer and less frequent expression of affect during fantasy play; nonsocial inhibition predicted decreased involvement in group play. Analysis of the changing dynamics of the ongoing peer interaction revealed that the role of child inhibition as a predictor of social behavior may be mostly evident during the initial encounter with the peer. Children who as toddlers were particularly socially inhibited, during the initial phase of peer interaction showed a significantly stronger pattern of shy and inhibited behavior and proximity to mother. In contrast to existing evidence that maternal depression may be a risk factor for the child's long-term peer relationships, no differences in social behavior were found between children of normal and affectively ill mothers during a brief encounter with unfamiliar peers.

Competence in interaction with peers is an important developmental task, particularly at the time when a child makes the transition from the immediate family to extended social systems involving peer groups. Children differ greatly in their sociability and their interactive patterns with peers; these, in turn, are predictive of many indices of further adjustment (Hartup, 1983; Ladd, 1990; Rubin, Hymel, & Mills, 1989; Rubin & Mills, 1988; see also review by Parker & Asher, 1987).

There is a considerable body of evidence that a child's behavioral inhibition to unfamiliar events, measured during the second or third year of life, is predictive of passive and withdrawn patterns of social behavior while interacting with peers later in childhood (Asendorpf, 1990; Broberg, Lamb, & Hwang, 1990; Gersten, 1989; Kagan,

Reznick, Clarke, Snidman, & Garcia-Coll, 1984; Kagan, Reznick, Snidman, Gibbons, & Johnson, 1989; Reznick et al., 1986).

Kochanska (1991) proposed a more differentiated approach to the analysis of children's inhibition in which two types of inhibition were described, depending on the type of the unfamiliar event: nonsocial (to a new environment) and social (to an unfamiliar person). These two types of child inhibition were found to be relatively independent of each other (see also Stevenson-Hinde, 1989).

It is likely that social inhibition is a stronger predictor of subsequent inhibited, shy, and passive behavior in the interaction with an unfamiliar peer than nonsocial inhibition. One of the objectives of this study was to explore, in a longitudinal design, the

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two forms of children's early inhibition—to *nonsocial* and *social* unfamiliar events—as predictors of their future behavior with unfamiliar peers.

A child's competence with peers is multiply determined. Familial variables, such as mother-child attachment (Sroufe & Fleeson, 1986), parental discipline (Baumrind, 1978), and parent-child play and interaction (MacDonald & Parke, 1984; Parke et al., 1989), have been repeatedly implicated. A second objective of this study was to investigate the child's functioning with an unfamiliar peer in relation to maternal psychopathology.

Maternal psychopathology, particularly affective illness, may be a risk factor for the child's inhibition to unfamiliar events and subsequent shyness and decreased sociability. Depressed mothers, because of their low energy, fatigue, and negative affectivity, may be less involved in providing the child with necessary opportunities to explore new environments and interact with peers. They themselves may manifest withdrawn, passive, and anxious behavioral patterns (Beck, 1967; Downey & Coyne, 1990; Pound & Puckering, 1985). Finally, depression and inhibition may have common biological and genetic underpinnings (Davidson & Tomarkin, 1989; Finman, Davidson, Colton, Strauss, & Kagan, 1989). Indeed, there is evidence that maternal depression may be associated with children's inhibition (Kochanska, 1991; Rosenbaum et al., 1988; Sameroff, Barocas, & Seifer, 1984) and with maladaptive patterns of peer relations and peer competence (Hammen et al., 1987; Weintraub, Neale, & Liebert, 1975; Weintraub, Prinz, & Neale, 1978; Zahn-Waxler, Denham, Iannotti, & Cummings, in press; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990).

A third objective was to investigate inhibition as a predictor of social behavior in the context of the changing qualities of an ongoing peer interaction. Typically, in existing studies, measures of child social behavior throughout the peer interaction have been used. This approach does not allow one to consider the changing course of the interaction and the processes of mutual peer adaptation. It is very likely that different phases of a social encounter present different challenges for a child (Rubin, Both, Zahn-Waxler, Cummings, & Wilkinson, in press), and that the role of temperament as a predictor of behavior may be stronger during some phases than others. Asendorpf (1990) reported that while behavioral inhibition

predicted a child's withdrawn behavior with unfamiliar peers, it did not impair interactions with familiar children. Similarly, the often used concept of a "slow-to-warm-up child" (Thomas & Chess, 1977) captures the quality of the initial inhibition to the unfamiliar, which may gradually subside. As the unfamiliarity "wears off" during a continuous interaction, the predictive role of temperament (inhibition to unfamiliar) may be expected to fade. Temperament could be a powerful predictor of the child's *initial* behavior during an interaction with an unfamiliar peer. However, as the interaction progresses and the peer's familiarity increases, different competencies and/or vulnerabilities may come into play.

We investigated the role of toddlerhood inhibition as a predictor of social behavior at 5 years during the initial phase of interaction with an unfamiliar peer and in the later phase. It was hypothesized that the predictive role of inhibition would be stronger during the initial encounter, and would wane thereafter. In addition, we expected that level of inhibition may *mediate* the child's reaction to the changing situational dynamics of peer interaction. Specifically, the initial social encounter may be particularly stressful for inhibited children. In this situation, they were expected to manifest a more pronounced pattern of social withdrawal than the less inhibited children.

In summary, the study had three objectives: (1) to explore whether social and nonsocial inhibition, measured early in childhood, differently predicted children's peer competence and sociability during interaction with unfamiliar peers at age 5; (2) to examine maternal affective diagnosis as a factor that may be related to children's peer competence and sociability; and (3) to consider inhibition as a predictor of child social behavior in different phases of the peer interaction; specifically, to test the hypothesis that the influence of inhibition will be strong during the initial encounter with an unfamiliar peer and will wane thereafter, and a related hypothesis that the initial encounter with an unfamiliar peer is particularly stressful for the inhibited children, who will then show a stronger pattern of social shyness.

### Method

#### *Overview and Overall Design*

The children were seen twice: when they were of toddler age (1½ to 3½ years) and when they were 5. At Time 1, inhibition

to social and nonsocial unfamiliar events was assessed; at Time 2, the child's interaction with an unfamiliar peer was observed. Maternal diagnoses were obtained prior to mothers' entry into the study.

### Sample

One hundred seven mothers and children were observed during the Time 2 paradigm involving the peer interaction. Of those dyads, Time 1 inhibition assessments were available for 100 children. This group is a subsample of a study of 127 normal and depressed parents and their children.<sup>1</sup> The mothers were recruited, when their children were of toddler age, by advertisements in the community. The families were mostly middle class (SES  $M = 50.63$ ,  $SD = 14.91$ ; Hollingshead, 1975), although six subjects came from the lower SES background (SES of 25 and under).

The volunteers were screened by a psychiatric nurse-practitioner with the Schedule for Affective Disorders and Schizophrenia, Lifetime Version, Research Diagnostic Criteria (Spitzer & Endicott, 1977). Only mothers who were diagnosed as not having a current or past mental disorder and those with a diagnosis of either unipolar or bipolar depression were accepted into the study. There were 39 control mothers (20 girls, 19 boys), 46 unipolar mothers (21 girls, 25 boys), and 22 bipolar (13 girls, 9 boys). Reliability of the diagnostic categories between our diagnostician and a staff member of the New York State Psychiatric Institute was 100% for a sample of 10 interviews.

### Procedures

*Time 1 assessment of inhibition to the unfamiliar.*—Children's inhibition to the unfamiliar was assessed from two videotaped encounters that differed in the content of the event: nonsocial (inhibition to a new environment) and social (inhibition to an unfamiliar person). Mothers and children interacted for several hours in a two-room laboratory apartment (a living room with an adjoining playroom).

Nonsocial inhibition was coded during the first 10 min in the apartment. Social inhibition was coded during the first 5 min of the interaction between the child and an unfamiliar adult female stranger, who entered the apartment at the end of the first hour of

the session. The stranger made attempts to involve the child in mutual play and to make physical contact with the child (play with a pegboard with the child in her lap).

*Nonsocial inhibition.*—The child's behavior was coded for every 30-sec interval. The coding categories reflected approach/withdrawal from the unfamiliar and included: inhibition of exploration (child does not touch objects, play, or walk around), active exploration (child plays with toys and/or objects, walks around the apartment), latency to enter the other room in terms of the number of 30-sec intervals since entry to the apartment (reliability kappa = .84); proximity to mother (child touching mother, child in the other room, child not seeking/initiating contact with mother) (kappa = .89). The measure of nonsocial inhibition was the difference between the sum of all inhibited behaviors and the sum of all uninhibited behaviors.

*Social inhibition.*—Again, every 30-sec interval of the child's interaction with the stranger was coded in terms of approach/withdrawal (expression of distress, such as anxious, wary, or sad affect; retreat from or ignoring the stranger; wary, hesitant interaction; appropriate, comfortable interaction) (kappa = .84); proximity to mother (child touching mother, child not seeking/initiating contact with mother) (kappa = .83). The measure of social inhibition was the difference between the sum of behaviors reflecting the child's shyness and inhibition and the sum of sociable, outgoing behaviors. (For details of the coding system and procedures, see Kochanska, 1991.) Nonsocial and social inhibition scores were not correlated,  $r(100) = .12$ .

*Time 2 assessment of peer interaction.*—When children were 5, they again came with their mothers to our laboratory. While they were in the apartment, an unfamiliar peer, matched with the target child as to gender and age, and her or his mother came "to visit." The unfamiliar dyad spent 50 min with the target dyad (who had been told in advance about the visit). A member of the staff brought the visitors into the apartment but did not facilitate the initial interaction. Dress-up clothes that included items appealing to both sexes (e.g., hats, dresses, capes, motorcycle helmet), a play kitchen

<sup>1</sup>"Affective Disorders and Affective Development: A Study of Childrearing and Child Development in Normal Families and Families with Affective Disorders," NIMH Protocol 79-M-123, Marian Radke-Yarrow, principal investigator.

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with a set of dishes, and a large plastic Bobo doll were available in the playroom.

The peer visit was segmented into four episodes: (1) unstructured (5 min); (2) snack time for children (15 min); (3) interaction over an attractive toy (battery-operated pinball machine), brought in by a member of the staff (5 min); (4) unstructured (25 min); the pinball machine is removed and replaced with other toys. Mothers remained in the living room throughout the session and were asked not to interfere in the children's play.

*Coding of interactions.*—The target child was the focus of coding; the peer's behaviors were not coded. Twenty minutes were sampled for coding from the videotapes: Segment 1—getting acquainted (the first 5 min of the interaction); Segment 2—the attractive toy (the first 5 min after the arrival of the toy); Segment 3—the first 10 min of unstructured play, following the removal of the pinball.

Social behaviors were coded after every 20-sec interval. A coder made decisions regarding three classes of judgments: (1) the *general activity categories*, predominant for the interval (adapted from Rubin, 1989), (2) *child affect*, and (3) *proximity to mother*. Cohen's kappas (Bakeman & Gottman, 1986) were used for reliability (20% of the sample). Percent agreements for each category are reported in parentheses.

*General activity categories* (kappa = .74) included: *unoccupied*—apparent lack of goal or focus in the child's behavior (90%); *onlooker*—child watching the peer, but not involved in an interaction (74%); *transition*—child moving from one activity to another, setting up a new activity, distracted while playing, trying several activities at a time (68%); *interaction with adult*—child involved in an interaction with one of the mothers (86%); *play*—child involved in play (85%); and *eating*—child mostly absorbed in the snack (83%). Two categories were coded on the basis of presence or absence: *conversation*—child involved in an active exchange of information with the peer, kappa = .80, and *stare* (Kagan et al., 1984)—child looking at the peer for more than 2 sec without talking or playing, kappa = .71.

If *play* was coded, the coder made an additional judgment (kappa = .69) about its social qualities (Rubin, 1989). These included: *solitary play*—child playing alone, focused on the activity, with little or no attention paid to the peer (78%); *parallel play*—child engaged in play beside (but not with) the peer, attentive to what the peer is doing, often using the same toys, parallel speech may be present (70%); and *group play*—child playing with the peer, coordinating and sharing the goal, focus, and toys (83%). Group play included also the instances when the child attempted to engage the peer in group play, invited the peer to join in play, or coordinated his or her actions with those of the peer.

*Child affect* (kappa = .65) included: *neutral* (74%), *happy* (64%), *anxious* (73%), *angry* (66%), *sad* (76%), *bored* (75%), *excited* (76%), and *pretend negative* (100%) or *pretend positive* (89%)—usually expressed during fantasy play—for example, pretends to cry while playing a "patient," exclaims with fear while pretending to be a spaceman attacked by a shark. More than one affective expression could be coded for each interval. The coder's judgment was based on the child's facial expression, body language, and tone of voice.<sup>2</sup>

*Proximity to mother* (kappa = .77) included: *touching* (91%); *within arm's length* (81%); *same room* (77%); *other room* (96%); and *other room, but checking on mother* (71%). Only the first two codes (combined) were retained for the analyses to express *direct proximity* to mother. For each child, 60 intervals were coded; thus, there was no need to create relative scores, and the raw frequencies of each category were used in the analyses.

## Results

### Overview of Analyses

Prior to the analyses, data reduction was performed to reduce the number of variables in the first two classes of codes: *general activity categories* and *child affect*. Then the analyses followed the order of the three research objectives.

Children's nonsocial and social inhibition at Time 1 were considered as predictors of their behavior in the peer situation *across*

<sup>2</sup> Some of the reliabilities of specific affect codes may seem relatively low; however, later in the analyses we essentially used aggregated affect categories: neutral, happy/excited, negative, and fantasy affect. When a corresponding reliability table was created, its overall kappa was .78 (79% neutral, 75% happy/excited, 72% negative, and 75% fantasy affect).

the entire peer session, in all three coded segments. To this end, children's nonsocial and social inhibition scores from the toddlerhood assessment were entered as predictors in hierarchical multiple regressions, where measures of child social interaction at age 5 were dependent variables. Next, children of well, uni-, and bipolar mothers were compared on their measures of behavior during the entire peer session.

The remaining analyses focused on the differences between the initial and later segments of the peer interaction. Two similarly unstructured contexts—Segment 1 and Segment 3—were used. Segment 2 was dropped because its situational potential differed from the other two segments. During Segment 2, the introduction of the attractive toy imposed not only a relative structure but also an element of competition into the interaction.

The predictive role of inhibition for the initial versus later phase of interaction was examined, and inhibited and uninhibited children were compared regarding their expected difficulties during the initial phase. This analysis was preceded by the examination of the two phases of the interaction to confirm that indeed these two phases differed in terms of predominant patterns of children's social behavior.

#### Data Reduction

Two principal components analyses were performed to reduce the number of the peer interaction variables and to create more robust patterns for the *general activity categories* and *child affect*. To assure that the factor structures of all segments were similar, in addition to the overall analysis separate PCAs were also performed for all three segments.

*PCA for general activity categories.*—In this analysis, categories of unoccupied, onlooker, transition, conversation with peer, interaction with adult, staring, eating, and playing were entered. Four factors emerged; only the first, most robust factor was retained. It described a shy, inhibited pattern and was labeled Shy/Inhibited. The following variables loaded on this factor: staring (.88), onlooker (.87), unoccupied (.58), and conversation with peer (-.53). This factor controlled 33% of variance. In all three separate PCAs for the three segments of interaction a virtually identical first factor was iden-

tified, with positive loadings by staring, onlooking, and unoccupied, and negative loadings by conversation with peer. It also strongly resembles patterns identified by Asendorpf (1990, 1991) and Kagan et al. (1989).

*PCA for child affect.*—In this analysis, the affective variables were entered: neutral, happy, anxious, angry, sad, bored, excited, pretend negative, and pretend positive. Three factors were produced. Happy/Excited controlled 26% of variance; the variables loading on this factor were happy affect (.90), excited (.58), and neutral affect (-.93). The second factor was labeled Negative Affect (20% of variance). All negative affects loaded positively on this factor: anxious (.83), sad (.81), angry (.60), and bored (.44). Finally, the third affective factor, Fantasy Affect (13% of variance), consisted of the positive (.72) and negative (.66) pretended affects. The three separate PCAs for the three segments again produced very similar factor structures.<sup>3</sup>

The four factor scores from the general activity and child affect categories—Shy/Inhibited, Happy/Excited, Negative Affect, and Fantasy Affect—the three different social forms of play, and the direct proximity to mother were dependent variables in the subsequent analyses.

#### *Nonsocial and Social Inhibition at Time 1 as Predictors of Social Behavior with Peer at Time 2*

Hierarchical multiple regressions were performed. Because children varied in age when their inhibition was assessed, to control for the influence of child age at Time 1 it was entered as Step 1 in every regression. Two predictors followed: (Step 2) Time 1 nonsocial inhibition, and (Step 3) Time 1 social inhibition. The results are presented in Table 1.

Measures of inhibition to the unfamiliar in toddlerhood predicted qualities of 5-year-olds' peer interaction. *Social* but not *nonsocial* inhibition strongly predicted high scores on Shy/Inhibited pattern and low scores on Fantasy Affect. The predictive value for Negative Affect was marginal (children with high scores on social inhibition in toddlerhood tended to express more negative affect).

Early *nonsocial* inhibition was a better

<sup>3</sup> Fantasy affect, which did not occur frequently enough during the initial phase, was not included in the PCA for this segment.

TABLE 1  
 NONSOCIAL AND SOCIAL INHIBITION AT TIME 1 AS PREDICTORS OF SOCIAL BEHAVIOR  
 WITH PEER AT TIME 2

Dependent Variable and Step	Predictor Entered	R <sup>2</sup>	Fch	Beta
<b>Shy/Inhibited:</b>				
1 .....	Age at Time 1	.00	<1	.09
2 .....	Nonsocial inhibition	.01	<1	.04
3 .....	Social inhibition	.13	13.57***	.36
<b>Happy/Excited:</b>				
1 .....	Age at Time 1	.00	<1	.03
2 .....	Nonsocial inhibition	.01	<1	-.06
3 .....	Social inhibition	.01	<1	-.02
<b>Negative Affect:</b>				
1 .....	Age at Time 1	.00	<1	.06
2 .....	Nonsocial inhibition	.03	2.47	.14
3 .....	Social inhibition	.05	2.99 <sup>+</sup>	.18
<b>Fantasy Affect:</b>				
1 .....	Age at Time 1	.00	<1	-.04
2 .....	Nonsocial inhibition	.02	1.77	.16
3 .....	Social inhibition	.06	4.31*	-.21
<b>Solitary Play:</b>				
1 .....	Age at Time 1	.01	1.18	.11
2 .....	Nonsocial inhibition	.02	1.12	.11
3 .....	Social inhibition	.03	<1	-.06
<b>Parallel Play:</b>				
1 .....	Age at Time 1	.01	1.21	-.14
2 .....	Nonsocial inhibition	.02	<1	.08
3 .....	Social inhibition	.05	3.66 <sup>+</sup>	-.19
<b>Group Play:</b>				
1 .....	Age at Time 1	.00	<1	-.02
2 .....	Nonsocial inhibition	.04	3.91*	-.21
3 .....	Social inhibition	.05	1.50	.12
<b>Proximity/Mother:</b>				
1 .....	Age at Time 1	.00	<1	.03
2 .....	Nonsocial inhibition	.00	<1	.02
3 .....	Social inhibition	.02	1.47	.13

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*\*  $p < .001$ .

predictor of group play. Children who were inhibited to a new environment at Time 1 spent less time in group play than those who were uninhibited.

#### Maternal Affective Illness and Children's Social Behavior with Peers

The dependent variables—the four factor scores (Shy/Inhibited, Happy/Excited, Negative Affect, and Fantasy Affect, the three different social forms of play, and the direct proximity to mother)—were entered in a MANOVA with maternal diagnosis and child sex as the between-subject factors. There were no significant main effects or interactions. Children of well, uni-, and bipo-

lar mothers, and boys and girls, had similar scores on all peer interaction measures.<sup>4</sup>

#### Initial versus Later Phase of Peer Interaction

**Data reduction.**—Prior to these analyses, analogous data reduction was performed for children's general activity categories and affect. Because the results of separate PCAs confirmed very similar factor structures, the analogous composites were created for Segment 1 and Segment 3 by adding variables positively loading on the factors (Tabachnick & Fidell, 1989). Thus, *shy/inhibited* behavior in Segment 1 was the sum of *staring*, *onlooking*, and *unoccupied* tallied for Seg-

<sup>4</sup> Predictive roles of social and nonsocial inhibition were similar in all three diagnostic groups, for all main dependent variables, as indicated by a series of the analyses of covariance within MANOVAs (SPSS-X Inc., 1988, pp. 617–619).

ment 1. The variable that loaded negatively, *conversation with peer*, was kept separate.

Similarly, the affective variables were tallied separately for all three segments: *happy affect* (sum of excited and happy; neutral was dropped), and *negative affect* (sum of anxious, sad, angry, and bored). Fantasy affect was not included in any analysis where the comparison of two segments of interaction was involved because it occurred mostly during Segment 3, and its instances during Segment 1 were too rare to warrant robust analyses.

The three play categories (*solitary*, *parallel*, and *group*) and *proximity to mother* (sum of occurrences when the child was touching and/or within arm's length from mother) were also tallied separately. Because Segment 3 had twice as many intervals as Segments 1 and 2, all scores for Segment 3 were divided by 2.

*Qualities of peer interaction in the initial versus later phase.*—To address this question, all dependent variables—shy/inhibited behavior, conversation with peer, positive and negative affects, solitary, parallel, and group play, and proximity to mother (each for the first and third segments)—were entered in a MANOVA with the type of behavior (eight types) and segment (first vs. third) as within-subject factors. The effect of the interaction of the type and segment was highly significant,  $F(7,100) = 19.07$ ,  $p < .001$ , thus indicating robust differences in frequencies of children's social behaviors in the two phases of interaction. The post-hoc  $t$  tests (all  $p$ 's  $< .001$ ) confirmed that the differences were significant for all categories of behavior and affect (see Table 2).

During the initial encounter, compared to the later phase, children displayed a sig-

nificantly higher level of shy/inhibited behavior and remained in closer proximity to mother. This context was also more affectively charged—the children expressed more of *both* positive and negative affects. On the other hand, during the third segment, as compared to the initial encounter, the levels of all kinds of play were higher, and children were more often involved in conversation with the peers.

*Nonsocial and social inhibition at Time 1 as predictors of social behavior during the initial and later phases of peer interaction at Time 2.*—The correlations between Time 1 nonsocial and social inhibition scores and the dependent variables, in the first and third segment, are presented in Table 3.

Table 3 indicates that most correlations between toddler-age inhibition measures and behaviors during the peer interaction were during the initial encounter. The  $T_2$  statistic (Steiger, 1980) was used to compare the correlations between inhibition and behaviors in Segment 1 versus inhibition and behaviors in Segment 3. Children who as toddlers were inhibited to a new person were, in Segment 1, but not in Segment 3, highly shy and inhibited,  $T_2(97) = 2.20$ ,  $p < .05$ , two-tailed; displayed high negative affect,  $T_2(97) = 1.34$ , N.S.; and remained in direct proximity to mother,  $T_2(97) = 2.04$ ,  $p < .05$ , two-tailed. Children who as toddlers were highly inhibited to the new environment also expressed a high level of negative affect during the initial encounter with the unfamiliar peer,  $T_2(97) = 1.33$ , N.S.

Correlations between toddlerhood inhibition and different types of play are quite revealing. Children who were uninhibited in the new environment as toddlers, during the third segment were often involved in

TABLE 2

CHILDREN'S SOCIAL BEHAVIORS IN THE TWO CONTEXTS (Segments) OF THE PEER INTERACTION

BEHAVIORAL CATEGORY	SEGMENT 1		SEGMENT 3	
	M	SD	M	SD
Shy/Inhibited .....	4.37	5.18	.34	1.06
Conversation with Peer .....	6.99	5.29	10.16	4.08
Happy Affect .....	6.35	5.24	4.36	4.64
Negative Affect .....	3.31	6.03	.77	1.84
Solitary Play .....	1.34	2.57	2.61	3.34
Parallel Play .....	1.80	2.45	3.95	3.42
Group Play .....	2.39	3.47	4.06	3.73
Proximity to Mother .....	2.95	4.24	.50	1.53

TABLE 3

CORRELATIONS BETWEEN NONSOCIAL AND SOCIAL INHIBITION AT TIME 1 AND SOCIAL BEHAVIORS DURING THE TWO PHASES OF PEER INTERACTION AT TIME 2

	NONSOCIAL INHIBITION		SOCIAL INHIBITION	
	Segment 1	Segment 3	Segment 1	Segment 3
Shy/Inhibited .....	.13	-.06	.33****	.05
Conversation with Peer .....	-.00	-.09	-.13	.03
Happy Affect .....	.03	-.04	-.01	-.05
Negative Affect .....	.18*	-.01	.21**	.02
Solitary Play .....	-.24***	.18*	.01	-.07
Parallel Play .....	.10	.03	-.12	-.09
Group Play .....	-.07	-.18*	.01	.12
Proximity to Mother .....	.08	-.05	.20**	-.06

\*  $p < .05$ .\*\*  $p < .025$ .\*\*\*  $p < .01$ .\*\*\*\*  $p < .001$ .

group play with the peer, and rarely involved in solitary play. However, during the initial encounter, they resorted to solitary play,  $T_2(97) = 3.71$ ,  $p < .001$ , two-tailed. Social inhibition in toddlerhood was not predictive of patterns of peer play.

*Initial encounter with an unfamiliar peer: Comparison of inhibited and uninhibited children.*—A related question was whether inhibited children show a more pronounced pattern of social shyness during the initial encounter with an unfamiliar peer than less inhibited children. To this end, children were divided into high and low on their nonsocial inhibition and high and low on their social inhibition at Time 1 (median splits). We focused on the most robust index of withdrawal—the shy/inhibited pattern that combines stares, unoccupied, and on-looking categories. An ANOVA for repeated measures was performed, with the shy/inhibited pattern, measured in the first and third segments, as the dependent variable. High versus low nonsocial inhibition and high versus low social inhibition at Time 1 were the independent variables. There was a significant interaction of the Time 1 social inhibition and segment,  $F(1,96) = 7.48$ ,  $p < .01$ . (The respective effect for nonsocial inhibition was not significant,  $F < 1$ .) The post-hoc  $t$  test ( $p < .005$ ) indicated that children who as toddlers were particularly inhibited to a stranger at age 5 manifested a more pronounced pattern of socially shy/inhibited behavior during the initial encounter with an unfamiliar peer than children who as toddlers were uninhibited (socially inhibited  $M = 5.86$ ,  $SD = 6.27$ ; socially uninhibited  $M = 2.86$ ,  $SD = 2.70$ ). However, this difference was no longer significant dur-

ing the later phase of the interaction (respectively,  $M = .47$ ,  $SD = 1.43$  and  $M = .23$ ,  $SD = .57$ ).

## Discussion

This study replicates and extends the existing literature on temperamental underpinnings of children's interactive styles with peers, but also brings an additional support for a more differentiated approach to child inhibition to the unfamiliar. In the earlier study, with the same children, it was proposed that the two forms of inhibition in toddlerhood—to social and nonsocial unfamiliar events—could be relatively independent. The present findings confirm the empirical and conceptual validity of a more differentiated conceptualization of children's inhibition to the unfamiliar.

It is possible that in studies where children have been selected for their extreme inhibition this difference has been obscured because in extreme groups both nonsocial and social inhibition are high. However, in the present study we found that the two forms of inhibition indeed function quite differently as long-term predictors of the children's social behavior with unfamiliar peers.

This distinction may become especially important over the course of development. While young children's inhibition may often be relatively unspecific, as their environments and contexts of functioning become more complex and varied, their emotional reactions are also likely to become more differentiated. It is possible that future research will posit further dimensions within inhibition. For example, in addition to



nonsocial-social, another differentiation was proposed by Asendorpf (1990)—inhibition toward strangers and inhibition due to experienced peer nonacceptance.

From the point of view of the child's social functioning, the early social inhibition may be particularly important and may predict such qualities of the child's interactive style with peers as reticence and shyness. In addition, it may be associated with constrained affective spontaneity during fantasy play. In light of existing evidence of the developmental importance of fantasy play and the sustaining role of affect (Rubin, Fein, & Vandenberg, 1983; Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984), this finding may highlight another potential area of inhibited children's developmental vulnerability.

However, patterns of play seemed to be better predicted by the early nonsocial inhibition. Children who as toddlers were uninhibited and actively explored the new environment, during the peer interaction at age 5 were more frequently involved in group play. At this point, the interpretation of this finding may only be speculative and tentative. Possibly, children who as toddlers were uninhibited and showed a high level of exploration and play in the new environment developed more instrumental play competence, for example, more skillful and imaginative use of toys, which, in turn, facilitated group play. In future studies, this hypothesis should be further examined.

In a recent study, Asendorpf (1991) reported that, between age 4 to 8, temperamentally inhibited children increasingly resorted to solitary-passive play during encounters with unfamiliar peers. This confirms that relations between temperament and play patterns extend far beyond early childhood, and that inhibited temperament may lead to a coping style that can subsequently result in social rejection and withdrawal (Rubin et al., 1989).

The lack of differences attributable to maternal affective illness is surprising in light of the existing evidence. For example, Zahn-Waxler et al. (in press) reported that children of depressed mothers showed more disturbed peer interaction patterns; problems in social adjustment of children of depressed parents have also been indicated (Downey & Coyne, 1990).

Our findings are also inconsistent with data reported by Rubin and his colleagues

(Rubin et al., in press). In that research, which was conducted within a paradigm and with the use of a coding system similar to the present study, the findings indicated that 5-year-old children of affectively ill mothers, compared to those of controls, spent more time in exploratory or constructive solitary play, less time in fantasy play, and more time in direct proximity to their mothers while in a similar situation with peers. In the present study, we did not find differences in any social-interactive behaviors. This was true for our variables that closely resembled the variables reported by Rubin et al., such as total solitary play, proximity to mother, fantasy affect, and also for other variables indicative of social reticence, such as the Shy/Inhibited pattern, conversation, or positive or negative affect. The main difference between our paradigm and that of Rubin and his colleagues (aside from, of course, a different sample) was the fact that in our study the peers were unfamiliar with the target children, while in the other study they were the target children's friends.

This difference is illuminating and opens interesting avenues for the interpretation of apparent inconsistencies and for new conceptualizations of the role of maternal depression for the children's sociability. Taken together, these studies indicate that maternal depression may be associated with the children's passivity, withdrawal, and lowered sociability during interaction with peers with whom the children had a lasting *relationship*. Thus, the withdrawn behavior observed in the laboratory could have been an expression of more pervasive patterns of social functioning in children of depressed mothers. Maternal depression need not be associated with the child's inhibition and shyness during a more transient and temporary social interaction with an unfamiliar peer. This interpretation would also apply to the existing evidence of diminished social competence in children of depressed mothers, as measured by teacher and mother ratings regarding the children's functioning in ongoing and long-term social interactions (e.g., in the classroom—Hammen et al., 1987; Weintraub et al., 1975, 1978). The clarification of the processes underlying the mediating role of maternal psychopathology for the children's patterns of social behavior in brief interactions and long-term social relationships seems a worthwhile objective for future research efforts.

An important contribution in this study is a more contextually specific approach to

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the role of temperament during the complex and dynamically changing social interaction. The findings clearly indicate that different phases of the peer interaction were characterized by quite different qualities of social exchange and patterns of activity. While these findings are consistent with common-sense intuition, they do allow for a more sophisticated conceptualization of the predictive role of inhibition for children's social interactions and call for modifications in future research paradigms. The relation between early inhibition and the typical reticent social pattern (passive and shy behavior, negative affect, proximity to mother) seemed to emerge distinctly during the initial encounter, and then seemed gradually to disappear over the course of the interaction.

The reaction to the initial encounter was particularly pronounced for children who as toddlers were highly inhibited to a new person, which has been well captured by Thomas and Chess's concept of a "slow-to-warm-up" child. However, as the interaction progressed, possibly other qualities and competencies or vulnerabilities of the child "took over" as predictors of social functioning as the unfamiliarity wore off. However, it should be noted that Gersten (1989) reported that some of the inhibited children continued to appear shy and withdrawn in a classroom situation even after the novelty had worn off. Clearly, the issues of a situational context in the study of children's inhibition and adaptation to the unfamiliar deserve more respect and attention in future work.

A more general word of caution seems indicated. Even though the identified pattern of social withdrawal resembled the work of other investigators (Asendorpf, 1990, 1991; Kagan et al., 1989), in this study the measures of inhibition itself were obtained during relatively brief laboratory paradigms. Thus, they may indeed be capturing the child's initial response to the unfamiliar, in contrast to more pervasive, traitlike behavioral tendencies, measured in varying contexts of the child's functioning and over extended periods of time. Also, the measures of peer interaction employed in the present study did not capture relatively complex features of social competence or verbal communication patterns. Possibly, had such assessments been included, we would have observed a more pervasive influence of temperament on the entire course of the child's social encounter with an unfamiliar peer.

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