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## ***Family and Professional Congruence in Communication Assessments of Preschool Boys with Fragile X Syndrome***

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*This study compared family and professional assessments of the communication skills of 34 preschool males with fragile X syndrome. Parents and professionals rated the boys' receptive and expressive communication. Parents also reported on the vocabulary skills of 16 of the boys, whereas professionals assessed their vocabulary diversity using a communication sample. Moderate agreement was found between parents and professionals for expressive communication ratings, whereas agreement for receptive communication ratings was low to moderate. Parents rated their children significantly higher than professionals for receptive communication but not for expressive communication. Parents and professionals rated children at a higher cognitive age as having fewer difficulties with receptive and expressive communication, whereas older children were rated as having more problems.*

During the past ten years, professionals in early intervention have shown heightened interest in having family report information included in the assessments of young children with disabilities (Diamond & Squires, 1993; Dinnebeil & Rule, 1994; Miller, Sedey, & Miolo, 1995). There are several reasons for this change (Henderson & Meisels, 1994; Sexton, Thompson, Perez, & Rheams, 1990). First, the Individuals with Disabilities Education Act (IDEA) requires that programs help families participate in the design and implementation of early intervention services at whatever level they choose. Second, family reports can provide information over and above that which can be obtained by professionals alone. Third, parental assessment may be cost-effective because less professional time may be required when parents participate. Fourth, participation of families in assessment facilitates professional-parent collaboration through joint decision making activities. Fifth, the results of assessment can be given more credence if corroborated across informants. Finally, there is increasing realiza-

tion that the family's perceptions of their child's developmental status influences child outcomes, parent-child interactions, and family functioning.

Due to the growing interest in including family report data in assessments, increased attention has focused on issues regarding congruence between family and professional assessments and factors which influence this congruence. Congruence refers to the degree of correspondence or agreement between individual's judgments, not the accuracy of those judgments (Dinnebeil & Rule, 1994). Studies of congruence between family and professional developmental assessments have been conducted since the late 1950's (Snyder, Thompson, & Sexton, 1993) and continue to the present time. Early studies focused on concerns about the accuracy of parents' estimates, with the majority of studies concluding that parents tend to overestimate their children's developmental abilities (Ewert & Green, 1957; Gradel, Thompson, & Sheehan, 1981; Heriot & Schmickel, 1967). Parents' ratings were considered either correct or in-

correct, and were thought to be an indication of how "realistic" the parents' views were about their children (Ewert & Green, 1957; Wolfensberger & Kurtz, 1974).

The research literature has gradually changed from a focus on parents' accuracy to an emphasis on agreement between parent reports and professional assessments and factors (e.g., demographic variables, age, and sex of the child) which influence agreement (Blacher-Dixon & Simeonsson, 1981; Diamond & Squires, 1993; Sexton, Miller, & Rotatori, 1985; Snyder, Thompson, & Sexton, 1993). Even if a high degree of congruence is found, it is not an indication of accuracy, because both parents and professionals could have erred (Suen, Logan, Neisworth, & Bagnato, 1995). Dinnebeil and Rule (1994) noted that while congruence cannot be used in an absolute sense to describe accuracy, if various sources agree, the credibility of the information they report is enhanced. However, it is recognized that parents and professionals have different perspectives and sources of knowledge about a child, and agreement is not necessarily expected. Still, there is some recent evidence to suggest that when mothers and professionals are given the same instruments to complete, and complete them in the same manner, their ratings are very similar (Snyder, Thompson, & Sexton, 1993).

Studies have examined congruence between parents' and professionals' developmental assessments using correlation coefficients, mean differences, and percentage of agreement. Blacher-Dixon and Simeonsson (1981) found significant correlations between mothers' and teachers' ratings of young children with mental retardation ranging in age from 9 to 75 months. Similarly, Bagnato (1984) found that the assessments completed by mothers of children 6 to 53 months with a variety of developmental disabilities were highly congruent with those of other team members. A number of other researchers have found strong positive correlations between parents' and professionals' developmental assessments (Diamond & LeFurgy, 1992; Schafer, Bell, & Spalding, 1987; Sexton, Kelly, & Scott, 1982; Sexton,

Hall, & Thomas, 1983; Sexton et al., 1990; Stancin, Reuter, Dunn, & Bickett, 1984).

Other studies have investigated the influence of child factors (e.g., age) and family factors (e.g., family income) on parent-professional congruence. Gradel and colleagues (1981) found that when parents and teachers completed the Developmental Profile (Alpern & Boll, 1972), the Bayley Scales of Infant Development (Bayley, 1969), and McCarthy Scales of Children's Abilities (McCarthy, 1972) for infants and preschoolers with disabilities, mother-professional congruence was greater for the older preschool group than for the infant group. The results of some studies have shown that family income had the most significant relationship to variance in mother-professional congruence scores, indicating that mothers with higher income levels tended to be more congruent with professionals in reporting levels of development (Sexton, Miller & Murdock, 1984; Sexton et al., 1985). Sexton and colleagues (1990) found that child IQ was the most noteworthy predictor of agreement in developmental estimates of parents and professionals who assessed 23 to 66 month old children enrolled in early intervention programs. The higher the IQ of the child, the smaller the differences in estimates from mothers and professionals tended to be.

In the area of vocabulary development several studies of typically developing children have compared parent report on the MacArthur Communicative Development Inventory (CDI) with professional measures of communication development (Fenson et al., 1993). Dale (1991) examined the validity of the MacArthur CDI Words and Sentences with 24 typically developing 2 year olds. Parents' reports correlated highly with professionals' reports in both vocabulary and syntactic development ( $r = .73-.79$ ). Dale, Bates, Reznick, and Morriset (1989) included an at risk sample and found strong positive correlations (.41-.63) between parent report vocabulary on an earlier version of the MacArthur CDI and language subscores on the Bayley Scales for full-term, high social risk, and precocious children at 20 months. For preterm children, however, the correlation between parent report vocabulary

and receptive language items on the Bayley was not significant. Miller et al., (1995) studied children with Down syndrome and found that parent report vocabulary correlated with the number of different words produced during a 30-minute language sample at .82 for children with Down syndrome and .75 for typically developing children. Thus, there has been a considerable number of studies showing high level of agreement in vocabulary assessments for typically developing children and a small number of studies for special populations, of at risk children (Dale et al., 1989), and children with mental retardation (Miller et al., 1995).

There have been no known studies which have included children with fragile X syndrome for the purpose of comparing family reports with professional assessments. Fragile X syndrome is a recently identified genetic disorder that is the most common known inherited form of mental retardation (Freund, 1994). Although issues of congruence between families and professionals for communication assessments are important for all children, they are especially interesting for preschool boys with fragile X syndrome. There is considerable variation in the communication abilities of children with fragile X syndrome, with some showing strengths in receptive communication and others in expressive communication. Moreover, males with fragile X syndrome may score below their full potential on standard assessment tasks (Sudhalter, 1992) because of test refusal, perseveration, and limited attention span (Hay, 1994). Parents could provide information about the typical communicative behavior of their child when not under pressure to perform in a testing context.

Congruence between parents' reports and professionals' assessments of the communicative abilities of young children is an important issue. The purpose of this study, which was part of a larger study of children with fragile X syndrome, was to determine the extent of agreement between parental reports and professional assessments of receptive and expressive language using several measures of communication and vocabulary development.

A secondary goal was to determine if child and family factors were related to congruence between families and professionals. Two research questions were set forth: (a) Are assessments of receptive and expressive communication similar for parents and professionals? (b) Are child factors (i.e., child's cognitive level, child's chronological age) and family factors (i.e., mother's education) significantly related to congruence between ratings of families and professionals of communication skill?

## **METHOD**

### ***Participants***

There were two participant groups for this study: the communication ratings group and the vocabulary subgroup. The vocabulary subgroup was part of the larger communication ratings group. Participants in the communication ratings group were 34 young boys with fragile X syndrome, their parents, and the specialists who rated and assessed their communication. All children and their parents were participants in a longitudinal study of the development of young boys with fragile X syndrome and their families (Bailey, 1992). All of the boys in the communication ratings group ( $N = 34$ ) were referred to the project from genetic clinics in three contiguous southern states. Each child had a definitive diagnosis of fragile X syndrome either through cytogenetic testing or through DNA analysis. Children were not excluded on the basis of the presence or absence of other disabilities. Participants in the vocabulary subgroup were 16 of the 34 boys in the communication ratings group who also participated in the Fragile X Communication Project (Roberts, Wallace, Bailey, & Burchinal, 1995).

The subset of participants in this study were parents whose children were below 6 years of age and lived within a 300 mile radius of the project administrative site. Characteristics for children and families who participated in the communication ratings group and for those who also participated in the vocabulary subgroup are shown in Table 1. Based on  $t$ -tests ( $p > .05$ ), children in the vocabulary sub-

**Table 1.**  
*Participant Characteristics*

Characteristic	Group	
	Communication Rating <i>N</i> = 34	Vocabulary Subgroup <i>N</i> = 16
Ethnicity <i>N</i> (%)		
African American	3 (9)	1 (6)
White	30 (88)	14 (88)
Hispanic	1 (3)	1 (6)
Age in Months		
Mean at testing ( <i>SD</i> )	43.2 (15.1)	44.8 (17.4)
Range at testing	17–66	20–74
Mean cognitive at testing ( <i>SD</i> )	21.1 (7.4)	23.6 (8.9)
Family Income <sup>a</sup> <i>N</i> (%)		
Low SES	9 (27)	4 (25)
Middle SES	24 (73)	11 (75)
Mother's Education <sup>b</sup> <i>N</i> (%)		
< High School	0 (0)	0 (0)
High School Diploma	15 (48)	7 (44)
Some College/Technical Trng.	8 (26)	4 (25)
College Degree	6 (19)	5 (31)
Graduate Degree	2 (7)	0 (0)
Mean Years in School ( <i>SD</i> )	13.6 years (2.0)	13.7 years (1.8)

<sup>a</sup>Based on 33 families who either received public assistance (low SES) or did not receive public assistance (middle SES).

<sup>b</sup>Based on 31 families.

group did not differ significantly from other children in the communication ratings group in mean child cognitive age, chronological age, or mother's education.

Thirty four mothers participated in the communication ratings group and 16 mothers participated in the vocabulary subgroup. One family had more than one child in the study. The mean educational level of the mothers in the communication ratings group and the vocabulary subgroup was 13.6 years and 13.7 years respectively. Five specialists participated in the communication ratings group. Four specialists collected data for the vocabulary subgroup.

### **Instrumentation**

**Communication ratings group.** Parents and professionals rated children's communication skills using the ABILITIES Index (Simeonson & Bailey, 1988) and professionals administered the Battelle Developmental Inventory

(Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984) to the children. The ABILITIES Index is a global rating scale that describes the functional abilities and limitations of young children with disabilities in nine major domains: audition, behavior & social skills, intellectual functioning, limbs, intentional communication, tonicity, integrity of physical health, eyes, and structural status. For each domain, the rater compares each child to typically developing children using an ordinal scale. Ratings range from 1 (*normal ability*), 2 (*suspected disability*), 3 (*mild disability*), 4 (*moderate disability*), 5 (*severe disability*), to 6 (*extreme disability*). The ABILITIES Index has been shown to yield a high degree of agreement among teachers, parents and specialists (Bailey, Simeonsson, Buysse, and Smith, 1993). Only ratings from the receptive communication (Understanding Others) and expressive communication (Communicating

with Others) domains were used in the analysis for this study.

The Battelle Developmental Inventory is a standardized developmental scale designed for use with children birth to 8 years of age. It consists of five developmental domains (personal-social, adaptive, motor, communication, and cognitive) divided into 22 subdomains. High test-retest reliability is reported by the developers. Only the communication (receptive and expressive) and cognitive (cognitive total) domains of this measure were entered into the analysis for this study.

*Vocabulary subgroup.* Children in the vocabulary subgroup were administered standardized language measures and a communication sample. The standardized language measures consisted of the MacArthur CDI and the Preschool Language Scale-3 (PLS-3; Zimmerman et al., 1992). Parents completed the MacArthur CDI and the professionals administered the PLS-3 and obtained the communication sample.

Two separate forms of the MacArthur CDI were used to assess the children's production vocabulary: (a) Words and Gestures (for children developmentally 8 to 16 months old and (b) Words and Sentences (for children developmentally 16 to 30 months old). The Words and Gestures uses parent report to request information on the child's comprehension vocabulary (words the child understands), productive vocabulary (words the child actually produces), and communicative and symbolic gestures. The production vocabulary section is a 396-item vocabulary checklist, organized into 19 semantic categories including nouns, sound effects and animal sounds, games and routines, verbs, adjectives, pronouns, question words, prepositions and locations, quantifiers, and words about time. The Words and Sentences also uses parent report to assess productive vocabulary, syntax, and morphology. The vocabulary section of Words and Sentences consists of a 680-word vocabulary production checklist that is organized into 22 semantic categories. Except for sound effects and animal sounds, helping verbs, and connecting words, the same categories are listed on the Words and Gestures form. Both forms

of the MacArthur CDI have high internal consistency (i.e., .95 to .96), moderate to high test-retest reliability, and substantial concurrent validity (Fenson et al., 1994). In this study, the number of different words produced and verbal production age for the form used were entered in the analysis.

The PLS-3 is a standardized measure of the receptive and expressive language abilities of children from birth to 6 years of age, which examines vocabulary, concept development, morphology, and syntax. Adequate internal consistency, test-retest reliability, inter-rater reliability, and validity is reported (Zimmerman et al., 1992). In this study, the child's expressive communication age scores were entered in the analysis.

A 30-minute communication sample was collected from the communicative interactions between an examiner and child during administration of the Communication and Symbolic Behavior Scales (Wetherby & Prizant, 1993). A 10-minute sample of mother-child interaction also was collected. The Communication and Symbolic Behavior Scales is a new standardized instrument designed to assess communicative, social-affective, and symbolic abilities of children between 8 months and 2 years of age. This scale uses a sampling procedure (communicative temptations, sharing books, and symbolic play probes) that resembles natural, ongoing adult-child interactions with the child's mother present, and it provides opportunities for the child to use a variety of communicative behaviors. For the mother-child interaction, the child and mother played together using age-appropriate toys that generally encourage language use. The toys included a playhouse, frog puppet, car, book, blanket, dinosaurs, and a bag of toys that contained various play foods and utensils. The mother was asked to play with her child using as many toys as she liked.

We computed the number of different words produced spontaneously by the child during the communication sample by combining the language sample produced during the Communication and Symbolic Behavior Scales and during the mother-child interaction tasks. A word was defined as a linguistic form

consisting of a sequence of one or more morphemes and one or more syllables that have meaning without being divisible into smaller units capable of independent use (Nicolosi, Harryman, & Kresheck, 1983). The number of different words produced by the child is interpreted as an index of the child's vocabulary diversity (Miller, 1992), not the child's total vocabulary size. For all samples, words were counted by the Systematic Analysis of Language Transcripts-Version 3 (SALT; Miller & Chapman, 1993), a computer analysis program.

### ***Procedures***

The ABILITIES Index and the Battell Developmental Inventory were conducted as part of the original study and were completed on the child's first assessment in the Fragile X Communication Project. These assessments were administered by an early intervention specialist and were completed within 3 weeks of the child's birthday. Parents completed the ABILITIES Index during an interview with an early intervention specialist. A separate examiner also rated the child on the ABILITIES Index immediately after a visit with the family. The Battelle Developmental Inventory was scored after the ABILITIES Index was completed.

The Communication and Symbolic Behavior Scales, the PLS-3, and the mother-child interaction sample were conducted for the 16 boys in the vocabulary subgroup. A speech-language pathologist and a graduate level speech-language pathology student completed the assessments. Tests were administered in the following order (a) the Communication and Symbolic Behavior Scales, (b) PLS-3, and (c) the 10-minute communication sample (mother-child interaction). These assessments were completed in the child's home or day care and were video and audio taped for transcription and analysis. In addition, parents completed one form of the MacArthur CDI for their child. The Words and Gestures form was completed for 12 children and the Words and Sentences for 4 children. To select the appropriate form of the MacArthur CDI, we used the child's expressive communication age score from the Battelle Developmental Inven-

tory. Two parents completed the MacArthur CDI 1 week prior to the first home visit from the Fragile X Communication Project, five completed it with an examiner during the first home visit, and nine parents completed it within a week after the first visit and returned it in a self-addressed stamped envelope.

A speech-language pathologist transcribed the words in the communication sample orthographically and typed them into the SALT program. SALT calculates the number of different words produced spontaneously in the communication sample for each child. To collect reliability data, a second person transcribed 4 minutes (10%) of each of the 16 communication samples. The number of different words in the same 4-minute sample also was calculated for the main coder. For each pair of samples, the reliability index was computed as the total number of agreed upon different words divided by the number of disagreements plus agreements for different words. Reliability for number of different words was 79% and ranged from 50% to 100%. The lower scores (i.e., 50%) occurred because in two samples children used only one to four words.

### ***Data Analysis***

The statistical analyses for the communication ratings group included correlations of parents' and professionals' receptive and expressive communication assessments, t-tests to determine whether the mean receptive and expressive ratings on the ABILITIES Index for parents and professionals were significantly different, and two repeated measures multiple regressions. In addition to these measures, ABILITIES Index percentages of agreement, the number and percentage of children associated with each rating of the parent and professional, and the percentage of paired parent-professional ratings for which there was a zero-, one-, two-, and three-point difference between ratings were calculated. Percentage of agreement was calculated as the total number of agreements divided by agreements plus disagreements. Coefficient kappa was computed to correct for chance agreement between

parents' and professionals' ratings of receptive and expressive communication.

To determine if child (i.e., cognitive age, chronological age) and family (i.e., mother's education) factors were significantly related to parents' and professionals' ratings of receptive and expressive communication on the ABILITIES Index, we used two repeated measures multiple regressions, one for receptive communication and one for expressive communication. Three variables, child cognitive age, child chronological age, and maternal education, were entered as continuous variables with one value per child (between-subjects factor). One variable, the informant (scorer) was a nested factor with two values per child on which repeated measures were obtained (within-subjects factor). For the vocabulary subgroup, correlations were run between the number of different words parents reported on the MacArthur CDI and the number of different words the child actually produced during a communication sample.

## RESULTS

### Communication Ratings Group

**Correlation.** Means, ranges, and standard deviations were calculated first for the Battelle Developmental Inventory receptive and expressive communication scores and then for parents' and professionals' receptive and expressive communication ratings on the ABILITIES Index (Table 2). Parents' ratings of receptive communication on the ABILITIES Index correlated moderately with professionals' ratings of receptive communication on the same instrument ( $r = .41$ ;  $p < .05$ ). A moderate, but somewhat stronger correlation ( $r = .50$ ;  $p < .01$ ) was found between parents' ratings of expressive communication on the ABILITIES Index and professionals' ratings of expressive communication on the same instrument. The correlation between parents' ratings of receptive communication on the ABILITIES Index and professionals' receptive scores on the BDI (administered by professionals) was moderate ( $r = .43$ ;  $p = < .05$ ). A high correlation ( $r = .75$ ;  $p < .001$ ) was found between expressive communication

**Table 2.**  
*Mean Scores for Communication Ratings Group (N = 34)*

Test	M	SD
Battelle Developmental Inventory		
Chronological Age <sup>1</sup>	43.2	15.1
Cognitive Age	21.1	7.4
Cognitive DQ <sup>2</sup>	52.1	16.6
Receptive Age	21.0	7.2
Expressive Age	19.6	8.9
Receptive DQ	54.0	19.5
Expressive DQ	47.7	16.8
ABILITIES Index—Receptive		
Parent Rating <sup>3</sup>	2.4 <sup>a</sup>	1.2
Professional Rating	3.3 <sup>a</sup>	0.8
ABILITIES Index—Expressive		
Parent Rating	3.6	0.9
Professional Rating	3.6	0.8

<sup>1</sup>All ages are reported in months.

<sup>2</sup>Developmental Quotient. DQ was used if it was greater than 65, otherwise, DQ was calculated as developmental age divided by chronological age multiplied by 100.

<sup>3</sup>Ratings for the ABILITIES Index are as follows: 1 = normal; 2 = suspected disability; 3 = mild disability; 4 = moderate disability; 5 = severe disability; and 6 = extreme disability.

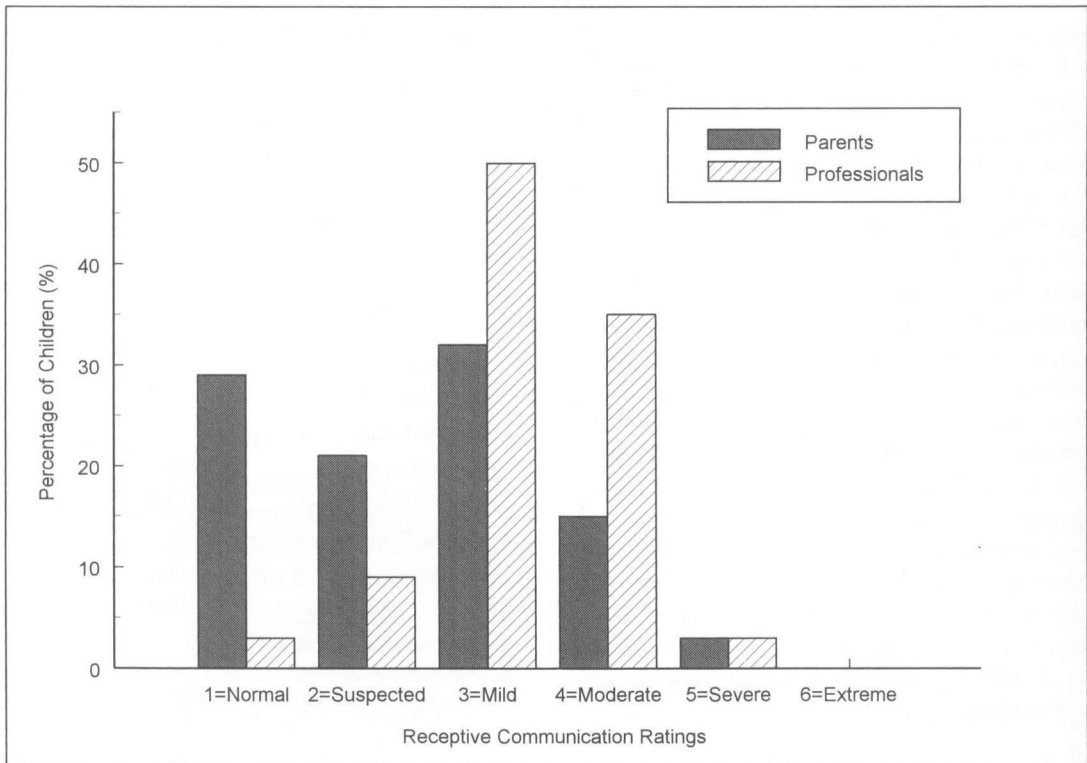
<sup>a</sup>The difference between the means for parent and professional receptive ratings was significant ( $p < .001$ ).

scores on the Battelle Developmental Inventory and parents' ratings of expressive communication on the ABILITIES Index.

**ABILITIES Index mean scores.** A t-test was used to determine whether there were significant differences between the mean parent and professional ratings of receptive and expressive communication. Results of the t-test indicated that parent ratings differed significantly from professional ratings for receptive communication ( $t = 4.39$ ,  $p < .001$ ), but not for expressive communication ( $t = 0$ ,  $p > .05$ ). The mean rating of children's receptive communication given by parents was significantly lower ( $M = 2.41$ ) than the mean rating given by the professionals ( $M = 3.27$ ). Lower mean score ratings on the ABILITIES Index indicated that the child had less severe disabilities (a score of 1 indicated *normal* and 6 indicated *extreme disability*).

**Agreement percentages.** Agreement per-





**Figure 1.** Percentage of children associated with each rating assigned by parents and professionals for receptive communication on the ABILITIES Index.

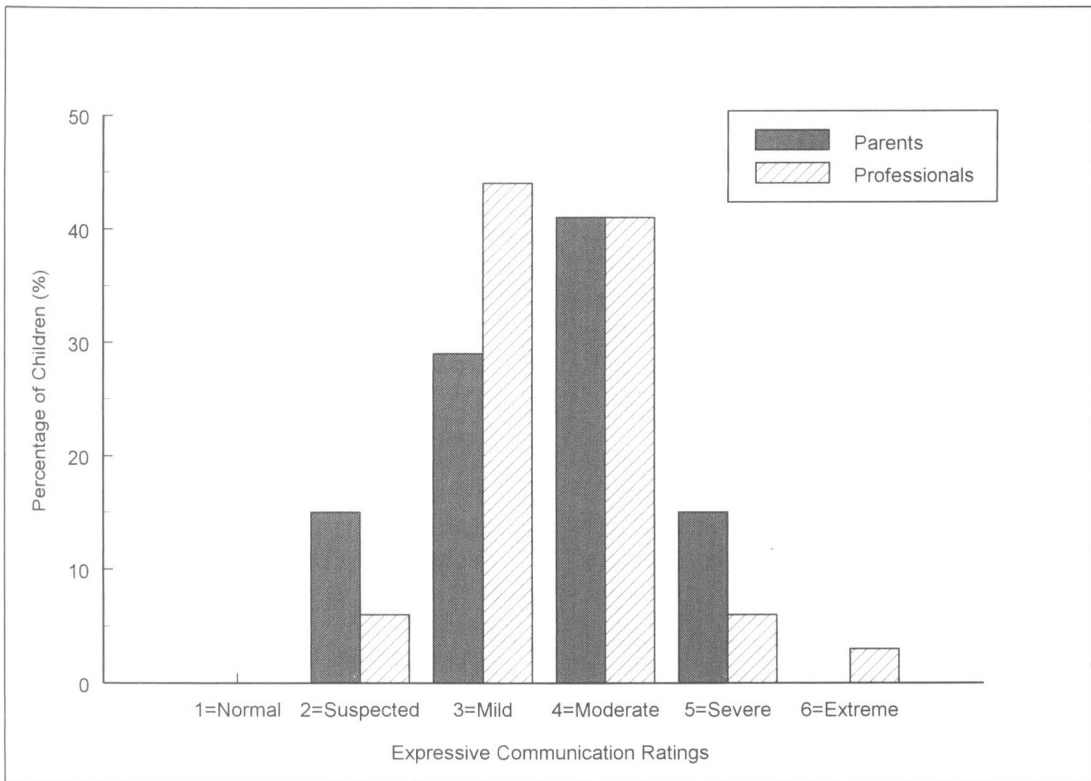
percentages were calculated for parents' and professionals' receptive and expressive communication ratings on the ABILITIES Index as follows (a) percentage of children associated with each rating category for parents and professionals, (b) the percentage of paired parent-professional ratings for which there was a zero-, one-, two-, and three-point difference between ratings of parents and professionals, and (c) the percentage of pairs of parent and professional raters who either agreed exactly or whose ratings were within one point of each other. Parents rated 10 of the children as normal on their receptive communication, whereas only 1 child was rated by professionals as normal on receptive communication.

The percentage of children associated with each ABILITIES Index rating assigned by parents and professionals is shown in Figure 1 for receptive communication and Figure 2

for expressive communication. For receptive communication, parents rated most of the children as *normal* (29%), *suspected disability* (21%), or *mild disability* (32%). Professionals rated most of the children as *mild disability* (50%) or *moderate disability* (35%). For expressive communication, both parents and professionals rated most of the children in the mild to moderate category.

The difference between parents' and professionals' receptive and expressive communication ratings on the ABILITIES Index was calculated. The percentage of pairs of raters who differed by one point was 38.24% for receptive communication and 64.71% for expressive communication. The percentage of pairs of raters who differed by two points was 26.47% for receptive communication and only 2.94% for expressive communication.

Finally, the percentage of pairs of raters



**Figure 2.**

*Percentage of children associated with each rating assigned by parents and professionals for expressive communication on the ABILITIES Index.*

who agreed either exactly or within one point of each other was calculated. For receptive communication, the percentage of pairs of parent and professional raters who agreed exactly was 29%, while agreement within one point was 68%. For expressive communication, the percentage of pairs of parent and professional raters who agreed exactly was 32%, and agreement within one point was 97%. Coefficient kappa (.37) could be described as fair for parent and professional receptive communication agreement ratings on the ABILITIES Index and strong (.62) for expressive.

*Factors related to agreement.* Two repeated measures multiple regressions, one for receptive communication and one for expressive communication, determined whether child and family factors were significantly related to agreement between parents' and profession-

als' ratings of receptive and expressive communication on the ABILITIES Index. Analysis of between-subjects variables revealed that the child's cognitive age and chronological age were significantly related to parent and professional ratings of receptive and expressive communication (see Table 4). More specifically, parents and professionals tended to rate children with higher cognitive age as having fewer problems with both receptive and expressive communication, whereas older children were rated as having more problems. The analysis of within subjects variables revealed that the difference between parents and professionals (scorer) was not significant after controlling for child cognitive age, child chronological age, and maternal education. In addition, it was revealed that child age, child cognitive level, and mother's education were not significantly related to agreement (i.e., dif-

**Table 3.**  
*Repeated Measures Analysis of Receptive and Expressive Communication on the ABILITIES Index (N = 31)*

Source	F (1,27)	
	Recep- tive	Expres- sive
Child Cognitive Age	19.3**	17.0**
Child Chronological Age	10.3**	16.6
Maternal Education <sup>1</sup>	1.3	1.1
Scorer	0.9	0.5
Scorer × Child Cognitive Age	0.0	0.1
Scorer × Child Chronological Age	2.7	2.7
Scorer × Maternal Education	1.6	0.5

<sup>1</sup>Maternal education was of interest only for calculating Scorer × Maternal Education.

\*\* $p < .01$ .

ferences) between ratings of parents and professionals for receptive or expressive communication.

### **Vocabulary Subgroup**

Only expressive vocabulary was measured in the vocabulary subgroup. Means, ranges, and standard deviations were calculated for all variables (see Table 4). The number of different words reported by both parents (1–673) and professionals (0–181) varied widely across subjects. The number of different words parents reported on the MacArthur CDI was significantly correlated ( $r = .96$ ;  $p < .001$ ) with the number of different words the child actually produced during a language sample. A similarly high positive relationship ( $r = .94$ ;  $p < .001$ ) was found between parents' reports of the number of different words their child produced on the MacArthur CDI and the child's expressive communication age on the PLS-3.

## **DISCUSSION**

Results of this study showed low to moderate agreement between parents' and professionals' assessments of children's communication skills. Parents' ratings of their children's receptive communication were significantly higher than professionals' ratings of receptive

**Table 4.**  
*Mean Scores for Parent and Professional Vocabulary Data (N = 16)*

Variable	M	SD
Parent		
CDI Different Words	217.50	249.24
CDI Verbal Production Age (in months)	21.00	6.97
Professional		
Language Sample Different Words	57.25	70.29
PLS-3 Expressive Standard Score	63.63	11.16

Note. CDI = MacArthur Communication Development Inventory; PLS-3 = Preschool Language Scale-3.

communication on the ABILITIES Index. Moderate levels of agreement were found between parents and professionals for expressive communication ratings. Parents' reports of expressive vocabulary correlated highly with professionals' measures of expressive vocabulary. Child and family factors were not significantly related to agreement between parents and professionals, however, children with higher cognitive age were rated as having fewer difficulties with receptive and expressive communication, whereas older children were rated as having more problems.

### **Parent and Professional Communication Ratings**

When a simple t-test was used, parents' ratings of receptive communication on the ABILITIES Index were significantly higher than professionals' ratings of receptive communication, whereas there was no significant difference between parents' and professionals' ratings of expressive communication. However, when a repeated measures multiple regression analysis was conducted controlling for child cognitive age, child chronological age, and maternal education, these observed differences in receptive communication were no longer significant. Stancin and colleagues (1984) found that mothers of children with severe impairments provided significantly higher estimates of their children's language than teachers on the Kent Infant Development

Scale (Katoff, Reuter, & Dunn, 1980). Likewise, Gradel and colleagues (1981) found that assessments of verbal skills made by preschoolers' mothers on the McCarthy Scales of Children's Abilities (McCarthy, 1972) were significantly higher than professionals' assessments. In contrast, Sexton and colleagues (1982) found no significant difference between parents' reports of their child's language skills on the Learning Accomplishment Profile (Sanford, 1974) and professionals' assessments for 7 month to 72 month old children with a variety of disabilities.

In addition to the analysis of mean score differences, correlations between parent and professional communication ratings and assessments were examined. Overall, moderate correlations were found between parents' communication ratings and professionals' communication ratings and assessments. Correlations for expressive communication ratings were somewhat higher than correlations for receptive communication. Blacher-Dixon and Simeonsson (1981) examined the consistency of maternal ratings for a group of 9 month to 75 month old children with disabilities using the Carolina Record of Infant Behavior (Simeonsson, 1979) and found that correlations between parents and teachers for expressive communication were somewhat higher than those for receptive communication. Schafer and colleagues (1987) found that scores obtained by parents' on the Developmental Profile II (Alpern et al., 1980) were strongly correlated with professionals' scores on the Early Intervention Developmental Profile (Rogers, et al., 1981) and that these scores remained strongly correlated over time.

The percentage of agreement between parent and professional ratings of communication skills also provided information regarding congruence. The percentage of agreement between ratings from parents and professionals for receptive communication was considerably lower (68% for agreement within one point) than the agreement percentages for expressive communication (97% for agreement within one point). Parents and professionals differed by 2 points on 26% of the ratings of receptive communication, whereas parents

and professionals differed by 2 points for only about 3% of the ratings of expressive communication.

In a recent review of the literature on parent-professional congruence, Dinnebeil and Rule (1994) found that for nine studies, the mean percentage of agreement was 82.4% (range 75% to 92%). Similarly, Sexton and colleagues (1985) found that the percentage of agreement between mothers and professionals using the Developmental Profile (Alpern & Boll, 1972) for children with various developmental disabilities ranged from 72% to 97% with a mean level of agreement 88%. In a study designed to assess the reliability of the ABILITIES Index, Bailey and colleagues (1993) found that receptive and expressive communication scales were among several items that consistently accounted for lower levels of agreement across parent-teacher, parent-specialist, and teacher-specialist groups.

There are several possible reasons for the differences in mean ratings of parents and professionals on the receptive communication domain of the ABILITIES Index in this study. First, parents' ratings of higher receptive communication ability may reflect the unique information they are able to provide about their children's communication (Henderson & Meisels, 1994) based on the many experiences they have with their children in variety of contexts. Furthermore, parents' evaluations of their child's level of abilities may be based on the sum of their experiences with their child rather than on only a single testing session or sample of behavior as was the case for professionals' assessment results. Second, expressive communication can lead to more obvious behaviors that can be rated and assessed than receptive communication and to greater congruence (Sexton & colleagues 1990). Third, the nature and level of the children's expressive communication difficulties may have inadvertently influenced some professionals' ratings of receptive communication. More specifically, the extent of the children's receptive communication involvement may have been related to the degree of their perceived expressive difficulties. Interestingly, 25 of 34 children (74%) were rated by profes-

sionals as equivalent on receptive and expressive communication (e.g., a rating of 3 on both receptive and expressive) and 8 of the 9 remaining children were rated by professionals as only 1 point higher (more extreme) for receptive communication than for expressive. This suggests that professionals viewed the extent of these children's receptive communication difficulties as similar to the level of impairment in expressive communication. Parents, on the other hand, rated only 7 of the 34 children (21%) the same on receptive and expressive communication while 27 (79%) of the children were rated as more extreme on expressive than receptive communication. This indicates that most parents viewed their children as having better receptive than expressive skills, producing a tendency for higher receptive ratings. For each of the 27 children rated more extreme on expressive than receptive communication, the difference between receptive and expressive ratings varied from 1 to 4 points.

A fourth view that could be taken regarding parents' higher ratings of receptive communication is that parents are by nature more likely to describe their child's performance higher than a professional would. In our study, however, parents rated their children as having significantly higher levels of receptive communication than did the professionals, but parent ratings of children's expressive communication were very similar to the professionals' ratings.

### ***Child and Family Factors and Agreement***

The repeated measures analysis of within subjects variables revealed that neither child chronological age, child cognitive age, nor mother's education was significantly related to agreement. The results support previous research that showed no significant relationship between mother's education (Sexton et al., 1990; Snyder, et al., 1993), age of the child (Sexton et al., 1982), and child IQ (Ewert & Green, 1957; Sexton et al., 1984; Sexton et al., 1985) and agreement between parents and professionals. Some previous studies have demonstrated a relationship between child age

(Gradel et al., 1981), child IQ (Sexton et al., 1990), and mother's education (Ewert & Green, 1957) and congruence between parents and professionals.

The repeated measures analysis of between subjects variables revealed significant relationships between child factors and parent and professional ratings. Overall, parents and professionals tended to rate children of more advanced cognitive age as having fewer problems with receptive and expressive communication, whereas older children were rated as having more problems. This is consistent with the literature indicating that as children with Fragile X syndrome get older, they may show more delays (Dykens, 1995).

### ***Parent and Professional Expressive Vocabulary Assessments***

The findings in this study support previous research that has shown high positive correlations between parent report vocabulary and the number of different words produced in a communication sample for typically developing children and children from special populations (Dale, 1991; Miller et al., 1995). Although the sample size in this study was smaller than the sample size used by Miller and other, the number of different words in the language sample and the number of different words reported by parents on the MacArthur CDI for this small sample were highly consistent, and yielded somewhat higher correlations ( $r = .96$ ) than correlations of the same measures ( $r = .74-.88$ ) reported in previous studies (Dale, 1991; Miller, 1992; Miller et al., 1995). Although we found considerable variability in the parent report vocabulary in this study, it was generally three to four times greater than vocabulary produced in a language sample. Miller and colleagues (1995) found that for typically developing children, the ratio of parent report vocabulary to vocabulary computed from a language sample was 3:1 at 20 months mental age and 4:1 at a mean mental age of 28 months.

### ***Conclusions***

This study provides evidence that parents and professionals are more congruent for expres-

sive communication than for receptive communication. Parents' ratings of receptive communication were significantly higher than professionals' ratings. Overall, professionals rated receptive skills as mildly to moderately delayed, whereas, parents rated their children as having no deficits in receptive language to having mild deficits. Further research is needed to explore the issues related to differences in parent and professional assessments. Results of this data indicate that ratings of receptive communication on the ABILITIES Index may vary depending on whether parents or professionals complete it. This warrants careful interpretation with other tests of receptive language and sources of information in early intervention service settings.

It is important to examine congruence between parents' views of the communicative abilities of young children and professionals' views to assist in planning intervention and subsequent assessment. Since assessment is an ongoing process, these issues become even more important. Although this study provides insight into parents' and professionals' observations and assessments of language, some limitations must be considered. First, these results can be generalized only to children with fragile X syndrome and not to other populations. Second, a small sample size was used, particularly with the vocabulary study.

Since parents are called to be active members of early intervention teams, their observations regarding their child's communication development is important in making decisions about their child's education. As Dinnebeil and Rule (1994) indicated, agreement between parents' and professionals' assessments may strengthen the credibility of the information that is obtained. On the other hand, differences between parents and professionals may be as valuable as congruence since a lack of agreement can stimulate discussion that facilitates appreciation of the unique views of parents and professionals regarding the child's abilities. These results reinforce the need for parents' participation in communication assessment activities in order to best serve the needs of the child and family.

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