Masthead Logo

Brigham Young University
BYU ScholarsArchive

All Theses and Dissertations

2019-04-01

A Discourse Analysis of Clinician-Child Interactions Within a Meaning-Based Phonological Intervention

Brittany Appleby Long
Brigham Young University

Follow this and additional works at: https://scholarsarchive.byu.edu/etd

BYU ScholarsArchive Citation

Long, Brittany Appleby, "A Discourse Analysis of Clinician-Child Interactions Within a Meaning-Based Phonological Intervention" (2019). *All Theses and Dissertations*. 7364.
https://scholarsarchive.byu.edu/etd/7364

This Thesis is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in All Theses and Dissertations by an authorized administrator of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.

A Discourse Analysis of Clinician-Child Interactions Within a Meaning-Based Phonological Intervention

Brittany Appleby Long

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Science

Barbara Culatta, Chair
Bonnie Brinton
Martin Fujiki

Department of Communication Disorders

Brigham Young University

Copyright © 2019 Brittany Appleby Long

All Rights Reserved

ABSTRACT

A Discourse Analysis of Clinician-Child Interactions Within a Meaning-Based Phonological Intervention

Brittany Appleby Long
Department of Communication Disorders, BYU
Master of Science

This qualitative study analyzed interactions between clinicians and a male child, aged 5 years 9 months old, with significant phonological as well as language deficits within a meaning-based phonological intervention implemented over a nine-month period. Play-based intervention strategies were presented in activities that varied in communicative complexity. The clinician, along with graduate-student assistants, frequently modeled and elicited target word productions as they interacted with the child in routines and scripted play contexts. Transcriptions of interactions were analyzed using a conversational analysis that explored engagement and participation, turn taking, and linguistic complexity of utterances produced in adjacent turns. The analyses illustrated ways in which the clinician's structuring of the activities influenced the child's participation. The turn taking exchanges were topically related when dealing with shared, immediate context. The reciprocal nature of the turn taking exchanges, and the child's grammatical productions were analyzed. The study suggests that contextualized intervention can make speech sound production relevant for children with phonological production as well as language deficits.

Keywords: meaning-based intervention, communicative context, speech-sound disorders

ACKNOWLEDGMENTS

Many thanks are due to the people who supported and encouraged me through this project. First, I would like to thank my thesis advisor, Dr. Culatta, for her constant patience and expansive expertise. I'm grateful for the many opportunities she provided for me to learn and teach about communication. This project would not have been possible without her dedication and persistence.

Next, I would also like to thank the other people who assisted in this project. Dr. Brinton and Dr. Fujiki for serving as committee members and providing their feedback, Dr. McPherson for serving as a proxy advisor, and Sandy Alger for keeping me organized and cheering me on. I would also like to thank Lee Ann Setzer for her research and great example of a master clinician. I have learned so much from watching her, and her graduate students, interact authentically and enthusiastically with CP in the recorded sessions.

Finally, I would like to thank my family for their love and support. My parents, for encouraging higher education and making it possible, Beth and Jeff for celebrating the small successes, and my husband, Roy, for his incredible patience and support throughout my graduate work.

TABLE OF CONTENTS

LIST OF TABLES

DESCRIPTION OF THESIS STRUCTURE

This thesis, A Discourse Analysis of Clinician-Child Interactions within a Meaning-based Phonological Intervention, is written in a standard thesis format that includes a literature review, method, results and discussion sections. Appendix A contains a list of conventions used for the transcription coding in this study. Appendix B contains the coded transcriptions. This thesis follows APA formatting guidelines.

CHAPTER 1

Literature Review

Language and phonological production errors frequently are treated by speech-language pathologists as independent deficit areas. While these disorders can occur in isolation, they are often comorbid conditions (Pennington & Bishop, 2009). A phonological intervention can be conducted in very interactive contexts that can also facilitate language and communication. Implementation of a communicative and linguistically-facilitative phonological approach requires the clinician to understand the relationship between speech and language, ways in which language and speech interact in natural communication, and options for addressing speech sound disorders in interactive contexts that can facilitate communication and language as well as phonological productions.

The Relationship Between Phonology and Language

Phonology is the study of the sound system of a language, which includes the rules for combining sounds (American Speech-Language Hearing Association, 1993). Being one component of the language system, phonology interacts with semantics, morphology, syntax, and pragmatics.

Phonology and semantics. Phonological productions are inherently connected to semantics, the meaning expressed in linguistic symbols, typically conveyed through spoken words and basic word combinations known as *semantic relations* (ASHA, 1993). Children's development of semantics is generally considered to encompass the breadth and depth of their vocabularies and growth in word knowledge. Word knowledge includes knowing (a) the sequence of sounds that make up a word, (b) conceptual knowledge of what the word is referencing, and (c) the part of speech or word class for that particular word (ASHA, 1993). For example, a 2-year-old child who has a developing knowledge of the word *cat* may know that the

sound sequence of /*kæt*/ refers to the furry, four-legged animal that meows. This involves pairing the sound sequence that she has heard to the characteristics that all cats share. While she does not need to be able to explicitly specify that the word /*kæt/* is a noun, she can reveal her underlying understanding of the part of speech through combining words such as *my cat*, *big cat*, or *cat go*.

Each part of word knowledge; meaning, sound structure, and part of speech; is necessary for a shared symbolic system of language to function properly. An incorrect sequence of sounds, whether receptively stored or expressively produced, often leads to misunderstandings or communication breakdowns. For example, if a child had an atypical representation of the sounds and the sound sequence for the word *cat,* she might produce /*kæ/*, /*æt/*, /*æ/, /tæt/* or */kæk/*. The child's use of incorrect sequencing and sound selection could lead to communication breakdowns.

The ability to correctly store the sounds and sequences that make up words is referred to as a *phonological representation*. If a phonological representation of a particular word is intact, the correct sounds will generally be stored in the correct order without any sounds being omitted or added. However, children with significant speech sound disorders are likely to have difficulty perceiving, storing or retrieving the sounds of certain words in a sequence. For example, a child who demonstrates the phonological simplification of final consonant deletion might have difficulty (a) perceiving final consonant sounds in words, (b) storing a phonological representation of final consonants, or (c) accessing final consonants when retrieving sound sequences. This often leads to difficulties differentiating between similar-sounding words, such as *go and goat*, which would both be produced and stored as */go/*. If the words are both perceived, stored, or retrieved as */go/,* a loss of meaning occurs which leads to difficulty conveying semantic knowledge.

Phonology and morphology. Morphology is also interconnected with phonology. *Morphology* refers to the study of the structure and composition of words (ASHA, 1993). Words are built using morphemes, the smallest unit of meaning. For example, in the word *cats* there are two morphemes: *cat* and *-s*. The first, *cat*, is a unit of meaning because it refers to a specific concept. The final *–s* is also a morpheme because it signifies the concept of plurality and therefore adds meaning to the word. Bound morphemes can be made up of a single phoneme (e.g., */s/* for *-s)* whereas free morphemes typically are comprised of multiple phonemes (e.g., */k/*, */æ/*, and */t/* for *cat*). A child must perceive and interpret the sound sequences they hear in order to separate sounds into morphemes to derive meaning. This ability influences later phonological skills, such as blending and segmenting, which are related to manipulating free morphemes to change their meaning. For example, changing *walk* to *walking* requires adding the bound morpheme *–ing* to the free morphemes *walk*. Phonological skills are necessary to manipulate the sound sequences that make up the morphological system.

Phonology and syntax. The relationship between syntax and phonology is most evident when analyzing phonological errors within a syntactical context. Several studies found that phonological errors increased as the length and complexity of the utterance increased (Faircloth & Faircloth, 1970; Panagos, Quine, & Kilch, 1979). Panagos (1982) theorized that this is due to competing processing demands. He proposed that added complexity in syntactic or phonological structures compounds to cause increased errors in both areas. In addition to competing processing demands, increasing the syntax demands (e.g., moving from the single word level to the two or three-word combination level) also increases the phonological demands (Masterson, Bernhardt, & Hofheinz, 2005). For example, moving from the single word level (e.g., *cat)* to the two or three-word combination level (e.g., *big cat* or *my big cat*) involves increasing the number

and variety of phonemes as well as increasing the coarticulatory and sequencing demands. Therefore, the phonological complexity increases as the syntactic complexity increases.

Phonology and pragmatics. Pragmatics refers to the communicative purposes for using language, the role that context plays in influencing language use, and the back and forth nature of conversational turn taking (ASHA, 1993). The contexts in which utterances occur and the reasons for communicating influence selection of words and morphosyntactic rules (Kamhi, 2006). As individuals encounter ideas to signal and communicative functions to convey, they must retrieve words and syntactical relationships to symbolize those ideas and convert the representations into speech. Decisions related to what to say are influenced by the context and the aims the speaker wishes to achieve within that context. And since speech is the vehicle by which language utterances are transmitted, phonological production of the words is also important for ideas to be communicated and functions achieved. Communicative demands that are influenced by the speaker's reasons to communicate and the context in which the communicative exchange occurs should be considered when addressing phonological, language, and communicative needs of children. Clinical interactions can be viewed in terms of the extent to which the partners engage in topically-related turn taking where both partners assume responsibility for keeping the exchange going and maintaining the topic.

The Relationship Between Speech and Language Disorders

Although phonology is part of the language system, a phonological disorder is considered a speech sound disorder (International Expert Panel on Multilingual Children's Speech, 2012). The relationship between speech and language disorders is evident when comparing their comorbidity and synergistic relationship.

Comorbidity of speech and language disorders. Estimations for the co-occurrence of speech and language disorders vary between approximately 20%-80%, meaning that somewhere between 20%-80% of children with either disorder (i.e., speech or language) also have the other (McGrath et al., 2007; Tyler, 2002). In addition, approximately 40%-80% of children with speech disorders were found to have language deficits (Fey et al., 1994; Lee & Rescorla, 2002). Similar estimations were found for the prevalence of speech disorders among children with language disorders. This correlation suggests that a child with a speech disorder is at risk for having a language disorder and vice versa.

Synergistic relationship between speech and language disorders. Speech and language are said to have a synergistic relationship. This suggests that difficulties in any component (i.e., phonology, semantics, morphology, or syntax) can influence any of the other components. This further suggests that difficulties in multiple language areas can lead to a complex communication problem.

Children with severe phonological impairments are more likely to also have a language disorder than children with less severe phonological impairments (Lewis, Ekelman, & Aram, 1989). Thus, larger and more severe deficits in speech are linked to a higher prevalence of concomitant language difficulties. This implies that more severe deficits in speech could influence the severity of language deficits, leading to an overall magnified communication disorder.

The synergistic relationship between speech and language deficits is evident when examining the linguistic context of articulation errors. Healy and Madison (1987) found that children with articulation disorders made significantly more errors in connected speech samples than in single-word utterances. This implies that as the linguistic context increases from single

words to conversational speech, more errors in speech are made. Speech tasks become more difficult when the linguistic context becomes more difficult.

The synergistic relationship between speech and language can have a positive implication for treatment. Most importantly, improvement in one area can lead to gains in the other. For example, children with both phonological and morphosyntactic deficits showed gains in both areas when intervention addressed morphosyntax only (Tyler, Lewis, Haskill, & Tolbert, 2003). This improvement in untreated areas occurs in large part because speech perception becomes more refined as language experience grows. Likewise, Tyler and Sandoval (1994) found that children with concomitant speech and language disorders demonstrated moderate improvement in phonology and in length and complexity of utterances when treatment focused on phonology only. This improvement in untreated language domains could be attributed to the synergistic relationship between speech and language. Such a synergistic relationship would suggest adopting intervention approaches that address speech and language for the purpose of supporting them both and improving communication abilities.

Meaning-Based Phonological Interventions

Cotreating speech and language simultaneously through meaning- and language-based intervention approaches capitalizes on the synergistic relationship between speech and language. Meaning-based phonological interventions present children with contrasting word pairs that vary in one phoneme, in contrived picture-naming tasks that occur out of a communicative context or assume that children's attention will be drawn to phonological structures within an approach that facilitates language. A number of meaning- and language-based interventions have a direct focus on speech sound production and an indirect focus on language, while other approaches focus on language and expect that there will be some positive influence on speech as well. Common

meaning- and communicative-based intervention approaches include the following: (a) Phonological contrast approach, (b) Cycles approach, (c) Complexity approach, (d) Naturalistic approach, and (e) Language-based intervention.

Phonological contrast approach. Phonological contrast intervention is an approach designed to emphasize contrast in meaning through minimal pair words. Contrast can be made with minimal oppositions (i.e., word pairs that differ by one minimally different phoneme), maximal oppositions (i.e., word pairs differ by one maximally different phoneme), or multiple oppositions (i.e., multiple pairs of words are used to contrast multiple phonemes with a collapse of contrast; Blache, Parsons, & Humphreys, 1981; Gierut, 1989; Weiner, 1981; Williams, 2000). Phonological contrast intervention uses meaning of words to emphasize the importance of phonemic contrasts. Despite targeting meaning of words, this approach tends to be drill-based and lacks salient communicative contexts that can provide incidental teaching of other language structures.

Cycles approach. Barbara Hodson's (1994) Cycles Approach is a type of phonological contrast approach that targets meaning by contrasting target phonemes or target phonological patterns in words to signal differences in word meaning. This approach is designed for children who are highly unintelligible with a limited phonetic inventory and who demonstrate omissions and substitutions. The goal of this approach is to increase intelligibility by emphasizing meaning created through contrasting phonemes in words. The Cycles Approach was designed after the natural acquisition of the phonological system in that classes of phonemes that share targeted features or characteristics are introduced multiple times before mastery is achieved. While the Cycles Approach targets meaning through contrasts in word pairs (e.g., *ship* vs. *sip*), more complex linguistic units are often not introduced in naturalistic, meaningful, communicative

contexts. The initial presentation of word pairs out of a communicative context is likely to limit potential incidental language gains, when compared to words taught in a more natural context.

Complexity approach. The Complexity Approach is designed to address complex and linguistically marked phonological elements to facilitate generalization to less complex sounds (Gierut, 2007). This approach utilizes maximal and multiple oppositions to contrast meaning through minimal pair words. However, unlike the phonological contrast approach, this intervention calls for making or signaling contrasting words in contexts that approximate conversational demands. Thus, this approach includes meaning-based and naturalistic contexts.

Naturalistic approach. Ann Tyler (2002) described naturalistic intervention for phonological disorders as the "systematic use of facilitation strategies to target the increased accuracy of specific sounds/words and the elimination of error patterns" (p.73). This is done with an emphasis on the meaning of the social interaction within communicative context. The meaningful and naturalistic approach allows for passive learning of phonological and linguistic structures while teaching "the functional value of verbal interaction" (p. 73). The Naturalistic Approach teaches specific phonemes and error patterns while also indirectly targeting syntax, semantics, and pragmatics through the use of frequent models and recasts.

Language-based approaches. Language-based approaches focus on all aspects of language and treat language as a whole. Kamhi (2006) described phonology's role in language-based approaches as "integral and inseparable part in the language constellation" (p. 274). Ann Tyler (2002) theorized that emphasizing the function of the phonological system in terms of pragmatics (i.e., in meaningful interactions) would lead to gains in phonological output. Thus, these approaches have no direct treatment of phonology. Language-based interventions include a narrative-based approach and focused stimulation.

The narrative-based approach, developed by Norris and Hoffman (1990), is based in whole-to-part learning through narratives. The narratives gradually increase in level of discourse structure and semantic complexity. At early levels of intervention, the child labels objects and actions in pictures. The clinician offers scaffolding to help lead the child to describe objects, and later to make inferences. Although no direct treatment of phonology occurs, children may demonstrate improvement of phonological skills due to the synergistic relationship between speech and language.

Focused stimulation is a naturalistic therapy approach in which a child is given multiple models of target morphosyntactic structures (Tyler, 2002). The child is given many opportunities to use the target structures in communicative contexts through facilitative techniques. Cleave and Fey (1997) describe many types of facilitative strategies, such as expansions, recasts, buildups and breakdowns, false assertions, forced choices, feigned misunderstandings, requests for elaboration, and withholding of objects and turns. Like the narrative-based approach, there is no direct focus on phonology. Instead, emphasis on the structures of language is thought to place additional focus on the sound structures of the words being manipulated.

While meaning-based approaches differ in the extent to which there is a direct focus on phonological production, the need to convey meaning and communicate naturally puts some focus on phonology. In other words, in some approaches the focus on speech is incidental to addressing language while in other approaches the focus on language is incidental to the focus on speech. The approaches that are based on phonological contrasts tend to highlight differences in word meanings in contrived, clinician-directed contexts that typically do not place children in highly communicative contexts until the generalization phase of therapy. And, while language-based approaches operate on the assumption that facilitative clinical interactions can lead to

children's gains in phonology, no studies have investigated the nature of communicative exchanges that occur within intervention sessions; and no studies have explored the manner in which clinicians interact in play-based contexts to draw child's attention to phonological productions while also conveying meaning and striving to achieve communicative functions. More research is needed on ways in which clinicians capitalize on conveying meaning within interactive contexts to support speech and language/communication from the onset of therapy rather than waiting until the generalization phase.

Purpose of the Study

The purpose of this study was to explore the role that the structure of the intervention activities and the clinician's linguistic and communicative behaviors played in the child's language and communication at four levels of contextual complexity (i.e., interactive routines and scripted play). Three questions served to guide the analysis:

1. How was the child's engagement and participation influenced by the structure and complexity level of the activities?
2. To what extent did the child and clinician interactions reflect reciprocal conversational turn taking as opposed to a clinician-directed, initiate-respond-and evaluate (IRE) style?
3. How did the clinician's behavior and linguistic input within the participant structures (routines vs. script-based play) influence the child's language productions?

CHAPTER 2

Method

Setting and Client Description

This study took place in a university speech and hearing clinic. The client, CP, was 5 years 9 months old when the intervention began, and it lasted 9 months (Culatta, Setzer, & Horn, 2005). The information that follows pertains to CP's clinical history and to his functioning when the intervention commenced.

History. CP, a Caucasian male age, was 4 years, 2 months, when his parents first brought him to the university speech-language clinic because they were concerned about his speech, language, and cognitive functioning. The parents reported that CP was their first and only child. His mother reported that CP was born two weeks overdue, with the umbilical cord wrapped around his neck. He also had a significant history of ear infections, starting at age 18 months. CP's parents recalled that he babbled normally and spoke his first words at age one but then "stopped talking." When he was 3 years-of-age, they enrolled him in their school district's preschool for children with special needs with the eligibility classification of Developmental Delay. They described this preschool placement as "unstructured" and said that CP spent much of his time wandering around by himself.

When CP first came to the clinic, he was using a few mostly-unintelligible single words, gestures, and sound effects to communicate. His parents frequently interpreted his communication attempts for others. They reported that he seemed to understand simple one-part commands but was confused by longer directions. They also said that he seemed "frustrated" by his inability to communicate. CP was distractible, highly active, and noncompliant; he would tantrum frequently, and his tantrums would sometimes include hitting or biting others. Because

CP would not interact with the clinicians, or even with his parents in the clinic setting, clinicians performed mostly observational and interview assessments. CP's scores on the Cognitive Linguistic and Social-Communicative Scales (CLASS; Tanner, 1984) and the Receptive-Expressive Emergent Language Scale (REEL; Bzoch & League, 1991) put his expressive language in the 18-24-month range and his receptive language in the 30-33-month range.

The first focus in therapy was on helping CP interact willingly with clinicians and his mother and participate in turn-taking during interactive play. CP's mother participated in every session, and his father attended when his work schedule permitted. When CP started intervention, he spent a large portion of every session crying, screaming, and trying to leave the room. CP's behavior stabilized after the first 4 months of treatment. CP's mother hypothesized that part of his improvement in behavior was due to placement of pressure-equalization tubes in his ears at that time, helping him attend to auditory information and improving his general health.

As CP developed more coherent play routines and a few word productions, clinicians were able to analyze samples of his spontaneous language. The goals of intervention then shifted to establishing meaningful verbal communication through a core of single words and short phrases, using Fey's (1986) focused stimulation approach. CP showed improvement in his lexical abilities and language functions, including requesting objects, requesting help, initiating topics, and producing some two-word combinations. Because CP's utterances were frequently difficult for others to understand, clinicians attempted to add brief periods of drill-style articulation intervention to his treatment sessions, using picture cards and reinforcers, but CP was resistant to the structured treatment.

Functioning at the time of the study. The intervention for this study began when CP was 5 years, 9 months of age. At the commencement of the intervention, CP had a mean length of utterance of 1.48 and demonstrated use of single-word utterances (e.g., *me, yeah,* and *ok)* and frequent productions of stereotypical phrases (e.g., *here a*_____and *please help*). CP was also found to have a small vocabulary for his age and was considered 5% intelligible in phrases and 10% intelligible in single words by two unfamiliar adults.

CP demonstrated several phonological processes including unstressed syllable deletion, final consonant deletion, gliding, vocalization, and cluster reduction that influenced his intelligibility. Final consonant production was selected as the primary treatment objective to facilitate the greatest improvement in intelligibility. (See Table 1 for a summary of CP's testing results at age 5 years 9 months).

The Intervention

Intervention sessions were conducted in a university speech and language clinic with an ASHA certified clinician conducting the therapy with assistance from one or two graduate students. CP's mother or father were also present on occasions.

The phonological intervention was designed to be presented within meaningful, interactive contexts (see Culatta et al., 2005). Within the naturalistic, language–based intervention, the clinician arranged interactions and activities that encouraged CP to take self-selected turns. The child also was given various character roles and was often put in the role of directing others' behavior. The goal was to have him actively engage in interactive activities that approximated natural or authentic play and communicative contexts (e.g., constructing art or food projects, engaging in iterative routines, participating in scripted play) by accessing turns, initiating actions, making verbal contributions, acting on materials, and contributing ideas.

Table 1

Assessment Results for CP at age 5 years 9 months

Area	Measure	Result
Cognitive	IQ	SS: 75
	Play	• Explored objects and engaged in appropriate object manipulation • Demonstrated little representational or symbolic behavior
Hearing	Speech audiometry	20 dB in both ears
Language	Expressive Vocabulary Test (Williams, 1997)	SS: 56
	Peabody Picture Vocabulary Test-III (PPVT-III; Dunn & Dunn, 1997)	SS: 79
	Preschool Language Scale-3 (PLS-3; Zimmerman, Steiner, & Pond, 1992)	SS: 47 Total Language Score
	Brown's stage and MLU	Stage 1; MLU -1.48
	TTR	.25 TTR (from 83/136 non-imitative utterances)
Phonology	Goldman-Fristoe Test of Articulation-2 (GFTA-2; Goldman & Fristoe, 2000)	<1 percentile
Phonology	Percent Consonants Correct	47%: "severe" (Shriberg & Kwiatkowski, 1982)
	Phonetic inventory	
	Stops	p, b, k, g, t, d
	Fricatives	f, sh, s, h
	Affricates	ch
	Liquids	none
	Glides	j, w
	Nasals	n, m
	Phonological process analysis	Unstressed Syllable Deletion: 85% Final consonant deletion: 100% Gliding: 100% Vocalization: 100% Cluster Reduction: 100%

In structuring representational play activities, the clinician would often take a dominant character role and then exchange roles with CP. This allowed the clinician to model target productions, demonstrate the story or play events, and illustrate response options that CP then had the opportunity to apply. The clinician arranged for story and play characters to encounter events and interactions that necessitated the use of key words with targeted phonological patterns.

Structure of individual sessions. CP was seen for intervention for two 50-minute sessions per week for eight weeks for the purpose of this study. A supervisor at a university clinic was the main clinician, while graduate student clinicians also assisted in implementing the intervention activities. CP's mother was present in most sessions and would also model correct productions when she was there. On a few occasions, CP's father joined in the intervention interactions.

The intervention was based on a modified cycles approach (Hodson, 1987) that provided opportunities to use target words in meaningful contexts. Each session included a review of the previous week's targets, auditory bombardment of new target words, and evoked production of target words – all of which occurred in interactive contexts that varied in complexity based on previous performance and support for correct target production. Target words and semantic/syntactic structures reflected CP's language goals. Therapy activities consisted of interactive routines, play scripts, and story enactments. Themes and target words were often introduced by telling CP an adapted version of a repetitive story, such as *Green Eggs and Ham* (Seuss, 1960), or by engaging him in a structured play routine that highlighted target words. CP also participated in reciprocal exchanges in which the clinician modeled target words and created reasons for CP to use them during the activities.

Procedures to control communicative and linguistic complexity. The contexts moved from simple, predictable routines to more complex and less structured scripted play and story enactments. Four levels were developed to control the communicative complexity within the intervention activities. In Level 1, the communicative context involved simple, predictable routines with one or two recurring actions. Productions were evoked primarily as requests for actions, objects, or turns, and linguistic targets included one or two key single-words with high levels of exaggerated modeling. In Level 2, the context consisted of elaborated routines with some variation in the actions and an increase in the number of actions or objects applied to the actions. Level 2 also incorporated a greater variety of key words and lower level of modeling. Level 3 context consisted of simple scripts with actions occurring in a sequence and an overarching theme being represented in play. Level 3 incorporated target words addressing several sounds or more than one phonological pattern. Level 4 consisted of flexible, elaborated scripts with little modeling of targeted phonological production/s and corrective feedback when errors occurred. Level 4 also included monitoring and corrective feedback in naturally occurring events or contexts. (See Table 2 for a description of each of the four levels.)

The sessions were characterized in terms of the goal (i.e., targeted sound and words), participant structure (i.e., arrangement of roles, nature of the activity, and access to materials), options for CP to participate (e.g., tightly structured routine vs. flexible scripted play), and designated complexity of the communicative context.

Table 2

Levels of Communicative Complexity

Level	Descriptions of the Communicative Context
Level 1: Simple routine	Simple routines with one or two recurring actions; high predictability; productions elicited as requests (actions, objects or turns) or commands. One or two key words repeated frequently; high levels of exaggerated clinical modeling.
Level 2: Elaborated routine	Routines with several actions applied to an object or one action applied to several objects. Two or three target words (with same phonological goal or focus); target words modeled at high level.
Level 3: Simple script	Theme-based sequences of events with the client given options to direct the play (make decisions) and produce self-initiated turns; reasons to use targets incorporated in activities designed to teach another phonological target. Two different targets goals embedded in one activity; exposure to target for one goal alternated with targets designed to teach another goal; targets produced in simple phrases or two-word combinations; moderate level of modeling.
Level 4: Elaborated script	Flexible interactions within a theme-based script with the client given some control over directing the play events; a number of different actions (or events) occurring within the action sequence. Core of key words; 2 or 3 different goals addressed or monitored; monitoring of previously introduced patterns with corrective feedback; low level of modeling.

Data Collection and Preparation

Therapy sessions were recorded and transcribed by the clinicians who conducted the intervention. Reliability of these original transcripts was determined and then the transcripts were coded to characterize clinician-child interactions following conversational discourse conventions.

Recording and preparing transcripts. Each of the intervention sessions was video recorded. Segments of the sessions, deemed by the clinician to be representative of the intervention activities, were transcribed by the clinician for the purpose of conducting a case study investigation (Culatta et al., 2005). Information about the context (adults present and nature of the activity) was included with each transcript. In the current study, two recordings and transcriptions were selected for analysis at each of the four levels of complexity so that contrasts could be made in nature of interactions at the different levels of communicative complexity and participant structures (clinician-controlled routines vs. flexible play scripts). (See Tables 4-10 in Appendix B for the coded transcriptions.)

Determining reliability of the transcripts. Reliability of the transcripts was determined in a two-step process. First, the researcher viewed the recordings and determined percent of utterance-by-utterance agreement with the original transcriptions. The utterance-by-utterance agreement for the two transcriptions was found to be 86% and 94%. In the process of reviewing the original transcripts, the researcher added any missing conversational conventions (pauses, overlap, emphasis, prolongation, intelligibility, and truncated words/phrases) and descriptions of nonverbal behaviors. Second, after the researcher added missing conversational conventions, a faculty member in communication disorders reviewed the transcripts, with access to the videos,

and determined percentage of agreement for accuracy of utterances and presence of conversational conventions based on Jefferson's (2004) coding system. (See coding conventions listed in Appendix A.)

Determining reliability of the coding. Each turn (verbal utterance or nonverbal gesture or action) was coded according for discourse turn type and communicative function according to Dore's (1979) classification system. (See the transcripts in Appendix B). The recordings were also marked within reciprocal conversational exchanges (turns per topic) between CP and the adult who was engaged in the interaction at the time. (In addition to the main clinician, student clinicians and CP's parents were often present in the sessions). Sequenced topically-related turn exchanges were defined as ones that began with an initiated topic and contained subsequent partner utterances in which the partners' turns either maintained or elaborated that topic. Often, however, turn exchanges were related to shared, immediate context. Reliability of the coding was determined by having the faculty member determine number of agreements or disagreements for two of the samples. Once reliability of 85% was achieved, the researcher completed coding the rest of the transcripts.

Data Analysis

This investigation analyzed clinician-child interactions within phonological intervention contexts with the goal of exploring how playful intervention for speech sound productions could provide facilitative contexts for communication and language productions as well. The study drew upon two qualitative frameworks: participant structure and conversation analysis.

Participant structure. This study considered the way in which the structure of the activities (i.e., simple routines at Levels 1 and 2 vs. more complex play scripts at Levels 3 and 4) influenced CP's participation and his speech and language behaviors. The manner in which

options for participation are arranged within a context has been referred to as participant structure (Philips, 1972). While Philips coined the term participant structure to describe different ways that teachers arrange interactions with their students, the concept can be applied to clinical contexts as well. Clinicians can allocate turns, impose constraints, and signal expectations that impact the way clients contribute. Participant structures carry expectations regarding how clients can participate and communicate.

The video recordings and transcripts from the eight intervention activities (two at each of the four levels) will be viewed in light of their participant structures. The researcher will contrast differences in reciprocal turn taking engagement, and client participation within activities that vary in complexity (routines at Levels 1 and 2 of the intervention vs. scripts at Levels 3 and 4 of the intervention).

Clinicians can modify participant structures in an effort to ensure that their clients are provided with various types of participation experiences and various levels of communicative complexity. Different participation structures reflect the forms of communication that are accepted, the ways information is exchanged, the way materials and turns can be accessed, and the way in which opportunities to participate are conveyed (Kovarsky, Culatta, Franklin, & Theadore, 2001; Philips, 1972). The participant structure analysis can document the child's ability to take part in various types of activities and communicative contexts. While the clinician made a prior decision about the complexity of the communicative context, the analysis of participation that occurred within the intervention contexts, on a turn-by-turn basis, serves to document the extent to which the clinician accomplished her goal. The idea was to keep exchanges interactive and reciprocal while gradually increasing communicative complexity.

Conversational analysis. In addition to the participant structure, a conversational discourse analysis was selected to characterize the interactions between the clinician and CP during the intervention sessions. The conversational analysis explored the nature of the turn taking exchanges that occurred within the intervention activities. In conversational discourse analysis, each conversational turn is viewed in relation to other turns in a sequence within an exchange (Atkinson & Heritage, 1984). Conversational turns consist of two or more utterances positioned immediately adjacent to one another (Schegloff, 1984). Adjacent pairs consist of such exchanges as question-answer, comment-elaboration, and offer-acceptance/refusal. The turn-by-turn analysis permits inspection of the how each partner's utterances are related in terms of function, content, and form. An inspection of the transcribed interactions using conversational analysis fits within the social interaction theory that views how conversations and language productions take on meaning in context (Gee, 2011).

Conversational discourse analysis permits inspection of the extent to which the clinician and child are responsive to each other's communicative behaviors. It provides information as to the extent to which partners are responsive to and accommodate to each other's productions. The analysis can also view the extent to which CP incorporates clinician-modeled productions (sounds, words, and sentence constructions such as two- and three-word semantic relations) in his own utterances.

Often in phonological therapy, client productions are tightly controlled by the clinician who dictates what, when, and under what conditions the client makes a response. Thus, the interactions within phonological intervention sessions are often characterized by a highly-controlled clinician-directed Initiate-Respond-Evaluate (IRE) sequence, particularly when a clinician is attempting to establish a behavior (Kovarsky et al., 2001; Kovarsky & Maxwell,

1992). Unlike ordinary topically-related turn taking where partners tend to produce semantically-contingent utterances that extend the topic, participation in therapy contexts is often highly controlled by the adult who allocates the child's turns (Sturm & Nelson, 1997). While a typical turn sequence during establishment of sound productions consists of the IRE structure (clinician initiates a request for a response, the client responds, and the clinician evaluates that response), this study attempts to structure intervention in exchanges that are more varied, naturalistic, and reciprocal. The IRE discourse pattern is one in which the client has little opportunity to initiate responses; and few different types of communicative acts or functions are displayed (Kovarsky, 1990; Kovarsky & Duchan, 1997; Simmons-Mackie & Kovarsky, 2009).

CHAPTER 3

Results

This study explored a clinician's and child's communication and language use in intervention activities created to address the child's (CP's) speech sound productions. The results provide descriptions and analyses of CP's engagement and participation, the conversational exchanges that occurred between CP and the clinicians, and language used by CP and the clinicians within intervention activities at different complexity levels.

Participation and Engagement

Session transcripts and videos were analyzed for CP's engagement and participation. As indicated in the Method section, the clinician planned activities within four operationally-defined levels of complexity. Level 1 consisted of simple routines that permitted CP to request turns to obtain or manipulate desirable objects; Level 2 consisted of elaborated routines with varied objects and actions; Level 3 consisted of a simple scripted play context; and Level 4 was designated as elaborated scripted play that would permit CP to contribute to the planning of the script. This section will characterize CP's participation and engagement considering the different participant structures and four complexity levels. The goal was to gain insight into how the activity structures influenced CP's participation and engagement. Analyses from representative sessions at each of the four complexity levels are presented below.

***Stick a Chick* (Level 1 activity).** In the *Stick a Chick* activity, a Level 1 simple routine, CP and the clinician, C1, stuck stickers of chicks on sticks. CP was given multiple opportunities to request stickers and to direct his mother and a student clinician, C3, to stick chicks on sticks. Two key words were targeted (*chick* and *stick*) to address production of final /k/. The transcript

that follows illustrates a predictable routine where a few actions (e.g., stick and lick) are applied to a few objects (chick and stick).

C1: [chick] stick
Shows CP the chick sticker on a popsicle stick
CP looks at his mother, then at C1, looks back at his mother, and then at the chick on the stick.
C1: on the stick
C1: I'll lick chick.
Shows CP one method for making the chicks stick to the popsicle sticks
CP: chick, Mama
CP directs his mother to put a chick on a stick. CP keeps his hands in his lap and demonstrates a neutral affect.
MOM: yeah, I want a chick.
MOM: NV turn: taps stick along table as she moves it towards CP.
CP: NV turn: sits back to watch the stick and scratches his nose
C1: or we could stick (.) with glue
Shows CP another method for sticking the chicks.
CP: NV turn: leans forward to get glue on his finger from a cup of glue
C1: stick chick
Tells CP to stick the chick.
CP: NV turn: rubs glue from his finger onto the chick.
C1: NV turn: holds CP's hand to help him stick the chick on the stick
MOM: chick on stick please
Requests that CP and C1 stick the chick onto the stick.
C1: time to stick the chick
Attempts to entice CP to produce the key words. Sticks the chick on the stick.
CP: NV turn: leans back in chair to peel dry glue off his finger
MOM: thank you
CP: NV turn: leans forward and looks at the chick
CP: welcome

In this interaction, CP was focused on the task of sticking the chicks on the sticks for most of the time. Although CP engaged in the activity of sticking chicks on sticks, he also frequently looked away from the materials and his conversational partners and leaned back in his chair. When the clinician or CP's mother spoke to him, CP would shift his focus back to the task at hand. While CP was attentive when sticking the chicks on sticks, there were no indications of laughing or smiling or productions of positive expressives such as "wow!" At times the clinician raised CP's interest in the activity by enticing him to try different stickers and offering another

way to stick chicks on sticks (using glue instead of licking the adhesive strip). One particularly noticeable display of engagement occurred after the student clinician, C3, joined the interaction and created a spectacle that added some variation to the activity when she made a chick do a trick.

CP: NV turn: CP looks at the chick in C3's hand. He reaches for her hand and pulls it toward the envelope to put the chick away.
C3: oh, my chick does a trick.
Pretends to make the chick fly around like an airplane.
CP watches the chick flying with a neutral affect.
C1: a trick
Said excitedly
CP: NV turn: imitates the action by making the chick fly around while imitating the flying sound effect. Makes eye contact with his mother and C1 and smiles before putting the chick away in the envelope.
MOM: whoa, another trick

In this portion of the interaction, CP and C1 were packing up the chicks. C3 drew CP's attention to her chick by pretending to make it fly around. At that point, CP demonstrated joint attention with his mother and with C1, seemingly to call attention to the event, and smiled broadly.

Eat at Sam's **(Level 2 activity).** *Eat at Sam's* was based on embedding requests for desirable objects in a routine set within a restaurant theme. It entailed commenting (*mmm* and *yum*) as well as requesting food items (*ham, jam,* and *graham*). CP was placed in the role of a waiter at Sam's restaurant. In this role, he needed to interact with, and go between, the cook and the customers. In *Eat at Sam's,* six key words, as opposed to two in the *Stop Cop* activity, were targeted (*Sam, ham, yum, graham, jam, and mmm)* to address production of the final /m/. In the transcribed segment that follows, the participants, acting as customers, ask Sam the owner and waiter, to give them ham, jam, or graham (crackers). Sam then makes a request to the cook and places the orders for the customers.

C1: you want ha[m:] (.) for everybody?
Speaks as the cook; elongates /m/ sound for emphasis
CP: [ham]
Requests ham. Makes eye contact with C1.
C2: mm[m]
Comments
C1: (o)[k] don't forget to give it to (th)em this time, Sam. (as opposed to eating it himself)
CP: here
Hands ham to a customer (C3) enthusiastically and makes eye contact with her.
C3: Thanks [Sam:]
Elongates /m/ to emphasize correct production
C1: [? here's ham]
CP: [CP]
Requests ham for himself. Raises his hand while making the request.
C1: [mmm]
CP: CP [ham]
Repeats request for ham with final /m/ omitted. Grabs a piece of ham. While looking at C3.
C3: [yum:]
Elongates /m/ to emphasize correct production
C1: what do you want?
Attempts to elicit correct production. Gently holds CP's hand to give him an opportunity to produce ham with the final /m/.
CP: CP ham=me
Repeats request with emphasized /m/ and no pause between "ham" and "me." Raises ham up high.
MOM: put your ham:
Emphasizes final /m/ while beginning to tell CP to put the garbage in the trash can
C1: all gone ham (.) in the can:
Interrupts MOM to prompt CP to put garbage in the trash can.
CP: ahh
Smiles and looks at MOM. Pretends to eat ham.

In Eat at Sam's, CP was given multiple opportunities to make requests using key words containing the targeted final /m/. (In addition to eliciting requests for the targeted food items, the clinician flexibly highlighted the word *can*, which while not planned kept the focus on the goal of adding final consonants to simple word structures.) The *Eat at Sam's* participant structure consisted of an elaborated routine with several objects, actions, and key words incorporated. The participant structure gave CP some control over the situation since his role as waiter permitted him to interact with customers and the cook. CP displayed delight in this role and sometimes

ordered food items for himself. He was engaged throughout the interaction and maintained eye contact. CP also demonstrated a moment of being silly with his mother. He smiled and looked at his mother while pretending to eat the ham that was meant for her.

Save the Animals **(Level 3 activity).** *Save the animals,* a Level 3 activity, consisted of a script-based role play where two animal protectors (CP and C2) were pitted against an animal catcher who wanted to lock up the animals. To keep the animals free, C2 and CP would steal the animal catcher's lock and cage. Incorporated into the activity were opportunities for CP to produce the target words *lock, mouse, cat, knock,* and *up* with several different final consonants (/k/, /s/, /t/, and /p/). The arranged participant structure was such that CP and C2 could plan to thwart the efforts of the animal catcher. The transcribed segment illustrates the conniving that occurred between C2 and CP.

C2: where's lock?
Entices CP to find the lock. Whispers to encourage a conniving tone.
C1: no lock
Looks around and acknowledges that her lock is now missing.
C2: hide lock
Directs CP to hide the lock while whispering.
C2: hide lock
Repeats whispered request

CP: hide mouse
Whispers and deletes final /s/
C2: hide mouse?
Requests clarification
CP: hide (.) hide cat
Whispers. Changes request to hiding the cat, instead of the mouse.
C2: ok (.) [hide cat]
C1: [where's] my lock?
Speaks to self to indirectly mention to CP and C2 that she knows the lock is hidden.
C2: uh oh
Signals the anticipation that the animal catcher is coming.
C1: [I was] asleep and someone stole my lock.
Speaks to self directly and CP and C2 indirectly
CP: NV turn: CP quickly takes the cage and lock and hides them behind his back. He looks up at C1 with his eyes wide, his mouth tight, and his body tall and stiff.

C1: where's lock?
Directs question to CP
CP: don't know
Pretends not to know. Moves lock down.
CP: check there
Purposefully indicates to look in the wrong place
Deletes final /k/ final consonant on "check"
C2: no: lock
Pretends not to know
Emphasizes final /k/

CP appeared to delight in planning to protect the animals and spontaneously suggested ways to keep the animal catcher from finding the mouse, cat, and lock. He pretended not to know where he hid the lock and suggested that the animal catcher look in the wrong place. CP took his role seriously and spontaneously came up with ideas for fooling the animal catcher. Nonverbal behaviors (tone of voice, intensity, facial expressions) all indicated that he was fully engaged.

CP's use of whispering was especially interesting in the *Save the Animals* activity. Despite having limited speech and language skills, CP was highly engaged and conveyed excitement (interest, delight, eagerness to take on his character's actions, thrill, animation (animated), commitment, involvement?) in his role through the use of whispering. He was able to convey the secretive and conniving nature of the plotting scheme. When whispering, CP was taking on the role of a co-conspirator and co-director of the play. He shifted the play from being heavily clinician-controlled to being more child-led.

Don't Cross the Bridge **(Level 4 activity).** One Level 4 activity, *Don't Cross the Bridge*, could be described as a story enactment in which the players recreated the Troll Bridge story where a troll, hiding under a bridge, tries to capture those who attempt to cross. In this activity, a table served as the bridge, and CP and the clinician pretended to be trolls living under the bridge

and preventing animals and a kid (a felt doll) from crossing the bridge. In the segment below, CP tells the clinician who to lock up in a pretend cage.

C1: I'm troll
    In deep, growly, "troll" voice
C1: mmhmm
CP: take take duck
    Uses an excited tone of voice
    Makes stuffed animal duck hop across the table
C1: aha duck (.) haha
    C1 takes the duck
CP: cat
    Indicates that the cat should try to cross the "bridge"
    Makes stuffed animal cat hop across the table
    Makes eye contact with C1
C1: aha cat (.) huha
    Takes the cat
CP: ki:d
    says/kI/
    Deletes final /d/ and elongates the vowel
    Makes felt doll hop across the table
    Makes eye contact with C1
C1: who?
    Pretends to not understand
    Puts hands on hips
CP: kid
    Corrects production
    Makes eye contact with C1
C1: oh (.) haha kid
    Takes the felt doll
CP: mou- mou- mouse
    Makes toy mouse hop across the table
    Makes eye contact with C1
C1: mouse haha

While the *Don't Cross the Bridge* activity was designed to be at Level 4, this exchange contained fairly predictable and repetitive elements. CP, however, was the one directing the play – deciding who should cross the bridge and who the troll should capture. CP initiated the interaction by telling the clinician to take the duck. From there, the interaction continued with CP directing the clinician to take other animals.

CP continuously demonstrated engagement by quickly directing one animal after the next to cross the bridge. He demonstrated frequent joint attention and acted as the animals by making them hop across the bridge. He exhibited very animated vocal inflections and facial gestures and body postures. He appeared to take great joy in plotting with the clinician and in carrying out the actions in the story.

Summary of participation and engagement. CP's participation and engagement appeared to be influenced by the structure of the activity. The tightly structured routines provided fewer opportunities for CP to contribute ideas because he was mostly requesting pre-determined objects or actions. In the scripted play contexts, the clinicians elicited and incorporated his ideas into the on-going planning of the play. While generally attentive and eager to participate in Levels 1 and 2 activities, CP appeared more animated and playful in the scripted contexts, with an increase in facial expression, variety of pitch and intonation, laughter, and time spent looking at his conversational partners. The scripted contexts permitted more open-ended, flexible contributions than the routines.

One element that was able to be incorporated due to the open-ended, flexible nature of elaborated routines and scripts was CP's interest in co-conspiring. CP's mischievous co-conspirator behavior began to emerge in Level 2 interactions but was even more present at Levels 3 and 4. He demonstrated exaggerated actions, looking at the person being "fooled" from a sideways glance, and whispering. CP appeared to demonstrate an increase in engagement as the interactions moved from tight routines with frequent requesting and little commenting to elaborated routines and scripts with a larger variety of communicative functions, such as co-conspiring.

Conversational Discourse

In addition to exploring engagement and participation in the intervention activities, the conversational analysis permitted an inspection of the nature of the turn taking exchanges. By considering adjacent clinician and child turns, the interactions were viewed for topic maintenance and communicative functions. Interactions among CP and the adults present were viewed within representative samples of the activities at each of the complexity levels.

***Stop Cop* (Level 1 activity).** In an activity entitled *Stop Cop*, a simple routine, two key words were targeted (*stop* and *cop)* to address the goal of producing the final /p/. In this activity, one participant played the role of the cop in a "Red Light, Green Light" game. The other participants moved toward the cop when the cop gave permission by holding up a "green light" sign and stopped when the sign was turned to *red*. The participants "won" the game when they made it to the cop at the end of the "road". *Stop Cop* was designed to provide frequent opportunities for CP to produce the target words. A transcribed sample of the interchange follows.

C1: play c[op]
    Digs through box of materials to find props for the cop
CP: [mmm]
    Shows interest in the props
C1: (o)kay ready?
C1: I'm a cop
    Puts on sunglasses
    MOM gasps, playfully
C1: I'm the cop
C1: Look CP (.) co: p
    Puts on cop hat, pauses for emphasis then models "cop" with an elongated vowel and emphasized /p/
C1: I'm the cop
C1: oop not yet (.) hop down
    Commands CP to stop looking through the box of materials and to get down from standing on a chair

C1: hop
Helps CP hop down from the chair
C1: I'm cop
Redirects to the activity of playing "Stop Cop"

In the first 10-utterances of *Stop Cop* activity, the clinician modeled the words *cop* and *hop* as she introduced the activity. The clinician produced nine utterances while CP only produced one. However, in the transcript below, the clinician reversed the roles and CP encountered opportunities to take turns and produce the targeted words.

In the exchange below, CP commanded his mom and a clinician to stop moving forward. At times in the activity the clinician stepped out of the theme-based routine to elicit a correct production by asking CP to imitate a target word with inclusion of the final /p/.

C1: ok you tell us to go and=
Uses cloze structure
CP: =stop
CP responds immediately with no pause between his utterance and the clinician's.
Says /da/ with final consonant deletion and cluster reduction
C1: stop
Models correct production with emphasis on the final /p/
CP: Mom
Acknowledges that his mother moved to the starting line
C1: CP can you say it (.) stop
Gets down to his level, models the word, and asks him to repeat the model for final /p/
CP: stop
Says /dap/ with final /p/
C1: good job. (o)kay
Runs to the other side of the room to the starting line
CP: stop
Says /dap/
CP: green
Says /gwin/
CP: stop
Says /dap/

The *Stop Cop* routine relied on a tightly regimented way to elicit productions. The controlled activity approximated an IRE discourse structure that occurs when children are expected to make productions as part of a game or picture-naming task. The content or theme of the exchange was heavily contextually supported and not a true conversation since there was

little or no semantic contingency between the participant's utterances or expansions on a partner's previous utterance. Instead, either CP was commanding the adults to stop or go, and the adults were commanding CP. Thus, the primary function achieved was the command with a few evaluations of CP's speech productions (e.g., *good job*) and a comment made when the participant got to the end of the road (*we made it*). CP also once initiated a request to have his mom go to the starting line.

Within a highly structured activity in *Stop Cop*, most of the interactions were highly scaffolded, which put constraints on (or influenced) CP's turn-taking and participation. The clinician limited the options for roles and actions which did not give CP opportunities to direct the play nor did it invite spontaneous utterances.

Celebrate Mouse **(Level 2 activity).** *Celebrate Mouse*, an example of an activity designed to be a Level 2 interaction, consisted of CP, the supervising clinician, a graduate student clinician, and CP's mother wearing headbands to pretend to be mice and cats. They pretended to be at mouse's party and to celebrate by eating snacks and drinking limeade. *Celebrate Mouse* was designed to target final /m/, /s/, and /p/ in an elaborated routine. The objective of the activity was for CP to produce the target words *lime, mouse, cat,* and *chip* with four different final consonants (/m/, /s/, /t/, and /p/).

C1: Does mom want chip?
    Indirect request for CP to use the target word *chip*
CP: mom (.) chip (.) too
    Initial consonant deletion on *too*
MOM: I want chip
CP: ok
C1: ask C3 mouse
    Directs CP to offer chips to the student clinician, C3.
CP: (o)k (.) chip too
    Reaches arm out to offer chip
    "chip" said with final consonant deletion
C3: I want [chip]

C1: [chip]
Models correct production at the same time as C3
CP: chip
C1: chip

In this example, C1 demonstrates the use of indirect and direct request to elicit productions of key words within the interaction. C1 prompts CP to initiate a request for information to another participant by producing an indirect request (i.e., asking an information question). The clinicians use indirect requests (i.e., information questions and comments that suggest the need for information or to ask what another participant wants or is thinking), which are more naturalistic or communicative ways to elicit utterances. In addition to using indirect requests, the clinician also used a direct request ("ask C3 mouse"). These clinician-initiated utterances prompt CP to initiate an offer of chips to his mother ("Does mom want chip?") and also to C3. The initiations were maintained, but not elaborated.

Make a Mess **(Level 3 activity).** In the *Make a Mess* activity, designed to be a Level 3 script, CP, C1, C2 and CP's mother took turns being the clerk at a pop and ice cream shop. The participants playing the role of customers ordered pop and ice cream in a cup. The clerk pretended to break the pop and ice cream machine while filling the order and making a big mess.

Key words included: *pop, cup, cop*, *mess*, *clerk*, *hat,* and *ice cream* to target 5 final consonants (/p/, /s/, /k/, /t/, and /m/).

CP: ahhh a mess (.) you (made the mess)
Looks at C2
C2: a [mess]
MOM: I made a mess
CP: /h/-
False start
MOM: who made that mess?
CP: MOM mess
MOM: I made [the mess]?
C2: [Oh MOM] made the mess

C2: uh oh
CP: MOM (.) Call cop
C1: MOM's gonna [call the cop]
C2: [call the cop]
C1, C2, and MOM laugh
MOM: ok

In the *Make a Mess* activity, CP initiates the interaction by commenting that someone has made a mess. When asked who made the mess, CP responds that his mother made the mess and that she now needs to call the cop because she is in trouble. In this interaction, CP uses language relatively creatively to accuse his mother and direct her with a consequence. He moves beyond simple requesting to make comments and statements (call a cop).

The turn taking exchange revolves around investigating who made the mess and what to do about the mess. CP initiated the interaction and his mother and C2 maintained the interaction. After, his mother made a request for information (Who made that mess?) to continue the conversation. CP elaborates by saying "call cop."

***Play a Trick at McDonald's* (Level 4 activity).** In a Level 4 activity, *Play a Trick at* McDonald's, CP and C1 took on the role of servers at a fast food restaurant. They schemed to play tricks on the customers, C2 and CP's mother, by placing strange items in their food and drink orders. The activity was designed to achieve final consonant production for /k/, /s/, /p/, and /m/ in 13 key words: *Trick, Yuck, Pop, Sheep, Snake, Ice cream, Look, Some, Like, Sip, Sick, Like, Quick*. In the segment below, CP and C1 decide what toy animals they will put in the customers' pretend food.

C2: I want- I want pop.
    Takes on role of a customer
CP: hamburger, that one, hamburger (whispers)
    Whispers and points to the hamburger to indicate that the customer should order a hamburger so that he can play a trick with it.
MOM: and I want a hamburger
    Responds to CP's request by ordering the hamburger

C2: [I want pop]
Repeats request
C1: [are you going to play another trick?]
Directs question to CP
C1: should we put snake or sheep (in the hamburger)?
Gives CP options for the first trick
CP: sheep
Said with the final consonant
C1: okay, put sheep here (.) sheep
Points to hamburger to show where to hide the sheep
CP: sheep (.)? sheep here
C1: I'm going to put the sh- (false start) snake in the pop
Shifts focus to C2's order to play a second trick
CP: here pop
Gives C2 her order
C2: the pop
CP: here, mama (.) hamburger you:
Gives his mother her order

In this activity structure, the clinician facilitated CP's involvement in planning the play by asking opened-ended question (e.g., "What do we do next?"). She placed CP in roles that would serve to elicit his ideas and engage him in co-planning, CP was given opportunities to decide how to trick the customers – which odd items to place in what order. He requested that his mom, one of the participating customers, order a hamburger so she could be tricked. He took on the role of a server and gave the food to the customers. The structure of the activity permitted the clinician to follow CP's lead in several instances, creating a somewhat naturalistic exchange.

This interaction involved several requests (e.g., "I want pop."). C2 used an information question ("What do we do next?") and a directive (I'm going to put the sh- (false start) snake in the pop). CP used several maintenances and one extension (sheep (.) pepper).

Summary of conversational discourse. The analyses of turn taking exchanges (or of conversational discourse) indicated that during Level 3 and 4 participant structures, the participants (CP and an adult) engaged in some topically-related and semantically-contingent conversational exchanges. Being responsive to CP's contributions and permitting an array of

functions in the Level 3 and 4 participant structures more closely replicated authentic communicative contexts than the simple requests for actions or objects that tended to occur in Level 1 and 2. At all complexity levels, the clinicians were responsive to CP's initiations.

The clinician's attempts to model or elicit a final consonant on key words in a tightly controlled Level 1 and 2 routines appeared to affect the topic maintenance and turn taking. Clinicians tended to acknowledge and extend the content in CP's preceding utterances when they were not modeling single word productions. To elicit productions in Levels 1 and 2, clinicians tended to put CP in a role where he would give commands to his communicative partners or make requests. To elicit productions in Levels 3 and 4, CP encountered reasons to achieve a wider variety of communicative functions in the scripted play and story enactment contexts.

The nature of the interactions between the adults and CP appeared to vary depending on how much control the clinician placed on the activity structure. Level 3 (*Save the Animals*) and Level 4 (*Play a Trick at McDonald's*) activities provided CP with options for initiating actions and making comments. The more complicated scripts provided a greater number of opportunities for CP to respond and a greater number of possible events and variations of events to comment and direct.

Language Use

The complexity of CP's and the clinician's language productions were viewed in the intervention activities. An attempt was made to discern the extent to which the clinician's input influenced the complexity of CP's grammatical productions. Prior to the initiation of this study, CP's expressive language productions consisted of single words, occasional successive single words (two words produced with a slight pause between them to signal related ideas), and stereotypical expressions. An appropriate level of grammatical complexity to model would be

two- and three-word combinations signaling basic semantic relations (e.g., actor-action, action-object, possessor-possession). This section looks at the nature of clinicians' and CP's language use both in routines (levels 1 and 2 activities) and scripted-play contexts (levels 3 and 4 activities). It explored the extent to which clinician productions could influence CP's language productions (i.e., explore adjacent utterances to determine the extent to which CP produced expanded word combinations following modeled productions). Some turn-by-turn exchanges that illustrate the relationship between the clinician's input and CP's productions (or productions of two- or three-word combinations) appear below.

Stop Cop **(Level 1 activity).** In the Level 1 *Stop Cop* interaction, the adult tended to model key words mostly in single words. There were some instances of modeling 2- and 3-word combinations (basic semantic relations). One example appears below in CP's adjacent response to the C1's performative statement, "I'm the cop."

C1: I'm the cop
CP: me (.) CP (.) I be cop

In this example, CP followed the "I'm the cop" utterance with two successive single words (*me* and *CP*), and he then followed it with a 3-word sentence ("I be cop."). CP's "I be cop" utterance incorporated the clinician's previous utterance. He imitated the clinician's prior utterance with reduction (e.g., an imitation with reduction).

Stick the Chick on a Stick **(Level 1 activity).** CP's utterances in the Level 1 *Stick Chick* interaction tended to be single-word utterances or stereotypical phrases (e.g., adding "mama" "chick, mama"). CP produced 2-word utterances that were direct imitations of the clinician's utterance. He also demonstrated imitations with reduction of the clinician's utterance.

C1: chick stick
    points out that the chick is sticking on CP's mother's stick
CP: mmm-hmm
    acknowledges the clinician's comment
C1: What about C3?
    Indirectly requests CP to ask C3 to stick a chick sticker on a stick
CP: chick stick
CP directs C3 to stick a chick using a 2-word utterance that was modeled seconds previously by the clinician
C1: Would you like to take home some chick?
CP: take home chick (imitates preceding utterance with reduction)

Eat at Sam's **(Level 2 activity).** In the level 2 *Eat at Sam's* interaction, while most of the input was modeling of single words, the clinician also produced target words in two-word combinations.

C2: I want (.) I want graham:
CP: oh
C2: more graham
CP: three graham (.) please

CP's production of "three graham" was an example of modifier + object semantic relation. It was not a direct imitation of the preceding utterance. However, it utilized structure found in earlier productions.

Celebrate Mouse (Level 2 activity). In the Level 2 *Celebrate Mouse* interaction, the clinician modeled the word *too.* CP uses the word in a sequence of successive single words.

C1: oh, we've got chips, too
C3: [lim:e]
MOM: [mmm]
C1: Does mom want chip
CP: mom (.) chip (.) too

Save the Animals **(Level 3 activity).** The Level 3 *Save the Animals* activity includes examples of how the clinician's models fit grammatical production goals for CP. The clinicians frequently produced two-word semantic relations, and CP often picked up on these and

incorporated part of the modeled production in his own utterances. Inspecting turn-by-turn exchanges illustrated times when CP imitated the clinician's utterances with expansion.

C2: hide lock
    Directs CP to hide the lock
C2: hide lock
    Repeats request
CP: hide mouse
Takes the structure and format of the student clinician's utterance and changes it to generate a novel request
C2: hide mouse?
    Requests clarification
CP: hide (.) hide cat
Changes request to hiding the cat, instead of the mouse, and uses the same 2-word format with "hide (noun)."

After the utterance *hide lock* was modeled, CP produced *hide cat* and *hide mouse*. These appeared to be generative utterance, since they were not direct imitations.

***Make a Mess* (Level 3 activity).** In the Level 3 interaction *Make a Mess*, CP relied on previously modeled information to make a somewhat novel request. The model occurred 37 seconds before the reduced imitation.

MOM: I'll call a cop (.) you better stop
37 seconds later: CP: MOM (.) Call cop

***Don't Cross the Bridge* (Level 4 activity).** In the Level 4 interaction *Don't Cross the Bridge*, the clinician models a 3-word phrase "dog in cage," using a locative semantic relation. CP then generates a novel 3-word phrase and later used the "animal + in + cage" phrase pattern initially modeled by the clinician.

C1: Haha (.) dog in [ca:ge]
CP: dog
CP: Umm kid go cage
C1: that cage?
CP: yeah
C1: okay kid (.) in cage
CP: mouse in cage

***Play a Trick at McDonald's* (Level 4 activity).** In the Level 4 *Play a Trick at McDonald's* activity, CP's mother and the student clinician were responsive to CP's utterances and modelled the correct usage of the word "for." CP does not use the word "for" but does signal the possessive relationship in the two-word combination "hamburger you."

CP: here, momma (.) hamburger you:
MOM: hamburger for me
C2: and pop for me, thank you

Summary of linguistic complexity. Observations of the transcripts revealed times when the clinician's language productions were considered to be grammatically facilitative (i.e., responsive to CP's preceding utterances and slightly above his productions). Analyses also indicated instances when CP's subsequent two-word productions mirrored the modeled structure and incorporated modeled words.

The analyses also revealed times when the clinician's utterances were not considered to be facilitative of CP's use of more complex sentences (or basic semantic relations). This tended to happen when she was explaining a task or emphasizing inclusion of a final consonant in single word productions. Thus, while the clinician's utterances could serve as appropriate models for more complex grammatical productions, other exchanges within an activity were focused more on correct phonological production in single words than production of grammatically more correct utterances. Modeled utterances appeared to be appropriate examples of semantic relations when the clinician and CP were in the midst of sharing an experience or engaging in actions on objects as opposed to when the clinician was explaining what would happen and directing or requiring single-word requests for desirable turns or objects.

CHAPTER 4

Discussion

This study explored the nature of interactions within clinical contexts designed to improve speech sound production in a young child who exhibits language difficulties. It explored how clinicians elicited final consonant productions within highly communicative interactions that could facilitate communication and language as well as speech sound productions. This discussion addresses clinical implications derived from the analysis, factors that could influence results, and limitations and recommendations for future research.

Clinical Implications

The study has a number of implications for implementing speech sound intervention for children with language difficulties. These included mechanisms to support language, communication and speech; steps involved in controlling communicative complexity; and ways to heighten interactive communicative exchanges.

Mechanisms to support language, communication, and speech. The study supports the notion that interactive intervention for speech-sound disorders can occur in a naturalistic context that is also structured to facilitating language and communication. Addressing phonology and language intentionally in communicative-based contexts can entail more than expecting that better phonological productions will be an incidental byproduct of language therapy or vice versa. Clinicians can be consciously aware of mechanisms to support both speech and language productions. They can also be aware that similar underlying psycholinguistic mechanisms influence the development of speech and language (phonological representations; deep memory or structures and input (Stackhouse, 1997).

Interventions for young children with significant speech and language issues can challenge clinicians to adequately address both deficit areas. A child with co-occurring speech-sound and language disorders needs to be motivated to derive purpose and meaning for applying targeted skills to achieve communicative functions in social interactions. Highly-dense, supported practice and control of the communicative environment can serve as useful factors for getting children to achieve sound production goals within contexts where meaning and purpose are capitalized on from the beginning of intervention. Within representational play scripts the child can be exposed to relevant vocabulary and sentence structure in events (actions) that highlight the meanings and use of words and word combinations.

Steps involved in controlling communicative complexity. The findings point to the value in developing strategies for systematically controlling complexity of communicative contexts. Often therapy approaches begin with clinician-directed requests for productions and move to game-like interactions and conversations with little information about how to control or create authentic interactions at various levels of complexity. Clinicians can find that moving from simple to more complex contexts can be somewhat tricky to achieve. Being aware of the notion of participant structure can help clinicians achieve this. However, despite having operational definitions for moving gradually from simple to complex contexts, some overlap among levels can be expected. While the nature of an interaction results from many variables operating simultaneously, the manner in which the clinician conceives the structure is important.

Clinicians must keep principles in mind rather than following a tight set of procedures. The clinician monitors targeted phonological and language goals while keeping the script in mind permitting the child to contribute to the development of the play script. The clinician

encourages the child to make suggestions, contribute information, or make decisions in regard to the characters, roles, props, and events.

While tightly controlled exchanges can be used to initially address target sound and word productions, the clinical context can be manipulated to increase complex, natural, authentic communicative contexts (Culatta et al., 2005). Clinicians can shoot for naturalistic conversational interactions to be part of intervention from the beginning. In this study, the clinician provided high levels of opportunities for the child to practice production in supported routines and moved to representational play scripts that involved more varied turn taking and opportunities to achieve a number of communicative functions.

Ways to create highly interactive, communicative exchanges. The study illustrates how, in naturalistic contexts, the clinician can impose control over stimuli and support responses while drawing upon a variety of commutative functions to elicit responses. While the results do not negate the value of providing discrete trial opportunities for children to practice and establish targeted sound production, it does suggest that frequent opportunities to practice skills can be achieved in interactive contexts (exchanges). Children can be provided with opportunities to produce target words in routines and theme-based scripts with various levels of support in interactive exchanges. At times the clinician set up frequent opportunities for the child to make frequent requests for objects or turns, but she also modeled and incorporated some other functions as well (e.g., commenting, conveying information, responding to information questions rather than test questions). Clinicians can initially provide high levels of modeling and support and then loosen and decrease support and increase communicative complexity as the child becomes more competent. One advantage to this is that even when presenting simple and fairly-

structured activities, clinicians can permit and encourage spontaneity (Kovarsky & Duchan, 1997) and capitalize on child's spontaneous initiations (or communicative acts).

Factors that Influence the Communicative Exchanges

The study had several factors related to participant structure that influenced the communicative exchanges. Such factors include responsiveness to children's contributions and adults present.

Responsiveness to children's contributions. While clinicians are typically responsive to children's contributions and attempt to expand or incorporate their ideas in the interaction, the extent to which they do so can influence the complexity of the context. The clinicians were able to be more responsive to CP's contributions in the less structured events (activities). Also, the freer or more flexible the script or representational play, the more opportunity there is for children to contribute ideas.

Children can encounter many functional reasons to produce target words in highly supported and controlled but authentic-like communicative situations. With gradual release of supports, the intervention can move children from controlled sound production to use of sound targets with minimal or no support in more communicatively complex contexts. Loosely structured, conversational contexts imply greater focus on functionality and less on repeated practice of new forms.

Clinicians can implement strategies to increase the communicative complexity of these scripted, theme-based contexts. They continue to draw upon naturalistic meaning and purpose to replicate authentic social exchanges and situations within representational play activities but can reduce modeling and increase complexity of the context and exchange demands. The goal is to

replicate the complexity of authentic exchanges and to still elicit and monitor production of the targeted skill.

Adults present. A factor that influenced the nature of the interactions and complicated the analysis was the number of adults in the room. At times the number of adults in the room with CP varied, and this influenced the complexity and demands of the conversational interactions. On occasions CP's mother or father would participate in the session and on occasions a student clinician or two were present. In some instances, when there were multiple clinicians present, CP seemed to have fewer opportunities for spontaneous initiations. However, in other instances, CP and one of the student clinicians would co-conspire or plan how they would interact with the main clinician, providing several opportunities for CP to initiate.

Limitations and Suggestions for Future Research

There are limitations in the study that are inherent in the nature of the qualitative design. As a qualitative study, there was no attempt to control for variables that could have impacted CP's performance. Future research could employ single-subject designs to contrast targeted- with untargeted language productions or experimental within- or between-subject designs where children's performance is compared as they encounter structured with more naturalistic intervention contexts.

While gains in speech-sound production were monitored (see Culatta et al., 2005), the study did not tie the intervention to specific gains in language. The study could be strengthened by predetermining specific language and communicative objectives for CP. Attempts in the future could look more specifically at the role in which language gains can be a byproduct of interactive intervention for speech sound disorders. Certainly, identification of very specific goals would help clinicians determine what language gains have been achieved. Conducting pre-

and postintervention baselines using elicited tasks and samples of spontaneous language productions and communicative use would give a better comparison of language and communication before and after intervention. While CP produced some words in intervention that had not been observed prior to the initiation of the targeted therapy sessions, and produced some words and semantic relations only after modeling, we could not be certain that these words were not ones that he had produced in other contexts. The study did reflect, however, that the input was generally relevant to his language level – at least when great effort was not placed on single-word production to achieve a final consonant.

Conclusion

The findings suggest that the approach documented in this study would be beneficial to speech language pathologists and to their clients. The study suggests that contextualized intervention can make speech sound production relevant for children with phonological production as well as language deficits. Children with phonological disorders, particularly those with co-occurring language problems, can benefit from focus on sound production (differences) within contexts that draw attention to the use of words to interact and convey (communicate) different meninges and functions. Clinicians can gradually increase communicative complexity and decrease supports for productions while keeping the context and reason for the exchange purposeful and naturalistic (see Culatta, 1984; Culatta & Horn, 1982; Setzer, Culatta, & Horn, 2005). Signaling of meanings and engaging in purposeful communication, rather than an IRE discourse model, appeared to be very motivating. The eliciting stimuli with authentic functions relates to real-world functioning, and the focus on communication coordinates or fits well with oral language goals.

References

American Speech-Language-Hearing Association. (ASHA,1993). *Definitions of communication disorders and variations*. Retrieved from www.asha.org/policy

Atkinson, J. M., & Heritage, J. (1984). Structures of social action: Studies in conversation analysis. *Cambridge University Press and Editions De La Maison Des Sciences De L'Homme, 23-24*. doi:10.1017/S0022226700011464

Blache, S. E., Parsons, C. L., & Humphreys, J. M. (1981). A minimal-word-pair model for teaching the linguistic significant difference of distinctive feature properties. *Journal of Speech and Hearing Disorders*, *46*, 291-296.

Bzoch, R., & League, R. (1991). *Receptive-Expressive Emergent Language Scale.* Gainesville, FL: Tree of Life Press.

Cleave, P., & Fey, M. (1997). Two approaches to the facilitation of grammar in children with language impairments: Rationale and description. *American Journal of Speech Language Pathology*, *6*, 22-62.

Culatta, B. (1984) A discourse-based approach to training grammatical rules. *Seminars in Speech and Language, 5*, 253-263.

Culatta, B., & Horn, D. (1982). A program for achieving generalization of grammatical rules to spontaneous discourse. *The Journal of speech and hearing disorders, 47*, 174-180. doi: 10.1044/jshd.4702.174

Culatta, B., Setzer, L. A., & Horn, D. (2005). Meaning-based intervention for a child with speech and language disorders. *Topics in Language Disorders, 25*, 388-401. doi: 10.1097/00011363-200510000-00013

Dore, J. (1979). Conversational acts and the acquisition of language. In E. Ochs & B. B. Shieffelin (Eds.), *Developmental pragmatics* (pp. 339-361). New York, NY: Academic Press.

Dunn, L., & Dunn, L. (1997). *Peabody picture vocabulary test: Third edition (PPVT-III)* [Assessment Instrument]. Bloomington, MN: Pearson.

Faircloth, M. A., & Faircloth, S. R. (1970). An analysis of the articulatory behavior of a speech-defective child in connected speech and in isolated word responses. *Journal of Speech and Hearing Disorders*, *35*, 51-61.

Fey, M. E. (1986*). Language intervention with young children*. Boston, MA: Allyn & Bacon

Fey, M. E., Cleave, P. L., Ravida, A. I., Long, S. H., Dejmal, A. E., & Easton, D. L. (1994). Effects of grammar facilitation on the phonological performance of children with speech and language impairments. *Journal of Speech Language and Hearing Research, 37*, 594-607. doi:10.1044/jshr.3703.594

Gee, J. P. (2011). *An Introduction to Discourse Analysis: Theory and Method* (3rd ed). New York, NY: Routledge.

Gierut, J. A. (1989). Maximal opposition approach to phonological treatment. *Journal of Speech and Hearing Research*, *54*, 9-19.

Gierut, J. A. (2007). Phonological complexity and language learnability. *American Journal of Speech-Language Pathology, 16*, 6-17.

Goldman, R., Fristoe, M. (2000). *Goldman-Fristoe Test of Articulation: Second edition (GFTA-2)* [Assessment Instrument]. Bloomington, MN: Pearson.

Healy, T. J., & Madison, C. L. (1987). Articulation error migration: A comparison of single word and connected speech samples. *Journal of Communication Disorders*, *20*, 129-136.

Hodson, B. (1987) *The Assessment of Phonological Processes*. Danville, IL: Interstate Publishers.

Hodson, B. (1994). Determining phonological intervention priorities: Expediting intelligibility gains. *Children's phonology disorders: Pathways and patterns* (pp. 67-68). American Speech Language Hearing Association.

International Expert Panel on Multilingual Children's Speech (2012). Multilingual children with speech sound disorders: Position paper Retrieved from http://www.csu.edu.au/research/multilingual-speech/position-paper

Jefferson, G. (2004). Glossary of transcript symbols with an introduction. In G. H. Lerner (Ed.), *Conversation analysis: Studies from the first generation* (pp.13-31). Amsterdam, Netherlands: John Benjamins.

Kamhi, A. G. (2006). Treatment decisions for children with speech-sound disorders. *Language, Speech, and Hearing Services in Schools*, *37*, 271-279.

Kovarsky, D. (1990). Discourse markers in adult-controlled therapy: Implications for child centered Intervention. *Journal of Childhood Communication Disorders, 13*, 29-41. doi:10.1177/152574019001300105

Kovarsky, D., Culatta, B., Franklin, A., Theadore, G. (2001). Communicative participation as a way of facilitating and ascertaining communicative outcomes. *Topics in Language Disorders, 22*, 1–20. doi:10.1097/00011363-200111000-00003

Kovarsky, D., & Duchan, J. (1997). The interactional dimensions of language therapy. *Language, Speech, and Hearing Services in Schools, 28*, 219-230.

Kovarsky, D., & Maxwell, M. M. (1992). Ethnography and the clinical setting: Communicative expectancies in clinical discourse. *Topics in Language Disorders*, *12*, 76-84. doi: 10.1097/00011363-199205000-0000

Lee, E. C., & Rescorla, L. (2002). The use of psychological state terms by late talkers at age 3. *Applied Psycholinguistics, 23*, 623-641.1 doi:10.1017/s014271640200406x

Lewis, B., Ekelman, B., & Aram, D. (1989). A familial study of severe phonological disorders. *Journal of Speech and Hearing Research, 32*, 713–724.

Masterson, J. J., Bernhardt, B. H., & Hofheinz, M. K. (2005). A comparison of single words and conversational speech in phonological evaluation. *American Journal of Speech-Language Pathology*, *14*, 229-241.

McGrath, L. M., Hutaff-Lee, C., Scott, A., Boada, R., Shriberg, L. D., & Pennington, B. F. (2007). Children with comorbid speech sound disorder and specific language impairment are at increased risk for attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*, *36*, 151-163.

Norris, J. A., & Hoffman, P. R. (1990) Language intervention within naturalistic environments. *Language, Speech, and Hearing Services in Schools*, *21*, 72-84.

Panagos, J. (1982). The case against the autonomy of phonological disorders in children. *Seminars in Hearing*, *3*, 172-181. doi:10.1055/s-0028-1094185

Panagos, J. M., Quine, M. E., & Kilch, R. J. (1979). Syntactic and phonological influences on children's articulation. *Journal of Speech and Hearing Research*, *22*, 841-848.

Pennington, B., & Bishop, D. (2009). Relations among speech, language and reading disorders. *Annual Review of Psychology, 60,* 283-306.

Philips, S. U. (1972). Participant structures and communicative competence. In C. B. Cazden, V. P. John, & D. Hymes (Eds.), *Functions of language in the classroom*. New York, NY: Teachers College Press.

Schegloff, E. A. (1984). On some questions and ambiguities in conversation. In Atkinson, J. M. (Eds.), *Structures of Social Action* (29-52). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511665868

Seuss, D. (1960). *Green Eggs and Ham*. New York, NY: Penguin Random House.

Shriberg, L. D., & Kwiatkowski, J. (1982). Phonological disorders III: A procedure for assessing severity of involvement. *Journal of Speech and Hearing Disorders, 47,* 256-270.

Simmons-Mackie, N., & Kovarsky, D. (2009). Engagement in clinical interaction: An introduction. *Seminars in Speech and Language, 30*, 5-10.

Stackhouse, J., & Wells, B. (1997). *Children's speech and literacy difficulties: A psycholinguistic framework*. London, England: Whurr Publishers.

Sturm, J. M., & Nelson, N. W. (1997). Formal classroom lessons. *Language Speech and Hearing Services in Schools, 28*, 255-273. doi:10.1044/0161-1461.2803.255

Tanner, D. C. (1984*). CLASS, The cognitive, linguistic and social-communicative scales*. Tulsa, OK: Modern Education Corporation.

Tyler, A. A. (2002). Language-based intervention for phonological disorders. *Seminars in Speech and Language*, *23*, 69-82.

Tyler, A.A., Lewis, K.E., Haskill, A., & Tolbert, L.C. (2003). Efficacy and cross-domain effects of a morphosyntax and a phonology intervention. *Language, Speech, and Hearing Services in Schools*, *33*, 52-66.

Tyler, A. A., & Sandoval, K. T. (1994). Preschoolers with phonological and language disorders: Treating different linguistic domains. *Language, Speech, and Hearing Services in Schools*, *25*, 215-234.

Weiner, F. (1981). Treatment of phonological disability using the method of meaningful minimal contrast: Two case studies. *Journal of Speech and Hearing Disorders*, *46*, 97-103.

Williams, A. L. (2000). Multiple oppositions: Theoretical foundations for an alternative contrastive intervention approach. *American Journal of Speech-Language Pathology*, *9*, 282-288.

Williams, K. T. (1997). *Expressive Vocabulary Test* [Assessment Instrument]. Bloomington, MN: Pearson.

Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (1992). *Preschool language scale: Third edition (PLS-3)* [Assessment Instrument]. San Antonio, TX: The Psychological Corporation.

APPENDIX A

Conventions for Transcription Coding

Linguistic Complexity

Length of utterance
Exact imitation
Imitate with reduction
Imitate with expansion
Grammatical pauses

Conversational Functions (Dore, 1979)

Assertive Acts
Requests for information
Requests for actions

Comments - identifies, labels, describes (observable)
Statements - evaluations, attributions, explanations, rules, mental events, feelings (not observable)
Responsive Acts
Responds to requests for information (answers questions)
Responds to assertives (responds but does not add new information) Acknowledgments -- yeah, what?
Agreements - Okay, Right, Yeah, sure
Responds to requests for clarification - repeats or clarifies
Expressives (e.g., Wow!)

Turn Type

Initiation (I) - new topic
Maintenance (M) - nothing added or new Answers questions but doesn't add Acknowledges, agrees
Extension (E) - adds to topic (extend self vs extend other) Extends own utterance (extend self)
Extend other's utterances (EO)
Extend other (add to partner's utterance)
Extend self (add to or elaborate own utterance) Extend tangentially (related but not well)
No response (NR)
Non-verbal turn (NV) - fills turn with gesture or action

Conventions

Emphasized: <u>underlined</u>
Overlapped utterance: [ ]
Elongated vowel: :
Truncated word: wor-
Implied sounds or words:
( ) Probable word: ?word
Unintelligible: XXX
Nonverbal turn: NV turn
Grammatical pauses: (.)
Overlap: [ ]
No pause =

APPENDIX B

Coded Transcriptions

Level 1 Coded Transcription "Stick the Chick on a Stick"

Session date: 4/10/01
Recording time: 12:22:29-12:26:25
Target productions: final /k/

Context of the interaction: CP, his mother, the supervising clinician, and a graduate student clinician stick chick stickers to popsicle sticks by licking the adhesive on the back of the sticker and/or using glue. They then place them inside an envelope and transition to story time.

Participants: C1: supervising clinician; C3: graduate student assistant clinician; CP: child; MOM: CP's mother

Table 3

Level 1 Coded Transcription "Stick the Chick on a Stick"

Utterance number	Transcription	Context	Turn-type	Function
1.	C1: [chick] stick	Shows CP the chick sticker on a popsicle stick	I	Comment
2.	C1: on the stick		ES	Comment
3.	C1: I'll lick chick		ES	Comment
4.	CP: chick, Momma	CP directs his mother to put a chick on a stick. CP keeps his hands in his lap and demonstrates a neutral affect.	I	Request for action
5.	MOM: yeah, I want a chick	Taps popsicle stick while moving it closer to CP	MO	Response to request for action
6.	C1: or we could stick (.) with glue		ES 3	Comment
7.	C1: stick chick		MS	Comment

8.	MOM: chick on stick please	MO 4	Request for item
9.	C1: time to stick the chick	MS 7	Comment
10.	MOM: thank you	MO 4	Social
11.	CP: welcome	M	Social
12.	MOM: chick	I	Comment
13.	C1: chick stick	MO	Comment
14.	CP: mmm-hmm	MO	Acknowledgment
15.	C1: what about C3	I	Indirect request for action
16.	CP: chick stick	I	Request for information
17.	C3: I want a chick	EO	Response to request for information
18.	CP: ?chick	Repetition	Acknowledgment
19.	C3: on my stick	EO	Response to request for information
20.	CP: stick mmm-hmm	I	Acknowledgment
21.	C1: ok stick chick	MO	Request for action
22.	CP: NV turn: sticks chick on the stick	MS	Response to request for action
23.	C1: stick	MO	Comment
24.	C1: stick the chick on the stick	MO	Comment
25.	C1: there	MO	Comment
26.	C3: thank [you]	MO	Social
27.	CP: [uh-oh] (.) C3	I	Expressive
28.	C1: C3's got a chick on a stick	I	Comment

29.	C1: two chicks		ES	Comment
30.	C1: look	Pushes CP's chair closer to the table	MS	Request for action
31.	C1: another chick		ES	Comment
32.	C1: mmm		MS	Acknowledgment
33.	C1: whoops XXX	Mumbles	I	Expressive
34.	C1: another chick		Repetition 31	Repetition
35.	C1: stick		MS	Comment
36.	C1: that chick sticks		MS	Comment
37.	C1: XXX this sticker XXX oh	Quiet, mumbled self-talk	MS	
38.	C1: what should we do?		I	Request for information
39.	CP: NV turn: points and looks at C3		MO	Response to request for information
40.	C1: stick C3?		I	Request for information
41.	C1: look	Pushes CP's chair closer to the table	MS	Request for action
42.	C1: another chick		ES	Comment
43.	C1: mmm		MS	Acknowledgment
44.	C1: whoops XXX	Mumbles	I	Expressive
45.	C1: another chick		Repetition 31	Repetition
46.	C1: stick		MS	Comment
47.	C1: that chick sticks		MS	Comment
48.	C1: XXX this sticker XXX oh	Quiet, mumbled self-talk	MS	
49.	C1: what should we do?		I	Request for information
50.	CP: NV turn: points and looks at C3		MO	Response to request for information

51.	C1: stick C3?		I	Request for information
52.	C1: ask C3		I	Request for action
53.	CP: /dI/ (.) C3	"stick" with final consonant deleted and cluster reduction	MO	Request for information
54.	C3: ok		MO	Response to request
55.	C1: can you say stick	Direct elicitation of target production	I	Request for action
56.	CP: stick		MO	Response to request for action
57.	C1: ok		MS	Acknowledgment
58.	C1: stick		MS	Comment
59.	C3: stick		MO	Comment
60.	C1: another chick		I	Comment
61.	C1: ask mom if she wants a chick		I	Request for action
62.	CP: chick	Said with final /t/ substituted for /k/	MO	Request for information
63.	C1: ok		MO	Acknowledgment
64.	MOM: yeah, I want a chick		MO	Response to request for information
65.	MOM: chick		MO	Comment
66.	CP: huh	huffs	I	Expressive
67.	MOM: yay		I	Expressive
68.	C1: I don't have a chick		I	Indirect request for action
69.	CP: here one		MO	Response to request for action
70.	C1: ok, ask me if I want one		I	Request for action

71.	C1: say chick		MS	Request for action
72.	CP: chick		MO	Response to request for action
73.	C1: ok (.) stick (.) chick		MS	Request for action
74.	CP: stick a chick	"Stick" and "chick" said with final consonants deleted	Repetition	Acknowledgment
75.	C1: chick (.) sticks. stick	Points to chick	MS	Comment
76.	C1: I think that is all the chicks and sticks I have		ES	Statement
77.	CP: [whew]		MO	Expressive
78.	C1: Oh no wait, would you like to take home some chick?		I	Request for information
79.	CP: take home chick		MO	Response to request for information
80.	C1: ok put all the chicks you want in the envelope		I	Request for action
81.	C1: chick		MS	Comment
82.	C1: you can- you can take just these ones here XXX sticks		ES	Comment
83.	C1: Put that one in		MS	Request for action
84.	C1: put that one in		Repetition	Request for action
85.	C1: chick		MS	Comment
86.	C3: oh, my chick does a trick	Makes sound effect for chick flying and twirling	I	Comment
87.	C1: a trick		Repetition	Acknowledgment
88.	CP: (imitates sound effect)	Makes chick	MO	Performative

89.	MOM: whoa, another trick		MO	Comment
90.	C1: another trick		Repetition	Comment
91.	C3: a chick (.) trick		MS	Comment
92.	C1: a chick trick		Repetition	Comment
93.	C1: ok (.) lick		I	Request for action
94.	CP: ugh		I	Expressive
95.	C3: ick		MO	Comment
96.	C1: and stick		I	Comment
97.	C1: stick		Repetition	Comment
98.	C1: uh-oh		I	Expressive
99.	CP: huh?		I	Request for information
100.	C1: didn't stick		EO	Response to request for information
101.	C1: lick		I	Comment
102.	C1: lick		Repetition	Comment
103.	C1: ok		MS	Evaluation
104.	C1: stick		MS	Comment
105.	C1: stick		Repetition	Comment
106.	CP: /gIt/	"stick"	I	Comment
107.	C1: [ok]		MO	Agreement
108.	MOM: [wow]		MO	Expressive
109.	C3: That's [cool CP]		I	Statement
110.	C1: [Chicks]		MO 95	Comment
111.	C1: Ok say bye chicks		I	Request for action
112.	CP: Bye /dI/	Deaffrication, final consonant deletion, stopping, prevocalic voicing	MO	Response to request for action

113.	MOM: Those are cool chicks		I	Statement
114.	C1: And they sti:ck like nobody's business		EO	Statement
115.	CP: ?wow (.) ?wow (.) ? wow	Walks slowly across the room to go see the other materials	I	Expressive
116.	C1: Wow		Repetition	Agreement
117.	MOM: Wow		Repetition	Agreement
118.	C3: That was cool CP		I	Statement
119.	CP: Mmm hmm		MO	Agreement
120.	C1: Kind of what we are planning on this spring if that's ok		I	Comment
121.	MOM: Mmm hmm		MO	Agreement
122.	C3: let's do our story		I	Request for action
123.	C3: let's do our CP story	Puts pillow on the floor in preparation for story time	ES	Repetition
124.	MOM: ooo		MO	Acknowledgment
125.	CP: XXX (.) XXX dat (that) (.) a story (.) CP (.) story momma		EO	Comment

Level 1 Coded Transcription "Stop Cop"

Session date: 5/03/01
Recording time: 13:11:08 - 13:14:11
Target production: Final /p/

Context of the interaction: The clinician initiates the game "Stop Cop". The clinician, child, and child's mother take turns pretending to be the cop. The cop says "stop" and "go" while using a sign with a green side and a red side. The other participants can move towards the cop when the cop says "go" and must stop when the cop says "stop".

Participants: C1: supervising clinician; CP: child; MOM: CP's mother

Table 4

Level 1 Coded Transcription "Stop Cop"

Utterance number	Transcription	Context	Turn-type	Function
1.	C1: play c[op]	Puts on glasses	I	Comment
2.	CP [umm]		MO	Acknowledgment
3.	C1: (o)kay ready		I	Comment
4.	C1: I'm a cop			Performative
5.	-	MOM gasps	MO	Expressive
6.	C1: I'm the cop		R	Performative
7.	C1: Look CP (.) co:P	Puts on hat	MS	Comment
8.	C1: I'm the cop		MS	Comment
9.	C1: oop not yet (.) hop down		I	Request for action
10.	C1: hop	Helps CP hop down	MS	Request for action
11.	C1: I'm cop		I	Comment

12.	C1: Mom (.) I'm the cop [come on]	Gestures to mom to follow her	ES	Comment
13.	MOM: [oh look] (.)the cop		MO	Acknowledgment
14.	C1: I'm the cop		MS	Comment
15.	C1: stay right here		I	Request for action
16.	CP: [ah]		MO	Expressive
17.	MOM: [ooh] the cop		MO	Comment
18.	C1: I'm the cop		I	Comment
19.	CP: me (.) CP(.) I be cop		I	Request for turn
20.	C1: you can be the cop (.) in a minute		EO	Response to request
21.	C1: look this says go:	Points to green go sign	I	Comment
22.	MOM: wow		MO	Expressive
23.	C1: this says (.) sto: p	Points to red stop sign	I	Comment
24.	C1: I'm the cop	Points to self	I	Comment
25.	C1: stop		I	Request for action
26.	C1: ok (.) go:		I	Request for action
27.	C1: stop	LAS flips sign to red stop sign and bends over for emphasis MOM & CP laugh	I	Request for action
28.	-	-	-	-
29.	C1: ready: (.) go	Stands up straight	I	Request for action
30.	C1: stop	C1 Bends over for emphasis MOM & CP laugh	I	Request for action
31.	MOM: tricky cop	Mom laughs	EO	Statement
32.	C1: ready go:		I	Request for action

33.	C1: stop	CP: laughs	I	Request for action
34.	C1: go		I	Request for action
35.	C1: stop		I	Request for action
36.	C1: go		I	Request for action
37.	C1: stop		I	Request for action
38.	C1: go:		I	Request for action
39.	C1: sto:p		I	Request for action
40.	C1: now you can be the:		I	Response to request for action
41.	CP: cop		MO	Comment
42.	C1: yeah, the cop	Reaches for hat	MO	Acknowledgment
43.	CP: take glasses		I	Request for item
44.	C1: ok CP's the cop hi cop	Points to glasses	EO	Comment and Agreement
45.	CP: hi	MOM laughs	MO	Acknowledgment
46.	C1: ok you tell us to go and=		I	Request for action
47.	CP: =stop		MO	Comment
48.	C1: stop		MS	Agreement
49.	CP: Mom		I	Request for action
50.	C1: CP can you say it (.) stop	Gets down to his level, models the word, and asks him to repeat the model for final /p/	I	Request for action

53.	CP: stop		MO	Response to request
54.	C1: good job. (o)kay	Runs to the other side of the room to the starting line	EO	Statement
55.	CP: stop		I	Request for action
56.	CP: green		I	Request for action
57.	CP: stop		I	Request for action
58.	CP: (o)kay	Flips sign to green go sign	I	Request for action
59.	CP: dop	(said "stop" emphasized beginning and ending consonants and substituted /d/)	I	Request for action
60.	CP: stop		I	Request for action
61.	C1: Oh uh	Shuffled forward then stopped	MO	Expressive
62.	CP: g- (go)		I	Request for action
63.	CP: stop		I	Request for action
64.	CP: stop		I	Request for action
65.	C1: good job		I	Statement
66.	C1: we made it		ES	Comment
67.	MOM: y[eah]		MO	Expressive
68.	C1: [who's] gonna be the cop [now]		I	Request for information
69.	CP: [you] (.) Momma cop		EO	Response to request for information
70.	MOM: ooh I get to be the cop		EO	Comment
71.	C1: say cop		I	Request for action
72.	CP: cop		MO	Response to request for action
73.	C1: all ri:ght		MO	Statement

74.	C1: mm-hmm		MO	Acknowledgment
75.	C1: okay CP	Began moving towards the starting line	I	Request for action
76.	CP: [whoa]	ran to the starting line	MO	Expressive
77.	C1: [here we] g- are	Ran to the starting line	I	Comment
78.	MOM: stop		I	Request for action
79.	MOM: go		I	Request for action
80.	MOM: stop		I	Request for action
81.	MOM: go:		I	Request for action
82.	C1: Mom's a good co[p]		I	Statement
83.	MOM: [stop]		I	Request for action
84.	C1: look at that cop		I	Request for action
85.	MOM: go		I	Request for action
86.	MOM: stop		I	Request for action
87.	MOM: go=		I	Request for action
88.	MOM: = stop		I	Request for action
89.	C1: oh	laughs	MO	Expressive
90.	MOM: go		I	Request for action
91.	MOM: stop		I	Request for action
92.	MOM: go		I	Request for action
93.	CP: we made it		I	Comment
94.	C1: what do you want to be	Crouch down to CP's level. CP takes hat from MOM.	I	Request for information
95.	C1: what do you want to be		MS	Request for information

96.	CP: all done	Gives hat back to mom. Climbs up to see tub of materials on the counter	EO	Response to request for information
97.	MOM: you're done		MO	Acknowledgment
98.	C1: oh, you're done		MO	Acknowledgment
99.	MOM: okay		MO	Agreement

Level 2 Coded Transcription "Eat at Sam's"

Session date: 5/29/01
Recording time: 13:16:19 - 13:18:06
Target productions: Final /m/

Context of the interaction: CP, the supervising clinician, and CP's mother sit around a table while wearing paper deli hats. They pretend to be at Sam's restaurant. One graduate student clinician, C3, joins in on the interaction, while the other, C2, sits off to the side to collect data. During the interaction, C2 and C3 trade roles.

Participants: C1: supervising clinician; C2: graduate student assistant clinician; C3: graduate student assistant clinician; CP: child; MOM: CP's mother

Table 5

Level 2 Coded Transcription "Eat at Sam's"

Utterance number	Transcription	Context	Turn-type	Function
1.	C1: one two (.) what do you want?		I	Request for information
2.	CP: three		MO	Response to request for information
3.	C1: you want ha[m:] (.) for everybody?		ES	Request for information
4.	CP: [ham]		MO	Agreement
5.	C2: mm[m]		MO	Comment
6.	C1: (o)[k] don't forget to give it to (th)em this time Sam		I	Request for action
7.	CP: here	Hands C3 a piece of ham on a toothpick	I	Acknowledgment
8.	C3: Thanks [Sam:]		MO	Comment
9.	C1: [? here's ham]		I	Comment

10.	CP: [CP]		I	Request for item
11.	C1: [mmm]		I	Comment
12.	CP: CP [ha-]		MS 10	Request for item
13.	C3: [yum:]		I	Comment
14.	C1: what do you want		I	Request for information
15.	CP: CP ham=me		MO	Response to request for information
16.	MOM: put your ham:		I	Request for action
17.	C1: all gone ham (.) in the can:		I	Comment
18.	CP: ahh		MO	Acknowledgment
19.	C3: [mmm]		I	Comment
20.	MOM: [mmm] more ham:		I	Request for item
21.	C3: bye Sam:	Stands up and trades places with C2	I	Performative
22.	CP: ?goodbye XXX		MO	Performative
23.	C1: eat your ham		I	Request for action
24.	C1: hi Sam:		I	Performative
25.	C2: Hey Sa[m:]	Waving hand to gain CP's attention	MO	Performative
26.	MOM: [mmm]		I	Comment
27.	C2: Sam:	Waving hand to gain CP's attention	Repetition 25	Performative
28.	CP: eat eat		I	Request for action
29.	C2: I want (.) I want graham:		I	Comment

30.	CP: oh		MO	Acknowledgment
31.	C2: more graham		MS	Request for item
32.	CP: three graham (.) please		I	Request for item
33.	C1: three graham: please		MO Repetition 32	Acknowledgment
34.	C1: ok		MO	Agreement
35.	C2: I want graham:		MS 31	Comment
36.	CP: ?mom ? get? a XXX (.) XXX		I	Request for action
37.	C2: I want graham:		MS repetition 35	Comment
38.	C1: CP (.) say- ask C2 want jam:		I	Request for action
39.	CP: k- mmm		MO	Agreement
40.	C1: go ask C2	Points at C2	MS	Request for action
41.	MOM: ask C2 (.) if she wants jam:	Points at C2	MO	Request for action
42.	C2: CP	Waving to get CP's attention	I	Comment to gain attention
43.	C1: NV turn: walks over and guides CP over to C2		MS	Request for action
44.	C1: Say want jam:		I	Request for action
45.	CP: jam:		MO	Response to request for action
46.	C2: I want jam:		MO	Comment
47.	CP: NV turn: puts the character "Sam's" hat on C2		I	Performative
48.	C1: oh, C2 is [Sam:]		MO	Performative
49.	C2: [I] am Sam		MO	Performative

50.	C2: ok CP want jam:	Leans in to draw CP's attention to the question and model	I	Request for information
51.	CP: jam:		MO	Response to request for information
52.	C2: jam (.) oh CP wants jam Sam	Scoots over to table to get jam for CP	MS	Comment
53.	C1: ok there's jam:		I	Comment
54.	CP: NV turn: covers mouth with shirt and hands		I	Refusal
55.	C2: jam		MO 53	Comment
56.	CP: XXX eat	Points at C2 and covers mouth again	MS	Comment
57.	C2: not for CP. Who		I	Acknowledgment and request for information
58.	CP: eat		I	Request for action
59.	C2: wants jam		MS 56	Request for information
60.	CP: eat		MS Repetition 58	Request for action
61.	C2: Sam		ES 59	Performative
62.	CP: Sam		MS repetition 61	Performative
63.	C1: [Sam: jam:]		MO	Comment
64.	C2: [Sam eat jam]	Points to self	MS	Comment
65.	CP: NV turn: nods head in agreement		MO	Agreement
66.	C2: ok (.) Sam eat jam:	Takes a bite of the graham cracker with jam	MS	Comment
67.	C2: mmm		I	Comment

68.	C1: yum:	MO	Comment
69.	C2: good jam:	MS	Statement

Level 2 Coded Transcription "Celebrate Mouse"

Session date: 5/31/01
Recording time: 13:43:30 - 13:44:31
Target productions: Final /m/, final /t/, final /s/, and final /p/

Context of the interaction: CP, the supervising clinician, a graduate student clinician, and CP's mother wear headbands to pretend to be mice and cats. They pretend to be at mouse's party and celebrate by eating snacks and drinking limeade.

Participants: C1: supervising clinician; C2: graduate student assistant clinician; C3: graduate student assistant clinician CP: child; MOM: CP's mother

Table 6

Level 2 Coded Transcription "Celebrate Mouse"

Utterance number	Transcription	Context	Turn-type	Function
1.	CP: ?lime for you	Deletes final consonant on "lime"	I	Request for information
2.	C1: say lim:e	Models correct production	I	Request for action
3.	C1: lim:e		Partial repetition	Request for action
4.	CP: ?you ?lime you			Request for information
5.	C1: Cat wants lime		I	Comment
6.	C1: Mouse wants lime		ES	Comment
7.	MOM: ok		MO	Acknowledgment
8.	C1: Should we pour some [lime]		I	Request for information
9.	CP: [XXX]		-	-
10.	C1: ok here you go (.) XXX? put? your XXX C3	mumbles	MS 8	Comment

11.	C1: lime:		I	Comment
12.	C1: lime:		Repetition	Comment
13.	CP: lim:e		Repetition	Request for action
14.	CP: lim:e		Repetition	Request for action
15.	C1: oops	Pours limeade faster than expected	I	Expressive
16.	CP: lim:e		Repetition	Request for action
17.	CP: lim:e		Repetition	Request for action
18.	C1: There we go (.) lime:		MS 11	Comment
19.	C1: What a party [CP] mouse		I	Statement
20.	CP: [? great]		I	Evaluation
21.	CP: yeah		MO 19	Acknowledgment
22.	C1: great lim:e		EO 20	Comment
23.	CP: /iʔɛ/		-	-
24.	C1: oh, we've got chips too		I	Comment
25.	C3: [lim:e]		I	Comment
26.	MOM: [mmm]		MO 24	Acknowledgment
27.	C1: Does mom want chip		I	Request for information
28.	CP: mom (.) chip (.) /u/ (too)	Initial consonant deletion on "too"	MO 27	Request for information
29.	MOM: I want chip		MO	Response to request for information
30.	CP: ok		MO	Acknowledgment
31.	C1: ask C3 mouse		I	Request for action

32.	CP: (o)k (.) chip too	Reaches arm out to offer chip "chip" said with final consonant deletion	MO 31	Agreement and request for information
33.	C3: I want [chip]	Models correct production	MO	Response to request for information
34.	C1: [chip]	Models correct production	MS	Comment
35.	CP: chip		MO	Comment
36.	C1: chip		MS	Comment

Level 3 Coded Transcription "Save the Animals"

Session date: 5/29/01
Recording time: 13:48:04 - 13:49:37
Target production: Final /k/, final /s/, final /p/, and final /t/

Context of the interaction: The child and a graduate student assistant clinician pretend to hide a toy mouse and cat inside a toy house. They then steal a lock from the house while the supervising clinician pretends to sleep. The supervising clinician wakes up and attempts to find the lock.

Participants: C1: supervising clinician; C2: graduate student assistant clinician; CP: child

Table 7

Level 3 Coded Transcription "Save the Animals

Utterance number	Transcription	Context	Turn-type	Function
1.	C2: here comes [cat]	whispers	I	Comment
2.	CP: [/h/] /h/ help me	Reaches out to give C2 (toy mouse???)	I	Request for action
3.	CP: help me		M	Repeated request for action
4.	C2: [ok]		M	Agreement
5.	C1: [ahh] sleep		I	Comment
6.	C2: k		M	Agreement
7.	C1: oh (.) sleep		I	Comment
8.	CP: help me		I	Request for action
9.	C2: ok		M	Agreement
10.	CP: hide [? these]	CP sits down at the table in front of the toy house	I	Request for action
11.	C2: [op]en.	CP looks at C1 then back to C2 and toy house	I	Request for action

12.	C2: open		M	Request for action
13.	C2: help me (.) [open]		ES	Request for action
14.	C1: [mm wake]	CP looks at C1 then back to C2 and toy house	I	Comment
15.	C2: uh oh		M	Expressive
16.	C1: wake		M	Comment
17.	C2: uhoh		M	Expressive
18.	C1: wake		M	Comment
19.	C1: wake		M	Comment
20.	C1: [he:y where's] lock		I	Request for information
21.	C2: [hurry]		I	Request for action
22.	C2: hurry		M	Repeated request for action
23.	C2: where's lock		I	Request for information
24.	C1: no lock		M	Response to request for information
25.	C2: hide lock		I	Request for action
26.	C2: hide lock		M	Repeated request for action
27.	CP: hide ?mouse		I	Comment
28.	C2: hide mouse		M	Acknowledgement
29.	CP: hide (.) hide cat.		ES	Request for action
30.	C2: ok (.) [hide cat]		M	Agreement
31.	C1: [where's] my lock		I	Request for information
32.	C2: uh oh		M	Expressive
33.	C1: [I was] asleep: and someone stole my lock:		ES	Comment

34.	C2: [? hide lock]		I	Request for action
35.	CP: NV turn: hides lock behind back		M	Agreement
36.	C1: where's lock	C1 kneels and leans in C2 gasps	I	Request for information
37.	CP: don't know	Stereotypical phrase? Hides lock under the table	M	Response to request for information
38.	CP: check there	Points to toy house	EO	Request for action
39.	C2: no lock	Shakes head	M	Comment
40.	C1: NV turn: knocks		I	Performative
41.	C1: knock		M	Comment
42.	CP: who's there		M	Request for information
43.	C1: knock		M	Comment
44.	C1: open up		I	Request for action
45.	C1: open u:p	Opens toy house	M	Repeated request for action
46.	C2: hide mouse	whispers	I	Request for action
47.	C1: ah ha mouse		I	Comment
48.	C2: oh		M	Expressive
49.	C1: where's lock		I	Request for information
50.	C2: oh		M	Expressive
51.	CP: ah mouse (.) /kæ/	Says “cat” with final consonant deletion. CP pretends to make the mouse run away.	M	Request for action
52.	C2: mouse		M	Acknowledgement
53.	C2: op here's cat	Reaches for toy cat	EO	Comment
54.	C2: no lock	Shakes head and toy cat. Speaking as the cat.	I	Comment
55.	C2: no [lock]	Speaking as the cat	M	Comment

56.	CP: [lock]	Speaking as the mouse	M	Comment
57.	CP: no /la/	"lock" with final consonant deletion	M	Comment (repeats clinician)
58.	C2: no [lock]		M	Comment
59.	C1: [no what]	Attempts to elicit correct production	I	Request for information
60.	C2: no lock	models correct production	M	Comment
61.	CP: no lock	Says correct production	M	Comment
62.	C2: [good]		I	Statement
63.	C1: [no: lock]	Pulls arms back	I	Comment
64.	C2: no [lock]	Shakes head	M	Comment
65.	CP: [down]	Points down	I	Comment
66.	C1: [where's lock]	Puts hands on hips	I	Request for information
67.	CP: down here		EO	Response to request for information
68.	C1: NV turn: looks under the table		M	Acknowledgement
69.	C2: ah dow:n lock		M	Acknowledgement
70.	CP: hide		I	Request for action
71.	C2: [hide]		M	Acknowledgement
72.	C1: [aha] here's cage		I	Comment
73.	C2: [uh oh]		M	Expressive
74.	C1: [aha he]re's lock		I	Comment
75.	C2: hide (.) lock house		I	Request for action
76.	C1: I:'m going to lock		I	Comment
77.	C2: quick hide		I	Request for action

78.	C2: [hide] mouse		ES	Request for action
79.	C1: [knock]	Knocks on toy house	I	Comment
80.	C1: here you knock (.) this time CP.	Hands CP the toy and pushes house closer to him.	I	Request for action
81.	C1: you knock		M	Request for action
82.	CP: ok.		M	Agreement

Level 3 Coded Transcription "Make a Mess"

Session date: 6/21/01
Recording time: 13:21:21 - 13:22:19 Target productions: Final /p/, /k/, and /m/

Context of the interaction: CP, his mother, the supervising clinician, and a graduate student clinician participate in an ice cream shop routine. One character plays as the clerk and attends to the customers.

Participants: C1: supervising clinician; C3: graduate student assistant clinician; CP: child; MOM: CP's mother

Table 8

Level 3 Coded Transcription "Make a Mess"

Utterance number	Transcription	Context	Turn-type	Function
1.	CP: Cup		I	Comment
2.	C1: Ok cup		M	Acknowledgment
3.	C2: Here it [comes]		I	Comment
4.	C1: [in a] cup	Attempts to get ice cream	EO	Comment
5.	C1: Nope	Ice cream does not come out of toy	M	Comment
6.	C2: You're making a mess		I	Comment
7.	CP: stop /ma/		I	Request for action
8.	C2: Stop, stop		MO	Request for action
9.	MOM: I'll call a cop (.) you better stop	C1 and MOM laugh	EO	Indirect request for action
10.	C2: ok (.) [I want]		I	Request for item
11.	C1: [wait]		I	
12.	C2: I want pop		MS 10	Request item

13.	C1: You are not the clerk	Points to CP	MS 11	Comment
14.	C1: You have no hat		ES	Comment
15.	C2: aww here's my [XXX]	C1 and C2 talk at the same time	I	Comment
16.	C1: [here's ice cream] in a cup		I	Comment
17.	CP: NV turn: [takes hat from MOM and places on his own head]	CP makes crinkling noises when placing hat on head	I	Performative
18.	CP: XXXX	CP rips hat without noticing		
19.	C2: Oh, you're the clerk	MOM adjusts hat on CP's head and attempts to fix rip	MO 17	Performative
20.	C2: ok		MO	
21.	CP: no:w		I	Request for turn
22.	C2: CP will clerk	MOM continues to fix hat	M 19	Performative
23.	CP: no:w	Said louder with more emphasis	Repetition 21	Request for turn
24.	C1: [Here's ice cream]		Repetition 16	Comment
25.	C2: [XXX]	whispers		
26.	CP: ahhh a mess (.) you		I	Comment
27.	C2: a [mess]		MO	Acknowledgment
28.	MOM: made a mess		MO	Acknowledgment
29.	CP: /h/-			
30.	MOM: who made that mess?		M	Request for information
31.	CP: MOM mess		M	Response to request for information
32.	MOM: I made [the mess]?		M	

33.	C2: [Oh MOM] made the mess		M	Agreement
34.	C2: uh oh		M	Expressive
35.	CP: MOM (.) Call cop		I	Request for action
36.	C1: MOM's gonna [call the cop]		MO	Comment
37.	C2: [call the cop]	C1, C2, and MOM laugh	Repetition	Request for action
38.	MOM: ok	Puts apron on CP	I	Acknowledgment
39.	C2: ok CP will clerk		MS	Comment

Level 4 Coded Transcription "Don't Cross the Bridge"

Session date: 12/6/01
Recording time: 17:10:27 - 17:11:51
Target productions: Follow-up for all targeted sounds

Context of the interaction: The clinician pretends to be a troll who takes stuffed animals and puts them in cages. CP controls the interaction by deciding which animals the troll should take.

Participants: C1: supervising clinician; CP: child

Table 9

Level 4 Coded Transcription "Don't Cross the Bridge"

Utterance number	Transcription	Context	Turn-type	Function
1.	C1: I'm troll	In deep, growly, "troll" voice	I	Performative
2.	C1: mmhmm		MS	Agreement
3.	CP: take take duck	Makes stuffed animal duck hop across the table	I	Request for action
4.	C1: aha duck (.) haha	Takes the duck	MO	Respond to request for action
5.	CP: cat	Makes stuffed animal cat hop across the table	I	Request for action
6.	C1: aha cat (.) huha	Takes the cat	MO	Respond to request for action
7.	CP: /kI:/	Deletes final /d/ and makes felt doll hop across the table	I	Request for action
8.	C1: who?	Puts hands on hips	I	Request for information
9.	CP: kid	Corrects production	MO	Response to request for information

10.	C1: oh (.) haha kid	Takes the felt doll	M 7	Respond to request for action
11.	CP: mou- mou- mouse	Makes toy mouse hop across the table	I	Request for action
12.	C1: mouse haha		MO	Respond to request for Action
13.	CP: [This]	Makes dog hop across the table	I	Request for action
14.	C1: [mouse] in cage (.) haha	Puts mouse into cage	EO 11	Comment
15.	CP: dog (.) big one	Continues making dog hop across the table	ES 13	Request for action
16.	C1: do:g (.) I have no big cage (.) hmmm	Returns to using normal voice	EO	Respond to request for action
17.	CP: get down (.) ?right there	Points under the table	ES	Request for action
18.	C1: oh, that's a cage under there?		MO	Request for information
19.	CP: mmhmm		MS	Agreement
20.	C1: (o)kay		MO	Agreement
21.	C1: I'll lock mouse (.) in the ca:ge	Finishes putting the mouse in the cage	M	Comment
22.	C1: Haha (.) dog in [ca:ge]	Switches to "troll" voice and takes the dog stuffed animal and puts it under the table	I	Comment
23.	CP: [da-]			
24.	CP: Umm kid go cage		I	Request for action
25.	C1: that cage?		MO	Request for information
26.	CP: yeah		MS	Response to request for information
27.	C1: okay kid (.) in cage		MO	Agreement

28.	CP: mouse in cage		I	Request for action
29.	C1: Mou:se?	Uses normal voice	MO	Request for information
30.	CP: ?in cage		MO	Response to request for information
31.	C1: is that mouse?		I	Request for information
32.	CP: no (.) cat		MO	Response to request for information
33.	C1: oh cat (.) in cage		MS	Acknowledgment
34.	CP: XXX in cage		I	Request for action
35.	C1: okay (.) haha	Switches to “troll voice”	MO	Agreement
36.	C1: in ca:ge	Rubs hands together	MO	Comment
37.	CP: NV turn: shakes finger at the troll (C1)		I	Performative
38.	C1: I have a lock		I	Comment
39.	CP: oh no		MO	Expressive
40.	C1: NV turn: gestures with hands up		I	Request for information
41.	C1: now what?		ES	Request for information
42.	CP: a bridge	Pointing to bridge	MO	Response to request for information
43.	C1: a bridge		MS	Acknowledgment
44.	C1: okay	Sets up bridge	MO	Agreement

Level 4 Coded Transcription "Trick at McDonald's"

Session date: 6/21/01
Recording time: 13:24:00 - 13:27:56
Target productions: Follow-up of all targeted final sounds

Context of the interaction: CP and C1 pretend to be workers at McDonald's. They add a toy snake and toy sheep to the food orders to surprise their customers, C2 and CP's mother.

Participants: C1: supervising clinician; C2: graduate student assistant clinician; CP: child; MOM: CP's mother

Table 10

Level 4 Coded Transcription "Trick at McDonald's"

Utterance number	Transcription	Context	Turn-type	Function
1.	C1: Let's play another trick	whispers	I	Comment
2.	C1: come here (.) CP come here (.) let's play a trick	Whispers	MS	Request for action
3.	C1: NV turn: gestures with hand to come closer		MS	Request for action
4.	C1: come here (.) let's play a trick	whispers	Repetition	Request for action
5.	CP: what?	whispers	MO	Acknowledgment
6.	C1: let's play a trick, look what we'll put on the hamburger this time	whispers	ES	Comment
7.	C1: we'll put on XX ok	whispers	ES	Comment
8.	CP: ice cream	whispers	EO	Request for action
9.	C2: ice cream	Whispers and chuckles	repetition	Request for action

10.	C1: okay, here's your hamburger, what else would you like?	Returns to normal speaking volume	I	Comment and request for information
11.	C2: umm (.) [let's see]		MO	Acknowledgment
12.	CP: [ice cream] (.) ice cream		Repetition 8	Request for action
13.	C2: oh, ice cream (.) that's a good idea (.) I want ice cream		MO 12	Acknowledgment
14.	CP: NV turn: attempts to get a toy sheep from a toy ice cream machine		MS 12	Performative?
15.	C1: be careful		I	Request for action
16.	C1: not that one		I	Comment
17.	CP: XXXX		-	-
18.	C1: that's fine		I	Comment
19.	C1: out ice cream		I	Comment
20.	C1: oh, he's stuck	The toy sheep gets stuck	I	Comment
21.	C1: let's put him in (.) there		I	Request for action
22.	CP: here	CP places toy sheep on top of ice cream cone	MO	Agreement
23.	C2: ice cream		I	Comment
24.	C2: okay, let me try		MS	Request for action
25.	C2: ewww! yuck!	All laugh	ES	Expressive
26.	C2: it's not ice cream, it's a	Prompts with cloze structure	ES	Request for information
27.	CP: sheep	Drops sheep on floor	MO	Response to request for information

28.	C2: a sheep, ewww! yuck!	All laugh	MS	Comment
29.	C2: I don't like sheep	MOM picks up sheep and hands it to CP	ES	Statement
30.	C2: I want [ice cream]		ES	Comment
31.	CP: [baaa]		MO 29	Performative
32.	CP: NV turn: throws sheep		MO 29	Acknowledgment
33.	C2: bye bye sheep		MO 32	Performative
34.	C1: let's see if they want any French fries, okay?		I	Comment
35.	CP: ok /haI/ (?fries)	Whispers Substituted /fr/ for /h/ and final consonant deletion of /z/	MO	Request for action
36.	CP: /haI/ (? fries)		Repetition 35	Request for action
37.	C1: ask them if they'd like some fries	Whispers	Repetition 34	Request for action
38.	CP: no XXX ok XXX ok		EO	
39.	C1: give 'em the snake	Whispers	I	Request for action
40.	C2: do you want more food?		I	Request for information
41.	MOM: yeah, I want some French fries		MO	Agreement
42.	C2: okay		MS	Acknowledgment
43.	C1: snake this time (whisper)		I	Comment
44.	C1: ha ha ha ha, we're playing a trick		I	Comment
45.	CP: trick (.) put X in X		EO	Request for action

46.	C2: French fries sound good (.) I want some too	laugh	ES 40	Comment and request for item
47.	C1: what did you put in that time?		I	Request for information
48.	CP: XXX			
49.	C1: we put in the=	Prompts with cloze structure	MS	Request for information
50.	CP: =sheep		MO	Response to request for information
51.	C1: and the=	Prompts with cloze structure	MS	Request for information
52.	CP: =snake		MO	Response to request for information
53.	CP: here		I	Request for action
54.	C2: it's for MOM		EO	Comment
55.	CP: NV turn: hands French fries to MOM		I	
56.	MOM: mmm, thank you, I'll try one of these	Pretends to be afraid and drops the snake	EO	Acknowledgment
57.	MOM: ahh (.) yuck		I	Expressive
58.	C2: oh quick (.) hide!	Pretends to cower in fear behind CP CP and C1 laugh	I	Request for action
59.	MOM: [it's a snake]		MS 57	Comment
60.	C2: [it's a snake!]		Repetition 58	Acknowledgment
61.	MOM: go away!		ES 57	Request for action
62.	C2: go away, snake!		MO repetition 57	Request for action
63.	C1: [ha ha we played a trick]	Pretends to tease C2 and MOM	I	Comment

64.	C2: [I want some] can I have some?		I	Request for item
65.	MOM: yeah, you can have some		MO	Response to request for item
66.	MOM: I don't know if you want any		EO	Comment
67.	C2: NV turn: pretends to take a bite		I	Performative
68.	C2: eww (.) yuck yuck	Makes a disgusted face then puts down the sheep	I	Expressive
69.	C2: it's a=	Prompts with cloze structure CP laughs	ES	Request for information
70.	CP: =sheep		MO	Response to request for information
71.	C2: oh, it's a sheep		I	Comment
72.	C2: you played a trick (.) you played a trick	CP and C1 laugh	I	Statement
73.	C1: we better be nice		I	Comment
74.	C2: oh (.) we'll make them some pop (.) nice pop		ES	Comment
75.	C2: that was yucky		ES 72	Statement
76.	C2: no more tricks		ES	Request for action
77.	C1: what did you put in the pop, CP?	Whispers	I	Request for information
78.	C2: no tricks		MS repetition76	Request for action
79.	C2: I want- I want pop		I	Request for item
80.	CP: hamburger, that one, hamburger	whispers	I	Request for action

81.	MOM: and I want a hamburger		MO	Acknowledgment
82.	C2: [I want pop]		MS	Request for item
			repetition 79	
83.	C1: [are you going to play another trick?]		I	Request for information
84.	C1: should we put snake or sheep?		I	Request for information
85.	CP: sheep		MO	Response to request for information
86.	C1: okay, put sheep here (.) sheep		I	Request for action
87.	CP: sheep (.) pepper	Puts the sheep on the hamburger	EO 85	Comment
88.	C1: I'm going to put the sh- snake in the pop	Puts the snake in the pop	I	Comment
89.	CP: here XXX	Hands C2 the pop with the snake in it	I	Performative
90.	C2: the pop		MO	Acknowledgment
91.	CP: here, momma (.) hamburger you:	Hands MOM the hamburger with the sheep	I	Performative
92.	MOM: hamburger for me		MO	Acknowledgment
93.	C2: and pop for me, thank you		EO	Acknowledgment
94.	C2: I'm going to have [a sip]		I	Comment
95.	MOM: [ooh, that looks] like a good hamburger		I	Statement
96.	C1: [oh look]		I	Comment
97.	C2: [ahh] eww yuck	Pretends to scream and drop pop out of fear	I	Expressive

98.	C2: You played another trick		I	Statement
99.	C2: oh no! [that was sick!]		ES	Statement
100.	C1: [let's see how she likes] her hamburger]		I	Comment
101.	MOM: mmm, hamburger (.)	Pretends to scream and recoil in fear	I	Comment
102.	MOM: ahh (.) it's a sheep (.) yuck		I	Expressive
103.	C1: I think that's the end of our McDonald's (.) Nobody wants to come anymore		I	Statement
104.	C2: uh uh		MO	Agreement