

Abstract

**Use of Oral Language General Outcome Measures to Describe Children According to  
Language Status**

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The purpose of the study was to determine if short language samples can effectively distinguish children with language impairments from those who are typically developing. Four elicitation methods (individual picture descriptions, multi-scene picture description, narrative, and interview) were administered to 14 typically developing children and 3 children with language impairments in Chapel Hill, NC as well as to 16 typically developing children in Greenville, NC. Each task was administered 3 times and lasted 1 minute. All samples were collected and transcribed by the principal investigator and then analyzed using 5 general language sample measures (Number of Total Words, Number of Different Words, Number of Total Utterances, Mean Length of Utterance, Errors/Omissions). Intercorrelations between the elicitation tasks were found for each measure and then the effect size was determined comparing the typically developing children and children with language impairments in Chapel Hill, NC. Significant correlations were observed between most measures. A review of the correlation strength revealed the strongest relationships between the descriptions of individual pictures and multi-scene picture description tasks. Notable differences were observed between children with

language impairments and typically developing children. The largest group differences were observed for the Number of Different Words measure. The results suggest that the short language samples produce meaningful information and are clinically feasible.

Use of Oral Language General Outcome Measures to Classify Children According to Language  
Status

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Under the Direction of Laura Ball and John Heilmann

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## **Chapter 1: Introduction**

Speech-language pathologists are required to document the effectiveness of treatment within all settings that services are provided. Major stakeholders, including third party payers, family members, and school administrators, are entitled to accountability and require documentation of the progress made (or lack thereof) on established goals. In addition, ASHA's position statement on evidence based practice states that treatments should be based on empirical evidence from the literature and through one's own clinical experiences. Effective outcome measures are required for researchers completing the efficacy studies that influence clinical practice. Furthermore, clinicians require strong outcome measures to validate their own practice, which in turn strengthens their clinical knowledge. Unfortunately, there are limited data supporting valid, reliable, and clinically feasible outcomes measures for children's oral language skills (Ukrainetz, 2006).

### **Methods of Documenting Outcomes**

**Standardized measures.** Speech-language pathologists (SLPs) use assessment as a means of identifying children with speech and language impairments. Typically SLPs teach their clients new skills and then document outcomes by administering an assessment after a predetermined length of time, usually at the end of each grading period. The assessment is aimed at summarizing the learned information and to determine the child's current level of performance. If the child scores poorly, the material is taught again and then assessed once more. These measures are standardized and each child is given the same test (Harlen & James, 1997).

Reliability and validity are reasons for choosing many standardized measures. Using reliable and valid measures is important because it allows clinicians to be confident in the child's

score, or the amount of change measured throughout their time in therapy as being reliable and meaningful. In reality, these tests do not provide enough detail to determine if change has occurred over time. Standardized tests are designed to generate stable data that is not sensitive to subtle changes in language characteristics that are present in the language profile of the child who has an impairment (McCauley, 2001).

McCauley and Swisher (1984) identified another drawback to standardized tests. Situations must be avoided in which test items are explicitly taught to the child. Also the test should not be administered a second time in too short of a time period. Both of these situations could lead to the child scoring higher because of the specific items being examined were memorized or learned without generalization. Researchers and clinicians find standardized measures to be useful during examination of children, but these tests should be used cautiously and with recognition of their shortcomings.

**Observations of change in language.** Another way of assessing the child's change is to determine if the people who interact with the child, such as a parent, a teacher, or a SLP, consider the changes made by the child as substantial (Kazdin, 1977). That is, for meaningful change to occur in a child's language, someone must notice it. These methods range from informal questioning of significant others in the child's life to panels of naive listeners that make judgments about the child's speech productions. Subjective judgments provide both qualitative and quantitative data about the child's language changes but may not be practical in many clinical settings (McCauley, 2001). Furthermore, there is limited empirical data documenting the reliability and validity of such judgments.

**Performance of specific therapy tasks.** Instead of asking for observations about the child's language changes, researchers and clinicians often measure outcomes of specific skills

using performance on therapy tasks. These measures are not standardized and cannot be used to compare among children; they simply reveal how the child performed on a specific task during a particular therapy session. This information is helpful but may not be reliable. Variability in procedures used in therapy tasks can occur depending on both the clinician's elicitation and the child's performance on any given day. Because of this, such measures cannot be compared to other children's performance and norms cannot be created. Furthermore, variability in administration procedures and/or stimuli used can introduce substantial measurement error. These outcomes are typically restricted to a limited set of skills and do not address the overall changes in the child's ability to effectively use language to communicate.

**General outcome measures.** Methods for documenting outcomes must be reliable, valid, and sensitive to measuring change within a given child. Instead of addressing specific skills or using standardized measures that may not be sensitive, researchers and clinicians may consider using general outcome measures. These measures use standardized procedures to monitor progress as the child continues to learn new skills (Deno, 1985). General outcome measures should provide educationally related information that allows for decisions to be made about education and the curriculum for the overall student population and at the individual student level. Instead of measuring outcomes based on the sub-skills learned in therapy sessions, general outcome measures can be used to observe overall skills required to perform in a particular subject area.

To monitor progress, the data on a child's performance and acquisition of learned information should be collected on a regular basis. If progress on the measurements occurs throughout the learning process, then the method of treatment is judged to be effective. On the other hand, if the child is not making progress at the same rate as other students or as quickly as

expected then the SLP can adapt the teaching methods to meet that child's specific needs (Deno, 1985; Harlen & James, 1997). Rather than waiting for quarterly or annual assessment of progress towards treatment goals, the SLP could briefly assess the child's oral language skills by completing short assessments on a more frequent basis. Overall, using this type of assessment approach leads to improved learning and provides immediate feedback to the student and the SLP on progress.

**History of general outcome measures.** The focus of general outcome measures over the past twenty-five years has centered predominately on reading. Previously, only mastery measurements or standardized tests were used to evaluate a child's reading. These measures tested a small number of skills, and once a satisfactory score was achieved, a new skill set would be introduced. Research by Fuchs and Deno (1991) found that if the test used to measure students' progress contained a larger, mixed group of problems or concepts not limited to skills just learned, the children did not score as well. This issue motivated a comprehensive line of research examining the inherent problems associated with mastery measurement (Fuchs & Deno, 1991; Deno, 1985).

General outcome measures were suggested as the alternative to the mastery measures in a variety of subject areas. School psychologists have used general outcome measures to screen children, identify problems, make educational decisions about intervention plans, and monitor the child's progress towards goals and response to intervention (Hintze, Christ, & Methe, 2006). In reading, fluency serves as an overarching goal of early reading skills by integrating many individual skills into one central task. To read fluently, one must be able to access lexical information, understand sound-letter correspondence, combine individual sounds into whole words, process the meaning of words, and relate the current reading with background knowledge

(Fuchs, Fuchs, Hosp, & Jenkins, 2001). Reading fluency has been observed to exhibit the highest criterion validity compared to other general outcome measures including cloze, question answering, and recall (Fuchs, Fuchs, & Maxwell, 1988).

### **General Outcome Measures in Speech-Language Pathology**

The principles of General Outcome Measures, as listed above, can be applied within speech-language pathology. Language sample analysis (LSA) is well suited for monitoring process of children's oral language skills (Miller & Chapman, 1981; Tager-Flusberg & Cooper, 1999). LSA can be related to the general curriculum; children must use oral language in conversations and narratives to be successful in the classroom. A language sample documents a child's language in naturalistic. Thus, the clinician can be confident in deducing that language sample data is a true representation of the child's language abilities and this therefore verifies LSA as a valid tool. Measures from language samples are stable over time (Heilmann, Miller, Iglesias, Fabiano-Smith, Nockerts, & Andriacchi, 2008) and can identify language impairments in children (Dunn, Flax, Sliwinski, & Aram, 1996; Heilmann, Miller, & Nockerts, 2010).

The effectiveness of LSA for tracking progress is the professional standard in the research community, as LSA is the primary means for documenting outcomes in research studies on treatment (Balason & Dollaghan, 2002; Fletcher & Peters, 1984; Watkins, Kelly, Harbers, & Hollis, 1995).

Though LSA is a valid reliable tool that can be used to identify language impairments and track progress, it lacks clinical feasibility. A traditional language sample requires at least a 5-minute sample, which then requires about 5 minutes of transcription for each minute of spoken (recorded) language. This, at least 25 minutes is needed to transcribe a brief 5-minute sample, increasing the total amount of time for collection and transcription to 30 minutes. Because of

this time commitment, LSA has limited feasibility for use in regular monitoring of child's progress in most clinical settings.

Researchers have sought to find more practicable ways of using language samples for diagnostic purposes and tracking progress. There is limited evidence that some LSA measures are reliable when using 1-minute samples (Heilmann, Miller, & Nockerts, 2010; Tilstra & McMaster, 2007). However, additional research needs to examine reliability and validity of such short samples as well as to evaluate the optimal context for the language sample collection.

**Development of oral language curriculum based measures.** Fuchs (2004) stated that the first stage of curriculum based measurement research is to examine the properties of the static score. This component is important when evaluating validity and reliability of the measures in comparison with traditional psychometric measures (Fuchs, 2004). Work is currently underway documenting the reliability and validity of measures from a series of short language samples (Heilmann, 2011). In addition to documenting reliability and validity, general outcome measures must effectively distinguish between children with impairments and children who are typically developing. While comprehensive LSA has been shown to be effective in identifying children with language impairments, research must be completed to determine if short samples are equally as effective as the long samples. If short language samples distinguish typically developing children from those with impaired language, this provides additional evidence that the measures are in fact valid. Therefore, the purpose of this study is to identify whether short language samples can effectively distinguish children based on language status. This study will address the following questions:

1. Are language sample measures (Number of Different Words, Number of Total Words, Number of Total Utterances, Mean Length of Utterance, Errors/Omissions) significantly

related to each other when comparing across elicitation contexts in typically developing children?

2. Does a subset of language sample measures generate the strongest group correlations between typically developing children?

3. Do measures of language sample taken from short language samples significantly differ between typically developing children and children with language impairment?

4. Does a subset of elicitation contexts generate the group differences between typically developing children and children with language impairment?

## Chapter 2: Methods

### Participants

The participants for the primary sample were recruited from public schools in Chapel Hill, North Carolina. The goal of questions 1 and 2 was to document the properties of the measures when collected from typically developing children. Additional samples from Greenville, North Carolina were used from another research project under the direction of Dr. John Heilmann, to add statistical power to the analyses.

**Chapel Hill sample.** All participants were children enrolled in kindergarten or first grade at local elementary schools in Chapel Hill, North Carolina. Children from the early school-age years (kindergarten and first grade) were chosen for participation given the importance of oral language skills in their curricula (Justice, 2007). There is a strong relationship between children's oral language skills and reading (Roth, Speece, & Cooper, 2002), the other major component of young school-age children's curricula. The children were recruited from elementary schools in the Chapel Hill- Carrboro City School District in North Carolina through district speech-language pathologists (SLP) and letters to families. After obtaining Institutional Review Board permission through East Carolina University, the principal investigator worked with the district's lead SLP to gain Institutional Review Board permission through the school district. The lead SLP assisted the principal investigator in contacting school personnel to obtain permission to complete the study with students onsite at that particular school, and to assist with contacting potential participants' families and in completing the informed consent process. As part of the consent process, the parents provided permission for the researchers to review school records for hearing and vision screening information and previous language assessment scores for the children with language impairments.

Seventeen children were recruited for this study: 3 children with language impairments and 14 typically developing children with no history of language impairments. Originally, the recruitment goal was 20 children with language impairments. However two principals did not approve of the study taking place in their school and one child did not pass the hearing screening and another child moved out of the school district. Lastly, several parents did not grant permission for their child to participate or failed to return the consent form after two copies were provided leading to only 3 children with language impairments included in the study.

For both groups of children, participants were excluded if they had a documented hearing or visual impairment or if English was not their first language. These criteria were established through records review – children must have passed a hearing and vision screening in the past year and not be enrolled in English as a second language services. If children had not passed a hearing screening, the investigator completed a screening using the guidelines of the American Speech-Language-Hearing Association (American Speech-Language-Hearing Association, 1997).

The three children with language impairments had been diagnosed by an ASHA certified speech-language pathologist. They all had a current Individual Education Plan (IEP) primarily addressing language goals. In addition, the child must have scored below 85 on a comprehensive language assessment (e.g., *Preschool Language Scales, Fourth Edition*) in the past year based on record review. The Total Language standard scores for each child were as follows: 74, 72, and 68 on the *Preschool Language Scales, Fourth Edition*. The 14 typically developing children were recruited from the regular classroom. Each participant's teacher completed a questionnaire to document that there were no concerns regarding the child's language skills.

The researchers chose to rely primarily on a clinical diagnosis as a means for identifying children with language impairments. The primary criterion for inclusion in this study was identification of language impairment by an ASHA certified speech-language pathologist. While children must score one standard deviation below the mean standard score on a language test, there must also be an identified concern of the child's language skills. Using standardized test criteria alone may not be sensitive to the variability that is characteristic of language impairment. Many standardized tests are biased against children of diverse backgrounds and may not be sensitive to classification of impairment (Campbell, Dollaghan, Needleman, & Janosky, 1997; Fazio, Naremore, & Connell, 1996; Plante & Vance, 1994). In addition, there is no gold standard for diagnosing children with language impairments and there is variability in what features determine language impairment classification (Aram, Morris, & Hall, 1993; Dunn, Flax, Sliwinski, & Aram, 1996; Lahey, 1990; Tomblin, Records, & Zhang, 1996). By using clinician diagnosis, the concerns that the SLP, classroom teacher, and parents may have for a child's development of language were taken into account (Dollaghan & Campbell, 1998). This approach allows the clinician to use theoretical background knowledge and allows for improved diagnosis of children with diverse backgrounds in a more sensitive way.

**Greenville sample.** To increase the power for the first set of analyses documenting the relationship between the potential outcomes measures, 16 additional samples were collected from data obtained for another research project completed in the Child Language Lab at East Carolina University (Heilmann, 2011). These samples were part of a larger project documenting the reliability and validity of outcome measures. All participants were between 4;6 – 6;0 years of age and were typically developing, per parent report. Each child completed the same protocol as the children in the Chapel Hill sample.

## **Elicitation Procedure**

Four oral language elicitation tasks were used throughout this study. The tasks ranged from highly structured to less structured as listed: a single picture description task, a multi-scene picture description task, a narrative picture task, and a structured interview. It was predicted that the highly structured tasks would be more reliable, as these tasks inherently facilitate consistency during administration and should generate similar complex language from each child. However, validity may be weaker with these tasks if they are unable to compel the child to use complex language or if the child produces responses unrelated to the presented stimuli.

Each task was timed to last between one to two minutes. Before the elicitation tasks were presented to the child, the examiner provided a detailed description of what was expected during each task, as well as examples of detailed responses. At the beginning of each task, the child was reminded to use as much detail as possible when talking. By using highly structured elicitation procedures and clearly describing the expectations for the child's performance, previous studies using similar tasks (Heilmann, 2010) have shown that responses were typically 2-3 minutes in length and have verified that children comprehended the tasks and that they facilitated sufficient amounts of talk for analyses.

**Single picture description.** For the single picture description task, children were presented with a picture and asked to provide a description of the presented actions. The child completed training using three sample pictures. First the examiner told the child what a shorter description sounds like ("The boy is reading.") based on a provided picture and then was cued to produce an longer, more detail description ("The young boy is reading a book with a yellow flashlight."). Ten different picture cards were presented to elicit each language sample of 1-2 minutes. As each picture was presented, the child was told, "Tell me a long sentence about this

picture.” This task was modeled after the Fluharty Preschool Speech and Language Screening Test (Fluharty, 2000), where a child is asked to describe an action based on a picture of a character completing the action. The pictures were collected from the Super Duper Story Starter cards (Webber, 2005) and each picture presented a 4-inch by 6-inch color photograph that depicted one to three characters engaged in an action.

**Multi-scene picture description.** Next, the children were given three separate pictures containing five scenes with multiple characters participating on each. These were used to obtain a 1-minute language sample and thereby complete the multi-scene picture description task. The child was asked to “tell about as many things that are happening in the picture as possible”. During the sample tasks, the participant was provided with examples of how to expand sentences and cued to talk about each part of the picture. After the directions were stated, the examiner started a stopwatch and if the child paused for more than three seconds during the task, they were cued to expand their utterance. After 1-minute of verbal description of each picture, the child was asked to stop and a new picture was presented. Unlike the single picture description task, these pictures were black and white line drawings from the SPARC Picture Series that depicted six to eight characters engaged in a variety of actions (LinguiSystems, 1993) and the pictures were matched for the number of characters, objects, and actions.

**Narrative picture task.** In the narrative picture task, the examiner presented the child with a sample narrative and the child was cued to tell a story based on a target picture after being provided one minute to think about a story and examine the picture (Tilstra & McMaster, 2007). This procedure was adapted from the Test of Narrative Language (Gillam & Pearson, 2004). The examiner provided a sample story that included a description of actions prior to the picture, in the picture, and after the picture. The child was reminded to make the story as long as

possible and if the child failed to begin telling the story within five seconds, the examiner cued with “tell me how this story starts”. If the child failed to respond after another five seconds then the test was discontinued and the examiner moved onto to another picture. The child was cued with “tell me what else happened” if they paused for more than five seconds after they had started their narrative and they moved onto another picture after one minute.

**Structured interview.** Last, a 1-minute structured interview was conducted with the child (Evans & Craig, 2002). Each of the questions related to the activities or knowledge of the personal experiences of the child. The child spoke about each set of standardized questions (listed in Appendix B) and then the examiner moved to the next set after 1-minute. If needed, the child was cued to think about a recent event at school or home and once the child began describing the event, the examiner asked open-ended questions to assist the child in expanding the details and information presented (e.g., “Tell me more about ...”). After five cues had been provided, the examiner moved on to the next question.

### **Data Collection and Analysis**

The elicitation tasks were each administered three times to each child and the order of presentation was randomized to reduce order bias. All of the tasks were audio recorded for later transcription. The elicitation task responses were transcribed using the standard conventions for the systematic analysis of language transcripts (SALT; Miller & Iglesias, 2010). The principal investigator transcribed the responses after completing training in the rules of transcription and practicing transcription for 10 hours. Utterances were segmented using conversational units (C-units), which define an utterance as all independent and dependent clauses (Loban, 1976).

**Transcription accuracy.** Upon completion of the language transcription by the principal investigator, 100 percent of samples were checked for accuracy by a second transcriber trained in

completing language sample analysis. The second transcriber listened to the original oral samples and confirmed the original transcription. All discrepancies were resolved by the second transcriber correcting minor changes and major discrepancies were brought to the attention of the project manager for the final decision.

**Language sample measures.** The following measures were analyzed using the first minute of each language sample:

1. Number of total words (NTW) is a measure of productivity in which the total number of words spoken by the child will be examined.
2. Number of total utterances (NTU) is a productivity measure that includes all utterances produced by the child through the task including independent and dependent clauses.
3. Number of different words (NDW) is a semantic measure that looks at the variety of words produced by the child.
4. Mean length of utterance in morphemes (MLU) is a measure of overall expressive language skills of a child (Miller & Chapman, 1981) measuring syntax. MLU can identify child with language impairments (Aram, Morris, & Hall, 1993).
5. Numbers of errors and omissions (ErrOmit) were calculated by summing the total number of word-level errors, utterance-level errors, and omissions of words and morphemes that occur in obligatory contexts.

## **Chapter 3: Results**

### **Properties of Measures from Typically Developing Children**

Table 1 describes the demographic information for the participants involved in the study. The groups of children from Chapel Hill had very similar mean ages, whereas the ages for the children in Greenville were lower. There were more girls found in the Greenville sample than the Chapel Hill one. Within the Chapel Hill sample, there were no girls in the group of children with language impairments, but the group of typically developing children was weighed more for boys to accommodate the difference.

To analyze elicitation tasks on the general language performance measures, the first minute of each testing format was used; however, some of the narratives were less than one minute in length. Pearson correlations between the four elicitation tasks were calculated using each of the five language sample measures. Each correlation is organized in separate tables according to the measure under study. The correlation analyses were completed using (a) one language sample (b) a combination of two language samples, and (c) all three language samples. This allowed for comparisons between different lengths of samples to see if the correlations improved with an increase in amount of data analyzed.

Table 2 summarizes the correlations between the 4 elicitation tasks for the Number of Total Words measure. In Table 2, all correlations using 2-3 samples had significant correlations of moderate strength for the NTU measure. Weak correlations were observed when using one sample, with the exception of the correlation between the multi-scene picture description and the interview.

Table 1: Demographics of Study Participants

	Age	Gender Ratio (Boys:Girls)
Chapel Hill – TD	6;6	5:2
Chapel Hill - LI	6;7	3:0
Greenville	5;1	4:5
Total Sample	6;4	7:6

Table 2: Intercorrelations for total utterances between four experimental elicitation contexts.

	Description of individual pictures			Multi-scene picture description			Narrative		
	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples
Multi-scene	.24	.65*	.78**						
Narrative	.39*	.59**	.74**	.29	.66**	.81**			
Interview	.18	.65**	.77**	.69**	.82**	.88**	.03	.58*	.76**

\*  $p \leq .05$   
 \*\*  $p \leq .01$

Table 3: Intercorrelations for total words between four experimental elicitation contexts.

	Description of individual pictures			Multi-scene picture description			Narrative		
	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples
Multi-scene picture description	.54*	.73**	.85**						
Narrative	.59*	.72**	.83**	.43*	.64**	.83**			
Interview	.23	.69**	.81**	.66**	.77**	.84**	.20	.62**	.80**

\*  $p \leq .05$

\*\*  $p \leq .01$

Strong correlations were observed between all measures using three samples for the NTW measure (Table 3). When a single sample was used, strong correlations were observed on the description of individual pictures and multi-scene picture descriptions, description of individual pictures and narrative, and multi-scene picture description and interview tasks. The correlation strength increased for all measures when using two samples and then further increased when using three samples. Overall, stronger intercorrelations for NTW compared to NTU were seen.

In the MLU analysis, significant correlations were observed between the multi-scene picture description and interview tasks as well as the descriptions of individual pictures and multi-scene picture descriptions when using only one sample. As the number of samples increased the correlations did not improve as much for the MLU analysis as they did in the other measures (Table 4).

In Table 5, strong correlations were observed on all samples except when comparing one sample of the description of individual pictures and multi-scene picture description, the description of individual pictures and interview, and the narrative and interview tasks on the NDW measure.

There was variability in the intercorrelations found when the number of samples increased on the ErrOmit measure as shown in Table 6. With the exception of the description of individual pictures and narratives, multi-scene picture description, and interview tasks, relatively weak correlations were noted on one sample measures. The correlations improved with an increase in number of samples for all comparisons except the description of individual pictures and interview tasks. There were weak correlations when three samples were used for comparing the individual picture descriptions and

Table 4: Intercorrelations for MLU between four experimental elicitation contexts.

	Description of individual pictures			Multi-scene picture description			Narrative		
	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples
Multi-scene picture description	.51*	.62**	.64**						
Narrative	.38*	.50**	.57**	.42*	.55**	.62*			
Interview	.25	.39*	.47**	.65**	.60**	.66**	.26	.53**	.59**

\*  $p \leq .05$

\*\*  $p \leq .01$

Table 5: Intercorrelations for number of different words between four experimental elicitation contexts.

	Description of individual pictures			Multi-scene picture description			Narrative		
	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples
Multi-scene picture description	.46**	.70**	.82**						
Narrative	.56**	.72**	.85**	.58**	.72**	.86**			
Interview	.43**	.79**	.89**	.67**	.82**	.87**	.41*	.73**	.86**

\*  $p \leq .05$

\*\*  $p \leq .01$

Table 6: Intercorrelations for errors & omissions between four experimental elicitation contexts.

	Description of individual pictures			Multi-scene picture description			Narrative		
	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples	1 Sample	2 Samples	3 Samples
Multi-scene picture description	.19	.50**	.70**						
Narrative	.54**	.55**	.60**	.31	.61**	.60**			
Interview	.27	.28	.43*	.62**	.60**	.49*	.44*	.65**	.60**

\*  $p \leq .05$   
 \*\*  $p \leq .01$

interview. An increase in the number of samples did not lead to an increase in the correlations for the interview and multi-scene picture descriptions.

**General trends across measures and contexts.** The multi-scene picture description and interview tasks had higher correlations when using one, two, or three samples than the other task comparisons. Across all measures, NDW, NTW, NTU, and MLU had the strongest correlations (in that order). The description of individual pictures and multi-scene pictures had the strongest intercorrelations throughout the sampling contexts.

The positive intercorrelations of tasks using various measures were found to increase in strength with an increase in the number of samples analyzed in all conditions except on the multi-scene picture description and interview on the MLU measure as well as the multi-scene picture description task and interview, the multi-scene picture description and narrative, and narrative and interview on the ErrOmit.

### **Comparison of Children with Language Impairments and Typically Developing Children**

The group of children with language impairments was compared to the group of typically developing children from Chapel Hill to determine if there were group differences on the elicitation tasks and the language performance measures. Only the children from Chapel Hill were included in this analysis because they were age-matched. A series of analysis of variance (ANOVA) tests were completed with the language sample measure as the dependent variable and the group (typically developing children versus children with language impairments) as the between groups variable. ANOVAs were calculated for each measure and elicitation context for a total of 60 comparisons. The significance is not reported, as it was not meaningful, due to the small number of children with language impairments, the uneven sample size, and the large number of comparisons. Rather, the principal investigator was more

interested in examining at the amount of difference between the two groups in these pilot analyses. Eta squared ( $\eta^2$ ) values were calculated for each ANOVA to document effect size. The effect sizes were compared to determine which measures and/or context resulted in the largest group differences. The differences between the groups and the effect sizes are summarized in Table 7.

There were notable differences between the two groups for most of the measures and elicitation contexts. The smallest group differences were found on the interview task and the largest group differences were found on the description of individual pictures and the narrative. The largest variations were with the NDW and ErrOmit measures for individual pictures descriptions. The smallest differences appeared with the NTU measure for the narrative task. Only 11 of the 20 effect sizes yielded an increase as the number of samples analyzed increased for the language performance measures. On all measures, the children with language impairments had lower average scores than the typically developing children. The one exception was with the NTU measure on the multi-scene picture description, interview, and narrative in which scores were relatively equal.

The effect sizes across the measures and contexts were averaged together to demonstrate general trends. When comparing language performance measures, larger group differences were found in the mean effect sizes for the NDW measure and ErrOmit measures. The NDW measure presented the smallest group differences on the interview task. The smallest group differences were found with the NTU measure overall, with the

Table 7: Mean performance (SD) and effect sizes documenting differences between the children with language impairments and the typically developing children

		Total Utterances			Total Words			MLU			Different Words			Errors & Omissions			Mean $\eta^2$
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Description of Individual Pictures	TD	9.2 (2.2)	19.5 (4.1)	28.8 (4.9)	66.2 (16.8)	136.4 (28.0)	203.9 (39.6)	8.6 (1.9)	8.4 (1.4)	8.6 (1.5)	37.7 (8.0)	79.0 (12.8)	119.3 (16.9)	1.0 (1.4)	1.8 (1.9)	2.2 (2.1)	
	LI	6.7 (0.6)	12.7 (2.1)	18.7 (1.5)	34.3 (4.2)	71.0 (16.5)	108.7 (11.5)	6.0 (1.0)	6.4 (.7)	6.6 (.4)	21.0 (1.0)	43.3 (9.1)	66.3 (11.7)	2.7 (1.5)	5.0 (3.6)	9.0 (5.6)	
	$\eta^2$	<b>.20</b>	<b>.34</b>	<b>.44</b>	<b>.40</b>	<b>.50</b>	<b>.52</b>	<b>.25</b>	<b>.27</b>	<b>.24</b>	<b>.45</b>	<b>.58</b>	<b>.63</b>	<b>.18</b>	<b>.26</b>	<b>.49</b>	<b>.38</b>
Multi-scene picture description	TD	10.4 (2.4)	20.1 (4.3)	30.9 (6.1)	73.1 (22.0)	152.9 (43.4)	234.0 (59.3)	8.5 (2.2)	9.1 (1.8)	9.1 (1.4)	41.1 (9.1)	81.9 (18.0)	126.4 (23.5)	.6 (1.1)	1.2 (1.8)	2.2 (2.7)	
	LI	10.7 (1.5)	22.0 (5.29)	32.3 (9.2)	54.7 (8.7)	113.3 (16.3)	162.0 (45.9)	6.1 (.25)	6.3 (.6)	5.8 (.2)	24.7 (5.7)	52.3 (9.5)	72.7 (20.2)	3.3 (2.9)	10.0 (8.9)	15.7 (11.4)	
	$\eta^2$	<b>.00</b>	<b>.03</b>	<b>.01</b>	<b>.12</b>	<b>.13</b>	<b>.20</b>	<b>.19</b>	<b>.32</b>	<b>.50</b>	<b>.37</b>	<b>.33</b>	<b>.47</b>	<b>.37</b>	<b>.49</b>	<b>.55</b>	<b>.27</b>
Narrative	TD	9.7 (3.0)	18.4 (3.7)	27.9 (5.7)	69.7 (20.4)	140.1 (31.4)	207.2 (44.9)	8.8 (3.0)	9.0 (2.0)	8.8 (1.5)	39.4 (9.1)	81.6 (14.2)	119.9 (17.5)	.4 (.7)	.6 (.9)	.9 (.9)	
	LI	15.3 (3.8)	25.7 (4.9)	8.7 (2.5)	44.3 (19.4)	88.3 (37.5)	142.3 (47.9)	6.9 (2.1)	6.3 (1.7)	6.2 (1.3)	20.7 (8.5)	43.0 (15.9)	69.0 (15.5)	3.3 (3.2)	8.7 (5.0)	13.3 (5.0)	
	$\eta^2$	<b>.13</b>	<b>.10</b>	<b>.03</b>	<b>.21</b>	<b>.30</b>	<b>.25</b>	<b>.06</b>	<b>.23</b>	<b>.34</b>	<b>.42</b>	<b>.54</b>	<b>.59</b>	<b>.44</b>	<b>.72</b>	<b>.86</b>	<b>.35</b>
Interview	TD	8.2 (3.2)	16.9 (4.7)	26.4 (6.8)	59.9 (27.7)	119.8 (45.1)	187.8 (62.4)	7.9 (2.4)	7.7 (1.9)	7.9 (1.4)	36.3 (14.5)	73.3 (22.8)	112.4 (34.6)	.3 (.6)	.4 (.6)	1.6 (2.0)	
	LI	8.7 (2.5)	17.0 (1.0)	29.3 (3.5)	38.7 (9.0)	72.3 (22.9)	156.0 (38.4)	5.0 (1.1)	4.7 (1.4)	5.6 (.5)	17.7 (2.5)	39.0 (7.2)	74.3 (9.9)	3.0 (2.6)	5.3 (4.7)	8.0 (7.5)	
	$\eta^2$	<b>.00</b>	<b>.00</b>	<b>.03</b>	<b>.10</b>	<b>.17</b>	<b>.04</b>	<b>.21</b>	<b>.31</b>	<b>.23</b>	<b>.24</b>	<b>.30</b>	<b>.19</b>	<b>.49</b>	<b>.54</b>	<b>.38</b>	<b>.22</b>
Mean $\eta^2$		<b>.11</b>			<b>.25</b>			<b>.26</b>			<b>.43</b>			<b>.48</b>			

largest differences in description of individual pictures and the smallest group differences on the interview tasks.

When comparing language performance measures, there were larger group differences in mean effect size for the NDW and Err/Omit measures. The NDW measure had the smallest group differences on the interview task. The smallest group differences were found with the NTU measure, with the largest group differences in the description of individual pictures and the smallest group differences on the interview tasks.

## **Chapter 4: Discussion**

The purpose of this study was to document the properties of short language samples and to determine if short language samples can distinguish between typically developing children and those with language impairments. This study examined the differences found between typically developing children on general language performance measures including Number of Different Words, Number of Total Words, Number of Total Utterances, Mean Length of Utterances, and Errors/Omissions. Four elicitation tasks were completed with 14 study participants in the Chapel Hill cohort and 16 participants from the Greenville cohort. Each task was administered three times, generating three separate 1-minute language samples that were used in the final analyses. The tasks included descriptions of individual pictures, multi-scene picture description, narrative and interviews ranging from the most structured to least structured (as listed here). Language sample analysis, the recommended standard for differentiation between children with language impairments and those who are typically developing, can be a time consuming endeavor. This study investigates the use of short samples to thereby make LSA a more clinically feasible means of documenting treatment progress. Several measures and elicitation methods have the potential to distinguish those with language impairments from children with typically developing language.

### **Properties of Measures from Typically Developing Children**

A positive correlation was seen on all elicitation tasks in analyses of the linguistic utterances from typically developing children on a variety of measures. For most task intercorrelations of elicitation tasks, the increased number of samples led to an increase in correlation. For most of the measures, there was greater variability across the measures when examining one sample ( $r=.18-.69$ ) and two samples ( $r=.28-.82$ ) than when analyzing three

samples ( $r = .43-.89$ ) suggesting that when more data is available, more meaningful information is found. This implies that clinicians need to collect multiple samples to achieve validity, a task that is not often feasible in a single diagnostic session. However, multiple language samples could be collected to monitor progress of children enrolled in a treatment program. Because the samples are one minute in length, they could be administered more frequently than a traditional language sample analysis. Several samples could be collected over the course of a few therapy sessions and the data could be combined, presumably increasing the validity of the language data. Conversely, these data suggest that sample collection time could be increased to three minutes in length to be valid on their own; this would still be much shorter than many recommendations in the literature (e.g., 10 minutes or 100 utterances) (Leadholm & Miller, 1992; Miller, Long McKinley, Thornman, Jones, & Nockerts, 2005).

Across the measures and listed in descending order, the Number of Different Words, Number of Total Words, Number of Total, and Mean Length of Utterance had the strongest correlations. Though the NDW measure had the strongest correlation, another measure might be selected for implementation with various children. For example, there was very little difference in the intercorrelation strength of the NDW measure and the others, so there would be minimal loss from choosing among these measures. Language transcription is required to use the NDW measure, because it requires examining the language sample in its entirety. A transcription of the language sample may not be needed for the NTW measure, the NTU measure, or the MLU since these measures can be calculated without full orthographic transcription. Emerging evidence has shown that examiners can calculate these measures in real time with a good level of accuracy, which is a substantial benefit to clinical feasibility (Naylor & Heilmann, 2011).

The errors and omissions measure yielded the weakest intercorrelations and produced inconsistent correlations as the number of samples analyzed increased. The likely rationale for this is that the specific errors and omissions did not occur frequently; the children did not produce many errors or omissions during the tasks.

Of the sampling contexts, the description of individual and multi-scene picture context had the strongest intercorrelations overall. These tasks provided the most structure, requiring that the child talk about what was presented in the picture without formulating a story to go with the picture or answer questions to an interview. Because of the structure, there is potentially less variability in the vocabulary available to the child and the response also requires the least amount of discourse organization. Also, the child must organize the structure of the story in a narrative and must respond to the examiner's cues and responses during a conversation. These variables are not a factor in the 1-sentence responses of the individual picture descriptions.

### **Comparison of Children with Language Impairments and Typically Developing Children**

Typically developing children were compared with children with language impairments to investigate differences between groups by comparing the effect sizes from ANOVA tests. It should be noted that these measures are exploratory and should be examined with caution due to the small number of participants used in the study.

Larger the effect sizes found between groups are the result of larger group differences on the elicitation tasks and language sample measures. The largest group differences were found with NDW and ErrOmit measures. Watkins (1995) found that children with language impairments produce significantly fewer different words than typically developing children. Children with language impairments tend to produce more grammatical errors as well as omit more words and morphemes than age-equivalent peers (Bedore & Leonard, 1998). Thus the

results of this study are consistent with previous research findings of children with specific language impairments. The large group differences provide information on measures that can discriminate between those with language impairments and those that do not.

The smallest group differences were seen with the NTU measure, with the typically developing children and children with language impairments producing almost the same number of utterances on the less structured tasks. In addition, the smallest group differences were noted on the interview task when comparing elicitation methods. These small group differences did not distinguish the children with language impairments from typically developing children as much as measures and tasks with larger group differences.

The typically developing children had higher average on MLU. This was expected because research has shown that children with language impairments produce shorter utterances (Watkins, Kelly, Harbers, & Hollis, 1995). Moreover, there were less errors/omissions produced by the typically developing children. NTW had strong intercorrelations on the elicitation task comparisons, but this measure did not prove effective in discriminating between the two groups in the effect size analysis. This is an important factor when searching for measures that can be used to differentiate those with language impairments and those who do not.

### **Limitations**

There were some limitations to this study. The primary limitation was the small number of children in the group with language impairments. Because of the small sample size, the data is representative of the children studied and may not reflect the overall trends of children with language impairments. Studies including larger groups of children with language impairments are needed in the future to account for the heterogeneity of children with such impairments. Furthermore, studies are needed that compare the short language sample measures with well-

established measures like comprehensive language samples and standardized tests. This external comparison measure would improve validity of the short samples.

### **Conclusions**

This study demonstrated that short language samples can provide meaningful information to clinicians. These samples can improve clinical feasibility since they take less time to administer and analyze. They can assist clinicians in making data-based decisions for the purposes treatment planning and progress.

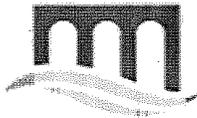
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## Appendix A: Institutional Review Board Approval



### EAST CAROLINA UNIVERSITY

University & Medical Center Institutional Review Board Office  
1L-09 Brody Medical Sciences Building • 600 Moye Boulevard • Greenville, NC 27834  
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb

TO: Alicia Luman, 100 Avery Apt., 302, Chapel Hill, NC 27517

FROM: UMCIRB 4-2-2

DATE: November 29, 2010

RE: Expedited Category Research Study

TITLE: "Use of oral language general outcome measures to classify children according to language status"

#### UMCIRB #10-0687

This research study has undergone review and approval using expedited review on 11.24.10. This research study is eligible for review under an expedited category number 6 & 7. The Chairperson (or designee) deemed this **unfunded** study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of **11.24.10 to 11.23.11**. The approval includes the following items:

- Internal Processing Form (dated 11.10.10)
- Parental Permission Form (received dated 11.19.10)
- Child Assent (received 11.19.10)
- COI Disclosure Form (dated 11.10.10)
- Thesis Presented to the Dept. of CSDL, ECU (July 2010)
- Memo from the PI (received 11.19.10)

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

**The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.**

## Parental Consent for Using Research Data

Dear Parent/Guardian,

I'm presently working on my Masters of Speech Language Pathology at East Carolina University. As part of my degree requirements, I am planning an educational research project to take place in Chapel Hill-Carrboro Schools that will help me to learn more about measuring children's progress in language therapy as they progress through speech therapy services. The fundamental goal of this research study is to determine if the administered assessments provide clinicians with information about how the child is improving in their language skills.

As part of this research project, your child will participate in one 30 minute session that will allow me to administer 12 short tasks. (As this study is for educational research purposes only, the results of each language activity **will not** affect your child's grade. In addition, I will work closely with the classroom teachers to ensure this study is completed during times that do not interrupt direct classroom learning.)

I am requesting permission from you to use your child's data (i.e. language test scores) and to allow your child to participate in my research study. Please understand that your permission is entirely voluntary.

If you have any questions or concerns, please feel free to contact me at school at (704) 796-7491 or by emailing me at lumana09@students.ecu.edu. If you have any questions about the rights of your child as a research participant, you may contact *The University and Medical Center Institutional Review Board* at 252-744-2914.

Please detach and return the form below by \_\_\_\_\_ . Thank you for your interest in my educational research study.

Alicia Luman  
Researcher/Investigator

As the parent or guardian of \_\_\_\_\_  
(write your child's name)

- I grant my permission for Alicia Luman to use my child's data in her educational research project regarding language therapy. I voluntarily consent to Alicia Luman using any of the data gathered about my student in her study. I fully understand that the data will not affect my child's grade, will be kept completely confidential, and will be used only for the purposes of her research study.
- I do NOT grant my permission for Alicia Luman to use my child's data in her educational research project regarding language therapy.

Signature of \_\_\_\_\_ Date: \_\_\_\_\_  
Parent/Guardian:

UMCIRB  
APPROVED  
FROM 11.24.10  
TO 11.23.11

**Child Assent Form**

***This is to be read to the children in order to gain assent:***

My name is Alicia and I am a student just like you. As part of my school, I get to learn about kids and how they talk. You have been asked to participate because you are in kindergarten or first grade. If you decide to participate in this study, you will be asked to talk to me about some pictures, make up a story, and answer some questions.

You do not have to be in this study if you don't want to and you can quit the study at any time. If you don't like a question, you don't have to answer it and, if you ask, your answers will not be used in the study. No one will get mad at you if you decide you don't want to participate.

Other than the researchers, no one will know your answers, including teachers, friends, or strangers. If you have any questions, just ask me.

This research study has been explained to me and I agree to be in this study.

\_\_\_\_\_  
**Subject's Signature for Assent**

\_\_\_\_\_  
**Date**

Check which applies (to be completed by person conducting assent discussion):

- The subject is capable of hearing and understanding the assent form and has signed above as documentation of assent to take part in this study.
- The subject is not capable of hearing the assent form, however, the information was explained verbally to the subject who signed above to acknowledge the verbal explanation and his/her assent to take part in this study.

\_\_\_\_\_  
**Name of Person Obtaining Assent (Print)**

\_\_\_\_\_  
**Signature of Person Obtaining Assent**

\_\_\_\_\_  
**Date**

UMCIRB  
APPROVED  
FROM 11-24-10  
TO 11-23-11

## Appendix B: Elicitation Protocol

### **Task #1: Individual Picture Descriptions**

Directions: **“I am going to show you some pictures and I want you to tell me about them. If I show you a picture of someone digging, you might say, ‘The boy is digging in the sand with a red shovel.’ I want you to make sure you are telling me about what is happening in the picture and use complete sentences when you talk. Use as many details as you can when talking about the picture. Now, let’s try one.”** *Go to Sample A.*

*Show the child Sample A* and say, **“Tell me about this picture.”** If the child does not respond then cue the child again. If they still do not respond then say, **“You might say, The young boy is reading a book with a yellow flashlight”.**

Cueing for Complex Language: **“When you say your sentences, I want you to make sure that you are making the sentences as long as you can. You can use lots of words that describe things like, ‘delicious apple’ or ‘scary bear’”.** *Point to Sample A.* A simple sentence for this one would be **“He is reading”.** A long sentence would be **“The young boy is reading a book with a yellow flashlight”.** *Show Sample B.* For this picture, a simple sentence would be **“She is blowing bubbles”** but a better sentence would be **“The lady in the purple shirt is blowing lots of bubbles”.** Pretend that you are describing the picture to someone that cannot see the picture so you want to tell them as much as possible with lots of details.

*Show Sample C.* Say, **“Let’s try one more. Tell me a long sentence about this picture”.** After the child produces his sentence ask the child, **“Can you think of any words you can add to your sentence to make it longer?”** If the child does not come up with anything then say, **“You could call him big or brown”.** You could say **“The big brown chicken is eating food from the two children”.**

For each picture, say, **“Tell me a long sentence about this picture”.**

## **Task #2: Multi-scene Picture Description**

Begin this section with the following, “**Now I am going to show you some pictures that have lots of things going on. The pictures have a lot of people who are doing different things. I want you to tell me as much as you can about the pictures using long and complex sentences. You can use several sentences for each part of the picture, because there will be many things to talk about. Do you understand?**” If the child does not understand then the directions will be repeated.

Practice: “**Let’s look at this picture. You are start by telling me what you see in the picture. You could say, ‘There are a lot of kids playing at the park’ and then tell me as much as you can about each part of the picture. For example, there is a boy riding a scooter on the top of the page (point to the scooter). You could say ‘There’s a boy riding a scooter up in the top, next to the tree. He has one leg on his scooter and he’s pushing with his other leg. It looks like he’s going fast because his hair is blowing in the wind.’ Use as many details as you can and make it as long as possible. If I ask you to tell me more then just go to another part of the picture and tell me about it. I can’t see the picture so I want you to use as much detail as possible so I can imagine what is happening.**”

Form 1: “**Tell me as much as you can about this picture. Remember, I can’t see the picture so use as much detail as possible. Ready? Go!**” *Start stopwatch.*

>3 second delay, examiner prompts with “**Tell me more about what you see**”.

If the child says they have already talked about everything then say, “**That’s okay. Just keep telling me more about what you see**”.

After 1 minute, ask the child to stop and move to the next picture.

Form 2: “**Tell me as much as you can about this picture. Remember, I can’t see the picture so use as much detail as possible. Ready? Go!**” *Start stopwatch.*

>3 second delay, examiner prompts with “**Tell me more about what you see**”.

If the child says they have already talked about everything then say, “**That’s okay. Just keep telling me more about what you see**”.

After 1 minute, ask the child to stop and move to the next picture.

Form 3: “**Tell me as much as you can about this picture. Remember, I can’t see the picture so use as much detail as possible. Ready? Go!**” *Start stopwatch.*

>3 second delay, examiner prompts with “**Tell me more about what you see**”.

If the child says they have already talked about everything then say, “**That’s okay. Just keep telling me more about what you see**”.

After 1 minute, ask the child to stop and move to the next picture.

### **Task #3: Narrative Picture Description**

*Show Sample picture.* Say, “Now I’m going to tell a story that goes with the picture you see here (*point to Sample*). I want to you listen very carefully to my story and listen to all of the parts. I’m going to tell you about things that happened before this picture, in this picture, and after this picture. Good stories have exciting characters that do interesting things. I want you to listen carefully because when I am finished, you are going to make up a story about another picture.”

“I’m going to call this story “The Grocery Problem”. Now I’m going to start by telling you about things that happened before the picture. Once upon a time, there was a woman named Hannah. She was always busy with her job and taking care of her children. One day she needed to go to the store and get some groceries. Next I’m going to tell you about things that are happening in the picture. Hannah found all of the different things she needed to make dinner that night. She got in line to pay for her groceries. The man at the cash register put all of the groceries in a big paper bag. The bag was very full and it was heavy. Hannah paid the man for the groceries and started to leave. Right before she walked out the door, her bag ripped and all of the food she bought fell onto the floor. The eggs and milk broke and made a huge mess. She was not sure what to do. Last, I’m going to tell you about things that I think happened after the picture. The man working at the store didn’t want anyone to slip and fall on the mess so he went to get a broom to clean it up. Another man at the store helped Hannah replace all of the groceries that had broken. Hannah was so happy that someone helped her get more groceries and clean up the mess. Did you hear how I described all the important parts that you need when you tell a good story? My story has all of the important parts: a setting, characters, events, a problem, and a resolution.”

Form 1: “Here is a picture that I want you to tell a story about. In the picture, there is some sort of problem. I want you to look at it carefully and think of a story to tell. Think about what happened before the scene in the picture, what happened in the picture, and what happened afterward. Try to tell the best story and include as many details as you can think of. Make your story as long and as complete as you can. Think about your story now.” (*Start stopwatch*).

After 30 seconds say, “Now I would like you to tell me a story about the picture. Remember to tell me about things that happened before the picture, in the picture, and after the picture. Make it as long and as interesting as possible.”

If the child fails to begin speaking after 5 seconds, then tell the child “**Tell me how this story begins.**” If the child fails to respond after another 5 seconds then rephrase the question into “**How does the story begin?**” If there is still no response then discontinue testing.

Extending the narrative

1. If the child pauses for more than 5 seconds and has not finished his story, ask for more information by using an open ended statement like “**Tell me about what happened next**”.
2. 3 elicitation cues can be given, if needed.

Form 2: **“Here is a picture that I want you to tell a story about. In the picture, there is some sort of problem. I want you to look at it carefully and think of a story to tell. Think about what happened before the scene in the picture, what happened in the picture, and what happened afterward. Try to tell the best story and include as many details as you can think of. Make your story as long and as complete as you can. Think about your story now.”** (*Start stopwatch*).

After 30 seconds say, **“Now I would like you to tell me a story about the picture. Remember to tell me about things that happened before the picture, in the picture, and after the picture. Make it as long and as interesting as possible.”**

If the child fails to begin speaking after 5 seconds, then tell the child **“Tell me how this story begins.”** If the child fails to respond after another 5 seconds then rephrase the question into **“How does the story begin?”** If there is still no response then discontinue testing.

Extending the narrative

1. If the child pauses for more than 5 seconds and has not finished his story, ask for more information by using an open ended statement like **“Tell me about what happened next”**.
2. 3 elicitation cues can be given, if needed.

Form 3: **“Here is a picture that I want you to tell a story about. In the picture, there is some sort of problem. I want you to look at it carefully and think of a story to tell. Think about what happened before the scene in the picture, what happened in the picture, and what happened afterward. Try to tell the best story and include as many details as you can think of. Make your story as long and as complete as you can. Think about your story now.”** (*Start stopwatch*).

After 30 seconds say, **“Now I would like you to tell me a story about the picture. Remember to tell me about things that happened before the picture, in the picture, and after the picture. Make it as long and as interesting as possible.”**

If the child fails to begin speaking after 5 seconds, then tell the child **“Tell me how this story begins.”** If the child fails to respond after another 5 seconds then rephrase the question into **“How does the story begin?”** If there is still no response then discontinue testing.

Extending the narrative

1. If the child pauses for more than 5 seconds and has not finished his story, ask for more information by using an open ended statement like **“Tell me about what happened next”**.
2. 3 elicitation cues can be given, if needed.

#### **Task #4: Structured Interview**

Begin this task by saying, “**Now I’m going to ask you about things that you like to do and I want you to tell me as much as you can and I want your answers to be full of details. For example, if someone asked my pets, I would tell them all about my dog. (Pause for 2 seconds). My dog’s name is Buddy. He’s a big dog with soft yellow fur. My mom got him for me. We went to the pet store and there were a lot of dogs outside. They were dogs that needed new homes. Before we brought him home, we had to make sure we had everything he needs. We built him a fence and got him a dog house. He loves to go for walks and I take him out every morning.**”

**“You just heard me tell you about something that I really like. Now I’m going to ask you about things you do. I want you to tell me as much as you can. Do you understand?”**

### *Prompting*

Initiating the story:

Start stopwatch after asking the first scripted question.

After 5 seconds with no response then rephrase the question.

If there is still no response after another 5 seconds then rephrase the question again.

Expanding the Conversation:

Allow the child to talk about the topic at hand.

After a 3 second pause, ask for more information by using an open ended statement like “**Tell me more about \_\_\_\_\_**”.

5 elicitation cues can be provided.

After 5 cues, move on to the next question.

After 1 minute, go to the next question set.

### Form 1

What can you tell me about your family?

Tell me about a time when you got hurt.

What do you like to do outside?

### Form 2

Tell me about some TV shows or movies you watch?

What can you tell me about your friends?

Can you tell me about a trip or vacation your family took?

### Form 3

Tell me about where you live.

What do you do when it’s raining outside?

What does your family do for dinner?