4-1995

Development in Drawings and Language of Young Children with Hearing Impairments

Daniel Carey Nordenbrock

DEVELOPMENT IN DRAWINGS AND LANGUAGE OF YOUNG CHILDREN WITH HEARING IMPAIRMENTS

by

Daniel Carey Nordenbrock

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Speech Pathology and Audiology

Western Michigan University
Kalamazoo, Michigan
April 1995

ACKNOWLEDGEMENTS

I would like to express my appreciation to those who have inspired and supported me in my perpetual curiosity about the world and my search for the essence of a joyful and meaningful life. These individuals include (but are not limited to): Mary Carey Nordenbrock, my mother; Daniel Joseph Nordenbrock, my father; David Lyle Nordenbrock, my brother; James Lester Carey, my uncle; and Dr. Kurt ("Herr") Schild, my German professor who charged me to celebrate life to the fullest and express my individuality creatively.

I am also grateful to those who have contributed to the completion of this thesis: Dr. Nickola Wolf Nelson, for her expertise in language development and editing, as well as chairing my master's thesis committee; Dr. Robin Clark, for her expertise in art development; Dr. Harold (Hal) Bate, for his expertise in hearing disorders and aural habilitation; LuAnne Griese, for her assistance and participation in this study; and Jan Bermingham, for her assistance in this study.

Daniel Carey Nordenbrock

DEVELOPMENT IN DRAWINGS AND LANGUAGE OF YOUNG CHILDREN WITH HEARING IMPAIRMENTS

Daniel Carey Nordenbrock, M.A.

Western Michigan University, 1995

The use of free choice drawings and contingent questions as prompts to enhance oral language development in young children with moderate to profound hearing losses was the focus of this descriptive and experimental study. The effects of contingent queries (scaffolding) on drawing and oral language were measured using a single subject experimental design in which a staggered baseline was followed by treatment replicated across two sets of students at two levels of language abilities. An extensive coding system for dependent drawing and language variables was developed and utilized for analysis.

The major findings of this study were that the use of contingent queries of the message of children's drawings is significantly related to the number of words children produce. Contingent queries improve the output and quality of children's language (to a greater degree) and drawings (to a lesser degree) differently for each child. All four children benefitted from the drawing and contingent query approach.

TABLE OF CONTENTS

Table of Contents--Continued

CHAPTER

Table of Contents--Continued

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

It is widely acknowledged that children with severe to profound hearing impairments experience marked difficulty acquiring spoken language as a consequence of their hearing impairments (Kretschmer, 1989; Kretschmer & Kretschmer, 1978; Quigley & Paul, 1984; Seyfried, Hutchinson, & Smith, 1989; Yoshinaga-Itano, 1986; Yoshinaga-Itano & Downey, 1986). Children with hearing impairments also have difficulty connecting concepts about the world with spoken and written English (Furth, 1966; Quigley & Paul, 1984). Their ability to read has been reported to plateau at the third or fourth grade level (Yoshinaga-Itano & Snyder, 1985), and their academic achievement tends to plateau at the third or fourth grade level as well. Yet Furth (1966) demonstrated that the problems confronting children with hearing impairments involved language and not cognition. Educators are thus confronted with persistent difficulties in helping children with hearing impairments to use oral and written language receptively and expressively. More effective educational and language development techniques are clearly needed.

In the search for methods for fostering the language development of children with hearing impairments, one approach worthy of consideration is combining language and emergent literacy instruction with drawing. Recent investigations of brain hemisphere dominance and integration of knowledge modalities supports the consideration of using artistic expression to influence language skills (Brittain, 1979; Brookshire, 1992; Gardner, 1980, 1983; Herberholz & Hanson, 1990; Lowenfeld & Brittain, 1987; Schuell, Jenkins, & Jimnez-Pabn, 1964). Teachers of both normal-hearing and hearing-impaired individuals have long used art in concert with language arts activities, but without a clear rationale for the relationship between these expressive modalities. Brittain (1979) commented that drawing and writing are obviously related because "both are expressive, both communicate, and both need the development of comparable skills" (p. 206). For children whose conceptual development exceeds their language skill, starting with children's own drawings may be the most effective way to help them relate linguistic symbols to complex meanings. In a reciprocal fashion, needing words to describe drawings may make children more attentive to the details and relationships of their world.

The purpose of the current investigation was to examine the relationship between the oral language and

drawings of children with hearing impairments. By examining this relationship, more effective use of drawing could be developed to assist children with hearing impairments in their expressive language development; the efficacy of using drawing to teach oral and written language could be supported; and ultimately, the academic achievement of children with hearing impairments might be elevated.

Statement of the Problem

This was a descriptive study of the relationship between the development of oral language and the development of drawings in four young children with hearing impairments. The children, who were enrolled in a kindergarten-first grade program for hearing-impaired children using aural/oral educational methods, made daily drawings on topics of their own choosing and then dictated a written description or narrative to their teacher. Observations of the treatment occurred over over a nine week period. The drawings and related dictated oral expressions of the children were examined using primarily qualitative techniques. The research was designed to identify relationships among elements represented in the drawings and in the talk.

The broad research questions addressed in this investigation were:

1. Do predictable relationships exist between elements of the drawings and elements of oral language for this small group of children with hearing impairments? Specific relationships between drawings and talk that were investigated included: (a) the number of different things in drawings as related to the number of words in oral language, (b) the objects, people, and relationships depicted in drawings and the types of words spoken (e.g., agents, actions, objects, locatives, and attributes), and (c) depictions of events and actions in drawings and emerging narration.

2. To what degree do instructional activities influence children's drawing and talk? Specific relationships that were investigated include: (a) the level of teacher prompting in the form of questions and the number and types of words spoken by the children, as well as emerging narration, and (b) the topics and qualities of any of the teacher's drawings and the topics and qualities of drawings created by choice by the children.

3. Are there other factors involved that might explain individual differences in drawings and/or language, such as hearing, drawing, or language levels when the study began?

CHAPTER II

LITERATURE REVIEW

This chapter reviews studies examining the typical patterns and treatment of oral and written language difficulties of children with hearing impairment. Other topics include the integration of cognitive and linguistic functions, relationships between writing and drawing development, emergent literacy, emergent drawing, and specific studies examining relationships between the language and art of children with hearing impairments. It should be noted that the children with hearing impairments in this review were all learning spoken and written English through the aural/oral approach.

Language and Hearing Impairments

A number of researchers who have summarized investigations of the oral and written language of children with hearing impairments have contrasted the circumstances of learning language when one hears, with learning language when one cannot hear, or cannot hear well (Furth, 1966; Kretschmer, 1989; Kretschmer & Kretschmer, 1978; Lahey, 1988; Myklebust, 1960; Prinz, 1985; Quigley & Paul, 1984; Seyfried, Hutchinson, & Smith, 1989;

Yoshinaga-Itano, 1986; Yoshinaga-Itano & Downey, 1986; Yoshinaga-Itano & Snyder, 1985). A summary of these authors' positions is that children with normal hearing are exposed to constant auditory sensory input and experiences with oral language. Thus they gain a tremendous amount of knowledge about phonology and linguistic structures of English prior to entering school (Kretschmer & Kretschmer, 1978; Myklebust, 1960). All aspects of being a competent communicator using oral language are continuously at the hearing child's disposal. Furthermore, children with normal hearing are usually experienced at using language before learning content in school.

Children with severe-to-profound hearing impairments, on the other hand, are (in the absence of aural habilitation) deprived of auditory-linguistic input. The consequence is typically that their language development and communicative competence are delayed and impaired. It should be noted that Furth (1966) found that the difficulties children with hearing impairments encounter is related to language deficiency rather than cognitive defiency. Children with hearing impairments are unique in that they typically do not master oral language before attempting to become literate. Children with hearing impairments also have difficulty connecting concepts about the world with spoken and written

language and tend to learn English as a second language (with American Sign Language being the first language for many) at the same time they are attempting to learn to read and to learn content in school. As a result, most aspects of receptive and expressive language of children with hearing impairments are fundamentally delayed, and often characteristically deviant. In addition to being delayed, language skills typically plateau at around a third or fourth grade level (Quigley & Paul, 1984; Yoshinaga-Itano & Snyder, 1985). This subsequent language impairment usually leads to severe academic retardation for children with severe-to-profound hearing impairments with average or better intelligence. Children with severe or profound sensorineural hearing impairments have "alarmingly low levels of reading comprehension and overall academic achievement" that persist "throughout both academic and adult years" (Yoshinaga-Itano, 1986, p. 71).

It should be noted that, although the level of a hearing-impaired child's language impairment is related to his or her level of hearing impairment, it cannot be predicted by level of hearing impairment (Seyfried et al., 1989; Kretchmer & Kretchmer, 1978). Researchers have described several specific characteristics of the oral and written language of children with hearing impairments.

Oral Language

Children with hearing impairments are generally delayed in their oral language skills and have difficulty in the content, form, and use of English language. They have a restricted vocabulary and produce shorter sentences than children with normal hearing (Prinz, 1985; Yoshinaga-Itano, 1986). They also have a restricted knowledge of word classes, as evidenced by overuse of nouns and verbs and omission of function words (Seyfried et al., 1989). Children with hearing impairments omit auxiliary verb forms and have difficulty with question forms, pronouns, and prepositions (Prinz, 1985; Seyfried et al., 1989). They have difficulty selecting words from within semantic categories, and often have a severely restricted comprehension of linguistic concepts (e.g., space, time, and quantity)(Prinz, 1985; Seyfried et al., 1989). They also are impaired in their use of language to aid memory or to understand the implications of discourse organization (Kretchmer & Kretchmer, 1978).

Children with moderate-to-severe hearing impairments typically acquire syntax in the normal developmental sequence, but at a slower rate. Deviant language forms are usually restricted to children with profound hearing impairments (Seyfried et al., 1989). Children

with hearing impairments seem to have a paucity of English deep structure intuitions and difficulty with complex grammatical constructions (Kretchmer & Kretchmer, 1978). They tend to overuse the subject-verb-object sentence structure and lack syntactic flexibility (Seyfried et al., 1989). Children with hearing impairments have difficulty receptively and expressively with passive versus active sentences, complement constructions, relative clauses, conjoined clauses, morphological endings, and inflectional verb endings (Prinz, 1985; Seyfried et al., 1989).

Young children with hearing impairments primarily use gestures to indicate pragmatic intentions (Prinz, 1985). They have been found to initiate communication only rarely. They also have difficulty sustaining dialogue, repairing conversation, responding appropriately to the overture of their conversational partners, and determining when to enter a conversation (Seyfried et al., 1989).

Written Language

As with receptive and expressive oral language, children with hearing impairments are typically delayed in learning literate language and tend to plateau at around the fourth grade level in reading and writing. Specifically in regard to writing, children with hearing

impairments write less, producing shorter sentences and shorter compositions. They have a less diverse vocabulary. They produce a larger proportion of simple, single-clause sentences and a smaller proportion of compound and complex sentence structures. Specific grammatical errors children with hearing impairments make include word additions, substitutions, and omissions, as well as deviant word orders. Stories they write tend to be concrete rather than abstract. Children with hearing impairments typically begin stories about a picture stimulus "with a statement of consequence, omitting information related to causality" (Yoshinaga-Itano, 1986, p. 79).

Treatment of Language Disorder

Although the forecast for functional acquisition of English language for children with severe and profound hearing impairments may seem gloomy, the environment can be modified to support more normal language learning. It is generally accepted that:

> If the hearing impairment of a child is diagnosed early, he is capable of profiting from auditory input, and if the quality and quantity of his linguistic experience at home is normalized, his subsequent language performance, whether oral or manual, and his performance in reading and writing seems to parallel that of normally hearing children. (Kretschmer & Kretschmer, 1978, p. 139)

Integration of Cognitive Functions

In the last 20 years, several researchers have emphasized that knowledge is multi-faceted, and that areas of knowledge that have been traditionally seen as discrete are actually highly integrated (Brittain, 1979; Lowenfeld & Brittain, 1987). Furthermore, interest in hemisphere studies has been acute.

Some researchers have concluded that educators have over-emphasized certain areas, such as language, and have neglected others, making the right hemisphere the "neglected hemisphere" (Herberholz & Hanson, 1990, p. xx; Edwards, 1979; Gardner, 1980, 1983). Indeed, habilitative and rehabilitative therapy for different types of disorders now involve purposefully stimulating an adjacent area of the brain or the opposing hemisphere of dysfunctional regions of the brain (Brookshire, 1992; Schuell, Jenkins, & Jimnez-Pabn, 1964). Such techniques are used for aphasia (Brookshire, 1992; Luria, 1973; Schuell et al., 1964) and childhood language disorders (Carrow-Woolfolk, 1988).

This burgeoning realization that cognitive functions are essentially intertwined suggests the possibility that the development and cognitive functions of both art and language may be related as associated expressive modes.

Before investigators can pursue the developmental and cognitive relationships between art and language, however, relationships between language and drawing development, the nature of emergent literacy, as well as the nature and treatment of language disorders in children with hearing impairments need to be considered.

Relationship Between Writing and Drawing Development

The literature regarding relationships between writing and artistic development is largely anecdotal and based upon observation and case studies (Arnheim, 1969; Brittain, 1979; Clay, 1975; DiLeo, 1970; Dyson, 1982; Gardner, 1980; Genishi & Dyson, 1984; Goodman, 1986; Graves, 1983; Harste, Woodward, & Burke, 1984; James & James, 1980; Kellogg, 1969; Lowenfeld & Brittain, 1987; McGee & Richgels, 1990; Vygotsky, 1978; Wilson & Wilson, 1982). It is generally agreed that relationships do exist, but the extent and causative factors of the relationships have not been measured empirically.

As Brittain (1979) put it, "The relationship between drawing and writing is obvious. Both are expressive, both communicate, and both need the development of comp-arable skills" (p. 206). What is not obvious in the research, however, is the exact nature of this relationship and to what extent drawing can be

utilized effectively to enhance language development. Researchers also found that individual children varied greatly in their personal styles and modes of communication. Some children use scribbling and drawing more for rehearsal than others.

Wilson and Wilson (1982) observed that the reason children draw is to "symbolically explore their worlds" (p. 19). They further explained:

> Years before they can set down their original ideas in writing and numbers, children are able to record their ideas, feelings, and experiences through their drawings, as artists do --- a record to which the child may return time and time again, and one that may be shared with others. (p. 23)

The authors believed that children produce drawing "to know," in that they reinvent or construct objects for themselves, thus "drawing makes these thought structures perceivable to the child" (Wilson & Wilson, 1969, p. 24). Children can use drawings as a means for creating a working model of the world. The end result is that children's drawings convey their thoughts and ideas.

Children learn to discriminate between writing and drawing by around the age of two or three years. They are able to identify writing versus drawing, and they discriminate between their "drawing" marks and their "writing" marks. Harste et al. (1984) in their study involving 67 three, four, five, and six-year-olds found that children generally indicate vertical marks as

writing. On the other hand, Dyson (1982) noted that young children frequently interchange drawing and writing, using pictures, letters, or numbers to represent elements of their environment, and they consider print as symbols rather than as representing the sounds of speech. Goodnow (1977) observed that "when children name pictures on a page, they are most likely to do so from left to right in the United States or from right to left in Israel around the time when they are first learning to read" (p. 86-87).

Kellogg (1969) judged that the mental images children use to produced art "reflect an intelligence similar to that needed for learning to read. If the child can learn to see certain gestalts in art, he is capable of learning language gestalts" (p. 189). Kellogg observed that children generally teach themselves to draw, but language symbols are passed from generation to generation within cultural limitations. Children spend more time learning to communicate via language than via drawing. Development of writing also takes a longer time than drawing for expressing their thoughts and feelings.

Young children are typically better able to express themselves through drawing than through writing from about age two to age six or seven (Calkins, 1986; Gardner, 1980). Then, the use of drawing to communicate

diminishes considerably, and many children eventually completely cease to draw. Some researchers believe that this is because writing can be abstract and drawings are concrete, children recognize that their drawings are not accurate renditions of their world, and because it is easier to embed meaning into writing than a drawing (Calkins, 1986; Harste et al., 1984). Others dispute this claim and believe that drawings can be equally, if not more abstract than writing (Gardner, 1980, 1983).

Studies by Harste et al. (1984), as well as Staton (1985), found that children begin with drawings to convey meaning, and then move into print as they acquire language and experience the limitations of drawing. Ewoldt (1985) found a similar pattern of evolution from drawing to writing in children with hearing impairments when creating dialogue journals. Some researchers add that children may discontinue drawing because teachers and parents do not value art in our society, fail to instruct children in art, and do not themselves engage in artistic creation. Calkins (1986) observed that drawing is a predominant form of writing rehearsal for second graders, as mapping is for fifth graders. She further found (for normal hearing children) that:

> In kindergarten and first grade, many children convey their meaning more easily through drawing than through print. Drawing, therefore, can provide a supportive scaffolding for the writing. Because more information is embedded

> in the pictures than in the print, drawing provides a horizon and leads the child deeper into the writing. In a sense, our goal is to help children's writing catch up with their drawing. By second grade, writing has often surpassed drawing. Although these children may still find it easier to draw than to write, most find it easier to embed meaning into a written text than into a drawing. When second graders draw before each new page of writing, the pictures often hold back the written texts. (p. 70)

So "just as in the first grade, where the goal is to have writing catch up to drawing, in second grade, the goal is to have writing catch up to talking" (Calkins, 1986, p. 70). Calkins was addressing using drawing as scaffolding for writing with normal hearing children, but drawing might also provide a supportive scaffolding for oral language in the case of children with hearing impairments. Again, this point of view was challenged by others (Bruner, 1990; Gardner, 1980, 1983) who noted our society's overemphasis on literacy as a form of intelligence and believed that drawing (spatial intelligence) is not inferior to or less expressive or meaningful than writing.

In a research study involving the use of drawing for rehearsal for narrative writing in second- and third-graders with normal hearing, Caldwell and Moore (1991) found that drawing as a planning activity significantly improved the quality of writing, and concluded that drawing is a "viable and effective form of

rehearsal for narrative writing" and "can be more successful than the traditional planning activity, discussion" (p. 207).

Researchers examining creative development advocate teaching artistic skills because art usually communicates feelings more effectively than writing and has immeasurable value as a creative, therapeutic and joyful activity (Arnheim, 1969; Brittain, 1979; Herberholz & Hanson, 1990; Lowenfeld & Brittain, 1987). They are also in agreement that children sometimes draw to think or to communicate, and sometimes draw for moto-kinesthetic pleasure.

Researchers have observed that aspects of writing and drawing development coincide. For instance, it is generally observed that when children begin scribbling in drawing, they also begin scribbling attempts at writing. Brittain (1979) observed 40 preschool children and compared their printing of their names with their drawings and found that children who could write their names had progressed beyond the scribbling stage in drawing. Closed forms in drawings corresponded with writing letters with closed forms. Scribbled drawings corresponded with smaller scribbled writing. And recognizable objects in drawings corresponded with recognizable letters. Lowenfeld and Brittain (1987) found that kindergarten children who are still primarily scribbling

have difficulty performing at the expected level, and usually have difficulty learning to read. Clay (1975), in her observations of five year old children in Australia, found that children appear to have recurring schemas or programmatic movements for producing human figure drawings at a corresponding age in which they write letters, words and phrases repeatedly. She also included drawing pictures before the teacher wrote dictated captions among the ways that children learn to print.

Teachers of young children have long used art activities to foster language development (Genishi & Dyson, 1984; Herberholz & Hanson, 1990). Genishi and Dyson (1984) observed that many preschool and primary grade teachers have children tell about their own artwork, which is often recorded in writing by the teacher in a "language experience" technique (p. 168). They found not only that in young children's dictated stories, "the drawing conveys more of the story than the actual story does," but as children include more details in their pictures, "the detail naturally leads to longer, more complex sentence structures" (p. 232). Kellogg (1969) stated that children's pictures are meaningful to art researchers "primarily for [their] 'story' element or for [their] social or psychological significance rather than for [their] esthetic composi-

tion" (p. 148). Specific to children with hearing impairments, James and James (1980) proposed that art experiences can help mainstreamed children with hearing impairments to develop language, learn other school subjects, explore their environments, develop social skills, and gain confidence through self-expression.

Lowenfeld and Brittain (1987) held that art may be viewed as a form of social exchange which creates a vehicle for communication. They pointed out that "for a child, art is primarily a means of expression" (p. 7). And that "art expression changes as the child grows" and "expression grows out of, and is a reflection of, the total individual child" (p. 7).

Brittain (1979) suggested that "perhaps the best way to teach writing should be to have children draw and paint, to give them the opportunity to develop the skills necessary to accomplish the task at their own pace" (p. 201). Brittain argued that:

> Drawings can sometimes give a better indication of a child's reading readiness than a teacher's estimate can. Drawings are often used as indicators of a child's intellectual development. We found that children who drew a good deal were better at this task than children who did not draw very much. Putting these three statements together, one is immediately confronted with the possibility that art should be considered more than an amusing pastime for children at nursery school and kindergarten levels. (p. 203)

Emergent Literacy

The important part drawing plays in emergent literacy will be examined in further sections of this literature review. First, however, the typical pattern and sequence of emergent literacy will be described. According to McGee and Richgels (1990), children were traditionally introduced to literacy instruction in grade school because it was believed that the formalized instruction of reading and writing requires readiness approximating adults' reading and writing. It was also believed that writing could only be learned after reading was mastered. But as Teale and Sulzby (1986) summarized, significant written language development occurs (along with oral language development) from birth to age five. Children learn and use written language "long before their writing looks representational" (Harste et al., 1984, p. 15).

Goodman (1986) used the metaphor "roots of literacy" to describe how young children become aware that "written language makes sense" and they "attempt to make sense of and through written language in order to comprehend or express meanings, ideas, or emotions" (p. 6). Kellogg (1969) noted that "scribbling is considered by many adults to be a meaningless result of muscular activity" (p. 1).

Contrary to the belief many adults have about the insignificance of children's writing, "young children do indeed write, whether it be by 'scribble,' strings of letters, invented spelling, or other means of representation, some manifestations of which include drawing" (Teale & Sulzby, 1986, p. xix). McGee and Richgels (1990) stated that, for normally developing children, "drawing is an important part of their written communication and crucial for intended meaning" (p. 178).

Vygotsky (1978) referred to a concept called intentionality. He hypothesized that children move from a period in which they label their drawings based on aspects of the drawings ("object over meaning") to a period in which they intend to signify something with a drawing or word ("meaning over object")(p.98). When young children reach the schools, however, learning writing typically becomes artificial and an end in itself (Taylor, 1983, p. 90).

Teale and Sulzby (1986), writing about children with normal hearing, noted that all aspects of language (listening, speaking, drawing, reading and writing) "develop concurrently and interrelatedly, rather than sequentially" (p. xvii), even though, as Sulzby reported "the acquisition of conventional literacy does come long after children are judged to be quite competent in oral language situations" (p. 51).

Gardner (1980) used the term "romancing" to refer to the phenomenon in which children ascribe labels to unrecognizable words or objects in pictures after drawing them (p. 46). He considered it an important step in the development of representational symbols. Harste et al. (1984) added that risk-taking and social awareness, action, and intention are also factors affecting children as they develop language and literacy (pp. 192-193).

Specific strategies young children use to write include scribble writing, scribbling plus conventional and unconventional letters, invented spelling, copying environmental print, using frequently encountered words such as names, talking and drawing while writing, and asking adults questions (Calkins, 1986; Clay, 1975; Harste et al., 1984; McGee & Richgels, 1990; Sulzby, 1986; Taylor, 1983).

As Teale and Sulzby indicated (1986), "although children's learning about literacy can be described in terms of generalized stages, children can pass through these stages in a variety of ways and at different ages" (p. xviii). Indeed, as Bates, Bretherton, and Snyder (1988) indicated, "there seems to be some qualitatively different ways to make the transition from first words to grammar" (p. 3). Therefore, individual differences and developmental spurts and plateaus should be expected

and taken into account when evaluating literacy development.

Temple, Nathan, Burris, and Temple (1988) concluded that "it appears that children attend first to the whole and only much later to the parts" by attempting to write written lines before letters (p. 19). Some of the other concepts and principles necessary and involved in children's writing development include the "recurring principle," in which children discover that writing uses the same symbols repeatedly. Still others are the "generative principle," the discovery that a limitless amount of writing can be generated by using a small set of letters, the "sign concept," the concept that printed words are signs which are arbitrary and stand for something besides itself (as opposed to drawing which does not), the "flexibility principle," the concept that changing specific features of letters can lead to new letters, and "page-arrangement principles," which direct direction and placement of writing (Clay, 1975; Harste et al., 1984; McGee & Richgels, 1990; Temple et al., 1988; Vygotsky, 1978).

Children use and learn language functionally, based on real needs and experiences through active participation in language activities (e.g., Calkins, 1986; Teale & Sulzby, 1986; Wells, 1986). Brittain (1979) added that motivation is central to the acquisition of

reading, and that children need to "be eager to find out what the symbols mean." That is because "words are not isolated abstract forms to be memorized but are rather indicators of life experience that need a reference point in the child's life" (p. 204).

Nelson (1986) posited that children must first cognitively process events with event representations of real world knowledge through direct experience before becoming able to "perform in novel abstract tasks" (p. 4). In addition, she proposed that routines lead to "event representations" in children's memories which "enable the child to attach meanings to already established representations" and "play an important facilitating role in children's language acquisition" (p. 233). Nelson (1989) further proposed that children use narrative monologues or self-talk to "construct a representation of events in language," and simultaneously develop more elaborate and advanced grammatical constructions and more accurate cognitive representations (p. 63).

Bruner (1990) posited that children "make meaning" using narratives, resulting in a continuation of cultural narratives and a construction of "the Self" [capitalization in the original](p. 138). He further speculated that the "structure of human grammar might have arisen out of a protolinguistic push to narrate"

(p. 138).

Applebee (1978) provided additional examples of children's use of monologues in language development. Vygotsky (1978), however, posited that children learn through social interaction with a more competent, experienced member of their culture. It may be that a wide variety of experiences with language and events contribute to a child's language development. Children are exposed to and learn reading and writing skills informally in predominantly unplanned events at home with their families (Calkins, 1986; Clay, 1975; Taylor, 1983, 1986; Teale, 1986). Temple et al. (1988) also stated that by listening to stories at home, children learn to "compose" or put "together the details of a message in a form that is understandable to an audience" before they can write (p. 118). They also found that "children incorporate in their compositions bits and pieces of what they have heard and read in the works of others" (p. 119). Temple et al. (1988) further noted that "children are challenged to juggle the interests of self, audience, topic, and purpose in the writing" (p. 119). The authors also summarized that children discover that "compositions follow familiar patterns or forms" which assist children in reading and writing (p. 126). This discovery includes awareness of a predictable story schema, which assists children in compre-

hending as well as producing mature stories (Stein & Glenn, 1979). Later, as children become more proficient writers, they begin using the mature and natural writing process which includes rehearsal, drafting, revision, and editing (Calkins, 1986).

Development of Drawing

Research on the development of drawing in children is largely based on descriptions of general patterns of development and anecdotal observations (Brittain, 1979; Cates, 1991; DiLeo, 1970; Gaitskell, Hurwitz, & Day, 1982; Gardner, 1980; Goodnow, 1977; Herberholz & Hanson, 1990; Jones, 1992; Lowenfeld & Brittain, 1987; Kellogg, 1969). Yet there is remarkable agreement about the sequence and nature of artistic development in children. Most authors describe the sequence of drawing development as progressing from moto-kinesthetic scribbling to naturalistic drawings. Gardner (1980) summarized that "children first scribble, then make geometric forms, and then draw tadpoles" (p. 14).

Children begin their drawings in what is called the "scribbling" stage from about age two to age four (Lowenfeld & Brittain, 1987). The early "random scribbles" are dictated by physiology and dextral moto-kinesthetic development as well as eye control. Arcs are typically created due to elbow rotation. Children look away while

making random scribbles. No attempts at representation, spatial considerations, or placement patterns on the page are made.

After random scribbling, children gradually gain control over their scribbles, forming crude circles and other basic shapes in what is called "controlled scribbling" as hand and wrist movements are developed (Lowenfeld & Brittain, 1987). Children begin to draw "mandalas." Kellogg (1969) defined a mandala as lines with a circle or square in a concentric or radial formation. Kellogg believed that mandalas are prevalent in art and appeal to both children and adults because of their overall balance. Children can copy a circle in this stage. Marks become smaller, motions and shapes are repeated, a variety of marks are made, and vertical marks tend to appear before horizontal marks. Children watch what they are making when making controlled scribbling. Kellogg believed that placement patterns of scribbles on a page are children's first evidence of controlled shapes. Young children mark the transition from scribbling to representational drawing by naming their scribbles, even though the drawings may be unrecognizable (Lowenfeld & Brittain, 1987). This stage of development is referred to as "named scribbling."

From roughly ages four to seven, children are in the "preschematic" stage of drawing, in which they make

their first representational attempts (Lowenfeld & Brittain, 1987). Geometric shapes become prevalent, which gives evidence of planning, deliberation, and memory (Kellogg, 1969). Objects can only be recognized by looking at the whole drawing. Objects in pictures are not necessarily related to one another, squares can be copied at about age four, triangles can be copied at about age five, objects seem to float around the page, and art becomes communication with the self (Lowenfeld & Brittain, 1987). The first human figures drawn by children are often called "tadpoles" or "cephelopods" because thay consist of a circular head with big eyes (and possibly other facial features) and lines pointing downward. The human figures are constantly changing, but always face the viewer. Children gradually include arms, a body, fingers, toes, clothes, and hair, which are typically distorted and oddly placed. Goodnow (1977) observed that children move from using connected lines to continuous or all-embracing single line contours to draw humans, which makes expression of movement and distinctions between body parts possible, although it makes it difficult to represent small body parts.

From about five to nine years of age, children are typically in the "schematic" stage of drawing as they develop repeated shape concepts. A "schema" is a repeated and "satisfactory symbol for a person and for

familiar objects" (Lowenfeld & Brittain, 1987, p. 258). These schemas may become highly individualized. They are only altered when a special meaning is conveyed and new concepts are often built with conservative changes in familiar schemas. For example, an animal is drawn using a human schema with a horizontal body and different leg placements. Drawings in the schematic stage tend to represent or stand for concepts rather than actual perceptions as the drawings reflect children's active knowledge. Spatially, base lines and sky lines begin to appear, with the bulk of the drawing occurring between them. Pictures are two-dimensional with transparencies rather than overlapping objects. Goodnow (1977) found that children draw in orderly sequences, which are related to the inclusion or omission of parts. Goodnow noted that body parts may be omitted due to children's avoidance of overlapping spaces. Humans tend to be drawn as repeated schemas formed out of geometric shapes. Arms and legs show volume and are correctly placed. Personal experience and emotional values may be represented by exaggeration, omission, and distortion of proportion.

Children gradually move from the "schematic" stage to the "beginning realism" and "naturalistic" stages in which they become more aware of details and increasingly self-conscious about their drawings (Lowenfeld & Brit-

tain, 1987). Drawings convey more movement, show more depth, and become correctly proportioned and more naturalistic, assuming the child does not discontinue drawing and receives instruction in and masters drawing skills.

Goodnow (1977) pointed out that children's drawings illustrate their thinking and can be considered "visible thinking" (p. 145). Goodnow also stated that "drawings are equivalents: they contain only some properties of the original, and convention frequently determines which properties should be included and in what way" (p. 16). Goodnow further stated that the equivalents are ambiguous, so that two or more equivalents may sometimes stand for the same thing, and one equivalent may stand for two or more things. Furthermore, we can watch the way new equivalents are developed. When children make changes in their drawings, they tend to be conservative. Goodnow (1977) emphasized the point that "as in all problem-solving, we start from something we already do, rather than from a neutral slate, and that something may either help or hinder us" (p. 117). Goodnow finally stated that "experimenting to meet one novel goal will often be accomplished by sacrificing another goal" (p. 46).

Children draw for a variety of purposes with varying levels of expressive value. Lowenfeld and Brittain (1987) found that sometimes children produce art with "a

real depth of feeling and completeness; at other times the activity may be merely an exploration of a new material" (p. 59). Nevertheless, researchers concur that art is a primary means for children to express emotions, and emotional growth is often neglected in classrooms (Lowenfeld & Brittain, 1987).

Art as Measurement of Intelligence

The literature generally supports and occasionally encourages the use of drawing as an indicator of maturity and intelligence in children and as a tool to determine school readiness (Brittain, 1979; DiLeo, 1970; Harris, 1963; Jones, 1992; Kellogg, 1969; Lowenfeld & Brittain, 1987). Lowenfeld and Brittain (1987) state that, lack of involvement or presence of emotional disturbances aside, "usually a drawing full of details, reflecting a child's awareness of the world, indicates a child of high intellectual ability" (p. 61). Brittain (1979) adds that it is not the score that is important, but the overall developmental level of the drawing that establishes whether a child is ready to begin kindergarten. Brittain found that children who can draw recognizable objects rather than scribbles "will be able to deal more effectively with the reading program" (p. 131). Kellogg (1969) saw a relationship between intelligence for art and for learning to read, and suggested

a mental test using spontaneous drawings based upon developmental inclusion of objects in drawings and placement patterns.

Limitations of Using Art to Measure Intelligence

Several authors warn against overinterpreting drawings as precise measures of intelligence. Kellogg (1969) supported use of spontaneous art because "any mental test via art that pretended to yield precise, quantified gradations of intelligence would be an insult to the children" (p. 207). Kellogg concluded that the concept of the "Draw-a-Man Test" is faulty because "drawings do not accurately reflect children's conceptions or perceptions of objects, including human bodies" (p. 179). Kellogg found that children drew such different human figures that scores varied as much as fifty per cent in one week.

Kellogg (1969) stated that the intelligence children use to produce art reflects a similar intelligence needed to learn to read, and that drawing humans shows evidence of high intelligence, "and the child who can draw them in great variety, but cannot learn to read, surely is not lacking brain capacity to do so. Something else is wrong" (pp. 110-11).

Gardner (1983) held that there are "multiple intelligences," and "spatial intelligence" (e.g., art

and drawing) is not inferior to "linguistic intelligence" (p. 9). Gardner (1980) believed that an individual posesses multiple intelligences, and may have a strength in one or more area of intelligence. In short, Gardner's position was that measurement of intelligence biased toward only one or two of these areas of intelligence is inaccurate.

Vygotsky (1978) noted that children, in general, are satisfied simply to symbolize objects, and are less concerned with exact representations. And Goodnow (1977) found that children vary greatly in their skills and techniques within a day, week, or month. Therefore, making inferences about intelligence from drawings may be "dangerous" (p. 36).

Mortensen (1991) examined 540 drawings by 180 "normal" children aged 5 through 13, and found that "for very young children, the estimation of their intelligence comes to rest on very few items, which gives a high degree of inaccuracy" (p. 470). Mortensen asserted that "the use of drawing as a measure of intelligence or intellectual maturity tells perhaps more about Western culture than about children's drawings" (p. 48). She concluded that there is a positive correlation between intellectual function and drawing performance, but the correspondence is far from complete, and results should be regarded with great caution.

Specific Studies of Language and Art of Children With Hearing Impairments

Rottenberg and Searfoss (1992) studied the emergent literacy of seven preschool hearing-impaired children qualitatively within a school setting and found that "the children, through literacy, found a way to learn about the hearing world and, more importantly, to be a part of it" (p. 463). Specifically, they found that the children: (a) used literacy as a primary form of communication, (b) used literacy as an interactional tool, and (c) used literacy to make sense of the world around them.

Yoshinaga-Itano and Downey (1992) studied the written stories of 284 severely to profoundly hearing-impaired children between the ages of 7 and 21 years which were elicited by a picture of an accident scene. It was found that:

> Ninety percent of the stories included: 1) picture-based inference (exclusively describing the picture) and elaborations of picture-based inferences; or 2) world-based inferences (information coming predominantly from the child's world knowl-edge). Also, 72.5% of the stories contained elaborations of world-based inferences; 3) elaborations of an event; 4) use of surface structure linkage, chaining by topic or event; 5) a logical sequence; and 6) physical causality statements. A child's ability to use prior knowledge and access this world knowledge can be reflected in the child's use of either picture-based or world-based inferences. While the use of picture-based inferences can lead to the development of a well-formed story, the stories are qualitatively "richer" and more

> interesting when they incorporate aspects of the world knowledge which the child has acquired through life experiences. (pp. 143-144)

Bonnickson (1985) studied the language samples of six children aged 10 to 12 years with hearing impairments in a self-contained classroom, who were given an intensive language/reading program following a standard early language learning environment approach for one year. It was found that initial language samples totally lacked any "sentence sense" and averaged four word strings or sentences. At the end of the year, production was increased to an average of 41 word strings or sentences per language sample, with an average of 81% correct sentences. Bonnickson (1985) concluded that:

> The standard language learning model provides important elements in the language acquisition process for hearing-impaired students as well as for their normal-hearing peers. The hearing-impaired student should be seen as a beginning language learner (when this is truly the case) regardless of age. (p. 74)

She also concluded that the special language learning environment develops a solid, automatic language base which will later significantly improve and accelerate the learning of content areas.

Drawing development in children with hearing impairments parallels normal drawing development, as described previously (Cates, 1991; DiLeo, 1970). Exceptions to this perspective have been taken by Koppitz and Jones. Koppitz (1968) studied thousands of human

figures by school children and believed that children with hearing and speech disorders indicate anxiety by shading or exaggerating ears, hearing aids, the nose or mouth of their depictions of themselves. Jones (1992) concurred with Koppitz's psychotherapeutic perspective and referred to such abberant drawing elements as "emotional indicators".

On the other hand, Cates (1991) studied human figure drawings of 26 hearing-impaired and 26 normally-hearing children between the ages 9 to 18 matched for age and sex. Cates found no significant differences in development of drawing quality or presence of emotional indicators. Cates, however, noted that because the sample size was small and children with emotional handicaps receiving special education intervention were not included in the sample, the findings were limited in generalizability.

DiLeo (1970) studied thousands of drawings by children in a wide variety of settings including a school for the deaf, for which he was a consultant. He found that sensori-neural hearing loss in preschool children "does not affect the child's ability to reproduce a circle, a cross, a triangle, or a square; nor does it impede his ability to draw the human figure at a level consonant with his chronological and mental age" (p. 291). DiLeo, however, noted that nine of the fif-

teen drawings by children with hearing impairments had no ears, and six had ears which were small as compared with the attention given the eyes.

Summary

The literature suggests that children with moderate-to-severe hearing impairments typically have delayed and/or impaired English language development which negatively affects academic achievement. Yet early intervention through increased auditory input and normalized linguistic experiences can normalize performance in reading and writing.

Both drawing and language development follow predictable sequences and serve to express meaning, ideas, and emotions. Furthermore, drawing development for children with both normal hearing and hearing impairments tends to preceed and require less instruction than language development. Indeed, drawing can be used as an indication of reading readiness. Therefore, alternative expressive modes such as drawing show the potential for utilization as treatment approaches due to apparent similarities.

CHAPTER III

METHODS

The study was conducted using a combination of quantitative and qualitative methods. The development of oral language and the development of drawing for four children with severe-to-profound hearing loss was studied through two sources of data: (1) the children's drawings; and (2) their teacher's online transcription of the children's oral language produced about the drawings following two levels of scaffolding, or prompting, in the form of contingent queries. Effects of scaffolding levels were measured using a single subject experimental design in which a staggered baseline was followed by treatment replicated across two sets of students at two levels of language development. Dependent variables were codes of several aspects of the children's drawing and language.

Subject Criteria

The study was based on the drawing and language of four children whose ages ranged from five years, seven months to seven years, three months. To participate, each child had to meet the following criteria:

1. Be identified as hearing impaired before the age of two and experience a level of hearing impairment from moderately severe to profound.

2. Wear an amplification device.

3. Be free of any obvious visual, physical, cognitive, or emotional impairments.

Setting and Participant Description

The research was conducted in a self-contained combined kindergarten/first grade classroom for hearing-impaired children in a southwest Michigan county from October through December. The classroom used an exclusively oral/aural approach. Three of the children wore bilateral hearing aids that served as receivers for an F.M. system, with the transmitter microphone worn by the teacher. One of the students had a cochlear implant (indicating a profound hearing loss) which also received signals from the F.M. system. Three of the four students had returned for a second year of full days in the same classroom with the same teacher, while the fourth child had been in the classroom for half days the previous spring and full time for the current year. They were, therefore, familiar with the daily routine involved in this study of drawing and dictating a story or description of the picture. For hearing status and information concerning the children in this study, see

Table 1

Hearing Status and Information About Children

Subject	Age	Sex	Unaided Pure Tone Average in Left Ear (L) and Right Ear (R) (.5K, 1K, 2K in dB HL)	Amplif.
Cindy[a]	6;4	F	Not applicable	Cochlear Implant
Luke	6;7	M	L=80; R=77	Hearing Aid
Keisha	5;7	F	L=60; R=50	Hearing Aid
Nancy	7;3	F	L=83; R=93	Hearing Aid

[a]The names used in this report are pseudonyms.

Table 1. Brief descriptions of each child's hearing history, hearing levels, and educational levels follow.

Cindy had a bilateral profound sensorineural hearing loss secondary to meningitis at age 17 months. She received binaural hearing aids at age 22 months and received a cochlear implant at age 36 months. Cindy was using some signs when she began in the classroom, but used spoken English at the time of the study. Cindy was at the first grade educational level.

Keisha had a moderate to moderately severe to normal (6 kHz) reverse curve sensorineural hearing loss bilaterally which was discovered when she turned five years old. Her hearing loss was reported as being hereditary in nature; her father and siblings have similar hearing losses. At the time of discovery of her

hearing loss, she was fitted with bilateral hearing aids. Keisha used spoken English exclusively. Keisha was at the kindergarten educational level.

Luke had a moderately severe to severe bilateral sensorineural hearing loss secondary to a high fever at two years of age. Luke had worn bilateral hearing aids since that time. Luke used spoken English exclusively. He was at the first grade level.

Nancy had a progressive severe to profound bilateral sensorineural hearing loss of unknown etiology at the time of the study. She was originally diagnosed with a moderate to severe bilateral hearing loss when she was age 21 months. Nancy had worn bilateral hearing aids since age 23 months. She used spoken English exclusively and was at the first grade educational level.

The teacher in this study was a certified Teacher of the Hearing Impaired with a Masters of Education degree, who had been teaching preschool and early elementary children with hearing impairments for 27 years. She had been teaching first grade since four years previous to this study, and the present combined kindergarten and first grade for two years. The technique of using drawings with contingent queries was originally of her design.

Data Collection Instruments

Independent Variables

Two measures were used to describe the participants at the beginning of the treatment program. Audiometric test results in the children's files were collected for each of the children. Recent scores for each of the children on the Grammatical Analysis of Elicited Language (GAEL) (Moog, Kozak, & Geers, 1983) test were also collected for information about the children's expressive language skills.

Using the information about the GAEL tests, the four children were grouped into higher and lower language ability groups. Keisha was placed in the higher language level because her language was deemed to be too advanced to justify administration of the GAEL-C (complex sentence level). Nancy was also placed in the higher language group because she was appropriate for the use of the GAEL-C. Cindy was placed in the lower language group because of functioning at the level of the GAEL-S (simple sentence level). Luke was also placed in the lower language level group because the GAEL-P (pre-sentence level) was most appropriate for him. The four children were thus assigned to two sets of two, matched on the basis of relative strength of their language abilities, with Keisha and Nancy in the

higher level language group and Cindy and Luke in the lower level language group.

Dependent Variables

Dependent measures consisted of two informal scoring systems used to quantify aspects of: (a) children's spontaneous drawings; and (b) children's talk about their drawings. As described later in this chapter, the teacher recorded the children's talk about their drawings on their pictures. The experimenter then systematically coded the data using the codes found in Table 2.

Coding Procedure

To seek evidence of correlation between elements in the children's drawings and elements in the children's language, codes were developed and a scoring system was created to characterize performance in the two domains. The picture and oral language data were summarized by filling in blank data forms found in Appendix B and Appendix C. As described below (and defined in Table 2), several variables were measured or documented for analysis.

For each child's drawing, the experimenter created and recorded labels for each of the objects and characters drawn along with the number of times each element was present, how much detail was included, and whether

Table 2

Coded Dependent Variables and Their Definitions

Dependent Variable	Definition	Code
Semantic Cases		
Agent, pronoun	Initiator of an action verb--as a pronoun	A-PRO
Agent, proper	Initiator of an action verb--proper noun	A-PROP
Agent, common	Initiator of an action verb--common noun	A-COM
Experiencer, pronoun	Animate who experiences an event, action, or mental disposition--pronoun	E-PRO
Experiencer, proper	Animate who experiences an event, action, or mental disposition--proper noun	E-PROP
Experiencer, common	Animate who experiences an event, action, or mental disposition--common noun	E-COM
Possessor, pronoun	Animate who possesses an object or relation to another animate--pronoun	P-PRO
Possessor, proper	Animate who possesses an object or relation to another animate--proper noun	P-PROP
Possessor, common	Animate who possesses an object or relation to another animate--common noun	P-COM

Table 2---Continued

Dependent Variable	Definition	Code
Dative, pronoun	Animate recipient of object of action named by verb--pronoun	D-PRO
Dative, proper	Animate recipient of object ofaction named by verb--proper noun	D-PROP
Dative, common	Animate recipient of object of action named by verb--common noun	D-COM
Object, pronoun	A thing acted upon by an action verb--pronoun	O-PRO
Object, proper	A thing acted upon by an action verb--proper noun	O-PROP
Object, common	A thing acted upon by an action verb--common noun	O-COM
Possession, pronoun	A thing possessed by a possessor--pronoun	PS-PRO
Possession, proper	A thing possessed by a possessor--proper noun	PS-PROP
Possession, common	A thing possessed by a possessor--common noun	PS-COM
Factitive	Object or being resulting from action of the verb	FACT
Instrumental	Inanimate object or force which brings about the process of the verb but is not the instigator	INST
Locative	Place or spatial orientation of the state, action, or process of the verb	LOC

Table 2---Continued

Dependent Variable	Definition	Code
Article	An article	ART
Action verb	A verb with an observable action	A-VB
State verb	A verb describing the state of a person or object	S-VB
Particle	Part of a verb which can be put at the end of the phrase	PART
Preposition	Common prepositions	PREP
Coordinating conjunction	Make compound sentences ("and," "but," and "or")	CCONJ
Subordinating conj.	Make complex sentences (other conjunctions)	SCONJ
Attribute	Describes or qualifies nouns	ATTR
Temporal	Time-related words	TEMP
Exclamation	Exclamations	EXCL
Functions of Utterances		
Label	Label things in drawing	LABEL
Event	Describe an event related to the drawing	EVENT
Syntactic Maturity of Utterances		
Fragment	A fragment of a sentence	FR
Simple, incorrect	An simple sentence with grammatical errors	SI
Simple, correct	A simple sentence with no grammatical errors	SC

Table 2---Continued

Dependent Variable	Definition	Code
Compound, incorrect	A compound sentence with grammatical errors	CPI
Compound, correct	A compound sentence with no grammatical errors	CPC
Complex, incorrect	A complex sentence with grammatical errors	CXI
Complex, correct	A complex sentence with no grammatical errors	CXC
Maturity of narrative		
Isolated description	Events or objects are listed without regard to sequence	ID
Action sequence	Events are temporally related	AS
Specific drawing elements		
Ears	Ears are drawn on human figures	XEAR
Written unconventional letter	An attempted but incorrect letter is written spontaneously	XWUL
Written conventional letter	A conventional letter is written spontaneously	XWL
Written word	A correctly spelled word is written spontaneously	XWW
Written sentence	A correctly spelled sentence is written spontaneously	XWS
Themes of drawings		
Realistic theme	The drawing has realistic elements	XTR

Table 2---Continued

Dependent Variable	Definition	Code
Fantasy theme	The drawing has elements of fantasy	XTF
Related to news from home	The picture is related to the day's news from home	XNH
Not related to news from home	The picture is not related to news from home	XNNH
Levels of drawing development (abridged definitions)		
Named scribbling	Things in the drawing are unrecognizable but named by the child	XDNS
Preschematic and schematic	Has preschematic and schematic elements	XDPS
Schematic	Things in the drawing are drawn the same way consistently and are recognizable in isolation	XDS
Preschematic	Things in the drawing are mostly unrecognizable in isolation	XDP
Preschematic and beginning realism	Has preschematic and beginning realism elements	XDPB
Preschematic, schematic, and beginning realism	Has preschematic, schematic, and beginning realism elements	XDPSB
Schematic and beginning realism	Has schematic and beginning realism elements	XDSB
Beginning realism	Careful detail and perspective are included	XDB

ears or hearing aids were included on human figures to investigate any special sensitivity to their ears and their hearing impairments. The pictures were also analyzed for their themes and whether they were depictions of reality or fantasy. It was then determined whether the picture was related to the news the child reported from home.

The developmental levels of drawing were determined using codes based on concepts from several drawing researchers, which were summarized by Lowenfeld and Brittain (1987, pp. 474-479). When children included complete human figures in their drawings, the best score resulting from Draw-A-Person analysis (Goodenough, 1926; Harris, 1963) was recorded. If a child produced any writing, the developmental level of the handwriting was also scored (Harste, Woodward, & Burke, 1984).

For each child's oral language, several developmental and qualitative aspects were considered. For each utterance, semantic cases of each of the words were coded. These codes were developed and selected with the assistance of an expert in language development and analysis. The syntactic maturity level of the utterances were also noted, and whether the utterance served as a label or a description of an event depicted by the picture was determined and recorded. The number of different words as well as total words spoken by the

child was then logged. Finally, the level of narrative competence (Westby, Van Dongen, & Maggart, 1989) was analyzed and recorded. Specifically, whether the child's talk about the picture was an "isolated description" of what was in the picture or what happened in relation to the picture, or as an "action sequence" in which actions related to or depicted by the picture were sequentially described. No higher levels of narrative development (e.g., "reaction sequence," "abbreviated episode," "complete episode") were observed.

To examine the relative expressive output of language versus drawing, a table constructed for each drawing with three columns (see example in Appendix C). One list was "things in the picture, but not in the language," a second was "things in the language, but not the picture," and a third overlapping list included things that appeared both in the drawing and the words.

Coding Reliability

The reliability of the coding procedure for drawing was measured and established through comparison of coding between the experimenter and an expert in children's art. For two randomly-chosen drawings, the inter-coder reliability for coding of the number of elements and developmental level of drawings was 95%. For five randomly-chosen drawings coded again following a three

month interval, the intra-coder reliability of the number of elements and developmental level of drawings was 95% as well.

Reliability of the coding procedure for the children's oral language was likewise measured and established through inter-coder reliability with an expert in language and language development. Comparing 99 possible semantic word code differences, the reliability for coding semantic word codes was 93%. Auxilary verbs proved to be the most difficult of the semantic word codes to code reliably. The inter-coder reliability for coding the number of elements in drawings versus oral language using eight drawings was 88%. Intra-coder reliability of the oral semantic word codes was measured following an interval of three months using 48 possible semantic word code differences, and was established at 95%. Intra-coder reliability of the number of elements in drawings versus oral language was measured following an interval of three months using eight drawings, and was established at 90%.

Drawing and Talking Treatment Procedure

Experimental Context

Before beginning the actual treatment procedure each day, the children sat in a group with the teacher.

The class discussed the weather and the calendar date. Then each of the children shared with the class some news from home with support from the teacher. The news from home typically involved some event important to the child and his or her family. This news from home was communicated through notebooks which were taken home every day. At home, parents assisted their children to dictate the "news" chosen by their children. The parents also illustrated each day's entry with rough sketches.

Treatment Procedure

After all the children had told their news from home, they and the teacher moved to a kidney-shaped table where crayons, pencils, and blank sheets of 8 1/2" by 11" paper were available. Each child created a drawing on a topic of his or her own choosing. No time limit was established for this drawing activity, but it typically lasted ten to fifteen minutes. It is important to note that the children were able to see what their classmates were drawing. Although this behavior was not encouraged, evidence of peer influence could sometimes be observed. The children also had access to the teacher's stick-figure drawings, which she later drew as they watched based on their news from home, and then posted for discussion on a bulletin board at their

eye level.

After the period of free drawing, the teacher asked a child who appeared to be finished if he or she was done. If the child indicated "yes," the teacher took the drawing, expressed interest in it, placed it in front of her on the table and prepared to write on the picture with a marker. The teacher then used a general prompt to ask the child what she (the teacher) should write (this was the low-prompt condition). As the child told the teacher what to write, the teacher transcribed the child's oral language as accurately as possible, writing the child's response at the top or bottom of the drawing. In the high-prompt condition, the teacher asked additional questions about the drawing and/or events represented.

Following discussion of each child's picture, the drawing was used as the basis for mini-lessons in auditory perception and comprehension as the teacher took turns asking the children to respond to questions or comments, or to recognize phrases specific to their drawings. When these lessons were complete, the children's drawings were posted on a wall with the other days' drawings to create a journal for the week. Each day, the children reviewed any of their previous drawings for that week by looking at them and telling the teacher what each day's news had been.

The drawing and dictating activity occurred daily as part of the classroom educational routine. For purposes of analysis, however, drawings and language samples were collected from four five-day school weeks (the 7th, 9th, 12th, and 15th weeks of the school year). These weeks were selected to be fairly evenly spaced, avoiding the week of Thanksgiving in November and a week in December in which a special school program took precedence over the regular curriculum. The teacher had followed a similar procedure in the first six weeks of the school year, but used only the low level prompts then, and until the high level of prompting was introduced according to the staggered-baseline schedule for this study. After a high level of prompting was introduced for a given child, the teacher maintained the high-prompting level during interim (non-coded) weeks and subsequentially.

The staggered-baseline design was used with the two sets of children (matched for language abilities)--Keisha and Nancy; Luke and Cindy. This design was used to investigate the influence of systematic question prompts (scaffolding) used by the teacher, The teacher introduced prompting to one member of each of these two sets at different points in the intervention process on a staggered schedule. That is, all children in both sets received "low scaffolding" for the first six weeks,

as well as the 7th week, in which the first probes were taken (considered the "baseline" condition). The probes of the 7th week consisted only of the question "What do you want me to write?" In the 9th week, one member of each set (Luke and Nancy) continued to receive the low scaffolding probes, while the other group began to be prompted with "high scaffolding" (Cindy and Keisha). High scaffolding consisted of additional questions, such as "What's happening here" and "What is this?" The probes were conveyed as sincere interest in the context of the child's drawing and continued until the teacher determined that the child had communicated as much detail about the message as possible. For the third and fourth weeks of data collection, both groups received high scaffolding.

The teacher's fidelity to the protocol and accurate recording of the child's utterances was secured through the use of direct observations and random cassette recordings of the treatment procedure. These were transcribed and compared to the on-line transcriptions the teacher had made.

Reliability

It was found that the teacher followed the protocol for the level of scaffolding with 100% reliability. However, the teacher's on-line transcriptions varied in

their exact match to the audiotapes. There was a match of approximately 85% to 95% when comparing the teacher's on-line transcripts with transcripts of the audiotape. In general, transcription errors resulted from the teacher's difficulty in understanding the speech of the children or occasionally neglecting to write down something a child said as she helped him or her to clarify meaning. For example, when she was giving Keisha a high level of prompting, the teacher asked seven questions about why "Me and Daddy had to stay home" before Keisha was able to explain that she stayed at her house "because the doctor was busy." Not all of these questions and attempted responses were recorded. In addition, one of the students, Luke, had poor intelligibility and typically produced long strings of sounds which neither the teacher nor the experimenter could understand. Occasional words that could be understood in these strings of jargon were transcribed. Audiotape recordings were made but were not particularly helpful because of Luke's low intelligibility. Occasional dication errors were also present with the other three children. In spite of these limitations, on-line transcription has advantages of being gathered in the context of the discussion, and have the best chance of capturing words that are not clearly articulated and have clinical relevance. It should be noted that reliability problems

in transcription contributed to the decision not to use mean length of utterance (MLU) as a measure of language maturity.

Analysis Procedures

The data above, which included both quantifiable and qualitative-descriptive factors, were analyzed further using several techniques. Some data that could be quantified were compared using nonparametric correlation techniques. The effects of varied levels of scaffolding and individual children's language levels were submitted to analysis of variance (ANOVA). Qualitative analyses were also conducted by searching for patterns and relationships between factors in oral language, drawing, and the background profiles of the participants.

CHAPTER IV

RESULTS

This descriptive and experimental study was designed to investigate the relationship between the development of oral language and the development of drawings in young children with hearing impairments. Its aim was to address the difficulty many children with hearing impairments have in achieving a functional level of English language equivalent to their peers with normal hearing. The broad questions of this study included examination of whether relationships exist between elements of drawing and elements of oral language, whether teacher prompting influences the amount and type of children's talk, whether the teacher's drawings affect the children's drawings, and whether individual-difference factors systematically affect a child's drawing or language.

First, group results are reported based on analysis of quantitative data. Specific comparisons are made between the number of different things in the children's drawings and the number of words in their spoken language. The influence of prompting questions on the number of words spoken is also reported.

Individual analyses are then reported based on descriptions of each child's drawings and language, showing individual styles, as well as strengths and weaknesses in both of these expressive modes. Finally, results are presented related to the remainder of the investigative questions.

Group Analysis

The first section describes the relationship between the number of different things each child drew in each drawing and the number of different words the child produced when talking about the drawing. A Pearson Product Moment correlation coefficient analysis was performed on these measures. The second section describes the effect of prompting through questions on the children's total number of words spoken. In the third section, analysis of variance (ANOVA) was performed using CHILD (with 4 individuals treated as 4 "groups") and PROMPTING (with 2 levels of "low" and "high") as the independent variables, and using the number of total words produced as the dependent variable. The software program Systat (Wilkinson, 1990) was used for these analyses.

Table 3

Pearson r Correlation Coefficients of Each Child's Inclusion of Different Things in the Drawing and Different Words Produced Orally

Child	Correlation Coefficient (r)	Probability (p)
Cindy	0.170	.499
Luke	-0.123	.606
Keisha	-0.135	.617
Nancy	0.523	.018*

*Is significant at $p<.05$.

Number of Different Things Drawn Related to Number of Different Words Produced

Table 3 summarizes the Pearson Product Moment correlation coefficient (r) analysis correlating the number of different things each child drew with the number of different words the child produced orally. Only the Pearson r value for Nancy showed significance ($p<0.05$). Therefore, for three of these four children, how much they drew did not appear to be related to the variety of words they produced, but for one child it did.

Total Number of Words Spoken Related to Child and Level of Prompting

A two-way analysis of variance (ANOVA) was performed treating the individual children as separate

Table 4

Two-Way Anaylsis of Variance (ANOVA) Findings Compairing the Number of Total Words Based on the Child and Level of Prompting

Source of variance	Sum of squares	df	Mean square	F-ratio	p
Child	187.599	3	62.533	2.505	<0.067
Prompt	512.897	1	512.897	20.550	<0.000*
Child X Prompt	132.158	3	44.053	1.765	<0.163
Error	1622.322	65	24.959		

*Is significant at p<.05.

groups and using the presence or absence of additional prompting as the other independent variable. Results of the ANOVA are summarized in Table 4. The dependent variable in this analysis was total number of words produced. The results of the ANOVA showed no significant difference among the children, although the main effect of "child" approached significance [F(3,65)= 2.505, p=0.067]. The main effect of "prompting" was significant [F(1,65)=20.550, p=0.000]. The interaction effect for Child X Prompt was also not significant [F(3,65)=1.765, p=0.163]. This suggests that all children benefitted from prompting in producing more words. Figure 1 illustrates the staggered baseline effect of higher prompting across the two sets of children matched

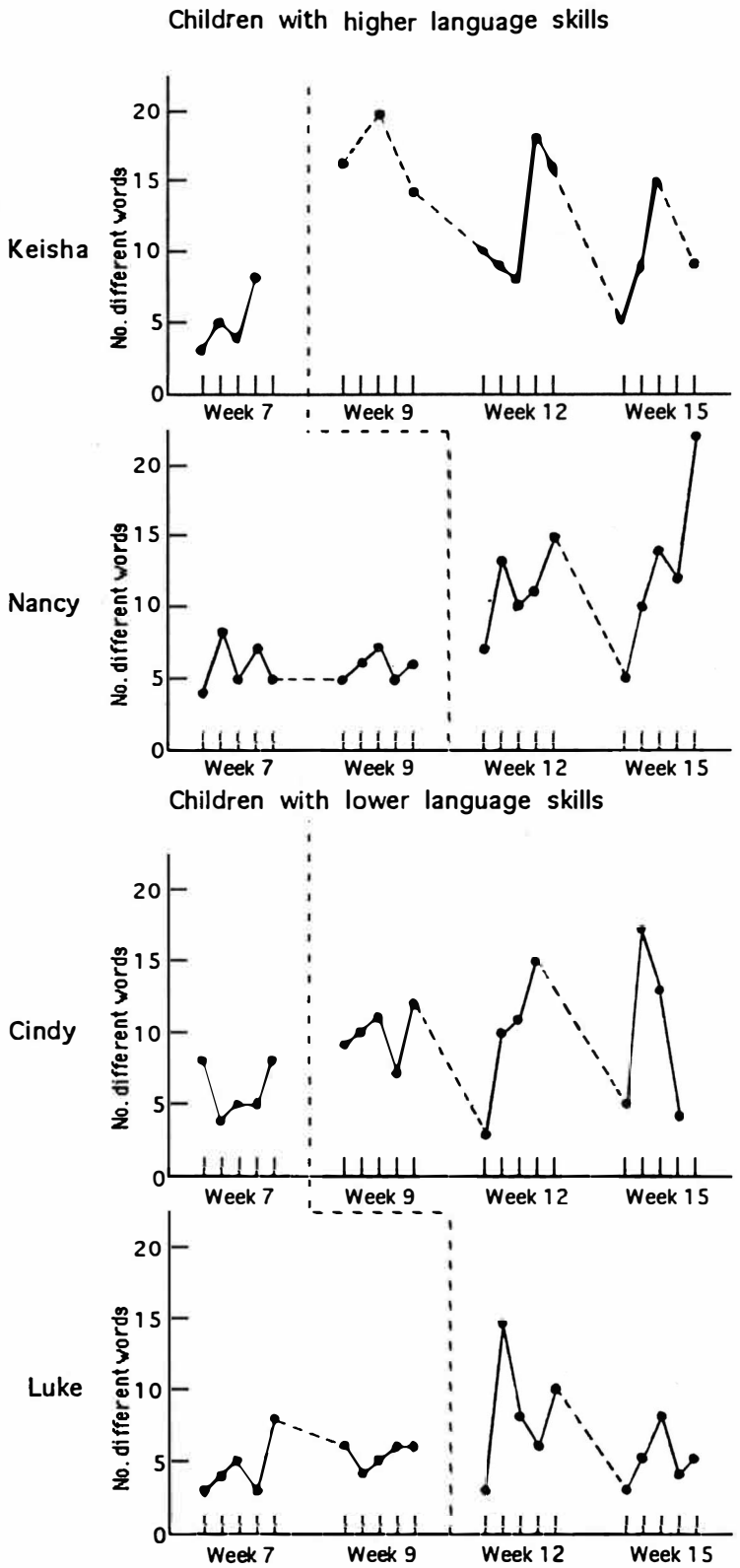

Figure 1. Multiple Baseline Effects of Prompting on Language Across Subjects in Two Sets. (Dotted lines represent absences [within weeks] or lack of coding [between weeks].)

for language abilities.

Individual Analysis

The remainder of the investigative questions were addressed by describing each child's distinctive drawing and speaking patterns. This is because no consistent patterns existed for all of the children in the interaction between qualities of drawing and spoken language. Specifically, it cannot be concluded from the data that, for all of the children, the kinds of things drawn are related to the types of words spoken, or that the theme of the drawing is related to maturity of narration. Indeed, only five explanations of pictures were above the isolated description level of narrative. However, the level of prompting by the teacher resulted in production of more words by all of the children. A higher level of prompting was also associated with improvements in drawing and/or language elements which were unique to each child.

For each child, his or her drawings will be described first for developmental level, content, theme, and effect of a higher level of prompting. Then the child's oral language regarding the drawing will be described for maturity level of narrative, function of utterances, syntactic maturity, preferred semantic case of words, preferred topics, and effect of a higher level of promp-

ting. Data pertinent to these descriptions are summarized in Tables 5 through 8 and Figures 2 through 9.

Cindy's Drawing

Cindy's drawings typically contained elements characteristic of both preschematic and schematic levels of drawing development. Items such as hearts, stars, and flowers were schematic in that they were consistently drawn one way. People were usually, but not always, drawn as stick figures. A few of her drawings showed budding use of perspective. For example, a few of the stick figures are shown in a side view while sitting, although heads always faced the observer.

Cindy, as well as the other three children, used both pencil and crayon to create her drawings, typically drawing in outline with the pencil first before coloring in with crayons. Her drawings usually were of significant people in events or of newly acquired objects (e.g., clothes, a necklace, or a book). Cindy wrote and spelled single words correctly on six of her pictures. Writing consisted of names labeling people and the word "up" to give direction on what to do with a pair of scissors in conjunction with a plastic-covered popsicle. More prompting did not appear to affect Cindy's drawings. Some similarities were seen between the teacher's and Cindy's (as well as all of the children's) drawings.

Table 5

Frequency of Drawing Variables: Ears, Writing, Theme, Relation to News From Home, and Developmental Level

Drawing variable	Cindy (N=18)	Luke (N=20)	Keisha (N=16)	Nancy (N=20)
Ears	0	7	0	0
Unconventional letters	0	2	0	0
Conventional letters	1	0	1	0
Correctly spelled word	6	0	2	2
Realistic theme	17	15	16	20
Fantasy theme	1	5	0	0
Related to news from home	4	10	4	8
Not related to news from home	14	10	12	12
Preschematic	4	3	15	1
Preschematic and schematic	13	5	1	11
Schematic	1	1	0	3
Preschematic and beginning realism	0	5	0	0
Preschematic, schematic, and beginning realism	0	1	0	0
Schematic and beginning realism	0	3	0	5
Beginning realism	0	2	0	0

Table 6

Average Type-Token Ratio (TTR) and Mean Length of Utterance (MLU) of Each Child's Speech for the Four Weeks

	Cindy	Luke	Keisha	Nancy
TTR	.63	.73	.78	.73
MLU	3.8	3.86	5.65	5.68

The teacher consistently drew human figures as stick figures. The teacher also drew important things in the picture with greater detail than other things in the picture. Although this was not as obvious with Cindy's or the other children's drawings, the teacher's drawing style appeared to be emulated by the children.

The maturity level of Cindy's and the other children's human figures through Draw-A-Man analysis is not reported. This is because it was determined that the quality of each child's human figure drawing varied dramatically from day to day. In addition, none of the children reliably drew the best figure they could.

Cindy's Oral Language

Cindy appeared to have the lowest level of oral language maturity compared to the other children when considering both the mean length of her utterances and

Table 7

Total Frequency of Use of Words by Semantic Case for Each Child

Semantic case	Cindy	Luke	Keisha	Nancy
Agent, pronoun	15	8	12	13
Agent, proper	14	3	8	18
Agent, common	0	0	2	1
Experiencer, pronoun	5	12	9	9
Experiencer, proper	1	2	4	4
Experiencer, common	0	0	0	3
Possessor, pronoun	5	1	8	9
Possessor, proper	2	2	0	2
Possessor, common	0	0	0	0
Dative, pronoun	2	0	2	0
Dative, proper	0	2	6	3
Dative, common	0	1	1	0
Object, pronoun	3	0	3	4
Object, proper	2	14	5	2
Object, common	33	11	18	23
Possession, pronoun	0	0	0	0
Possession, proper	0	0	0	0
Possession, common	1	1	0	1
Factitive	0	0	1	0
Instrumental	1	0	0	0
Locative	8	10	11	7
Article	7	8	11	10
Action verb	37	15	28	31
State verb	10	11	14	17
Particle	3	1	2	2
Preposition	8	7	21	11
Coordinating conjunction	1	1	6	18
Subordinating conjunction	1	0	4	0
Attribute	20	15	9	11
Temporal	2	0	3	2
Exclamation	1	0	0	0

the number of different words she used (Table 7). The majority of Cindy's narratives were at the isolated description level. She did, however, have more instances (three) of action sequence narratives than the other

Table 8

Total Frequency of Function and Syntactic Maturity of Utterances and Maturity Levels of Narratives

Function/ Syntactic maturity/ Level of narrative	Cindy	Luke	Keisha	Nancy
Label things in picture	6	10	4	3
Event description	42	23	28	33
Fragment	12	11	3	1
Simple, incorrect	26	17	6	18
Simple, correct	6	4	18	13
Compound, incorrect	2	1	1	3
Compound, correct	0	0	0	0
Complex, incorrect	2	0	1	0
Complex, correct	0	0	3	0
Isolated description	15	20	14	20
Action sequence	3	0	2	0

children. An example was "Mommy me go store. Go for walk looking for new mittens. Find new mittens." As with the other children in the study, the majority of Cindy's utterances functioned as descriptions of events rather than labels of things in the drawing.

The great proportion of Cindy's utterances were either fragments or incorrect, simple sentences. Cindy favored action verbs and common object nouns, producing

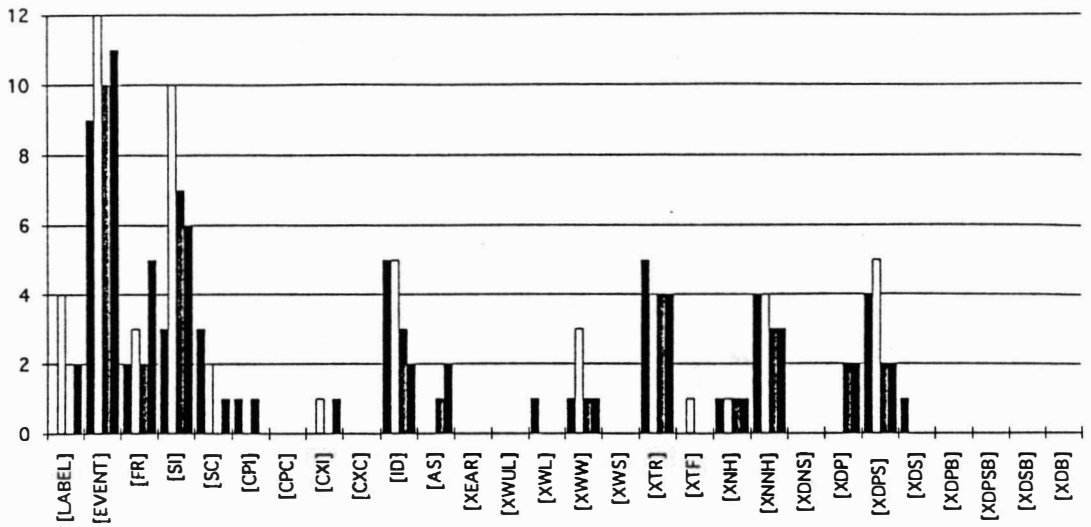

Figure 2. Cindy's Four-Week Utterance and Drawing Frequency Chart Showing Function, Syntactic Maturity, Narrative Level, Drawing Variables, and Drawing Developmental Levels.

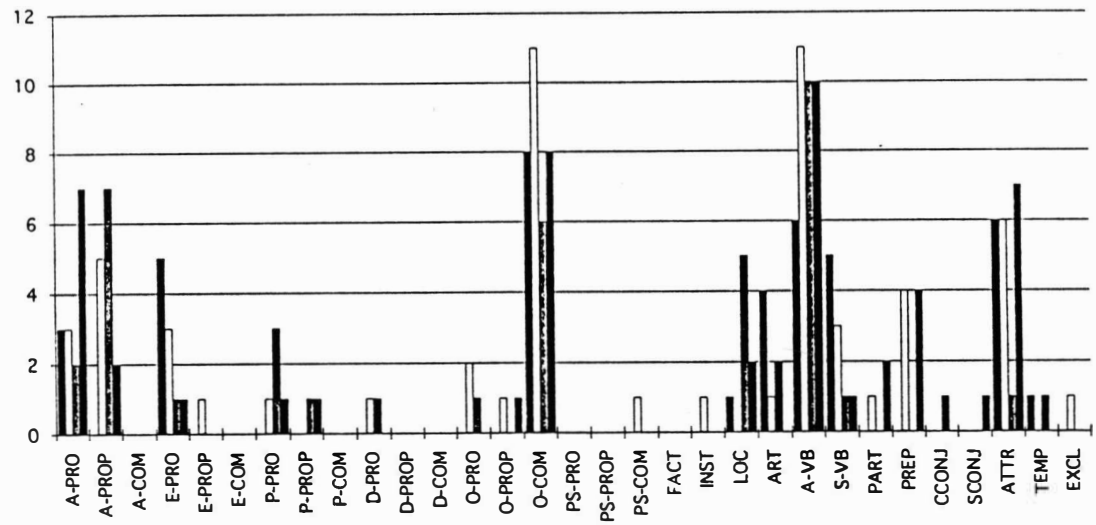

Figure 3. Frequency of Semantic Cases of Words in Cindy's Oral Language for Four Weeks (See Table 2 for legend).

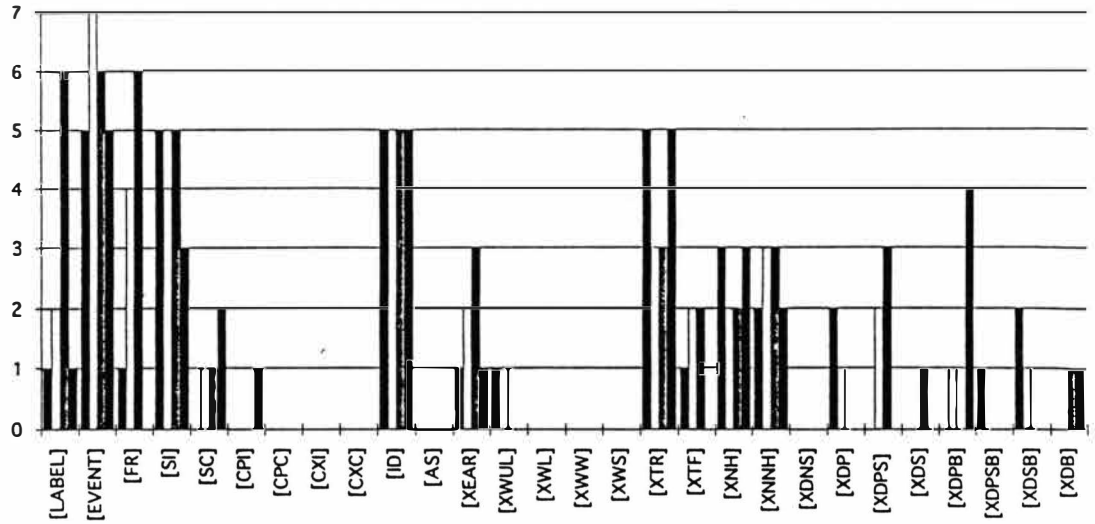

Figure 4. Luke's Four-Week Utterance and Drawing Frequency Chart Showing Function, Syntactic Maturity, Narrative Level, Drawing Variables, and Drawing Developmental Levels.

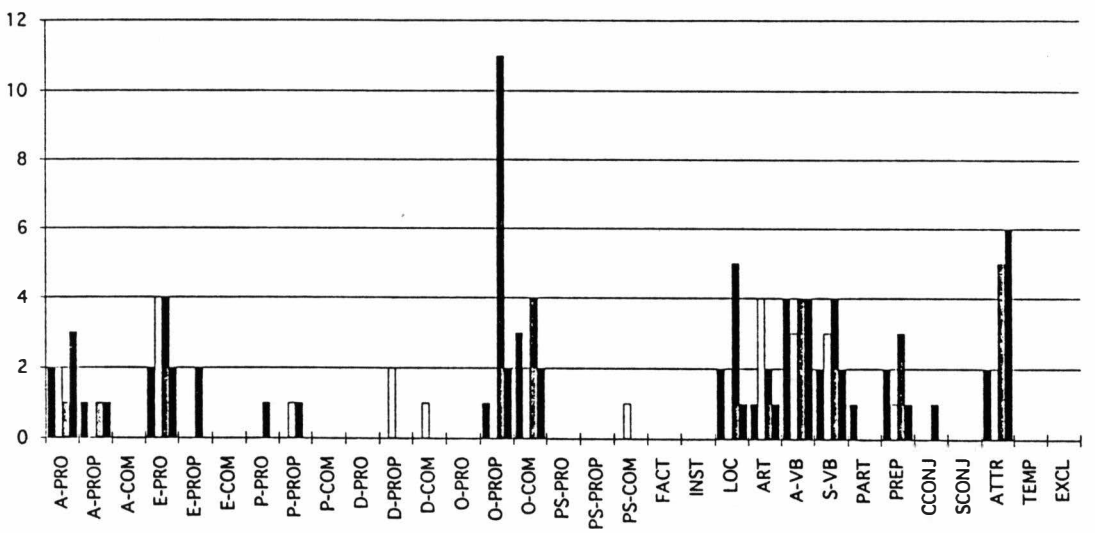

Figure 5. Frequency of Semantic Cases of Words in Luke's Oral Language for Four Weeks (See Table 2 for legend).

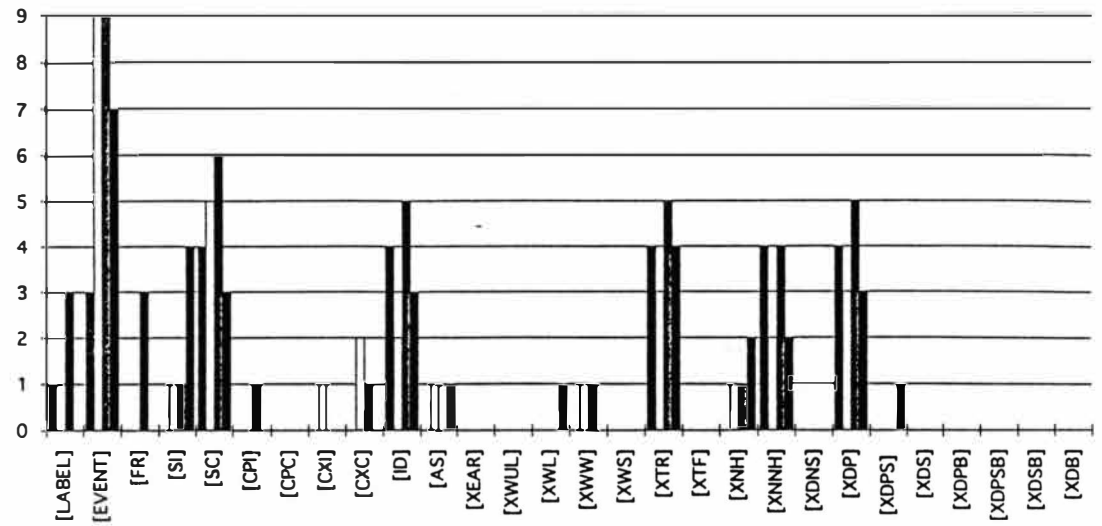

Figure 6. Keisha's Four-Week Utterance and Drawing Frequency Chart Showing Function, Syntactic Maturity, Narrative Level, Drawing Variables, and Drawing Developmental Levels.

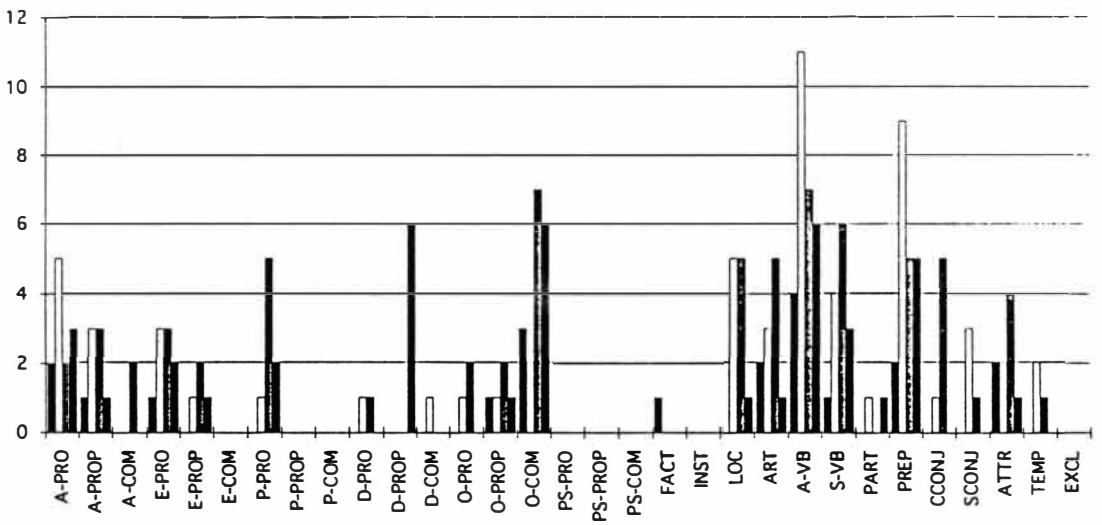

Figure 7. Frequency of Semantic Cases of Words in Keisha's Oral Language for Four Weeks (See Table 2 for legend).

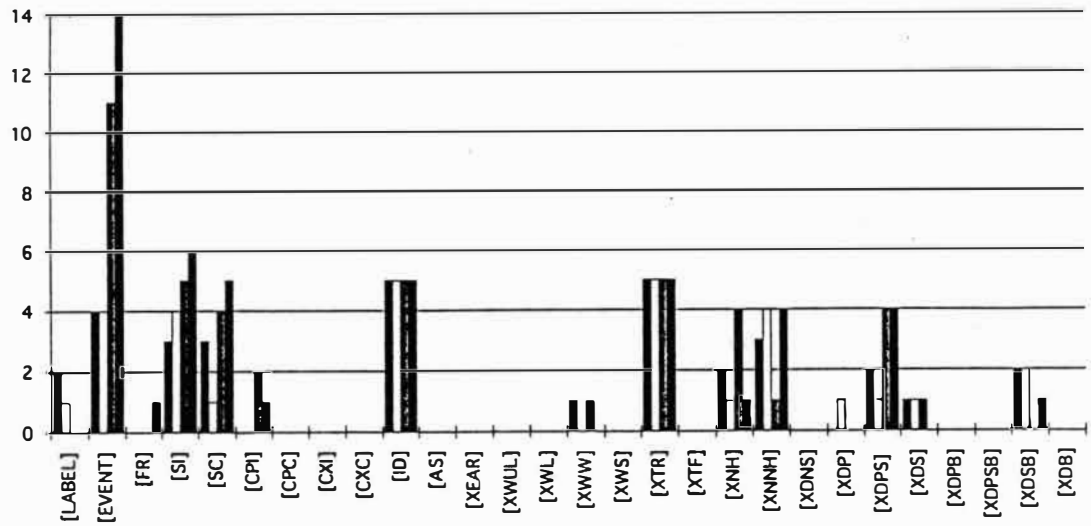

Figure 8. Nancy's Four-Week Utterance and Drawing Frequency Chart Showing Function, Syntactic Maturity, Narrative Level, Drawing Variables, and Drawing Developmental Levels.

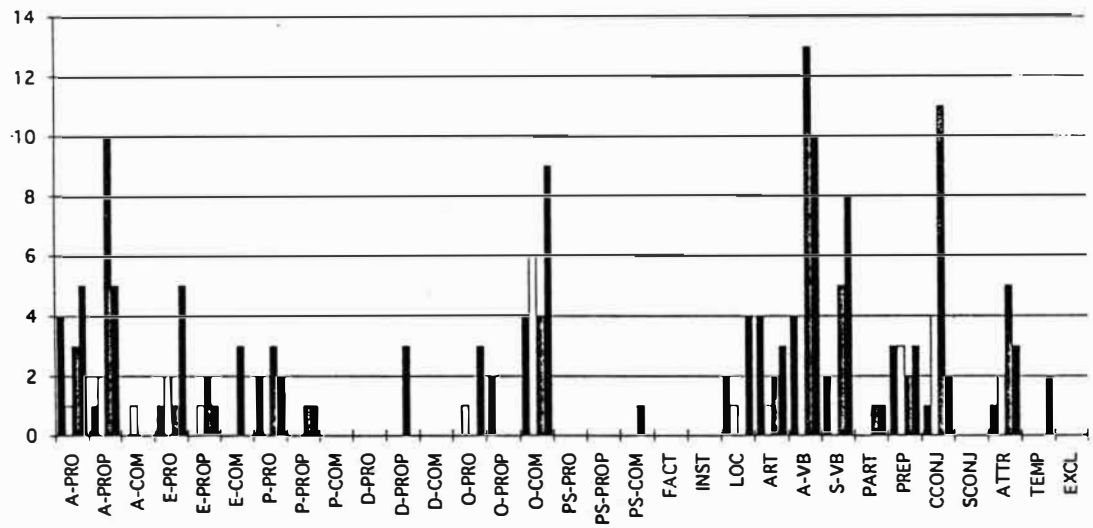

Figure 9. Frequency of Semantic Cases of Words in Nancy's Oral Language for Four Weeks (See Table 2 for legend).

them as the most frequent semantic cases of her spoken words. She also had the greatest number of attribute words of the four children. Cindy's preferred topic was what she, her family, or her babysitter had done. A higher level of prompting was accompanied by the appearance of action sequence narratives; however, this relationship could have been coincidental.

Luke's Drawing

Luke appeared to have the greatest level of drawing development of the four children, creating drawings which ranged from preschematic to beginning realism. However, the level of maturity of his drawings was not consistent. Luke's drawings seemed to improve throughout this study. His more advanced drawings showed perspective and more naturalistic points of view. For example, three of his drawings showed the backs of family members' heads as they watched television (on which appeared either a dinosaur or Power Rangers). Nevertheless, most of his people continued to be drawn as stick figures. Luke is the only child who occasionally drew ears on any of the people in his drawings.

Luke had more of an element of fantasy in his drawings than the other children. Instances of fantasy include depictions of children floating as they jump off the roof of a house, himself in bed outside in the rain,

and himself next to a Power Ranger. For Luke, a higher level of prompting was accompanied by an increasing maturity level of drawings, but the relationship may not be causal. Any relationships would also have been due to an indirect influence of prompting on subsequent days, as the children did not draw again on the same day after prompting.

Luke's Oral Language

All of Luke's talk about his drawings was at the isolated description level of narrative development. Most of Luke's utterances were either fragments or incorrect, simple sentences. It should be noted, however, that the decreased level of intelligibility of Luke's speech may have compromised the measure of his syntactic maturity, as well as other measures of his oral language.

Luke's most frequently used semantic cases were proper nouns as objects and a moderate number of attribute words. Luke typically talked about himself, family events, or television characters (a dinosaur, Crash Dummies, and Power Rangers). A higher level of prompting was accompanied by more productions of proper nouns for objects and attribute words. The jargonic quality of Luke's speech is typical of the gestalt language learning style discussed by Prizant (1983). Gestalt

learners are thought to use more right hemispheric processing. This would also be consistent with Luke's strengths in drawing.

Keisha's Drawing

Keisha's drawings were relatively immature and were predominantly preschematic. People in Keisha's drawings were drawn as either "tadpoles" (a head with two lines as legs) or stick figures. She tended to draw less than the other children, sometimes making drawings consisting simply of two or three people. Keisha occasionally wrote names over her depictions of people. A higher level of prompting did not seem to have an indirect effect on her drawings.

Keisha's Oral Language

Keisha's language skills were relatively strong. She produced the highest number of different words of the four children. Two of Keisha's narratives (elicited by a high level of prompting) could be characterized as action sequences, although the preponderance of her narratives were isolated descriptions. More of Keisha's utterances were complete sentences rather than incomplete sentences. She also produced three correct complex sentences (e.g., "Daddy took me to school because Mommy didn't have time").

Keisha's most frequently used semantic cases were pronouns as agents, action verbs, and prepositions. She usually talked about family events. Additional prompting was accompanied by more utterances about events, more action verbs and state verbs, and production of a greater variety of semantic cases of words.

Nancy's Drawing

Nancy tended to draw at the preschematic level with some schematic elements. However, five of her twenty drawings had elements of beginning realism as well, due to nontransparent overlapping of objects (e.g., legs drawn continuing beneath the table where a person was sitting). People were consistently drawn as stick figures, occasionally with clothes over them. Most of Nancy's drawings included people, although she periodically only drew places (e.g., her dad's pickup truck in front of her school) or things (e.g., her new winter clothes). More prompting did not appear to have an indirect effect on the quality of Nancy's drawings on subsequent days.

Nancy's Oral Language

Nancy had the highest mean length of her utterances of the children. All of her narratives, however, were isolated descriptions. The grammatical form of Nancy's

utterances were evenly divided between incorrect sentences and correct sentences. The preferred semantic case of Nancy's words were proper nouns as agents, action verbs, coordinating conjunctions, and common names of objects. Nancy typically talked about what she and her family had done. Additional prompting was accompanied by more event-oriented utterances, proper names for agents, action verbs, and state verbs.

Summary of Results

In summary, the number of different things drawn was significantly correlated with the number of different words produced orally for only one of the four children in this study, Nancy. For all four children, significantly more words were produced in the sessions in which additional prompting was given by the teacher in the form of questions about the meaning of the pictures and the events they depicted. Although close to significance, no significant difference in the total number of words produced was found between children in spite of evidence of different levels of incoming language skills. The total number of words produced in lower and higher levels of prompting, however, was significantly different. This effect was noted for all of the children.

It was also found that the teacher's drawing style

appeared to be emulated by the children's drawing styles. In addition, the four children in this study had different strengths, weaknesses, and idiosyncratic styles of drawing and writing. Each child benefitted from prompting, but in different ways from the other children.

For Cindy, additional prompting coincided with the appearance of action sequence narratives. Luke's level of drawing maturity increased when the teacher provided more prompting. He also produced more proper nouns for objects and attribute words. Given a higher level of prompting, Keisha's drawings showed no salient changes, but her oral language included more utterances about events, more action verbs and state verbs, and a greater variety of semantic cases of words. Likewise, Nancy's drawings appeared to be unaffected by more prompting, but her oral language contained more event-oriented utterances, as well as words which were proper names for agents, action verbs, and state verbs. It should be noted, however, that the staggered introduction of increased prompting was confounded with time. So general increases in oral language or drawing may also have been due to time and general learning.

CHAPTER V

DISCUSSION

This chapter includes a discussion of the results of this study. It does so in light of the research questions and the literature review. Limitations of the research are also discussed, as well as suggestions for further research.

Implications of the Results

A primary finding of the study was that the relationship between elements of drawing and elements of oral language is weak. A second major finding was that prompting improves the output and quality of children's oral language (to a greater degree) and drawings (to a lesser degree) differentially for each child.

First, no clear and consistent relationship was found between drawing and oral language. At least, no clear relationship could be found that applied to all children. One experimental question addressed the possibility of individual differences. At least two of the children showed clear, but opposite patterns. That is, Luke had well developed and imaginative drawing skills but limited oral language skills; whereas Keisha

had relatively well developed language skills, but drew little and had relatively immature drawing skills. What seemed to be significant for all the children was how important the event being depicted was to the child. This seemed to be a major factor affecting the relationship between drawing and oral language on a particular day. If the child was especially interested in the event depicted, the drawing did not necessarily contain more elements or details, but the oral language about the picture tended to consist of more words and be more complex.

It may be that the drawing thus served as a door to more language, which might not have otherwise been opened. This supports the authors (Brittain, 1979; Caldwell & Moore, 1991; Calkins, 1986; Harste et al., 1984; Kellogg, 1969; Wilson & Wilson, 1969) who maintained that art and language are related, in that both are expressive forms. In this way, drawing may provide scaffolding for language and writing. The results of this study support this position and the suggestion that drawing is an effective instructional avenue for fostering language development.

A second major question related to the influence of prompting on talking and drawing. All of the children in this study said more when prompted with the teacher's meaning-probing questions. Prompting, however, mani-

fested itself differently for each child. What was interesting about prompting is that it seemed to exert the strongest influence on the expressive mode that a child had as a strength, while exerting a lesser effect on the less developed expressive mode for that child. For example, when prompting was increased, the developmental level of Luke's drawings increased. During the high-prompt condition, he produced more drawings which could be characterized as examples of beginning realism. Luke's oral language was clearly weaker for him than drawing; however, the high-prompt condition was also associated with a higher frequency of attribute words. For Keisha, whose language was considerably more developed than her drawings, more prompting was associated with the use of a wider variety of semantic cases of words. As previously mentioned, however, her drawing maturity also improved over the course of treatments. That is, Keisha moved from drawing "tadpole" people made of two lines, a circle, and eyes to more identifiable human figures with details such as braided hair. It is not clear whether this change was in response to the prompting or developmental growth. On the other hand, the teacher's questions may have drawn her attention to details, which she began to include in future drawings.

The implication is that prompting with questions is an effective method of encouraging the development of

children's narrative skills. Prompting with questions about meaning tends to help children to develop their areas of strength. Its child-centeredness focuses instruction on the child, rather than attempting to change the child to fit the instructional method.

The fact that the effectiveness of this instructional method was established with these four children with moderate to profound hearing impairments has positive implications for addressing the problem many children with hearing impairments have with English language development and academic acheivement. Thus drawing and dictating oral narratives can be added to the regimen of approaches teachers of the hearing impaired use for early intervention.

It should also be noted that teachers should be aware that their drawings may influence the drawings of their students, and it is more likely to inhibit student's drawings than to enhance them. Drawing should not be seen as an inferior expressive mode or area of intelligence.

Limitations

The accuracy of this study's results were affected by several difficulties. First, the changes in drawing and oral language took place over a period of nine weeks. So any changes may have been due to some degree

to time and general development, rather than the particular instructional method of the study.

Another limitation is the difficulty the teacher had in transcribing the children's oral language accurately, on-line, as they talked about their pictures. The children's poor speech intelligibility limited the usefulness of such options as transcribing from tapes. And even when it could be understood on tape, it was evident that the teacher did not transcribe the children's oral language precisely. In Luke's case, particularly, poor intelligibility is likely to have depressed the measurement of his oral language performance. Observations across the treatment procedure, however, showed that Luke's intelligibility problems and the teacher's transcription inaccuracies were distributed across both unprompted and prompted sessions and likely had no systematic effect.

Reliable scoring of the drawings and oral language was also a challenge. For drawings, in particular, it is difficult to develop valid and reliable scoring procedures. Counting the number of items in drawings and selecting the most appropriate developmental level of the drawings seemed to have circumvented this problem. For language, some words did not fit neatly into the semantic coding system created for analysis. For example, some better system of coding needs to be estab-

lished for handling auxilary verbs. In spite of these limitations, the reliability of these measures among scorers was fairly strong.

This study is also limited in its ability to be generalized due to the small sample size. Likewise, it only addressed children who were attending an oral/aural program, and the results may not generalize to children learning American Sign Language or Total Communication. On the other hand, there is no reason to assume that drawing accompanied by contingent questions cannot be used to facilitate any form of language development. A suggestion for future research would be to replicate the study with a larger sample size and with deaf children learning other language systems, such as American Sign Language, or with children with other developmental disorders.

None of these limitations appear to contradict the gross findings of this study. The children's oral language and drawing improvements, for example, did not gradually improve over time. Rather, the staggered baseline design showed that at least some of the changes were clearly associated with the introduction of a higher level of prompting. The fact that the four children in this study were somewhat different from each other in degree and onset of hearing loss, as well as their strengths and weaknesses in drawing and oral

language, may enhance the generalizability of the study. All four of them benefitted from the prompting approach. All four also responded positively to the drawing and explaining technique.

Appendix A

Human Subjects Institutional Review Board Approval

Human Subjects Institutional Review Board

Kalamazoo, Michigan 49008-3899
616 387-8293

WESTERN MICHIGAN UNIVERSITY

Date: August 15, 1994

To: Dan Nordenbrock

From: Christine Bahr, Acting Chair for C Bahr

Re: HSIRB Project Number 94-07-08

This letter will serve as confirmation that your research project entitled "Development in drawings and language of young children with hearing impairments" has been **approved** under the expedited category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

The board would like to recommend that a few editorial changes be made to the consent letter:

1. Change "Your" to "My" in the final sentence of the third paragraph.
2. Change the final sentence of the first page to read "If I do not grant permission or later withdraw permission for my child's work to be used in the study, no educational services will be withheld from my child.
3. Leave a space between "study described above." and the line above it on the final page.

You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: August 15, 1995

xc: Nelson, SPAA

Appendix B

Data Sheet for Each Day's Picture and Language

DATA SHEET DATE:_____ SUBJ._____

PICTURE **ORAL**

ELEMENTS # DETAILS EARS WRITING ELEMENTS SEM. CASE CODES SYNT. MATURITY LABEL/EVENT

PICTURE DEVELOPMENT

THEME: REALIST. / FANTASY (DESCRIBE):

RELATED TO NEWS FROM HOME: + / --

DRAWING DEV'L LEVEL: 1 2 3 4 5 6 7

BEST DRAW-A-MAN (SCORE):

ORAL LANGUAGE DEVELOPMENT

TOTAL WORDS SAID:

DIFFERENT WORDS:

NARRATIVE LEVEL: 1 2 3 4 5 6 7 8

Appendix C

Data Sheet for Comparing Things in Picture to Things in Oral Language

DATA SHEET #2 DATE:_____ SUBJECT:_____

Things clearly in both the picture and the language	Things in the picture, but not the language	Things in the language, but not the picture

BIBLIOGRAPHY

Applebee, A. N. (1978). The child's concept of story. Chicago: University of Chicago Press.

Arnheim, R. (1969). Visual thinking. Berkeley, CA: University of California Press.

Bates, E., Bretherton, I., & Snyder, L. S. (1988). From first words to grammar: Individual differences and dissociable mechanisms. New York: Cambridge University Press.

Bonnickson, K. (1985). A functional language program that works: A pilot study. The Volta Review, 87(2), 67-76.

Brittain, W. L. (1979). Creativity, art, and the young child. New York: Macmillan Publishing Co., Inc.

Brookshire, R. H. (1992). An introduction to neurogenic communication disorders (4th ed.). St. Louis, MO: Mosby-Year Book, Inc.

Bruner, J. S. (1990). Acts of meaning. Cambridge, MA: Harvard University Press.

Caldwell, H. & Moore, B. H. (1991). The art of writing: Drawing as preparation for narrative writing in the primary grades. Studies in Art Education: A Journal of Issues and Research, 32(4), 207-219.

Calkins, L. M. (1986). The art of teaching writing. Portsmouth, NH: Heinemann Educational Books, Inc.

Carrow-Woolfolk, E. (1988). Theory, assesment and intervention in language disorders: An integrative approach. Orlando, FL: Grune & Stratton.

Cates, J. A. (1991). Comparison of human figure drawings by hearing and hearing-impaired children. The Volta Review, 93(1), 31-39.

Clay, M. M. (1975). What did I write?. Auckland, New Zealand: Heinemann Educational Books, Ltd.

DiLeo, J. H. (1970). Young children and their drawings. New York: Brunner/Mazel, Inc.

Dyson, A. H. (1982). The emergence of visible language: Interrelationships between drawing and early writing. Visible Language, 16(4).

Edwards, B. (1979). Drawing on the right side of the brain: A course in enhancing creativity and artistic confidence. Los Angeles, CA: J. P. Tarcher.

Ewoldt, C. (1985). A descriptive study of the developing literacy of young hearing-impaired kindergarteners. The Volta Review, 87(5), 109-126.

Furth, H. G. (1966). Thinking without language: Pyschological implications of deafness. New York: The Free Press.

Gaitskell, C. D., Hurwitz, A., & Day, M. (1982). Children and their art (4th ed.). New York: Harcourt Brace Jovanovich, Inc.

Gardner, H. (1980). Artful scribbles: The significance of children's drawings. Basic Books.

Gardner, H. (1983). Frames of mind: The theory of multiple intelligences. Basic Books.

Genishi, C. & Dyson, A. H. (1984). Language assessment in the early years. Norwood, NJ: Ablex.

Goodenough, F. L. (1926). Measurement of intelligence by drawings. New York: Harcourt, Brace & World.

Goodman, Y. M. (1986). Children coming to know literacy. In W. H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. 1-14). Norwood, NJ: Ablex.

Goodnow, J. (1977). Children drawing. Cambridge, MA: Harvard University Press.

Graves, D. H. (1983). Writing: Teachers and children at work. Exeter, NH: Heinemann Educational Books.

Harris, D. B. (1963). Children's drawings as measures of intellectual maturity. New York: Harcourt Brace Jovanovich.

Harste, J. C., Woodward, V. A., & Burke, C. L. (1984). Language stories and literacy lessons. Portsmith, NH: Heinemann Educational Books, Inc.

Herberholz, B. J., & Hanson, L. (1990). Early childhood art (4th ed.). Dubuque, IA: Wm. C. Brown.

James, P., & James, C. (1980). The benefits of art for mainstreamed hearing-impaired children. The Volta Review, 82(2), 103-109.

Jones, C. J. (1992). Human figure drawings of mildly handicapped students: Learning disabled, mildly mentally retarded, emotionally disturbed, and speech/language impaired. Springfield, IL: Thomas Books.

Kellogg, R. (1969). Analyzing children's art. Palo Alto, CA: National Press Books.

Koppitz, E. M. (1968). Psychological evaluation of children's human figure drawings. New York: Grune & Stratton.

Kretschmer, R. E. (1989). Pragmatics, reading, and writing: Implications for hearing impaired individuals. Topics in Language Disorders, 9(4), 17-32.

Kretschmer, R. R., & Kretschmer, L. W. (1978). Language development and intervention with the hearing impaired. Baltimore, MD: University Park Press.

Lahey, M. (1988). Language disorders and language development. New York: Macmillan.

Lowenfeld, V., & Brittain, W. L. (1987). Creative and mental growth (8th ed.). New York: Macmillan.

Luria, A. R. (1973). The working brain. New York: Basic Books.

McGee, L. M., & Richgels, D. J. (1990). Literacy's beginnings: Supporting young readers and writers. Needham Heights, MA: Allyn and Bacon.

Moog, J., Kozak, V., & Geers, A. (1983). Grammatical Analysis of Elicited Language. St. Louis, MO: Central Institute for the Deaf Press.

Mortensen, K. V. (1991). Form and content in children's figure drawings: Development, sex differences, and body experience. New York: New York University Press.

Myklebust, H. (1960). The psychology of deafness. New York: Grune & Stratton.

Nelson, K. (1986). Event knowledge: Structure and function in development. Hillsdale, NJ: Lawrence Erlbaum Associates.

Nelson, K. (1989). Narratives from the crib. Cambridge, MA: Harvard University Press.

Prinz, P. M. (1985). Language and communication development, assessment and intervention in hearing -impaired individuals. In J. Katz (Ed.), Handbook of clinical audiology (3rd ed.) (pp. 788-814). Baltimore, MD: Williams & Wilkins.

Prizant, B. M. (1983). Language acquisition and communicative behavior in autism: Toward an understanding of the "whole" of it. Journal of Speech and Hearing Disorders, 48, 296-307.

Quigley, S. P., & Paul, P. V. (1984). Language and Deafness. San Diego, CA: College-Hill Press.

Rottenberg, C. J., & Searfoss, L. W. (1992). Becoming literate in a preschool class: Literacy development of hearing-impaired children. Journal of Reading Behavior, 24(4), 463-479.

Schuell, H., Jenkins, J. J., & Jimnez-Pabn, E. (1964). Aphasia in adults. New York: Harper & Row.

Seyfried, D. N., Hutchinson, J. M., & Smith, L. L. (1989). Language and speech of the hearing impaired. In R. L. Schow & M. A. Nerbonne (Eds.), Introduction to aural rehabilitation (2nd ed.) (pp. 181-239). Needham Heights, MA: Allyn & Bacon.

Staton, J. (1985). Using dialogue journals for developing thinking, reading, and writing with hearing-impaired students. The Volta Review, 87(5), 127-154.

Stein, N. L., & Glenn, C. G. (1979). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), New directions in discourse processing (Vol. 2, pp. 53-120). Norwood, NJ: Ablex.

Sulzby, E. (1986). Writing and reading: Signs of oral and written language organization in the young child. In W. H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. 50-89). Norwood, NJ: Ablex.

Taylor, D. (1983). Family literacy: Young children learning to read and write. Exeter, NH: Heinemann Educational Books.

Taylor, D. (1986). Creating family story: "Matthew! We're going to have a ride!". In W. H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. 139-155). Norwood, NJ: Ablex.

Teale, W. H. (1986). Home background and young children's literacy development. In W. H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. 173-206). Norwood, NJ: Ablex.

Teale, W. H., & Sulzby, E. (1986). Introduction: Emergent literacy as a perspective for examining how young children become writers and readers. In W. H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. vii-xxv). Norwood, NJ: Ablex.

Temple, C. A., Nathan, R. G., Burris, N. A., & Temple, F. (1988). The beginnings of writing. Newton, MA: Allyn and Bacon, Inc.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.

Wells, G. (1986). The meaning makers: Children learning language and using language to learn. Portsmouth, NH: Heinemann.

Westby, C. E., Van Dongen, R., & Maggart, Z. (1989). Assessing narrative competence. Seminars in Speech and Language, 10, 63-76.

Wilkinson, L. (1990). SYSTAT: The system for statistics. Evanston, IL: SYSTAT.

Wilson, B. & Wilson, M. (1982). Teaching children to draw: A guide for teachers and parents. Englewood Cliffs, NJ: Prentice-Hall.

Yoshinaga-Itano, C. (1986). Beyond the sentence level: What's in a hearing-impaired child's story? Topics in Language Disorders, 6(3), 71-83.

Yoshinaga-Itano, C. & Downey, D. M. (1986). A hearing -impaired child's acquisition of schemata: Something's missing. Topics in Language Disorders, 7(1), 45-57.

Yoshinaga-Itano, C. & Downey, D. M. (1992). When a story is not a story: A process analysis of the written language of hearing-impaired children. The Volta Review, 95(2), 131-158.

Yoshinaga-Itano, C. & Snyder, L. (1985). Form and meaning in the written language of hearing-impaired children. The Volta Review, 87(5), 75-90.