

THE EFFECT OF COGNITIVELY CHALLENGING CONVERSATION ON ORAL
LANGUAGE DEVELOPMENT IN LOW-INCOME PRESCHOOL CHILDREN

by

CHRISTOPHER L. MACLEAN

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Abstract

CHRISTOPHER L. MACLEAN

The Effect of Cognitively Challenging Conversation on Oral Language Development in Low-Income Preschool Children

(Under the Direction of Dr. PAULA SCHWANENFLUGEL)

Preschool children growing up in poverty have fewer opportunities to practice complex language skills and consequently enter kindergarten linguistically and academically disadvantaged. To learn how to enhance oral language skills within this population, a ten-week intervention was employed with children attending lottery-funded universal prekindergarten classrooms serving low-income preschoolers. Experimenters, who met twice a week for 10 weeks with pairs of students, engaged children in a total of 500 minutes of cognitively challenging conversation. Pre- and post-test language sampling included the use of guided conversation, speech stems and the narration of a wordless picture book. Mean length of utterance at the word level (MLUw) was used as a gross measure of oral language ability. Results were compared with a control group, matched at pre-test on Expressive Vocabulary Test scores. Experimenters provided cognitively complex input by elaborating on child speech using various methods, including imitation, extension, expansion, recast, repetition, clarification and open-ended questions. Findings indicate that children made greater gains in MLUw as a function of the intervention and displayed significantly higher MLUw post-test scores than children in the control group. Results suggest that providing an additional 500 minutes of complex input can promote language development in academically disadvantaged children.

INDEX WORDS: Cognitively Challenging Talk, Oral Language Development, Preschool Children, Poverty, MLU, Early Literacy, Psycholinguistics

CHAPTER 1 INTRODUCTION

In the United States approximately 20% of children under the age of six live in poverty (National Center for Children in Poverty, 2004). For these youth, opportunities to practice complex oral language skills are limited by poverty-related factors such as young maternal age and extensive work hours, depression, use of intoxicants and low education levels of parents (Duncan & Brooks-Gunn, 1994). These foundational oral language skills interest educational researchers and policymakers because they influence academic performance. Since preschool language growth is linked with later school success (Aram, Ekelman, & Nation, 1984), enhancing early oral language development has been highlighted as a possible route towards closing the academic achievement gap between low and high-income students.

Despite their fundamental role in preparing children for kindergarten, oral language skills receive little sustained attention in early childhood education classrooms. One possible factor contributing to the lack of curricular emphasis in preschools is the traditional downplay of academic learning during this time. Until very recently, childcare facilities have focused primarily on social support, balanced meals and safe play environments (Ramey & Ramey, 1992). Even programs with explicit remediation intent, such as Head Start, usually have minimal training requirements for childcare teachers that stress health and safety practices over academic enrichment.

Current educational policy initiatives, such as No Child Left Behind, have renewed interest in examining the effects of academic learning in early childhood education. There is increasing support that foundational language skills can be introduced effectively in preschools

using developmentally appropriate methods (Schwanenflugel et al., 2005). Research has also provided support for early intervention efforts targeting language and literacy skill development (Hargrave & Senechal, 2000; Whitehurst et al., 1988). Since language skills learned before kindergarten have lasting effects on school achievement (Maxwell & Wallach, 1984), oral language development and academic learning in preschool is vital in preparing children for educational success.

Demographics

The challenge in supporting language development becomes increasingly complex as the nation's population of preschool-aged children becomes more diverse. The proportion of preschool children learning English as a second language, as well as children born to new immigrant families, has steadily increased within the last few decades (Annie E. Casey Foundation, 2005). Consequently, the number of young children entering schools from homes where English is not spoken has grown since 1990 (U. S. Census, 2005). Variation in oral language development among young children is significantly correlated with socioeconomic status, with variables connected to poverty having lasting influences on academic ability and dropout likelihood (McWayne, Fantuzzo, & McDermott, 2004). Both poverty and lack of English language competence call for methods that support language development.

Home Environments

Features of the home environment have powerful influences on oral language development. Children born into middle and high socioeconomic status families tend to engage in more interactive discussions with parents and may participate in frequent book reading

activities and trips to libraries, museums or other locations conducive to engaging conversation. These children are usually guided by a parent with explicit interest in building language skills (Hart & Risley, 1995; Hoff, 2003). A complex conversation style is usually employed that involves analyzing, predicting, summarizing, clarifying or evaluating (Dickinson & Smith, 1994). Conversely, talk directed at children growing up in low-income families tends to include more imperatives and prohibitions that focus on obedience. This concrete conversation style also takes the form of questions testing knowledge of basic facts. The differences in conversation practices used by families appear to result in dramatic discrepancies in oral language ability of preschool students at school entry.

Another feature of family conversation that influences language skill is the use of decontextualized language, talk that discusses abstract concepts and concepts not readily observable in the present. Examples of decontextualized language include elaborated explanations, personal narratives or pretend play. Again, families with higher incomes use more decontextualized language with their children (Curenton & Justice, 2004). As a result, these youths tend to score higher on language measures at school (Snow et al., 1991).

Preschool Settings

Research on language use in preschools finds that preschool teachers talk relatively infrequently to children. In one study of university-affiliated preschools with particularly low teacher-student ratios (1:4) and high teacher education levels, Wilcox-Herzog and Kontos (1998) found that over 80% of the time teachers did not engage children in conversation, even when they were less than three feet away. These findings suggest that although teachers physically place themselves near children, they do not necessarily engage them in conversation.

Preschool teachers spend most of their time facilitating play and attending to management. This trend appears even more prominently in centers serving primarily low-income children (Tabors, Snow, & Dickinson, 2001). In some settings, over half of teachers' speech centers around providing children with assistance in obtaining objects, managing behavior, supporting children in developing peer relationships, praising children for proper behavior or providing instructions (Dickinson & Smith, 1991; Dickinson, de Temple, Hirschler, & Smith, 1992; Kontos & Keyes, 1999).

One explanation for these findings focuses on teacher education levels, which are notoriously low in early childhood classrooms. For centers serving children in poverty, funding levels provide minimum wage salaries that target unskilled workers who tend to use less challenging language constructions than those associated with higher education levels and salary. Even federal intervention programs such as Head Start, which theoretically emphasize enrichment, have narrowed potential language enrichment by hiring the parents of children at the center. This population is not likely to have a high level of education. A lesser degree of education does not always result in the use of less enriched language, but limited knowledge of developmentally appropriate childcare practices is likely to result in fewer positive teacher-child interactions (Burchinal & Roberts, 1996; Pianta et al., 2005).

Measuring Language Growth

Mean length of utterance (MLU) was first employed as a gross measure of language development (Brown, 1973) and is currently used as a common assessment tool for examining expressive language ability. Recent research has also shown that MLU is strongly related to the total number of different words used by the child. This research sheds light on child vocabulary

development, a pillar of later literacy success (Dethorne, Johnson, & Loeb, 2005). As the current project was conducted in conjunction with a doctoral project examining vocabulary growth, further relationships between MLU and *d*, a measure of lexical diversity, will be discussed in later scholarly papers.

MLU is also considered an effective tool in identifying speech disorders in children (Einsberg, Fersko, & Lundgren, 2001). One study on MLU indicated significant differences between two groups of children, one with specific language impairments and the other without any such problems. Assessments showed that children without specific language impairments displayed significantly higher MLU than their peers with language impairments. These findings support the idea that MLU is useful in making judgments about the sophistication of language ability.

To calculate MLU, child speech is first transcribed and separated into individual utterances. Typically, for the purpose of calculating MLU, an utterance is defined as connected speech with pauses lasting less than two seconds where there are no major changes in intonation or attention. In the past, the total number of utterances was divided by the total number of morphemes to obtain a ratio, MLU_m. Recent research, however, has shown that simply using the number of words in each utterance, when converted properly, is almost perfectly correlated with calculations using morphemes (Parker and Brorson, 2005). Much current research now uses mean length of utterance at the word level (MLU_w) as a measure of language sophistication. To avoid introductory or closing conversation effects that might bias results, such as shyness or problems focusing on the task at hand, the literature suggests using the middle 50-100 utterances from the sample (Retherford, 2000). One study, however, showed no significant differences in MLU in differing transcription lengths (Brorson & Dewey, 2005). Regardless, the current project

used the middle 50 utterances of each sample to examine changes in participant MLUw as a function of the intervention.

Statement of Purpose

The purpose of the study was to examine one method for enhancing oral language skills in preschool classrooms by focusing on the provision of 500 minutes of cognitively complex conversation during the schooldays. Although preschool curricula may note the importance of verbal practices, they do not typically include a systematic way for teachers to engage children in conversation. If intervention data indicates that this amount of elaborative talk has a positive effect on oral language development, cognitively challenging discourse between classroom leaders and children can be used during literacy instruction. This challenging discourse in turn should have a direct effect on language growth, ideally resulting in improved reading ability and school achievement for children beginning elementary school.

CHAPTER 2 METHOD

Participants

Children. Participants included 20 children with a mean of 4.45 years of age at the beginning of the study who were attending lottery-funded prekindergarten classrooms in private childcare facilities in the southeastern United States. The population sample represented only normally developing English speaking children as determined by Expressive Vocabulary Test (EVT) scores collected during pre-testing. Roughly equal numbers of boys and girls were present in both conditions.

Experimenters. Undergraduate students with a minimum of one semester of experience in carrying out instruction, tutoring or intervention with young children conducted the pre- and post-testing. These students carried out the conversation intervention as well. A doctoral student and multiple faculty members from the local university provided training and continuous supervision. The experimenter team met regularly, exchanged and updated information about the progress of the intervention and received instruction for upcoming conversations throughout the research project.

Design

The experiment used a 2 group (intervention versus control) X time design in which group served as a between-subjects factor and time was a within-subjects factor. Children were matched at pre-test on EVT scores collected during the pre-testing phase. Students were paired both within center and within an individual preschool class to limit the effects of different

literacy instruction between teachers. A two-tailed t-test compared EVT percentile scores for the two groups, yielding a non-significant value ($p = 0.86 > 0.05$). Each of the experimenters was randomly assigned pairs of children with whom they met for 25 minutes twice each week for 500 minutes total. Children were paired according to teacher recommendations, with an emphasis on placing compatible children together. Children in the control group received no additional minutes of conversation.

Experimenter Training

Undergraduate students conducting the conversations attended a two hour training session prior to the beginning of the intervention (Appendix A). Training focused on a variety of techniques to elaborate on child language. Strategies included spending extra time for the child to process questions, allowing the child to take the lead in conversation by asking follow-up questions about the topic presented, and listening to the child to promote extensive descriptions of ideas and concepts.

Experimenters learned to imitate and repeat the children's responses to express interest in what they had to say and especially to focus on questions using how or why to prompt the children to continue talking about their thoughts. Turn-taking between children was highlighted as a way to encourage additional conversations besides just those conducted with the experimenter.

In cases in which children showed some reluctance to talk with the experimenter, the training procedure recommended slowing the pace to allow the child to engage in dialogue at a more comfortable pace or asking force-choice questions to limit the difficulty in responding verbally. Mid-intervention recordings were taken with each child in the experimental condition

to ensure that experimenters were adhering to the procedures described. During the intervention, supervisors also met regularly with experimenters to discuss progress, answer questions and provide ongoing feedback.

Procedure

Assessment. Assessment employed oral language sampling that included guided conversation concerning daily routines, speech stems in the form of photographs and the narration of a wordless picture book (Appendix B). Experimenters first asked children to describe activities that take place in the classroom they particularly enjoy. Experimenters were instructed not to provide leading questions and to simply allow the children to discuss and elaborate on their responses. Discussion focusing on games or units taking place within the child's classroom was particularly effective in encouraging children to speak with the experimenters. Next, experimenters asked children what they like to do when they are not in school, with experimenters using similar open-ended questions, typically highlighting family relationships.

Experimenters then presented the child with a series of pictures of common sites or practices with which the child would be expected to be familiar. Some of these included photos of Santa Claus, McDonalds, a doctor's office or a bumblebee. Experimenters explained what the child was looking at ("One time I was working in my garden and I got stung by a bee, do you see the bee?") and then asked the child to respond using an open-ended question style ("Have you ever been stung by a bee? What was it like?"). Experimenters aimed to elicit three thorough responses from each child.

For the third task, experimenters asked children to tell their own stories using one of two wordless picture books, *Good Dog Carl* or *Carl Goes Shopping*. Both books focused on practical daily routines with which children would be familiar, such as going to a store, taking a bath and eating food in the kitchen. Experimenters used the books as a base for children to talk about what they saw. Again, experimenters avoided leading questions as much as possible to allow the children to direct the conversation. To the extent possible, testers also avoided introducing new topics or words in prompting children to talk. Picture books were counterbalanced within groups for both pre- and post-testing. All pre-testing took place two weeks before the intervention. Post-testing was completed within two weeks following the intervention. A tester who had not provided the intervention to a child administered the child's post-tests.

Intervention. The intervention engaged pairs of children in two 25-minute conversations per week using the conversation techniques previously described. A total of 500 minutes of conversation was completed with each child in the experimental condition. Conversation partners were kept with the same pairs of children to maintain consistency. Conversation topics, for example school, family or play time, were provided for each session as well.

Analysis of transcripts. To calculate MLUw, experimenters first transcribed language samples from audio recordings using a software program called Transcriber according to CLAN requirements. *RES indicated experimenter speech, while child speech used *CHI. Speech utterances were segmented using punctuation marks after pauses lasting more than two seconds in duration or at changes in intonation or attention. Repetitions, stuttering, and unintelligible words or sounds were excluded from calculations by surrounding such phrases in brackets. As it takes a fair amount of time for some children to engage in conversation, the middle 50 utterances were examined using the +z CLAN switch to obtain a more representative utterance sample

(MacWhinney, 2000). In this way, shy children were not punished for early hesitance to speak with the experimenter.

CHAPTER 3 RESULTS

It was hypothesized that children in the experimental group would exhibit significantly higher MLUw scores following the intervention compared to those in the control condition. This data is described in Table 1. A two-tailed t-test comparing the two MLUw pre-tests verified that the two groups were not significantly different before the intervention ($p = .97 > .05$).

To analyze the data, researchers used a 2 (groups) X 2 (time point) mixed measures ANOVA with time as the within-subjects measure and groups as the between-subjects measure. Analyses indicate a significant time X group interaction $F(1, 18) = 10.24, p = .005, partial \eta^2 = .363$. The form of this interaction indicated that intervention children made greater growth in MLUw than control children. These results support the original hypothesis that children in the experimental condition would perform significantly better on post-testing measures than those in the control condition. Figure 1 demonstrates these findings graphically.

Table 1

Mean MLUw as a Function of Time and Group

<u>Condition</u>	<u>MLUw Pre-test Mean</u>	<u>MLUw Post-test Mean</u>
Experimental	4.10	5.16
Control	4.09	4.24

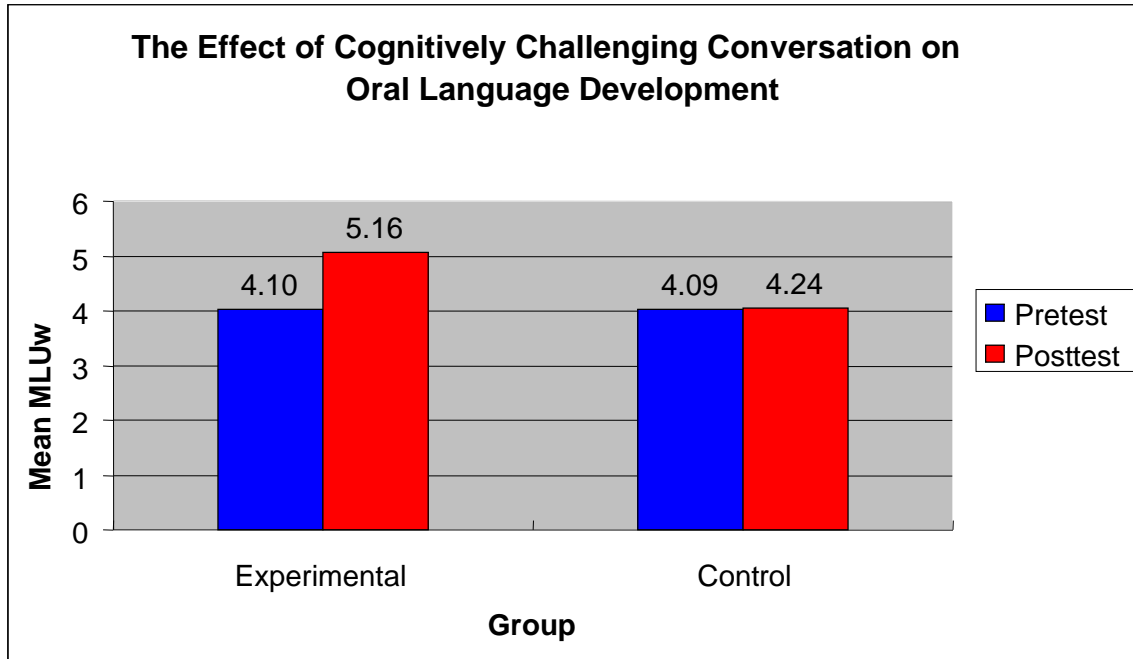


Figure 1 *Conversation and Oral Language Development*

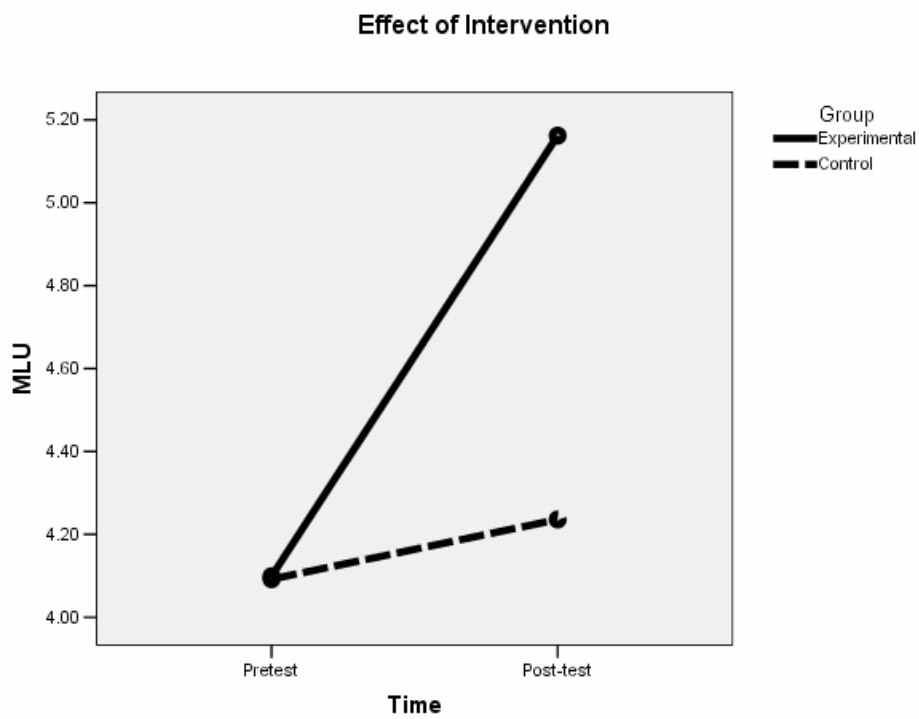


Figure 2 *Intervention and MLU*

CHAPTER 4 GENERAL DISCUSSION

Results indicate that children's oral language development can be enhanced by the regular use of cognitively challenging conversation, in this case a total of 500 minutes. As originally hypothesized, children engaging in complex conversation showed significantly higher MLUw scores than their matched peers in the control condition receiving no additional conversation. Study findings call for reform of instructional practice in preschool settings, particularly those serving low-income communities. A standardized teacher training program, focusing primarily on techniques to enhance children's oral language skills, should be developed in conjunction with modification to No Child Left Behind litigation targeting interactions between preschool teachers and students. Specific educational units could be developed, lasting 15-25 minutes, during which children could engage in complex conversation in small groups on a regular basis. These curriculum units could be integrated into regular school activities to supplement other literacy development strategies.

Another possible application would be to offer ongoing workshops throughout the school year during which preschool teachers could meet with educational researchers. These meetings would provide the opportunity for instructors to discuss their experiences supporting oral language development in the classroom and would give researchers the chance to share recent findings within the field. Armed with strategies shown to increase children's oral language development, teachers could then attempt to integrate complex conversation styles into multiple school lessons and provide feedback to researchers and policy makers.

The nature of cognitively challenging conversation requires teachers to interact with children individually or in very small groups because it requires extensive elaboration of child speech at the individual level. In a classroom of 20 or more students, it becomes nearly impossible for an instructor to manage large numbers of complex conversations. Therefore, another strategy to support early language development in preschools is to hire more teachers or part-time conversation facilitators. Logically, more trained teachers in the classroom should increase the amount of time each instructor can spend with each student, ideally resulting in more complex conversation opportunities. Theoretically, trained volunteers could supply many of the same functions used in the current study. In this case, results indicated that students from the nearby university with fairly limited training who committed to carrying out the intervention had profound effects on children's language growth within a relatively short length of time.

Preschools should also collaborate with families to maximize oral language development. Regular meetings should be scheduled to allow teachers to share child observations and to give parents the chance to voice their ideas for successful expressive language growth. This would ensure that families are aware of current research in language development, making it possible to apply findings in the home environment. Combined with modified teacher instruction and increased funding for preschool centers, oral language development among preschool students should be expected to increase. This oral language development in turn should have a direct impact on children's expressive language ability, resulting in a dramatic increase in academic achievement during the school years.

Future research might explore the relationship between attachment and oral language development. When interviewed about their experiences at the end of the intervention, all experimenters reported that they felt positive risk taking using oral language occurred in

conjunction with positive feelings of attachment. In other words, experimenters reported that once children seemed to feel safe and comfortable with the experimenter, they began to engage in more elaborate conversation. Should it be found that attachment between students and teachers is positively linked to oral language development and complex conversation, strategies could be designed to enhance rapport within the classroom. Therefore, the next step in this line of inquiry would be to examine the development of attachment across time while simultaneously taking note of oral language growth.

APPENDIX A
GUIDELINES FOR CONVERSATIONS

Guidelines for Conversations

Let the child lead:

- ❖ Provide pause time to allow the child to initiate talk. Typically, adults give children one second to respond before jumping in. Many children need much longer to process questions or information. Increase your wait time (count to ten slowly). Wait for the child to initiate. The initiation may not always be language; it might be pointing at a toy or picture.
- ❖ Follow the child's lead in conversation and respond to their focus of interest.
- ❖ Try not to change the subject.
- ❖ Listen when the child is talking; try not to interrupt their flow. Show interest through your facial expression or encouraging sounds.
- ❖ Try to be sitting face-to-face or side-by-side, showing joint attention.

Responsiveness:

- ❖ **Imitate** – Repeat what the child says using similar facial expressions and gestures. This lets the child know that you are interested, engaged and listening. Nod to indicate that you are understanding.
- ❖ Model language by using extensions, expansions and recasting.
 - Child: My sister Jennie there (pointing to classroom)
 - **Extension:** Your sister Jennie is there in the other classroom. What is she doing?
 - **Expansion:** Your sister Jennie is here in the same school. What can you tell me about Jennie?
 - **Recast:** Your sister Jennie is in the three year old classroom?

- ❖ Introducing vocabulary naturalistically into conversation through recasting and expansions of children's utterances.
 - Child: There aren't very many trikes.
 - **Vocabulary Recast:** *So tricycles are rare at your school? Are any other toys rare?*
- ❖ Child: She ain't got a book.
- ❖ **Repetition** with question: I wonder why she doesn't have a *storybook*.
- ❖ Ask **open-ended** questions: 'Tell me about this' or 'How do you do that?' or 'Why do you think that happened?'
- ❖ Ask **clarifying** questions,
 - Instead of 'That's such a great picture,' 'Tell me about that picture you drew.'
- ❖ You don't need to correct language or grammar directly. This can be done implicitly by repeating what was said with more context or in a standard form.
- ❖ Introduce topics in a vocabulary rich way: 'Look out the window at the hawk on the *oak* tree. I wonder what it is searching for, what kind of prey, maybe a mouse. What do you think it is doing?'

Turn-taking in conversation:

- ❖ Children may use a set of conversation rules at home that is different than those commonly used at school.
- ❖ Encourage children to balance turn-taking and build upon ongoing subjects in their conversation pairs.
- ❖ Encourage more than one turn on each subject.
- ❖ Be clear that you are encouraging the other child to take a turn when one is dominating.
- ❖ Urge them to clarify misunderstandings about the subject.

With children who show some reluctance:

- ❖ Try to establish joint attention with a toy, a picture or an activity.
- ❖ Make sure that you don't communicate pressure to talk.
- ❖ Slow the pace.

- ❖ Adapt your language to be simpler at first.
- ❖ Ask simple questions to keep the child part of the conversation. Even a question that will elicit a one word answer might be okay to keep things moving.
- ❖ Ask questions that demonstrate that you are listening and checking in that you are understanding the story.
- ❖ Ask questions with a forced choice.
 - On the playground do you like to play on the swings or the slide?
- ❖ Avoid questions that sound like a test with a ‘right or wrong’ answer.
- ❖ Avoid questions that are very concrete.
 - Ask ‘What was snack like?’ instead of ‘What did you eat for snack?’

A welcoming environment:

- ❖ Introduce topics about real-life situations.
- ❖ Talk about the environment, ‘It’s *freezing* in the hall today. What *temperature* do you like?’
- ❖ ‘Look at that drawing of a dog on the wall. My dog escaped into the yard today and I had trouble getting him in. Have ...’

Becoming a better story teller:

- ❖ By your active listening and responsiveness you can help children become more skilled at telling an engaging story. Prompt for missing information, including background details, specific vocabulary and relevant information.
- ❖ Model story telling.
- ❖ Encourage a story: ‘I bet you did something fun over the weekend.’
- ❖ Encourage imitations, ‘What does your father sound like when he’s trying to ... (whatever the story is about, i.e. ‘get everyone in the car.’)

In the case of a sensitive topic:

- ❖ As we are not counselors, try not to bring up a sensitive topic yourself. If a child initiates one (i.e. about divorce), listen responsively and be supportive. If a child discusses abuse,

listen, take notes and contact me immediately (cell- 706-614-8660) or Dr. Schwanenflugel (cell-706-296-8317). If you are unable to reach either of us, talk to the Center Director and provide her with the details and the notes. Don't leave the Center without sharing the information with us or the person at the highest level.

Props (discussion starters): Play telephone, photos from magazines and catalogues, pictures of your family or your animals, toy figures, phone, books, play dough or something of particular interest to the child that might be found in a childcare center.

Weekly Conversation Stems:

- 1 Family
- 2 Extended family/pets
- 3 Injuries, going to the doctor, visiting the hospital
- 4 Friends, play, sports
- 5 Birthdays, holidays, celebrations
- 6 Photo prompts of places in Athens/nature
- 7 Home/neighborhood
- 8 School, activities, teachers
- 9 Art, music, building
- 10 Family

APPENDIX B
LANGUAGE SAMPLE PROTOCOL

Language Sample Protocol

Conversational context (5 min) (Evans & Craig, 1991)

Interview with the child. Respond to child with rewording of child's comments or "that's interesting, tell me more about that." Try to avoid leading questions. Allow the child to take the lead.

- Tell me about the sorts of things you do in the classroom. What do you like to play with?
- What do you like to do when you're not in school?
- Do you have any brothers or sisters?

Personal narrative (aim is to elicit at least 3 personal narratives) (Peterson & McCabe, 1983)

- "I also brought some photos to show you" (Talk about the photos as outlined below. If the child responds "no," go to the next photo. If the child says "yes," ask him/her "Can you tell me about it?")

Prompts

- Oh look, this girl fell off the bars and hurt her knee. She had to go to the emergency room, and they put a cast on. Have you ever broken anything? Did you ever hurt yourself on the playground?
- Can you see the bee on the flower? I got stung by a bee once. Did a bee ever sting you?
- This little girl had to go to the doctor because she had a bad cough. Have you ever been to the doctor?
- The dentist visited my daughter's (sister's) school last year. All the children had to go for a check-up. Have you ever had a toothache? Have you ever been to the dentist?
- Look, this is Santa. He visited my daughter's (sister's) school last year. Have you ever seen Santa anywhere?
- These children went on a school trip. They all went on a bus to the zoo. Have you ever been on a school trip?
- Oh look who's this? (Ronald McDonald). I went to a birthday party at McDonalds last year. Have you ever been to McDonalds?

Story narration:

Books: *Good Dog Carl* and *Carl Goes Shopping*

- I would like to hear you tell a story using the pictures in this book, but the story can be from your own imagination. Would you like to do that? There is no right or wrong story; you can make up any story to go along with the pictures.

Prompts:

- Repeat what the child said. Can you tell me more? What's happening? What else do you see?

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