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Communicative intent in late-talking toddlers

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ABSTRACT

This research investigated communicative intent in 31 toddlers who were slow to talk and 32 normally developing toddlers matched on SES, age, and nonverbal cognitive ability. Communicative intent was studied during free play, both with the mother and with an unfamiliar examiner. Late talkers had lower rates of communication, initiation, and joint attention, but when total communicativeness was controlled for, they were just as likely to initiate, respond, and maintain joint attention as were their peers. As expected, the late talkers relied more on nonword vocalization, gestures, and gesture/oral combinations than their normally developing peers. Children in both groups initiated much more with the examiner (who was instructed to be passive) than with their mothers. Finally, regression analysis suggested that intake expressive language delay severity was the best predictor of age 3 MLU and IPSyn language outcome in the late talkers. However, after expressive delay severity was accounted for, late talkers who were more interested in initiating communication and sustaining joint attention had worse outcomes than late talkers whose communicative drive was weaker, suggesting that they had a more severe underlying language dysfunction.

Although communicative intent has been widely studied in normally developing toddlers, less is known about communicative behavior in children with specific language impairment (SLI). Work by Wetherby (Wetherby, Cain, Yonclas, & Walker, 1988) with normally developing toddlers indicated that both initiations and responses, the two main aspects of discourse structure, are present at all stages, from prelinguistic to multiword speech. There is also good evidence showing that the communicative function of joint attention is closely linked with progress in lexical acquisition (Tomasello & Farrar, 1986; Tomasello & Todd, 1983). Finally, in normal development, young children communicate chiefly by means of nonword vocalizations and gestures, which are then supplemented and finally replaced by meaningful words as the child progresses from 12 to 24 months of age (Acredolo & Goodwyn, 1990; Bates, Benigni, Bretherton, Camaoni, & Volterra, 1979).

Children with specific language impairment (SLI) have delayed language de-

spite normal cognitive and emotional development. Although children with SLI are, by definition, roughly normal in communicative intent (unlike autistic children), in several previous studies they have been found to differ from typically developing children in various aspects of communicative intent. In most of these studies, the children have been at least 3 years old, and youngsters with expressive delays only (SLI-E) have not been differentiated from those with delays in both receptive and expressive language (SLI). Children under the age of 3 who meet the criteria for SLI (e.g., they have delayed language skills but average nonverbal ability and normal personality development) are often referred to as late talkers to reflect the fact that many of these children appear to outgrow their language delay by age 3 or 4 and do not, therefore, go on to become language-disordered children.

In one of the first studies of communicative intent in preschoolers with SLI, Conti-Ramsden and Friel-Patti (1983, 1984) compared 14 late talkers in the 42- to 64-month age period with 14 MLU-matched normally developing children aged 19 to 33 months. Late talkers initiated dialogue significantly less often than comparison children during 5 minutes of free play with the mother (Conti-Ramsden & Friel-Patti, 1983). The mothers of the SLI children had a correspondingly higher rate of initiation than the mothers of comparison children; they produced significantly fewer answers and acknowledgments, presumably because they had less opportunity to do so, given their children's lower rates of initiation. In an additional report using the same sample, Conti-Ramsden and Friel-Patti (1984) found that children with SLI were more likely than normally developing younger children to make an ambiguous response to a maternal comment, suggesting difficulty in sustaining dialogue; in contrast, there were no group differences to maternal utterances requiring an obligatory response, such as questions and commands.

Communicative behavior in language-delayed preschoolers was also studied by Cunningham and colleagues (Cunningham, Siegel, van der Spuy, Clark, & Bow, 1985). Younger (age 3½) and older (age 4½) preschoolers with receptive and expressive language delays engaged in free play sessions with their mothers. The younger language-delayed children interacted less with their mothers than did the younger age-matched controls, but this difference was not found in the older language-delayed preschoolers. In both the younger and older cohorts, children with SLI initiated fewer interactions and ignored their mothers' overtures more than age-matched controls. Cunningham showed that more severe delays in receptive language were associated with less interaction, fewer initiations, and lower responsivity. Finally, this study showed that mothers of language-delayed children did not differ from mothers of normally developing preschoolers in their level of interaction, proclivity to ask questions, or responsivity to the child's initiations.

Wetherby, Yonclas, and Bryan (1989) studied five preschoolers with SLI using a taxonomy for communicative intent developed by Coggins and Carpenter (1981). In the Wetherby et al. study, three of the late talkers were similar to their age-mates in rate of communicative intent, but two of the youngsters had lower rates of communicative intent, similar to those of younger children with similar language levels. Communicative function varied broadly across the five

children, but all of the youngsters were restricted to gestures and vocalizations in terms of communicative means.

Whitehurst, Fischel, Lonigan, Valdez-Menchaca, DeBaryshe, and Caulfield (1988) studied parent-child verbal interaction in 28-month-old late talkers with normal receptive language. The parents of late talkers talked more, labeled more, and asked the child to imitate words more than the parents of age-matched controls. Relative to the parents of younger language-matched children, the parents of the late talkers were similar in their amount of conversation and level of labeling behavior, but they gave more imitative directives. The age-matched normally developing peers, who were matched with the late talkers in receptive language skills, used more phrases and appeared to ask more questions than their late-talking peers.

In the study most similar to the research reported here, Paul and Shiffer (1991) analyzed mother-child play interaction in late talkers using the Coggins and Carpenter (1981) codes, which had been previously used by Wetherby et al. (1989). In the Paul and Shiffer (1991) study, 22 late talkers ranging in age from 24 to 34 months were studied during free play with their mothers. Because Paul and Shiffer analyzed only initiations, their data do not address the balance between initiating and responding in late-talking toddlers. However, they did find that the late talkers, about a quarter of whom were delayed in receptive as well as expressive language, engaged in less joint attention with their mothers than the typically developing peers. As expected, the late talkers also relied on nonword vocalizations and gestures for communication more heavily than did their peers.

Although previous studies have provided some information about communicative intent in young children who are slow to talk, a number of important issues remain unexplored, particularly with regard to late talkers in the 2- to 3-year age range. First, the most in-depth previous study of communicative intent in toddlers who are slow to talk (Paul & Shiffer, 1991) utilized a sample that was somewhat heterogeneous with regard to both receptive language skills and age (Paul & Shiffer, 1991). Because both of these factors might be expected to impact on communicative intent, it is of interest to examine discourse structure, communicative function, and communicative means in a sample of late talkers, all of whom have normal receptive language ability and fall within a narrow age range (e.g., 24 to 31 months).

Second, no existing studies have examined how differences in interpersonal context might impact on communicative intent in late talkers. Bruner (1981) suggested that the communicative environment supplied by an adult partner provides the scaffolding within which children develop language. Thus, it seemed important to investigate whether young late talkers would display different patterns of communicative intent when interacting with a relative stranger who provides little scaffolding than they do with a parent who is making active efforts to involve them in play.

A third question still relatively unexplored in the literature is whether early differences in communicative intent predict the language outcome of late-talking toddlers. One might argue that late talkers with strong communicative intent are the most likely to have a good language outcome because such children want

to communicate and strive to do so even without words. On the other hand, it could also be the case that late talkers with good communicative intent are the most at risk for continuing language delay. The fact that these youngsters have not yet managed to acquire expressive language, despite good receptive skills and a strong urge to communicate, might indicate a more severe underlying pathology.

In summary, this research investigated discourse structure, communicative function, and communicative means in a sample of late talkers diagnosed between 24 and 31 months of age. All the late talkers in the sample had age-adequate receptive language skills. The late talkers were compared with a group of normally developing toddlers matched on SES, age, and nonverbal cognitive ability. In addition, the study examined the effect of conversational partner (mother vs. examiner) on child communicative intent in both groups. Last, for the late talkers only, the predictive relationship between differences in communicative intent and age 3 language outcome was examined.

METHOD

Subjects

The data for this study came from 63 middle-class to upper middle-class children (60 boys, 3 girls) between the ages of 24 to 31 months of age: 31 (29 boys, 2 girls) had been diagnosed as having delayed expressive language, and 32 (31 boys, 1 girl) were developing normally. All of the subjects were participants in Rescorla's longitudinal study of early expressive language delay (Mirak & Rescorla, 1998; Rescorla & Fechnay, 1996; Rescorla & Goossens, 1992; Rescorla & Ratner, 1996; Rescorla, Roberts, & Dahlsgaard, 1997; Rescorla & Schwartz, 1990) and had play sessions with both an examiner and the mother for which intact videotapes were available. Among the nine late talkers and seven comparison toddlers excluded were children who had played with their fathers, had not played with the examiner, had defective or missing tapes, or were a co-twin of another subject.

Criteria for being a late talker were a Bayley MDI of at least 85 (Bayley, 1969), receptive language on the Reynell Receptive Language Scale (Reynell, 1977) within 3 months of chronological age (CA), and at least a 6-month delay on the Reynell Expressive Language Scale relative to CA. Comparison children met the same criteria except that all had to be within 3 months of CA in expressive language. All of the subjects in the study met these selection criteria except for two late talkers, who had receptive delays of 4 rather than 3 months, and two comparison children, who had expressive language scores of 4 or more months below CA. Because these deviations were minor and did not serve to place any of the children into the contrasting group, these four children were included for all analyses.

At intake, demographic data were collected and each child was given a series of cognitive and language measures. Group differences were examined using independent sample *t* tests. As can be seen in Table 1, there were no significant differences between the groups in age and SES (as measured by the Hollings-

Table 1. *Intake and outcome measures by group*

	Late talkers (<i>N</i> = 31)	Comparison children (<i>N</i> = 32)
Intake age	26.03 (2.30)	25.56 (1.39)
Hollingshead total	53.32 (12.51)	55.38 (9.74)
Bayley nonverbal items	13.35 (3.08)	14.19 (3.69)
Reynell receptive <i>z</i> score	0.14 (0.54)***	0.97 (0.53)
Reynell expressive <i>z</i> score	-1.62 (.44)***	0.31 (0.52)
LDS vocabulary ^a	21.23 (22.88)***	228.03 (68.97)
Age 3 MLU <i>z</i> score	-1.44 (1.51)***	1.07 (1.05)
Age 3 IPSyn <i>z</i> score	-2.05 (1.42)***	.42 (0.74)

^aLDS = Language Development Survey (Rescorla, 1989).

****p* < .001, for independent *t* tests.

head scale). The two groups also did not differ in nonverbal cognitive ability, as indicated by comparable scores on the 19 nonverbal items on the Bayley above the basal level for the sample. These items tap such skills as assembling puzzles, building block structures, drawing, and placing pegs.

The groups were significantly different on all of the language measures administered. Although the late talkers were solidly at age level in receptive language as measured by the Reynell (1977), the comparison peers were significantly more advanced in language comprehension. As expected, the groups differed significantly in Reynell Expressive Language score, with the late talkers showing a lag in expressive speech of 8 to 9 months. Maternal reports of expressive vocabulary on the Language Development Survey (LDS) (Rescorla, 1989) also showed enormous differences between the groups, with the late talkers having about 20 words and the comparison children having well over 200.

A total of 26 of the 31 late talkers and 18 of the 32 comparison children were seen for follow-up at age 3 for a 30-minute mother-child play session using the Fisher-Price Village. Of the six late talkers without age 3 outcome data, one had a defective tape and the other five, among the earliest subjects recruited, had played with different toys and were therefore excluded. The comparison children without follow-up data had been in a pilot cohort that was not followed up at age 3.

The language sample from the mother-child play session was transcribed according to CHILDES conventions (MacWhinney, 1991) and then analyzed for MLU and Index of Productive Syntax (IPSyn) score (Scarborough, 1990). As can be seen in Table 1, there were still highly significant and substantial differences in expressive language outcome between the late talkers and comparison groups at age 3. As a group, the late talkers performed almost 1.5 *SDs* below age expectations in MLU and more than 2 *SDs* below average for their age in terms in IPSyn score. These scores are essentially equivalent to MLU and IPSyn outcome scores reported elsewhere (Rescorla, Roberts, & Dahls-

gaard, 1997) for the more complete sample of 34 late talkers and 21 comparison children seen at age 3.

Procedure

Data for this study were drawn from two free play sessions, each averaging 10 minutes in length, videotaped when the children were seen for intake between 24 to 31 months of age. In each case, the first play session consisted of the child with the examiner. The child was offered a basket of toys and allowed to play with no suggestions from the examiner. The examiner was instructed merely to respond minimally to the child's comments, observe the play, and engage in whatever behavior was necessary to keep the child involved with the toys. The second session consisted of the child with his or her mother. For this segment, the mother was encouraged to interact fully with her child, make suggestions, and elicit interactive play. For the earliest children recruited in both groups (a pilot cohort of 11 late talkers and 13 comparison children), these two play sessions were held on the same day as the cognitive and intake testing. For most of the subjects (20 late talkers and 19 comparison toddlers), the intake data were collected over two sessions, one week apart, with the play data used in the present study being collected on the second visit.

The children played with a basket of toys containing two dolls, two trucks, small animal and human figures, a pillow, two blankets, a small bottle, blocks, sticks, and a variety of other small objects. There were minor differences in the color, style, and size of the toys used by the pilot versus the main cohorts of subjects, but the two sets of toys were virtually identical for all practical purposes.

Coding communicative acts during play. For each of the 126 play sessions, a trained observer coded every communicative act for each child on the dimensions of discourse structure, communicative function, and communicative means. Within each dimension, the code categories were mutually exclusive. Appendix 1 summarizes these coding categories. A communicative act was defined as a verbal, vocal, or gestural behavior used to engage with, or respond to, another person (e.g., self-directed speech or speech directed toward dolls or animals were not coded).

Discourse structure was the first dimension of communicative intent coded. Categories included initiations, responses, and nonresponses. A communicative act was coded as an initiation if it was spontaneous or if it initiated a new topic (e.g., Mother: "I think the dolly is cold"; Child: "Truck."). An act was coded as a response if it answered a question or imitated a previous communicative act by the partner (e.g., Mother: "Did you crash the trucks?" Child: "Yeah."). The child was given a nonresponse code each time an answer was expected but not produced. For example, if a mother asked "What are you doing?" and the child did not answer within 3 seconds, the child was given a nonresponse code. The child was not given a nonresponse code for failing to answer if the rater felt the adult's question was rhetorical and therefore did not require an answer or if the

adult spoke again within 3 seconds of asking the question, thus providing no opportunity to respond. The child was not penalized with a nonresponse code in these situations, and a response was credited if he or she did produce an answer.

Based on Wetherby, Yonclas, and Bryan (1989), the codes for communicative function fell into three categories: behavioral regulation, social interaction, and joint attention. Behavioral regulation was coded if the child demanded or protested outside of the play context (e.g., "Get me water"; "Go sit down"; "No more toys."). Social interaction was coded for those conversational communications that did not involve play objects as their focus, although they could occur in playful discourse (e.g., "Peek-a-boo"; "Mommy play patty cake"; "Where Leslie go?"). Joint attention was coded for all communicative acts used to engage the partner with regard to play objects or actions (e.g., "Baby go night-night"; "Where blocks?"; or pointing to a baby blanket and then looking to the mother).

Each communicative act was also given a code for the category of communicative means. The three major codes in this domain were gesture (use of body or body part to communicate), vocalization (nonword utterance), and word (utterance containing at least one recognizable word), with two additional codes for gesture/vocalization combination and gesture/word combination. Gestures were coded only if they were clearly deemed communicative, such as pointing, nodding, shrugging, indicating, and requesting. Gestures were coded either as occurring alone or in combination with either nonword vocalizations or words.

Reliability. Two raters were trained to code the videotapes; they practiced on a small sample of the tapes until reliability on each variable reached 80% or better. Then each rater coded tapes independently, with both raters coding 32% of the tapes. Reliability was checked periodically throughout the coding process. If the raters disagreed on a code, they reviewed the videotape and agreed together on a final code for that communicative act. For each code, reliability was computed by dividing the number of times both raters agreed on the code by the total occurrences of that code.

The reliability for discourse structure codes was generally good, with agreement for initiations and responses ranging from 86 to 90%. Reliability for the nonresponse code was somewhat lower (67 to 74%), especially in the free play sessions with the examiner. This was most likely due to its infrequent occurrence, the problem of defining which questions were merely rhetorical and which required an answer, and occasional disagreements on the exact number of seconds elapsed. In the area of communicative function, the category of joint attention had the highest interrater reliability (93 to 97%). Social interaction was next highest (75 to 83%), and behavioral regulation interrater reliability was high in free play with the mother but low in free play with the examiner (86% vs. 62%). As before, the lowest reliability emerged for the code that was used least often. All the reliability scores for communicative means were fairly good (79 to 92%). The most difficulty was again encountered on the least frequent codes (e.g., gesture). We decided to eliminate behavioral regulation from further

analyses because of its relatively low reliability and low frequency (1.14% of overall communicative acts), but all other communicative intent variables were analyzed.

Scoring. Although the standard length of the free play sessions with both examiner and mother was expected to be 10 minutes, the actual time spent playing varied somewhat among the 126 sessions coded. However, the median time for both groups in both contexts was 10.00 minutes, and the means were all above 9.5 minutes, with no significant differences between groups or contexts.

The data on discourse structure, communicative function, and communicative means were first scored in terms of percentage of total communicative acts. The variable total communicative acts was defined as the sum of all initiations plus all responses in that play context: for example, total communicative acts with mother was computed as the sum of all initiations plus all responses with the mother. Total communicative acts served as the denominator for almost all percentage variables. Thus, the variable joint attention percentage with mother was calculated by dividing the total number of joint attention codes with the mother by the total communicative acts with the mother. The only exception to this rule was for the nonresponse code, for which the denominator was the derived variable opportunities to respond, defined as the sum of total responses plus total nonresponses with that partner. Thus, for example, nonresponse percentage with mother was calculated by dividing the total nonresponse codes with the mother by the denominator of opportunities to respond with the mother. Each percentage variable then underwent an arc sine transformation prior to parametric analysis.

In addition, the data on discourse structure, communicative function, and communicative means were calculated in terms of rate of occurrence over time. Rate variables for each coding category were computed by dividing the total number of occurrences of each code by the total number of minutes spent playing. For example, the variable initiations per minute with mother was calculated by dividing the child's total initiations during free play with the mother by the total time of the mother-child play session.

RESULTS

Communicative acts during play

The means and standard deviations for the late-talking and comparison groups on all of the percentage variables are shown in Table 2; comparable data for all the rate variables appear in Table 3. A two-way (group by partner) mixed model ANOVA was performed for each percentage and rate variable. Because of the relatively large number of variables, a $p < .01$ level was used to determine statistical significance.

Overall rates of communication. When the variable communicative acts per minute was analyzed, it emerged that the comparison children communicated significantly more often than their late-talking agemates (7 to 8 communications per minute vs. 5 to 7), $F(1, 61) = 8.00$, $p < .01$. Both groups were significantly

Table 2. *Percentage communicative intent scores by group and partner*

	Late talkers (<i>N</i> = 31)		Comparison children (<i>N</i> = 32)	
	Mother	Examiner	Mother	Examiner
% Initiation	35.10 (12.51)	77.43 (14.20)	41.50 (12.38)	75.34 (8.52)
% No response	10.42 (12.10)	6.64 (14.77)	9.42 (10.87)	9.12 (10.47)
% Social interaction	8.30 (15.47)	10.01 (13.98)	11.75 (10.40)	13.09 (14.92)
% Joint attention	88.01 (21.35)	89.21 (13.77)	86.66 (12.71)	85.91 (16.01)
% Vocalizations	59.40 (21.24)	53.65 (20.09)	18.53 (14.24)	16.29 (14.71)
% Words	18.34 (18.46)	12.37 (15.38)	70.42 (16.76)	71.35 (18.01)
% Gestures	7.73 (12.14)	9.25 (13.55)	2.09 (2.82)	2.37 (3.53)
% Gestures/vocalizations	12.18 (8.32)	20.81 (15.59)	1.41 (2.32)	1.35 (1.82)
% Gestures/words	2.21 (2.62)	3.41 (4.86)	7.57 (4.68)	8.43 (7.36)

more communicative with their mothers than they were with the examiner, $F(1, 61) = 22.61$, $p \leq .001$, and there was no significant Group $\times$ Partner interaction.

Discourse structure. When initiation percentage was examined, there was no significant difference between the groups, $F(1, 61) = .28$. This indicates that, when the late talkers did communicate, they were just as likely to initiate as were the comparison children. There was a significant session effect for the variable initiation percentage, $F(1, 61) = 323.98$, $p \leq .001$, with proportionally more initiations occurring in free play with the examiner. With the examiner, both groups initiated about 75% of the time, whereas with the mother, the initiation percentage was 35% for the late talkers and 41% for the comparison children. The interaction between group and partner was significant at only the $p < .05$ level, $F(1, 61) = 5.91$, $p \leq .05$.

Although the two groups of children were comparable in initiation percentage, the comparison group children were higher in initiations per minute, $F(1, 61) = 16.80$, $p \leq .001$. This difference is consistent with their higher rate of communicative acts overall. Both groups initiated more frequently with the examiner than they did with their mothers, resulting in a significant partner effect, $F(1, 61) = 65.05$, $p \leq .001$, but there was no significant Group $\times$ Session interaction for this variable.

Table 3. *Rate communicative intent scores by group and partner^a*

	Late talkers (<i>N</i> = 31)		Comparison children (<i>N</i> = 32)	
	Mother	Examiner	Mother	Examiner
Communicative acts	7.04 (2.25)	5.07 (2.60)	8.16 (2.74)	7.11 (2.58)
Initiations	2.35 (0.87)	3.74 (1.68)	3.30 (1.26)	5.28 (1.84)
Responses	4.70 (2.12)	1.33 (1.23)	4.87 (2.06)	1.82 (1.02)
No response	.48 (.50)	.08 (.15)	.38 (.28)	.13 (.11)
Social interactions	.64 (1.14)	.49 (.71)	.95 (.88)	.91 (1.13)
Joint attention	6.23 (2.64)	4.48 (2.48)	7.08 (2.68)	6.14 (2.74)
Vocalizations	4.18 (1.87)	2.59 (1.35)	1.53 (1.21)	1.03 (.79)
Words	1.42 (1.56)	.85 (1.38)	5.66 (2.06)	5.27 (2.67)
Gestures	.44 (.59)	.40 (.73)	.18 (.25)	.13 (.20)
Gestures/vocalizations	.83 (.58)	1.01 (1.09)	.12 (.21)	.08 (.11)
Gestures/words	.17 (.20)	.19 (.27)	.68 (.58)	.57 (.50)

^aRate calculated per minute.

When the variable responses per minute was analyzed, there was no significant group or interaction effect. However, there was a significant effect of partner, $F(1, 61) = 160.89, p \leq .001$, with frequency of responding during free play with the mother being double that with the examiner. This was most likely a function of the highly significant partner effect for the variable opportunities to respond per minute, $F(1, 61) = 199.56, p \leq .001$ (1.69 response opportunities per minute with the examiner vs. 5.21 with the mother). There was not a significant group or Group $\times$ Partner interaction for the variable opportunities to respond. Thus, the examiner and the mothers seemed to treat the late talkers the same as the comparison children with regard to eliciting communicative responses.

The code nonresponse was used when the child was expected to provide a response but failed to do so. There were no significant group, partner, or interaction effects for the variable nonresponse percentage with children in both groups failing to provide a response on 8 to 9% of opportunities. However, when data were examined in terms of nonresponses per minute, a partner effect did emerge, indicating that both groups of toddlers failed to respond more often during free play with their mothers than with the examiner, $F(1, 61) = 35.50$,

$p \leq .001$, consistent with the higher rate of opportunities to respond that the mothers provided. Neither the group effect nor the Group $\times$ Partner effect was significant.

Communicative function. Social interaction made up about 11% of all the communicative acts coded, with no significant group, partner, or interaction effects. On the other hand, when the variable social interaction per minute was examined, a modest group effect emerged, $F(1, 61) = 4.81$, $p \leq .05$, with comparison children manifesting a slightly higher rate of social interaction than the late talkers (an average of .93 vs. .56 acts per minute).

The great majority of the communicative acts coded were in the category of joint attention; this is not surprising, given that both the examiner and the mother were instructed to keep the children focused on the play objects. The joint attention percentage was about the same for both groups, averaging 86% for the comparison children and 89% for the late talkers. Although the children did not differ significantly between groups or partners in joint attention percentage, they showed a slight difference in terms of rate of joint attention acts, $F(1, 61) = 4.79$, $p \leq .05$. The strongest effect for this variable was for session partner, with more acts of joint attention per minute occurring during play with the mother than with the examiner, $F(1, 61) = 15.97$, $p \leq .001$. The Group $\times$ Partner interaction was not significant.

Communicative means. The last group of variables to be analyzed represented communicative means. As expected, vocalization percentage was high for late talkers (56.5%), whereas comparison children relied on nonword vocalizations only 17% of the time, constituting a significant difference, $F(1, 61) = 108.97$, $p \leq .001$. There were no significant partner or interaction effects for this variable. There was also a significant group effect for vocalizations per minute, $F(1, 61) = 52.65$, $p \leq .001$, with late talkers using nonword vocalizations more frequently. Not necessarily anticipated, however, was a highly significant partner effect, $F(1, 61) = 33.13$, $p \leq .001$. Vocalizations were used at a much higher rate during free play with the mother than with the examiner, especially for the late-talking group, producing a significant interaction, $F(1, 61) = 9.05$, $p \leq .01$.

The highly significant group difference found for word percentage was expected, $F(1, 61) = 185.28$, $p \leq .001$. Utterances using words made up only 15% of total communications by the late talkers, as opposed to 71% of the communicative acts produced by the comparison children. The partner and Group $\times$ Partner effects were not significant for word percentage. Similarly, the analysis of words per minute used during free play yielded a significant group effect, $F(1, 61) = 99.42$, $p \leq .001$, but no significant partner or interaction effects.

As expected, the late talkers had a much higher gesture percentage than the comparison children (8.5% vs. 2.2% overall), constituting a significant difference, $F(1, 61) = 8.83$, $p \leq .01$. There were no significant partner or Group $\times$ Partner interactions for gesture percentage. When gestures per minute were analyzed, there was a slight group effect, $F(1, 61) = 5.29$, $p \leq .05$, but no significant partner or Group $\times$ Partner interaction.

When gesture/vocalization percentage was analyzed, the late talkers showed

greater usage than the comparison children, as would be expected, $F(1, 61) = 93.79, p \leq .001$. Indeed, the late talkers used such combinations 16.5% of the time overall, as opposed to 1.4% of the time for the comparison children. In addition, there was a modest partner effect, $F(1, 61) = 5.46, p \leq .05$, with proportionally more combinations of gestures and nonword vocalizations when playing with the examiner than with the mother. This session effect appears to be due primarily to the late-talking group, as indicated by the modest Group $\times$ Partner interaction, $F(1, 61) = 4.21, p \leq .05$.

The last communicative means variable analyzed was gesture/word percentage. As expected, the comparison children manifested a significantly higher gesture/word percentage, $F(1, 61) = 28.87, p \leq .001$, but there were no significant session or interaction effects. A similar pattern was observed for gesture/word combinations per minute, $F(1, 61) = 27.47, p \leq .001$.

Concurrent relationships. The concurrent relationships between the communicative intent variables were examined by means of Pearson correlations. Across the sample as a whole, the children who were highly communicative in play with the mother were also significantly more likely to have a high rate of communicative acts per minute when playing with the examiner, $r(63) = .54, p < .001$. On the other hand, initiation percentage was not stable across partners, probably because all the children had to initiate if they wanted to communicate with the examiner, whereas with their mothers some children initiated a great deal while others spent more time responding to their mothers' initiations. Joint attention was also not significantly correlated across contexts, most likely because the level of joint attention was high across all children and partners. However, the child's means of communication were highly stable across partners, with correlations ranging from .54 to .84 (all $p < .001$) for use of gestures, vocalizations, words, and gesture/utterance combinations.

Children who had higher rates of communicative acts per minute spent more of their turns responding (and consequently, fewer turns initiating) than toddlers who communicated less frequently. This relationship was even stronger in the examiner sessions than in the mother-child session, $r(63) = .46, p < .001$, and $r(63) = .30, p < .05$, respectively. Consistent with this is the finding that communicative acts per minute was very highly correlated with opportunities to respond in both sessions, $r(63) = .81$ and $r(63) = .86, p < .001$. When children were playing with their mothers, their communicative rate was not significantly related to any of the communicative means variables. However, in play with the examiner, children who communicated more had significantly lower gesture and vocalization percentages, $r(63) = -.38, p < .01$, and $r(63) = -.46, p < .001$, respectively, and significantly higher word use, $r(63) = .56, p < .001$. This suggests that the mothers of late talkers were providing extensive "scaffolding" for communicative interchange, thus serving to level to some degree the communicative barriers that the lack of words presented for the late talkers.

The relationship between intake expressive language level and communicative intent variables was also examined using correlational analysis. For the mother-child sessions, expressive language skill, as measured by Reynell Expressive z score, was not significantly correlated with communicative acts per minute. On

the other hand, during examiner play, the children with better expressive language (higher Reynell z scores) had significantly more communicative acts per minute, $r(63) = .33$, $p < .01$. This pattern of correlations further suggests that maternal scaffolding tended to compensate for expressive language differences between the children, thus allowing the late talkers to communicate much like their normally developing peers.

During play with the mother, Reynell Expressive z scores showed a significant correlation with initiation percentages, $r(63) = .28$, $p < .05$. However, expressive language skill and initiation percentage were not correlated during examiner sessions. This suggests that the mothers of late talkers knew they had to initiate a great deal to engage their children in communication, whereas the mothers of comparison children could wait for their children to initiate more of the time. Because the examiner rarely initiated, the children in both groups had to do so if they wanted to communicate (recall that the initiation percentage during examiner play was 76% for both groups). There was no correlation between Reynell Expressive z score and joint attention percentage with either partner, consistent with the ANOVA results indicating no group differences in joint attention.

As would be expected, with both play partners there were very strong relationships between Reynell Expressive z score and use of words during play, $r(63) = .79$ and $r(63) = .82$, respectively, both $p < .001$, as well as significant negative correlations between Reynell and use of vocalizations during play, $r(63) = -.71$, $p < .001$, for both partners. The negative correlation between Reynell and use of gestures was also significant with both partners, $r(63) = -.34$ and $r(63) = -.38$, respectively, both $p < .01$.

The Reynell Receptive z score, which had a correlation of .60 with the Reynell Expressive z score, was not significantly correlated with any communicative variable except for a negative correlation with vocalization use, $r(63) = -.59$ and $r(63) = -.58$, respectively, both $p < .001$, and a positive correlation with word use, $r(63) = .50$ in both play sessions, $p < .001$. This is consistent with the fact that the groups were comparable in most aspects of communicative intent but differed significantly in both receptive language z score and use of vocalizations versus words during play.

Predictive analyses. Our final analyses examined whether differences in communicative intent among late talkers predicted differences in language outcome at age 3. Preliminary correlational analysis revealed no significant correlations between language outcome, as measured by MLU, IPSyn, or other major communicative intent variables. However, some of these correlations were in the range of .20 and several of them were negative, suggesting that it might be productive to examine the predictive relationship between communicative intent and language outcome more systematically, using hierarchical multiple regression. Thus, regression analyses were run for each of our two major measures of age 3 expressive language outcomes (MLU z score and IPSyn z score) in order to see whether the three major aspects of communicative intent in either the mother or examiner session (communicative acts per minute, initiation percentage, and joint attention percentage) would have any predictive power once differences in intake expressive language delay severity (Reynell Expressive z

Table 4. *Regression analyses between intake and outcome measures*

Predictor	<i>r</i>	<i>R</i> square	<i>R</i> ² incr.	<i>F</i>	<i>p</i>	Beta
<i>Hierarchical regression predicting age 3 MLU z: Mother session</i>						
Reynell Expressive z	.36	.13	.13	3.46	.07	.36
acts/min	.13	.14	.01	.28	.60	.10
% initiation	-.26	.28	.14	4.26	.05	-.42
% joint attention	-.36	.39	.11	3.95	.06	-.34
<i>Hierarchical regression predicting age 3 IPSyn z: Mother session</i>						
Reynell Expressive z	.46	.21	.21	6.21	.05	.46
acts/min	.27	.21	.06	1.80	.19	.24
% initiation	-.25	.38	.12	4.26	.05	-.38
% joint attention	-.20	.41	.03	1.08	.31	-.18
<i>Hierarchical regression predicting age 3 MLU z: Examiner session</i>						
Reynell Expressive z	.36	.13	.13	3.46	.07	.36
acts/min	.11	.16	.03	.95	.34	.19
% initiation	-.04	.17	.01	.18	.68	-.10
% joint attention	-.08	.17	.01	.10	.75	-.08
<i>Hierarchical regression predicting age 3 IPSyn z: Examiner session</i>						
Reynell Expressive z	.46	.21	.21	6.21	.05	.46
acts/min	.05	.23	.02	.70	.41	.16
% initiation	-.08	.33	.00	.01	.91	.02
% joint attention	-.02	.44	.01	.16	.69	.10

score) had been taken into account. Neither intake receptive language nor intake nonverbal ability were included in the regression analyses because previous reports from this longitudinal study of SLI-E (Mirak & Rescorla, 1998; Rescorla, Roberts, & Dahlsgaard, 1997) indicated no contribution of these measures to the prediction of outcome.

As can be seen in Table 4, intake Reynell Expressive z scores explained a significant amount of the variance in age 3 IPSyn z scores (21%), but its ability to predict age 3 MLU fell short of significance. When the variable communicative acts per minute was added to the regression, the increase in variance accounted for was minimal (1 to 6%). However, there was a significant increase in the *R*² when initiation percentage with mother was added to the equation (12% for IPSyn and 14% for MLU). Of particular note is the negative beta weight for this variable. This indicates that, once intake expressive language delay severity had been taken into account, late talkers who initiated more with the mother had a worse age 3 language outcome. Finally, the variable joint attention percentage with mother did not produce any further significant increase in the *R*², although it just missed the *p* < .05 level when MLU was the outcome measure. Once again, the beta weight for the joint attention variable was negative, suggesting that the tendency was for late talkers who had more consistent joint attention to have somewhat worse outcomes. For the examiner session, neither percentage of initiation nor percentage of joint attention added to the

prediction of language outcome. This may be because the examiner session was such an unusual communicative situation that it provided less prototypical data regarding the late talkers' communicative proclivities.

DISCUSSION

In contemplating the results of this research, it is important to keep in mind that the late talkers who participated in this study were very young (24 to 31 months), had normal nonverbal ability (Bayley MDI scores above 85), had ageadequate receptive language (Reynell Receptive language scores within 3 months of CA), and came from middle-class to upper middle-class, intact, white families. Thus, our study investigated whether toddlers from economically privileged backgrounds, whose only developmental difficulty was a delay in expressive speech, would differ from normally developing peers in communicative intent, as measured during free play.

The first communicative intent dimension examined in this study was discourse structure, which deals with the frequency of communicative acts and their distribution across the categories of initiation, response, and nonresponse. A major finding of this study was that late talkers communicated significantly less often than comparison children, even when full credit was given for the potentially compensatory vocalization and gesturing that late talkers typically employed. The late talkers also showed a significantly lower rate of initiation than the comparison children, which paralleled the group difference in overall communicative rate. This finding corroborates results reported by Conti-Ramsden and Friel-Patti (1983) and Cunningham (Cunningham et al., 1985), both of which showed a lower rate of initiations in language-delayed children. However, it is important to note that in the present study there was no group difference in the percentage of communications that were initiations. In other words, when the late talkers did communicate, they were just as likely to initiate as were the comparison children.

Late talkers and comparison children were very comparable with regard to both responses and nonresponses during free play. This was true whether these communicative functions were measured as percentages of total communicative acts or rates per minute. This is consistent with the findings of Conti-Ramsden and Friel-Patti (1984), in which children with SLI did not differ from comparison children in responding to questions, but it does differ from results reported by Cunningham (Cunningham et al., 1985), in which children with SLI had higher rates of nonresponding than comparison peers. That the subjects in the latter study were older than ours and typically had receptive as well as expressive delays may account for these differences in results.

The fact that the late talkers in our study differed significantly from their comparison peers in initiations per minute and not in responses per minute or nonresponses per minute indicates that the group difference found in communicative acts per minute was largely due to differences in the propensity to initiate in late talkers versus comparison toddlers. In other words, the late talkers seemed to be more passive in communicative style than the comparison children. Being less likely to initiate, they seemed to wait for their play partner to

initiate communication. When the adult partner did initiate, the late talkers responded at comparable levels to their normally developing peers (e.g., about 90% of opportunities to respond). This general pattern of results corroborates those of Conti-Ramsden and Friel-Patti (1983, 1984).

The next important finding of this study deals with the dimension of communicative function. In our study, late talkers and comparison children were virtually identical in joint attention percentage and social interaction percentage; they did have a lower rate of both variables, which is to be expected, given the overall communicative rate differences between the groups. These results partially replicate those of Paul and Shiffer (1991), in which late talkers had lower rates of joint attention acts per minute. In sum, although Bruner's (1981) model suggests that late talkers are more likely to engage in social interaction and behavioral regulation and less likely to participate in joint attention than their peers with better developed language skills, the late talkers in our study did not distribute their communicative time across the various function categories differently from their peers. Rather, they simply communicated less frequently, spending less of their time with the partner engaged in any type of communicative interaction.

Finally, the two groups were compared with regard to communicative means. The significant differences between groups in terms of vocalizations and words was expected. An additional finding was that the late talkers used significantly more gestures, both alone and in combination with vocalizations, than the comparison children. Normally developing children typically use many gestures early in the language acquisition process (Acredolo & Goodwyn, 1990), but this gestural communication is gradually replaced by verbal language as they acquire more words. Our late talkers had not yet made this transition. This finding corroborates those of Wetherby and colleagues (Wetherby et al., 1989), who reported that children with SLI rely more on gestures, whether used alone or in combination with vocalizations, than do comparison children.

A major focus of this study concerned the effect of conversational partner on communicative intent in late talkers and normally developing peers. Significant partner effects were found for the communicative dimension of discourse structure. First, children in both groups tended to communicate more during free play sessions with their mothers than during play with the examiner. In addition, for children in both groups, initiations constituted a higher percentage of communicative acts during play with the examiner than with the mother. Correspondingly, mothers provided significantly more opportunities to respond than did the examiner; for both groups, responses made up a much larger percentage of communicative acts during play with the mother than with the examiner. It appears, therefore, that the children in both groups attempted to fill the communicative void during free play with the examiner by initiating frequently. Alternatively, it might be argued that some mothers were so busy initiating during their play sessions that their children had less opportunity to do so.

There were no significant partner effects for the dimension of communicative function. With both partners, joint attention was the predominant communicative function engaged in by children in both groups. However, there were several significant results for the dimension of communicative means. In particular,

the late talkers showed a significant tendency to vocalize more often with their mothers than with the examiner. To contrast, there was no significant partner effect nor any significant group by partner interaction for words per minute, suggesting that the children who had good vocabularies felt equally comfortable verbalizing with the mother and the examiner. However, the late talkers (whose utterances consisted primarily of nonword vocalizations) were less forthcoming in talking with the examiner than with their mothers. The fact that the late talkers used gesture/vocalization combinations somewhat more frequently with the examiner than with their mothers further supports the notion that these children perceived their nonword vocalizations to be rather unintelligible to the unfamiliar examiner and therefore were inclined to supplement them with gestures more often than they did with their mothers.

Finally, the predictive analyses carried out in this research yielded several noteworthy findings. As in previous reports from this longitudinal study (Mirak & Rescorla, 1998; Rescorla, Roberts, & Dahlsgaard, 1997), the main predictor of age 3 language outcome was the severity of the child's expressive language delay at intake relative to age expectations (Reynell Expressive *z* score). Late talkers who were further behind in their expressive language at intake generally had lower MLUs and lower IPSyn scores at age 3 than their less severely delayed late-talking peers.

The variable communicative acts per minute did not have any significant predictive relationship to age 3 language outcome. Thus, a high rate of communicative acts with the mother or the examiner predicted neither a particularly favorable nor a particularly unfavorable age 3 language outcome. This may be because much of the variance in the variable communicative acts per minute was accounted for by the proclivity of the adult partner to provide opportunities to respond rather than to wait for the child to initiate.

One might argue that better measures of the child's own communicative proclivities are the variables initiation percentage and joint attention percentage, particularly when these are measured with a familiar communicative partner. This makes the significant negative predictive relationship between initiation percentage with the mother and later language outcome particularly intriguing. It appears as if, once the variance in outcome accounted for by intake delay severity had been removed, the children who initiated more with the mother had poorer outcomes. Similarly, late talkers who were more likely to maintain joint attention with the mother had somewhat worse language outcomes, especially as measured by MLU.

That severity of intake language delay relative to age expectations predicts the degree of language delay at follow-up is not surprising. The farther behind a child is in expressive language at intake, the greater progress that child has to make to catch up to age expectations (i.e., to close the gap) some 6 to 12 months later. However, the fact that, after intake delay severity was accounted for, late talkers with higher percentages of initiation and joint attention still had worse language outcomes is more surprising and somewhat paradoxical. Although this finding clearly requires more empirical verification, a possible explanation for this relationship will be proposed here.

Specifically, although our sample of late talkers was more homogeneous than

any other sample in the literature in terms of age, SES, nonverbal ability, receptive language skills, and expressive language level, we would argue that the children in this cohort were nonetheless not homogenous in what we might term their underlying diathesis for a language impairment. By "diathesis" we refer to a hypothetical, constitutionally based predisposition toward developing a disorder; in this case, the diathesis is for a weak expressive language system, which in the limit is referred to as specific language impairment (SLI). Although the nature of this diathesis is not currently known, we suspect (Rescorla & Lee, *in press*) that it stems from less than optimal functioning in the multiple neurological processes that support language (e.g., auditory perception, temporal order processing, phonological storage and retrieval, long-term memory, sequencing, sound-referent association ability, etc.). We would argue that the late talkers in our study probably differed in the degree to which they had a diathesis of this sort. We suggest that some of our toddlers were slow to talk because of a strong diathesis toward the development of SLI; for others, a strong diathesis was not present, but they were slow to talk for a variety of other reasons (e.g., intermittent otitis media, lack of strong communicative drive, poor parent-child fit, etc.).

Thus, we suggest that late-talking toddlers vary in the degree to which their language delay is based on an underlying diathesis or predisposition toward later expressive language weakness or impairment. Those with such a diathesis are likely to continue to manifest language delay for a considerable period of time; many may continue to have subaverage expressive language skills into adulthood, and some of these predisposed youngsters may well manifest clear SLI as they grow up. On the other hand, toddlers who are slow to talk for miscellaneous other reasons rather than because of an underlying diathesis toward SLI are likely to catch up in their expressive language relatively quickly and to perform in the average range on expressive language tasks once they have done so.

Given this notion of variation in underlying diathesis for SLI among our late talkers, our somewhat paradoxical findings with regard to communicative intent become interpretable. We suggest that toddlers with strong communicative intent – that is, children who try hard to initiate communication and to maintain joint attention – but who nevertheless are severely delayed in expressive language skills at 24 to 31 months must have this language delay because of some degree of underlying diathesis toward a weak expressive language system. Some of these youngsters will go on to be diagnosable with SLI, whereas others may simply manifest this diathesis by subaverage performance on expressive language tasks. On the other hand, late talkers who have weak communicative intent may be slow to talk not because they have an underlying diathesis toward SLI, but because other factors (e.g., periods of conductive hearing problems, lack of strong social-communicative drive, less than optimal conversational environment at home, etc.) have discouraged their expressive language development for a period of time. Once these factors have been addressed or once the language acquisition "drive" becomes sufficiently strong enough, these children, who are normally endowed for expressive language development (e.g., lack the diathesis for SLI), will start to talk and make rapid progress.

In sum, we suggest that toddlers who are eager to initiate communication and

are oriented toward joint attention but still have almost no expressive language may have a more severe underlying language problem or diathesis than those toddlers who are simply less interested in communicating and hence less motivated to acquire words. According to this view, a toddler's emerging language skills can be viewed as a joint function of his or her desire to communicate with others and underlying language acquisition capacity. To the extent that a toddler is relatively uninterested in initiating communication and sustaining joint attention with a partner, he or she may manifest some delay in acquiring vocabulary and producing word combinations relative to more communicatively inclined peers, even if his or her capacity for acquiring language is roughly within the normal range. On the other hand, a child who is strongly motivated to communicate but has some underlying dysfunction in language acquisition capacity (the hypothesized diathesis for SLI) may also have an expressive language delay relative to age expectations.

According to this account, once a child with a weaker communicative drive becomes motivated to talk, language acquisition will proceed relatively rapidly. However, for the late talker whose delay is more a function of an underlying dysfunction in the language acquisition system, language acquisition may be protracted despite an initially strong desire to communicate with others. The results of the research presented here give some support to this notion. That is, when the severity of language delay was held constant or accounted for, toddlers who were more communicatively inclined had a worse outcome than those who were less communicative.

In summary, the results of this study are consistent with previous research with young late talkers (Conti-Ramsden & Friel-Patti, 1983; Cunningham et al., 1985; Paul & Shiffer, 1991; Whitehurst et al., 1988) in demonstrating lower rates of communication, initiation, and joint attention than those manifested by normally developing age-matched peers. However, our study also revealed that, after total communicativeness had been controlled for, late talkers were just as likely to initiate and maintain joint attention as their normally developing peers. Furthermore, the late talkers did not differ from their comparison peers in either rate or percentage of responses or nonresponses. As expected, the late talkers relied more on nonword vocalization, gestures, and gesture/oral combinations than their normally developing peers. Furthermore, they showed some differentiation across play partners in how they used the communicative means at their disposal (e.g., vocalizing more with the mother than the examiner and using gestures to supplement vocalizations more with the examiner than with the mother). In addition, this study demonstrated that both late talkers and comparison children were able to adapt to the unusual communicative environment provided by the unfamiliar examiner. That is, children in both groups initiated much more with the examiner than with their mothers. Finally, regression analysis suggested that intake expressive language delay severity is the best predictor of language outcome in a 24- to 31-month-old late talker. However, these predictive analyses also suggested that, after expressive delay severity is accounted for, late talkers who are more interested in initiating communication and sustaining joint attention may have worse outcomes than late talkers whose communicative drive is weaker.

This research has several implications for parents and practitioners who deal with young children who are slow to talk. First, our results indicate that toddlers who have normal nonverbal ability and good receptive language but delays in expressive speech are just as capable of initiating communication and maintaining joint attention as their peers with normal language. However, they tend to engage in these behaviors less frequently than their normally developing peers. Our data suggest that adults who want to foster communicative initiation in young late talkers should refrain from extensive initiation themselves, thus giving the late talker more opportunity to open up topics of communication. However, should the play partner's goal be to increase overall rates of communication, then providing late talkers with many opportunities to respond by asking questions is likely to create more frequent communicative interchange. In addition, our data suggest that this select subtype of late talkers – 24- to 31-month-old children from middle-class backgrounds who have normal receptive language – are as responsive as their normally developing peers and thus have the motivation and ability to engage in sustained communicative interaction when an adult partner assists in this process by providing “scaffolding” through giving multiple opportunities to respond. A final implication of our data that is important for clinicians to consider is that late-talking toddlers who try hard to initiate communication and strive to maintain joint attention may be the most at risk for continued language delay. This may be because an underlying dysfunction in their language acquisition capacity (a diathesis for SLI) rather than a weak drive to communicate is the main factor responsible for the expressive language delay.

APPENDIX 1

COMMUNICATIVE INTENT CODES

Discourse structure

initiation: the child introduces a new topic or communicates spontaneously

response: the child responds to partner's statement or question

no response: child fails to respond in an obligatory context

Communicative function

behavior regulation: demands, requests, protests of partner not related to play; also play refusals

social interaction: conversational interactions with partner without a toy or play focus (includes social games, “peek-a-boo”)

joint attention: communicative acts to engage partner in play and to focus with partner on play objects

Communicative means

gesture: communicative nonvocal acts such as pointing, nodding, shrugging, demonstrating, requesting, and indicating

vocalization: nonword communicative utterance

word: communicative utterance containing one or more intelligible words

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