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Parental Perceptions of Their Child's Speech and Language Development

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This Honors thesis entitled

Parental Perceptions of Their Child's Speech and Language Development

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and submitted in partial fulfillment of the requirements for completion of the Carl Goodson Honors Program meets the criteria for acceptance and has been approved by the undersigned readers.

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Abstract

This thesis discusses parental knowledge of their child's speech and language development. To assess this topic, a survey was administered to 104 parents of preschool children in Arkadelphia, AR. The survey asked general questions concerning speech and language development in children. Results revealed that parents, regardless of income level or education level, have minimal knowledge of speech and language development in their children. Parents with four or more children scored higher on the survey than parents with three fewer children. Implications for further studies are discussed.

Background

The unique relationship between a parent and child is amazing. Even before the child is born, the baby and parents begin learning from one another. In a matter of time, a parent is able to tell the difference between a cry of hunger, a cry for comfort, and a sincere cry of pain. Parents have the uncanny, but instinctive ability to sense their child's feelings of happiness or sadness. Typically, parents even know what their child needs or wants merely by interpreting the child's cry. Due to the bond created through parenting, parents know their children better than anyone else in the world.

What the parent does with this knowledge of their child makes a significant impact on their child's development and future. Although studies have shown that other factors contribute to the development of the child, parents have been shown to take the leading role in this area. Repeatedly, parental involvement has been found to be a necessary component for student success, emotional well-being, and positive self-concept.

Children, from the time they come into the world, are constantly learning about their environment. They are extremely perceptive and notice details we, as adults, take for granted. A baby may be fascinated with a fan, curious about a ringing telephone, or even captivated by a shadow.

scorn—makes the least difference on what kind of person the child will become." (p. 53)

Regardless of Harris' studies, other studies promote family interactions as the basis of the child's overall development. In an article recently written for ***Science***, Marcia Brinaga (1997) explains the importance of mother to baby interactions in developing awareness of speech and knowledge of speech sounds. Also counteracting Harris' beliefs, Frank Lemming and Bryan Porter (1997) further support this idea through their recent study of parent and children interactions in schools. They found children in schools from homes with parents who encouraged their studying formed children who were good students.

A lack of parental concern has been found to be detrimental to children. A Special Issue of ***Newsweek*** written by Kantrowitz (1997) describes a situation where baby orphans were left to themselves in an institutional nursery. Although the basic needs of food and shelter were provided, no affection or intimate interaction was given to these babies. As a result, they were found to exhibit underdeveloped brain activity. Parents must realize that interactions with their children such as reading together, cuddling, making crafts together, and playing games are integral building blocks for their child.

Another recent study by Karen C. Y. Liu and Chu-Ying Chien (1998) of parent involvement with preschool aged children in Taiwan, reveals additional information supporting the need for parental knowledge and involvement with their children. Focused on the learning aspect of development, Taiwanese parents were given projects to complete at home with their children. Parents who were involved with this experiment changed their perceptions of children's learning. As perceptions were altered, parental involvement increased and parent-child communication was improved. The children were found to be more apt and more able to learn. Several early childhood teachers of the children undergoing the study commented that they could not recall ever having seen the children as enthusiastic about learning as they were during this project. The international results confirm the assumption that young children's early experiences, including interactions in the home environment, have lasting effects on their cognitive growth, educational achievement, and psychological development. A substantial amount of research on specific factors in the home that influence the Taiwanese children's behavior discovered maternal warmth, high levels of emotional involvement and interactions, and parental interest are positively associated with children's achievement.

Over the course of the Taiwan study, a change in the children was noted as the parents gained understanding of their children's learning processes, abilities, and various achievement levels. Because parents were more aware of the developmental levels of their children and were informed of appropriate developmental levels, parents were better able to help their children. As children have a tendency to be active learners, or learn by "doing", parents learned more appropriate ways to actively teach and interact with their children. According to the researchers, these improvements helped develop the "whole child". (p. 298) Children were found to be more emotionally stable and exhibited a higher mental capacity as a result of this parental interaction project.

Parental knowledge of their children's development, as shown thus far, is indispensable. Communication skills are important for the child to function adequately in society. The ability to communicate is our most human characteristic. This higher cognitive process is essential to learning, working, and social interaction. Therefore, impaired communication can affect every area of a person's life. Because this is such a pivotal component of development, parents should obviously be educated in this area. Although not a result of lack of care for their children, many parents do not know enough about typical communication

development to note atypical development in their children. Because communication skills are so crucial to the future of children, parents should be well equipped to monitor their child's speech and language development.

Unfortunately, "typical development" in children is an oxymoron. Children are unique. Because no two children are alike, it is logical to reason that no two children develop in the same fashion. This is a phenomenon that has baffled human minds for centuries! Late walkers, early talkers, crawlers...One can never know what to expect!

There is, however, some method to the madness. Although flexible and changeable, there are some basic and semi-predictable milestones that typically developing children attain at specific times in their lives. Although these should never be strictly adhered to, they are general milestones parents and/or caregivers can consider when monitoring normal speech/language development.

Information on the developmental stages of children can be found in numerous places. Professional journals such as ***Clinical Pediatrics*** and ***Journal of Child Language***, provide information on typical development and speech and language milestones. Additionally, popular magazines such as ***American Baby*** and ***Parents*** also provide professionally based information for the parent on their child's development.

The following is a sample of characteristics generally agreed upon for normal language development.

Age	General Characteristics
1-4 weeks	Engages in undifferentiated crying, which has no apparent purpose or meaning.
1-3 months	Differentiates cries to show pleasure or distress. Coos.
4-6 months	Capable of babbling, laughing, chuckling, or gurgling.
6-9 months	Repeats sounds made by parents. Changes pitch and inflection of sounds.
9-12 months	Repeats sounds made by parents. Changes pitch and inflection of sounds.
12-18 months	Beginning of true speech. Vocabulary of 1 to 20 words.
18-24 months	Uses as many as 300 words and uses two-word phrases. May continue use of jargon. Capable of expressing personal needs.
2-3 years	Uses as many of 1,000 words and three-to-four-word phrases. Uses speech to communicate wants. Begins to use pronouns.
3-4 years	Uses as many as 1,500 words. Employs longer, more complex sentences. Much of speech is clear

	to strangers. Uses speech to offer explanations, makes requests, and tell stories.
4-5 years	Uses more complex sentences and question forms. Shares ideas. Speaks in complete sentences. Ability to answer questions from readings and various situations.

Tables such as the one presented above are helpful for parents—especially beginning parents—to be more certain of their baby's appropriate speech and language development. Some children may develop one skill slightly earlier than predicted and another skill slightly later than predicted. This is normal and is no cause for panic. Developing one characteristic early does not necessarily mean that a particular child is the next super-genius. Likewise, developing one trait a bit later does not indicate that the child will be behind or underdeveloped. Albert Einstein, for example, was a late talker, waiting to speak his first words until the age of two. This obviously did not hinder his mental capabilities! However, a red flag should shoot up when a child is significantly behind other children in his or her group. Speech and language underdevelopment is an area that is difficult for parents to notice.

Parents are unaware of speech and language underdevelopment for different reasons. Sometimes parents have no desire to know that their child has a problem. A close friend of mine has a brother with mental retardation. Because her parents were not willing to accept that her brother had any sort of developmental problem, he did not receive the type of help he needed to learn and function appropriately in his environment. This has caused this young boy a great deal of grief and frustration and has resulted in his education taking much longer than it would have otherwise. Sometimes parents do not notice a problem in their children due to self pride. They prefer to ignore the problem rather than draw attention to this "embarrassment" that the child will presumably grow out of. Other parents worry that they are responsible for the problem and rather than address the child's development, the parent focuses on personal guilt. Still other parents are simply oblivious to their child and his or her development. They become accustomed to the child and do not see that the child is at risk for a speech and/or language disorder that can affect the course of the child's life.

Speech and language disorders affect the way people talk and understand. These disorders may range from simple sound substitutions to the inability to communicate to their peers and family. There are some red flags parents can be

aware of that may be indicators of potential speech and language problems.

1. Problems arose in pregnancy.
2. A traumatic injury/accident has taken place.
3. Illness such as a stroke, head injury, or aphasia have occurred.
4. The child talks in simple phrases rather than sentences that are age appropriate.
5. Limited understanding and use of vocabulary and grammar are noticed.
6. The child makes certain speech sounds abnormally, such as "wabbit" for "rabbit". They differ from others in the same age, sex, or ethnic group.
7. Speech and language is hard to understand.
8. The child is overly concerned about his or her own speech.
9. The child frequently avoids communicating with others.

Information is readily available and easily accessible for parents who want to know about their child's development. Sadly, this crucial aspect of parenting is frequently overlooked or ignored. Perhaps parents do not realize how important their intervention is for their children.

The next questions to ask are "Do parents have an adequate knowledge of their child's development?" and "Are

parents taking advantage of available information to prevent developmental disorders and help their children develop?" This project will focus on what parents generally know or don't know regarding speech and language development. This paper will also describe the role of the speech-language pathologist in informing parents about typical and atypical speech and language development.

Literature Review

Numerous sources were available on the topic of parental intervention and involvement, speech and language development in children, indicators of disorders, and parental perceptions. In this section, I will review the material found in research of the topic for this thesis project.

Childhood Education, Summer 1998 v74 n4 p213(7)
Project Approach and Parent Involvement in Taiwan.
Karen C.Y. Liu; Chu-Ying Chien.

This article provided information concerning the benefits of parental intervention with preschoolers. The project involved participation of parents in various activities, such as making dinner or researching the history of and making lanterns. From these activities, parents changed their perception of their children's learning and were able to better help them learn and grow as an individual. Increased parental involvement in their children's learning improved parent-child communication and improved the "whole child".

Father Doesn't Know Best: Parent's Awareness of their Children's Linguistic, Cognitive, and Affective Development
Eric #: ED144713
Jean Berko Gleason, Esther Blank Greif, Sandra Weintraub, and Janet Fardella
Boston University

This article provided some of the most valuable information of all the sources. It covered a study of sixteen middle class couples and their first-born children. The parents were asked questions about how they believed

their child would respond to different questions and situations. Their answers were compared with how the children actually answered. The study indicated that parents have general rather than specific knowledge of their child's developmental level. This article also explained different ways a parent innately knows how to interact with their child. These include a slow rate of speaking, repetitions, concreteness of subject, high pitches, simples rather than complex sentences, and clearly defined boundaries.

Newsweek Special Issue, Spring/Summer 1997
When a Child's Silence Isn't Golden
Claudia Kalb and Tessa Namuth

This is another helpful article describing the importance of speech and language intervention at a young age. It basically describes the debate between a wait-and-see approach and a let's-take-care-of-it approach concerning speech and language developmental delay. Some professionals believe early intervention for language delayed children is important to prevent problems down the road while other professionals believe the opposite. They believe that children are so variable and develop at such different rates, that a few years down the road they will even out developmentally and nothing harmful will result.

Evidence to both sides is given, but seems to lean more towards early intervention for language delayed children. Indicating that long-term problems can result from ignoring

developmental delay, this article shares that difficulties learning to read, write, and spell can result. Also, further behavioral problems can follow as a result of frustration over an inability to communicate.

American Baby, October 1992
I'm Talkin'
Paul Dworkin, MD, FAAP

This was an excellent source with valuable information on the development of language in children. Dworkin provided information concerning the progression of sounds and words made in speaking development, explained normally developing speech, talked about what is "normal", and even discussed cries, coos, and what makes sense in a baby's mind. Written for parents, a general timeline of characteristics to expect from children as they develop was included.

I was interested in the many things parents can do with their children to enhance their vocabulary and help them learn as easily and quickly as possible. Imitating cooing, playing communication games, and even not using "baby talk" were all suggestions given to parents. Dworkin explains how many things parents do can greatly aid the child in speech and language development. This shows that parental knowledge of development and intervention in learning is beneficial for the growing child.

Psychology Today, November 1999 v32 i6 p20
Getting Tots to Talk
Sam Martin

This article provides information for parents of children who are "late-talkers". Martin explains the difference between a normally developing child who decides to take their time with talking and a child who is at risk for a language disorder. He encourages the parent not to take late-talking lightly. These children require attention and serious side effects can result due to ignoring the problem. Martin further explains techniques clinicians use to help a child "find their voice".

Another integral piece of information provided by this article is its explanation of parental perceptions of their child's language development. This study concluded that parents generally do not realize the intelligence of their child. The parent speaks to the child in a much lower level than necessary.

Newsweek Special Issue, Special Issue Spring/Summer 1997
Getting a Good Start
Barbara Kantrowitz

This article provides information on the development of children and what parents can do to foster growth of speech and language in their children. Encouraging parents to take advantage of their child's curiosity and amazing ability to absorb such a massive amounts of information as they do in the first years, parents are told about the long term effects of what they do has on their children. Actions taken by parents determine their child's emotional well-being, mental capacity, and overall happiness. Further,

parents are informed of how important it is to give time and attention to their child. Many children are not even read to and over half of children under four are in a daycare that does not sufficiently supply learning experiences. Parents, as shown by this article, must have knowledge of their children and what affects them.

Family Living: Suggestions for Effective Parenting
Eric #ED313168
Assessing Your Preschooler's Development
Lilian G. Katz

Parenting is discussed in this article on assessing preschoolers' development. Many parents, it explains, worry that their child is not where he or she should be developmentally. Practical and easy recommendations are given to check different areas of their child's development. This is a valuable source which provides red flags which could possibly be indicative of language disorders. It is helpful because it explains when intervention is most needed. This is a wonderful source to educate parents on whether or not professional help is needed for their child.

Clearinghouse on Elementary and Early Childhood Education
Young Children's Oral Language Development
Eric #: ED313168
University of Illinois
Celia Genishi

This article provides information on the development of oral language. This is one of the child's most natural accomplishments which fascinates parents and onlookers. Providing an overview of the process and mechanics of language development, parents are given suggestions for

things they can practice with their children. Parents are warned against focusing on areas that need improvement. Rather, a parents should strongly praise their child's language accomplishments. Many suggestions are given for parental intervention. Treating the child as a conversationalist, talking slowly, taking turns...There are many things a parent can do. It is important for parents to understand they can help their children development language.

Parent Involvement Campaign
wysiwyg://40/http://www.pen.k12.va.us/Anthology/div/Stafford/involvement.html

This Internet site provides information supporting the assumption that parental involvement is beneficial to students. In a study incorporating parents into education through the Stafford County School, students' responses were studies. The parents were provided with a report card as an optional self-assessment tool designed to help parents analyze their present involvement in the educational processes of their children. Suggestions for further involvement were included. Researchers found that more children reached their highest potential as a result of this project.

Journal of Speech, Language, and Hearing Research 42:3 p. 744-60
Fourteen-Year Follow-Up of Children With and Without Speech/Language Impairments: Speech/Language Stability and Outcomes

Carla J. Johnson, Joseph H. Beitchman, Arlene Young, Michael Escobar, Leslie Atkinson, Beth Wilson, E.B. Brownlie, Lori Douglas, Nathan Taback, Isabel Lam, Mim Wang

This article indicates that early intervention in speech and language impairments is crucial. A variety of young children, both impaired and unimpaired, were studied over a fourteen year time period. The children with impairments early in life were shown to have continuing problems throughout school. Due to the absence of early intervention at the origination of the problem, severe disorders were created. When parents are unaware of their child's typical language development, the atypically developing children suffer greatly in the long run. According to the article, problems will persist in a variety of ways.

Help Your Child Listen and Talk Better: A Workshop for Parents

Eric #: ED234577

Campbell, Rhodene; Mueller, Penny Jean

This workshop material provides parents of normal and hearing or language impaired young children with information on helping their child's communication development. The article explored how children learn to talk, how hearing and talking are interrelated, how to help children listen and play attention, and how to improve children's talking. The ability parents have to impact and improve their child's speech and language development was reinforced.

Strengthening Parenting Skills: Infants, Toddlers, and Preschool.

Eric #: ED 388810

Emily Hall Tremaine Foundation, Inc., Hartford, CT.; Southern Illinois University

This article is a rich source providing a great deal of information and suggestions for parental involvement with their children. Providing information discussing children's needs and how parents can meet those needs, the parents are given a "job description" of sorts. Parents are encouraged not to leave all of the work of teaching their child to their teachers are school, but to take part in the exciting experience. This is described as enhancing children's social, emotional, and motor development. Parenting is a huge job and parents should be adequately educated to take on the responsibility.

Journal of Speech and Hearing Disorders, Vol. 54, 587-599, November 1989

The Language Development Survey: A Screening Tool for Delayed Language in Toddlers

Leslie Rescorla

Showing parents are the experts on their children, this article discusses a survey completed by parents concerning language development in their own children. Parents were found to be extremely reliable sources in predicting where their child is developmentally. The answers given by parents where found to be very similar to the scores the child made on a language assessment test. Ensuring that parents are the most knowledgeable resource concerning their specific child's language development, the question is do they know where their child *is* in comparison to where they *should be.*

A Parent Satisfaction Survey for Project PEACH
Eric #: ED179589
Louis Scheiner

A questionnaire was designed to determine parent perception of and degree of satisfaction with the services provided by Philadelphia's prescriptive educational approach to children with handicaps. Parents accurately perceived the skill areas in which their children showed improvement. These skill areas were language, self-help, social abilities, attentiveness, and gross and fine motor skills. Once again, parents where the most knowledgeable resource regarding the development of their child.

Language, Speech, and Hearing Services in Schools, Vol. 24, 236-242, October 1993
Language and Social Skills From a Diversity Perspective: Considerations for the Speech-Language Pathologist
Jack S. Damico, Sandra K. Damico

This article includes a study of the language and social skills from diverse cultural and linguistic background. Among the information concerning social skills, cultural diversity, and acculturation, I was most impressed with the language development of children from each diverse group. Although the children were from came from such vastly different backgrounds with all types of social implications and contexts, their language development was similar. The students learned, interacted socially, and developed their identities in the same universal manner. Of course, the way the children actually acted was very different, but the basic intentions and goals of the actions

were found to be the same. Because all children develop in the same manner and parents have been found to know most about their child's speech and language development, it makes sense to conclude that parents have knowledge of their child's speech and language development regardless of ethnic background.

Newsweek, p. 57-64; October 27, 1997
Why Andy Couldn't Read
Pat Wingert, Barbara Kantrowitz

Evaluating the effectiveness of schools on learning disabled children, this article researched why children are having the developmental problems they are having today. The study revealed that many parent blame the school for this problem, when in actuality the parent is partially at fault. Critics claim that many parents have been found to ignore signs of developmental delay in their children because they do not want to accept the fact that their child has a disorder. This addition to ineffective school assessment and lack of parental intervention, is a major contributing factor to language disorders in children. The article further explains the necessity of early intervention in these problematic areas. Failure to implement therapy early in life for these learning disabled children results in future and larger problems for these children. Children have been found to have severe reading difficulties later in life. This leads to other problems—in such areas as

behavioral problems, social underdevelopment, and self esteem.

Kiplinger's Personal Finance Magazine, June 1999 v53 i6 p92-97
An Apple for the Parents
Kristin Davis

This article discusses parental participation in Washington D.C. to develop public schools that would help children become more well-rounded. They placed a great deal of emphasis on encouraging virtues in children. Although this was not a religious movement, the children greatly benefited from learning of what is right and wrong. Parents had to go to a great deal of trouble to allow this type of teaching in a public school, rather than a private school.

I found this article relate to the topic of this research paper because it reveals how parents will work for a goal they firmly believes needs to be obtained. If parents realized how important speech and language development are, I believe they would behave like the parents discussed in this article went all the way to Washington to attain their goal.

School Psychology Review, 1999, Vol. 28, i3, p439-448
Effects of a Parent-Implemented Intervention on the Academic Readiness Skills of Five Puerto Rican Kindergarten Students in an Urban School
Cole & Amelia Lopez

This article is interesting because it shows the cultural diversity of Hispanic parents to other parents in regard to parental participation. Hispanic parents are typically less involved with their children's education.

However, this low level of involvement should not be considered a lack of caring. Rather, it has been suggested that Hispanic parents have limited knowledge of how to help their children. This study evaluates the effects of "parent-implemented academic drill intervention on Puerto Rican children's academic readiness skills." A kindergarten teacher suggested five of her students who were having difficulty learning the letters of the alphabet to be candidates for this parental intervention project. Five individual Puerto Rican parents of these children were given index cards to teach their children the letters of the alphabet. Results revealed that despite English proficiency or education level, parents were able to consistently use this intervention technique. Through parental intervention, all five children made improvements on identifying letters.

Journal of Adolescent Research, Oct99 Vol. 14 i4 p427-448
Cross-Generation Perceptions of Academic Competence: Parental Expectations and Adolescent Self-discipline.
L. J. Bornholt & J. J. Goodnow

This article studied parental versus adolescent perceptions and how these perceptions are related. 115 adolescents between the ages of 11 to 16 and their parents participated. Results reveal that the adolescent's perception of himself is a reflection of the parent's perception of the child, especially social perceptions. However, the child has the ability to compare himself with other peers and have a more accurate depiction on his own

social lives. The parents only see the child in the home setting.

In regard to the study in this project, this helps me understand that it is difficult for a parent to have a full understanding of their child's developmental level because they do not see the child's daily interactions. It may be difficult, especially in only-child situations, for parents to have other children to compare the child to in order to form accurate perceptions.

Canadian Journal of Psychiatry, Dec99 Vol. 44 i10 p1043-1049
Parental Knowledge of Attention-Deficit Hyperactivity Disorder and Opinions of Treatment Options: Impact on Enrollment and Adherence to a 12-Month Treatment Trial.
Penny Corkum, Pearl Rimer, & Russell Schachar

This study was performed to find what parents actually know about their children's ADHD disorder and how this knowledge effects the treatment chosen. Out of the 81 participants, it was found that the parents with a higher level of knowledge of this disorder decided on nonpharmacological treatments. Parents with greater knowledge were also most interested in support groups. Parents with less knowledge typically chose the pharmacological option to treat ADHD in their children.

This study is important because it shows the treatment differences between educated versus uneducated parents. I believe this has implications for the level of parental knowledge of speech and language development as well.

Parents may make wiser choices if they were more educated about their child's development.

British Journal of Sociology of Education, Sep98 Vol. 19 i3 p377-401
I Heard It on the Grapevine': 'hot' knowledge and school choice
Stephen J. Ball & Carol Vincent

This article explains how parents learn from one another. In the instance described in the article, parents chose a particular school because other parents researched it and knew it was a great school. Likewise, if parents were more educated concerning speech and language development, this knowledge would spread among parent groups.

Journal of Health Communication, Jan-Mar98 Vol.3 i1 29-47.
Childbirth and Infant Development Knowledge Gaps in Interpersonal Settings
Cecilie Gaziano & Joann O'Leary

This article examines the knowledge gap between higher socioeconomic status parents and lower socioeconomic parents about childbirth, infants, and infant development. In this study, there was no significant difference between the groups. This of course, supports the hypothesis of the study in this paper.

Newsweek, 4/28/97 Vol. 129 i17 p72
Teach Your Parents Well
Sharon Begley & Pat Wingert

This article discusses the importance that parents have more than a general knowledge of their child's development. The authors explain that there may be serious drawbacks for the child if the parent does know have a specific knowledge

of the early years of a child's life and their development. Rather than relying on instincts, the parent should become very aware of medical knowledge in order to raise their child to the best of their abilities.

Newsweek, Spring/Summer 97, p94-96
Doing the Best for our Kids
Hillary Rodham Clinton

This article further reiterates the importance of parents having knowledge of their child's development. The President and First Lady discuss how their knowledge helped them raise Chelsea and aid in her early development.

Christian Science Monitor, 6/25/98 Vol.90 i147 p9
Mine-Sweeping, and Other Skills of Motherhood
Ellen Klavan

This article discusses innate knowledge that only mothers have. Klavan explains that some of this knowledge is simply developed without a book, but only through experience. These skills include the ability to deal with family ordeals and domestic skills.

Journal of Marriage & the Family, May99 Vol.61 i2 p465-476
Work Demands of Dual-Earner Couples: Implications for Parent's Knowledge About Children's Daily Lives in Middle Childhood
Matthew Bumpus, Ann Crouter, & Susan McHale

This article presented information on a study which evaluated the impact of work demands on dual-earner parents' knowledge of their school-aged children's experiences. Through a survey administered to 203 participating parents, possible evidence that parents have minimal knowledge of their children was provided. The article explains that the

present fast-paced culture with both parents working plays a role in the relationships parents have with their children. The parents have less time to spend with the child and are sometimes detached emotionally. The surveys indicate moderators such as the children's gender and marital contentment also play a role in knowledge of their children. According to this article, when family dynamics are in line, parents have optimal knowledge of their children.

Statement of the Problem

It is no small problem when a fourteen-year-old is unable to sequence events or make an "r" sound due to the fact that his or her parents did not recognize this problem early in the child's critical developmental years. Now the child does not have the ability to write a paper for his or her English class or follow directions given for homework. The child is most likely afraid to speak in class and to other people due to a frustrating speech impediment. Because this problem was not addressed at a younger, critical stage, the problem has increased and will have lingering and perhaps lasting effects.

The most important figure in a child's development is the parent or caregiver. The parent spends time with the child and teaches the child about life. The parent plays a large role in determining who the child will one day be. When parents are either unable or unwilling to notice problems in their child's speech and language development, inevitable problems may follow. Many parents are simply unaware of specific milestones that are present in typically developing children. Subsequently,parents fail to receive the personal education needed regarding their child's speech and language development. Unfortunately, because of this lack of information some children do not receive the speech or language intervention needed.

Recent studies reveal that the majority of parents are unaware of developmentally appropriate milestones in their children. A study conducted on the parents of sixteen middle class families at Boston University supports this proposal. In this study, parents were asked to predict various responses their child would give to specific questions. For example, the parent was asked what word their child would use to label an object , or what was the child's favorite animal. These answers were then compared with the answers given from the children. The results reveal that parents typically have a general rather than a specific knowledge of their children's linguistic, cognitive, and affective abilities. The parent may know that the child has the ability to name six of ten vocabulary words, but they do not necessarily know which ones. This study indicated that parents have minimal knowledge of speech and language development in children.

This study also revealed some of what parents do know. Parents have the innate and intriguing ability to alter their speech for children. Parents instinctively know to raise their pitch for babies and exaggerate intonation to increase interest and understanding. No one has taught the parents this. They just know!

On the other hand, our present society makes parental knowledge of children's development difficult. A recent

study published in the Journal of Marriage & Family describes how our society has had serious effects on family life. With increased work demands and frequent two-parent working situations, not as much time is available for family relationships as in previous time periods. This decrease in interaction with each other, the authors explain, may result in parents becoming even less behaviorally and emotionally involved with their children. Further, such withdrawal results in parents knowing even less than they would otherwise. The authors of this study noted that as stress of the work situation increased, the less parents were able to closely monitor their children and have an adequate knowledge of their child's development. This journal article also explained how the rapid increase of divorce and dysfunctional families has also greatly contributed to a lack of appropriate parental knowledge of children due to distractions and life crisis.

Parents have been known to have incorrect preconceived notions of where their child is developmentally. Even with no substantial evidence provided, inappropriate decisions about schooling and intervention are made—or not made—based on these faulty perceptions. Therefore, if a child is underdeveloped, the parent may have the misconception that their child is functioning at a higher level than the child actually is and the parent will most likely treat the child

as the child is older. Speaking at an elevated level in which the child does not have the ability to comprehend what is being said, has negative effects on the child. This leaves the child feeling confused and may eventually cause the child to close himself to communication. Likewise, if a child is developmentally farther along than hypothesized by parents, the parent may not challenge the mind of their young child.

A recent poll given in 1994 by the Carnegie Corporation Study of "Starting Points", showed that only 50% of children are read to regularly by their parents. 56% of children are in a daycare where they are not shown the proper attention needed for sufficient developmental interactions. In general, parents do not realize the seriousness of these events—or lack of events. They are unaware of linguistic devices to employ, helpful activities to use or special ways to help learn sounds. When parents—innocently or stubbornly—do not see the potential problem in their child, the child does not receive the help they desperately need.

The results of this lack of knowledge of speech and language development has long term effects. Beginning kindergartners are not ready to learn, young minds are not challenged, and much needed therapy is withheld from children. Sometimes, behavior problems have been created due to the frustration the child feels over the inability to

communicate. A study in 1997 discussed in the ***Newsweek*** article, *When a Child's Silence Isn't Golden*, indicated that early speech and language disorders can lead to later difficulties learning to read, write, and spell. As a result, some pediatricians and preschools have abandoned the wait-and-see attitudes and are recommending intervention for children whose language development raises red flags. It is better to take care of the small problem before it grows to a large problem.

The largest question parents must face concerning this issue, is when is a problem serious enough that intervention must be sought. Although recognizing developmental delays strongly affects the course of events, it should be noted that sometimes the recognition is over exaggerated. Parents are typically concerned with their child's well-being and few parents make it through their child's early years without occasionally thinking they should consult a professional about the way their child is progressing. It can be difficult to determine what constitutes a disorder and what does not. However, with increased awareness of typical developmental milestones, parents can be more educated in their concerns—especially with speech and language abilities.

When parental knowledge and intervention are implemented, positive results are seen. As parents become

educated about speech and language development, they are able to help stop and prevent potential problems. The study performed in Taiwaan testing the benefits of parental intervention in school work with their children and was shown to greatly benefit the children through language and speech building activities completed by parent and child. Cognitive level, social interaction, emotional well-being, and overall communication skills contributed to the betterment of "the whole person" in each student with participating parents.

Parents innately know a great deal about their children. For example, unintentionally raising vocal pitch around babies, exaggerating intonation, speaking slower, and using progressively complex sentences are all ways parents know to act around their children. Despite the fact that parents understand a great deal about their children, parents generally have minimal knowledge of crucial aspects of development. Because parents are the people who have the most knowledge about their children, it is important for them to be adequately educated in both typical and atypical speech and language development. **The problem discussed in this project is that regardless of educational background or income level, parents have minimal knowledge of normal speech and language developmental milestones.**

In this paper, I plan to examine what knowledge parents have of speech and language developmental milestones in their children. It is my hypothesis that educational background and income level will have no effect on the amount of parental knowledge of this topic. I will further describe the possible role of the speech pathologist in educating parents of speech and language development in their children.

Hypothesis

I believe that regardless of socioeconomic status or educational background, parents have minimal knowledge of their child's speech and language development. There are several results I expect to find from this survey. The following is a list of what information I hope to derive from the survey:

1. Income does not indicate the parental knowledge of speech and language development.
2. Education level does not determine the parental knowledge of speech and language development.
3. Parents with more children know more about speech and language development in their children than parents who do not have as many children. The amount of children the parent has affects parental knowledge.

Method

Subjects

104 parents of preschoolers were randomly selected to complete the survey compiled by this researcher. The surveys were administered during 1999 "Kindergarten Round-up." Kindergarten Round-up is a time of developmental screening and assessment for pre-kindergarten students in Arkadelphia, Arkansas.

Parents of the children were from Clark, Hot Springs, Ouachita, or Nevada counties. The majority of parents surveyed were from Clark County.

Procedure

Surveys were given to parents to complete while their children were participating in the speech, language, and hearing screening portion of Kindergarten Roundup. The survey included basic questions concerning the general demographics as well as the number of children at home, ages of children, daycare information, parent education level, and income. The survey included a fill-in-the-blank portion and the socioeconomic answer portion was multiple choice. All developmental questions were multiple choice questions. The survey asks questions about normal speech and language development in children newborn-11 years of age. The survey took five minutes or less to fill out. The parent placed the completed survey in a box in the screening area.

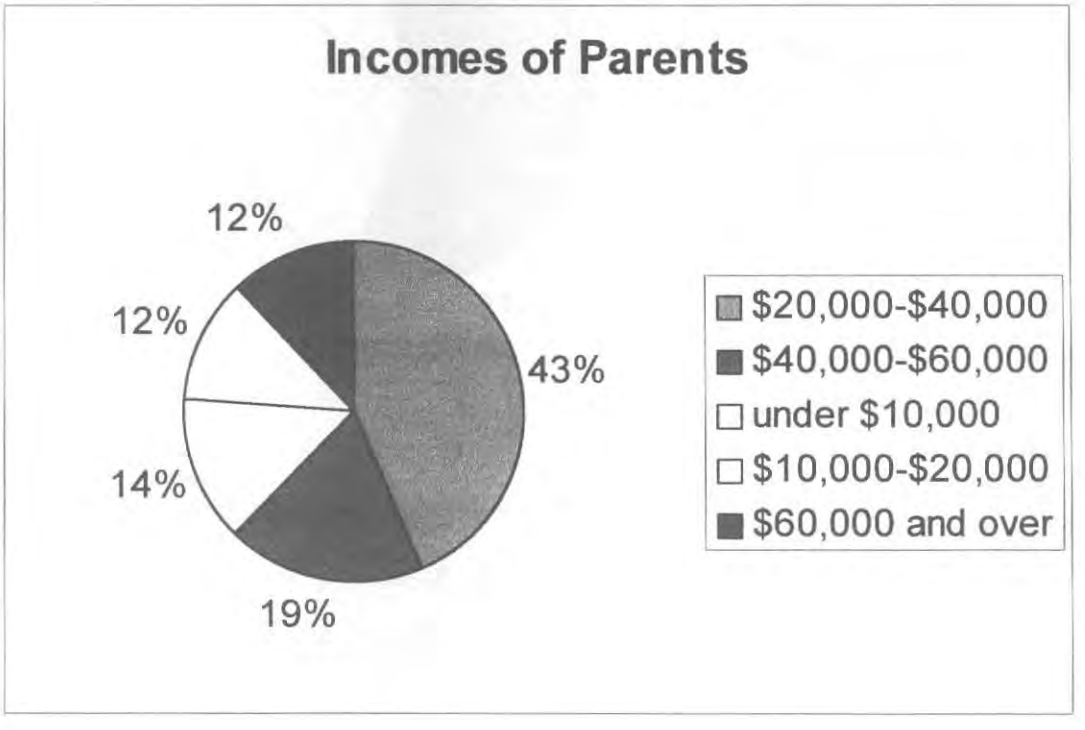
Parent Awareness Measure

Parents were informed that the survey was for the purpose of writing and undergraduate thesis. The survey included information at the top of the page that assured confidentiality and responses would be reported in group format only. Parents were not informed that the purpose of the survey was to assess parental knowledge of their child's speech and language development. A sample survey is provided in Appendix 1.

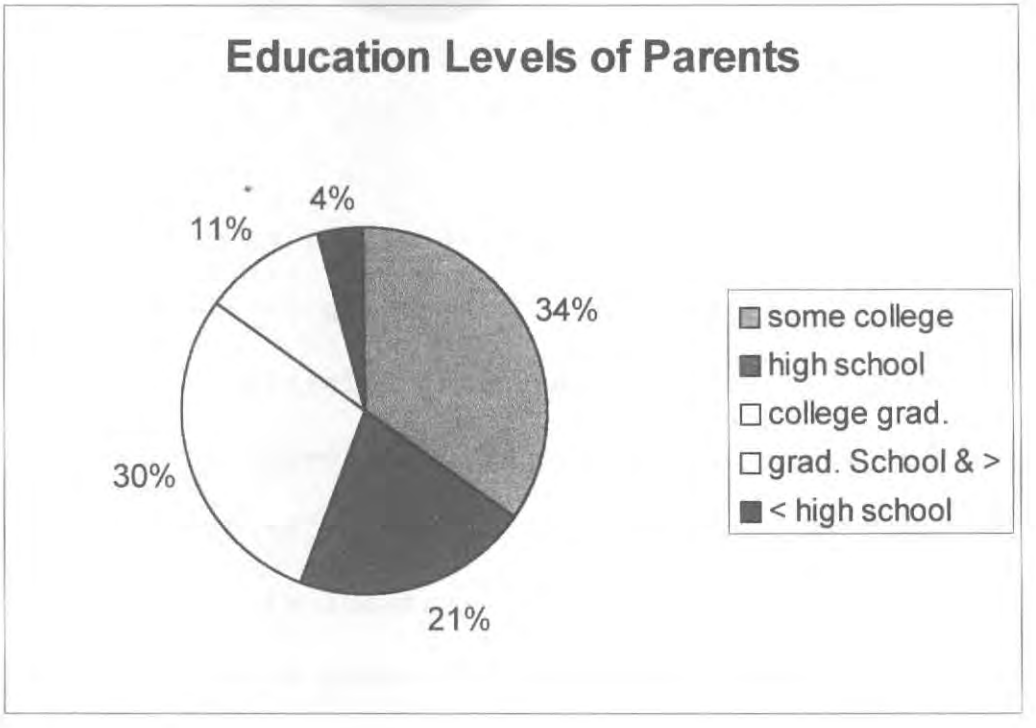
In order to interpret data, each survey response was assigned a number to represent the answer given. For the multiple choice questions on speech and language development, a=1, b=2, c=3, d=4. Data was then tabulated into an SPSS system where a series of tests were run to derive results and draw implications. Cross tabulations, frequency tests, Anova tests, and T-tests were used to draw information from the raw data. Data interpreted by the computer is shown in the results section of this project.

Results

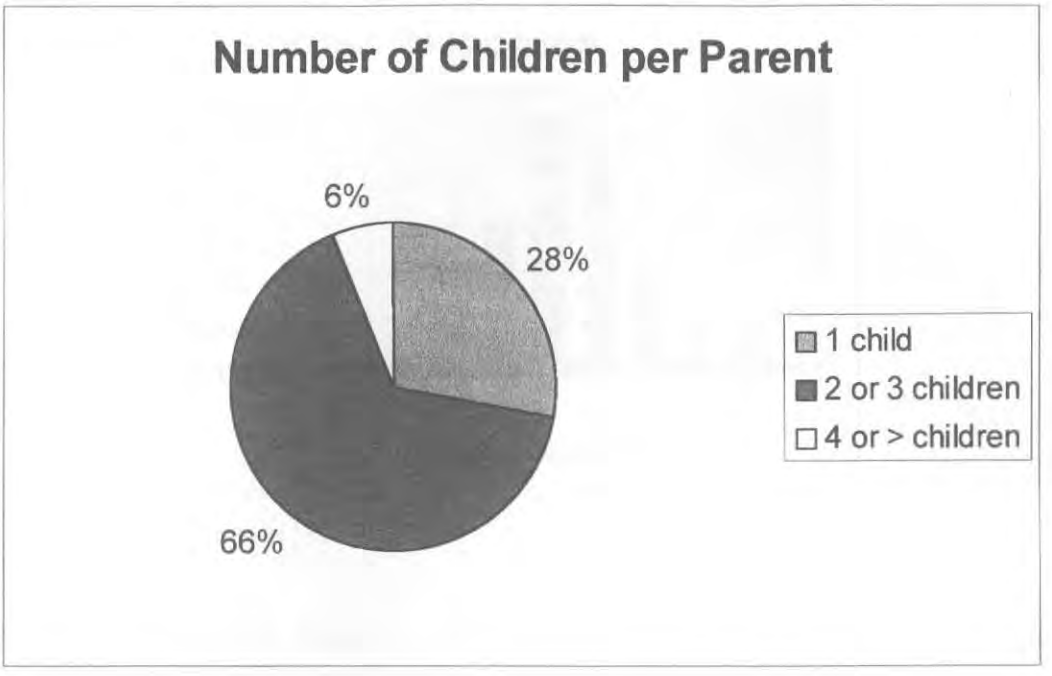
Parents participating in this study represent a wide variety of educational and socioeconomic levels. Of the 104 parents participating in this survey, only 101 filled out the upper portion of the survey. Frequency tests revealed 13.9% had an income of under $10,000, 11.9% had an income of $10,000-$20,000, 43.6% had an income of $20,000-$40,000, 18.8% had an income of $40,000-$60,000, and 11.9% had an income of $60,000 or more. These results are presented in the following pie graph:



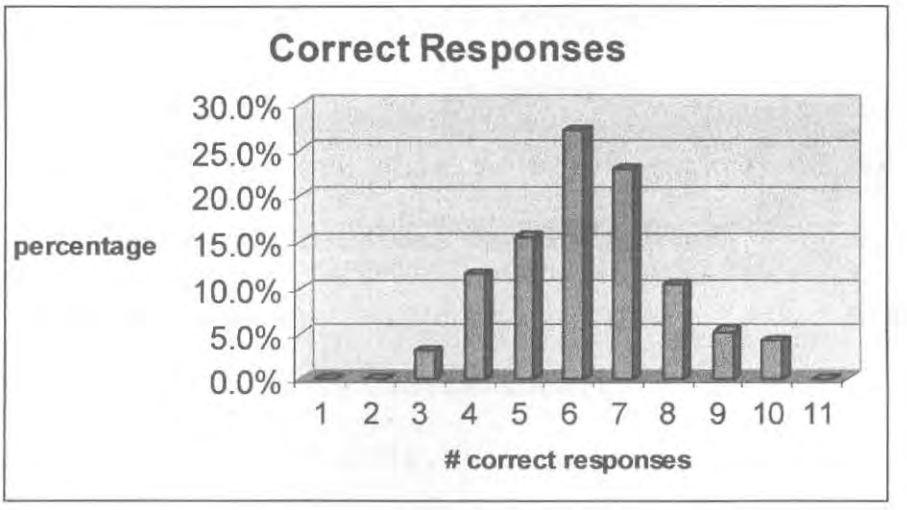
Of the 101 parents who filled out this top portion, frequency tests run on the data revealed 4% did not graduate from high school, 20.8% graduated from high school, 34.7% had some college education, 29.7% graduated from college, and 10.9% had been to graduate school or farther. These results are presented in the following pie graph:



Of the 104 parents participating, 28% of parents had one child, 66% of parents had two to three children, and 6% had four or more children. The following pie graph depicts these results:



Frequency tests run on data revealed frequencies of correct versus incorrect answers. Correct responses to questions varied. No participants answered all of the questions wrong. 4.2% answered 10 correctly, 5.2% answered 9 correctly, 10.4% answered 8 correctly, 22.9% answered 7 correctly, 27.1% answered 6 correctly, 15.6% answered 5 correctly, 11.5% answered 4 correctly, and 3.1% answered 3 correctly. No participant answered less than 3 correctly. The following chart graphically depicts these results:



The minimum number of correct responses is 3 and the maximum number of correct responses is 10. An anova test run on this data reveals a significance score of .423. (.05 indicates significance)

The following indicates the percentages of correct and incorrect responses of parents for each question on the survey:

1. By the age of one, a child should be able to speak _____ words.

a. Five b. one c. none d. ten

51% incorrect

49% correct

2. The sounds children typically make first are _____.

a. /p/, /b/, /m/ b. /k/, /g/, /s/ c. /l/, /r/, /f/

19.2% incorrect

80.8% correct

3. Children are able to put events in order and follow simple directions by the age of _____.

a. one b. eight c. three d. eleven

23.1% incorrect

76.9% correct

4. By the age of two, a normally developed child has a _____ word vocabulary.

a. 15-20 b. 4-5 c. 200-300 d. 50-100

48.5% incorrect

51.5% correct

5. Shortly after the first year, a child can typically _____.

a. make two work utterances b. verbalize ideas

c. form 3-4 word sentences

51% incorrect

49% correct

6. The preschool child is able to improve the quality of message through _____.

a. Emphasis and stress b. well formed sentences

c. use of prepositions

63.5% incorrect

36.5% correct

7. Babies vocalize pleasure and displeasure by the age of _____.

a. 2 weeks b. 18 months c. 6 months d. 3 months

67.3% incorrect

32.7% correct

8. By the age of _____, children are able to put two words together.

a. 3 yrs. b. 18 mo. c. 4 yrs. d. 10 yrs.

26.0% incorrect

74% correct

9. By three years of age, _____ can be expected.

a. two word combinations b. increased talkativeness c. verbalized ideas

52.9% incorrect

47.1% correct

10. Children gain the ability to discuss grammatical concepts by the age of _____.

a. Two b. eight c. five d. twelve

40.2% incorrect

59.8% correct

11. Babbling usually begins at _____.

a. 1 months b. 6-7 months c. 9-10 months

d.12-16 months

7. Babies vocalize pleasure and displeasure by the age of _____.

a. 2 weeks b. 18 months c. 6 months d. 3 months

67.3% incorrect

32.7% correct

8. By the age of _____, children are able to put two words together.

a. 3 yrs. b. 18 mo. c. 4 yrs. d. 10 yrs.

26.0% incorrect

74% correct

9. By three years of age, _____ can be expected.

a. two word combinations b. increased talkativeness c. verbalized ideas

52.9% incorrect

47.1% correct

10. Children gain the ability to discuss grammatical concepts by the age of _____.

a. Two b. eight c. five d. twelve

40.2% incorrect

59.8% correct

11. Babbling usually begins at _____.

a. 1 months b. 6-7 months c. 9-10 months

d.12-16 months

7. Babies vocalize pleasure and displeasure by the age of _____.

a. 2 weeks b. 18 months c. 6 months d. 3 months

67.3% incorrect

32.7% correct

8. By the age of _____, children are able to put two words together.

a. 3 yrs. b. 18 mo. c. 4 yrs. d. 10 yrs.

26.0% incorrect

74% correct

9. By three years of age, _____ can be expected.

a. two word combinations b. increased talkativeness c. verbalized ideas

52.9% incorrect

47.1% correct

10. Children gain the ability to discuss grammatical concepts by the age of _____.

a. Two b. eight c. five d. twelve

40.2% incorrect

59.8% correct

11. Babbling usually begins at _____.

a. 1 months b. 6-7 months c. 9-10 months

d.12-16 months

42.3% incorrect

57.7% correct

When incomes are compared to correct responses, the following means of correct responses are found:

Income	Mean no. Correct Responses
under $10,000	5.92
$10,000-$20,000	7.89
$20,0000-$40,000	6.07
$40,000-$60,000	6.5
$60,000 and over	6.09

When education level is compared to correct responses, the following means of correct responses are found:

Education Level	Mean no. Correct Responses
Less than high school	6.33
High school	6.11
Some college	6.36
College degree	6.52
Graduate school and farther	6.00

Question 1:

Number of Children	Incorrect Responses	Correct Responses
1	41.4%	58.6%
2 or 3	53.6%	46.4%
4 or >	66.7%	33.3%

Question 2:

Number of Children	Incorrect Responses	Correct Responses
1	24.1%	75.9%
2 or 3	18.8%	81.2%
4 or >	0%	100%

Question 3:

Number of Children	Incorrect Responses	Correct Responses
1	13.8%	86.2%
2 or 3	27.5%	72.5%
4 or >	16.7%	83.3%

Question 4:

Number of Children	Incorrect Responses	Correct Responses
1	55.2%	44.8%
2 or 3	45.5%	54.5%
4 or >	50%	50%

Question 5:

Number of Children	Incorrect Responses	Correct Responses
1	62.1%	37.9%
2 or 3	49.3%	50.7%
4 or >	16.7%	83.3%

Question 6:

Number of Children	Incorrect Responses	Correct Responses
1	58.6%	41.4%
2 or 3	68.1%	31.9%
4 or >	33.3%	66.7%

Question 7:

Number of Children	Incorrect Responses	Correct Responses
1	65.5%	34.5%
2 or 3	66.7%	33.3%
4 or >	83.3%	16.7%

Question 8:

Number of Children	Incorrect Responses	Correct Responses
1	31.0%	69.0%
2 or 3	23.2%	76.8%
4 or >	33.3%	66.7%

Question 9:

Number of Children	Incorrect Responses	Correct Responses
1	15%	14%
2 or 3	38%	31%
4 or >	2%	4%

Question 10:

Number of Children	Incorrect Responses	Correct Responses
1	11%	16%
2 or 3	26%	40%
4 or >	2%	2%

Question 11:

Number of Children	Incorrect Responses	Correct Responses
1	12%	17%
2 or 3	30%	39%
4 or >	2%	4%

An ANOVA test was run to test if these were significant differences for knowledge based on an individual's number of children, income level, and education level. Results from these tests revealed no significant differences between people of different education levels, people with different incomes, or people with different numbers of children. These following reveals these values.

Education levels: F=.282 Sig.=.889

Income levels: F=.869 Sig.=.423

Number of children: F=.132 Sig.=.396

Discussion

The results from this study support the hypothesis. Tests run on the data indicate that parents, regardless of income level or educational background, have a minimal knowledge of their child's speech and language development. Each of the groups and education levels share very near the same mean number of correct responses. Ironically, the highest scores were found in lower income, lower educated parents than in higher income, higher educated parents. This could be due to the higher educated individuals overanalyzing questions. It should be noted, however, that only 103 parents participated in this survey. Therefore, one parent's success or failure to answer a question correctly greatly alters the results—especially when results are specific to a particular group. More participants are needed for more accurate results.

The hypothesis was further supported as parents with more than 4 children scored higher on the survey than parents with 3 or fewer children. (see results for specific percentages) Parents were shown to have minimal knowledge about their child's speech and language disorders. It should be noted, however, that the survey was administered to only 6 individuals with 4 or more children.

These results present a problem. What can be done to help parents become more educated about their child's speech

and language development? I believe the speech pathologist has a major role in this area. Sending home information packets with clients and/or children from school, holding interest meetings for PTA meetings, sending speech and language newsletters, and meeting for conferences with parents of clients are several ways the speech pathologist can help parents become more aware of the critical speech and language milestones children should reach.

Implications for Further Study

There are several topics that could be further researched from this study.

Gender of survey respondents would have been another interesting inquiry to add to the survey. Recently, this has been a widely researched topic. Discovering the effects on questions answers in regard to gender differences between mothers and fathers in Arkadelphia would be an interesting research pursuit. How many mothers or fathers filled out the survey? One could show their different perceptions of and reactions to their children. Their individual knowledge of the child could also be compared. A study of this nature was performed in Boston on 16 middle class families. Using the different variables in this survey, such as income and education, would be an interesting follow-up in relation to gender of the one surveyed.

This survey was performed over a variety of ethnic groups. It would be a beneficial addition to the project to add a question making reference to this question. Citing the differences between perceptions of their children's speech and language development—if any could be found—between different ethnic groups would be another interesting exploration. This type of study could also provide a basis to the thesis statement of this project.

Inquiring about the age of the parent filling out the survey would also have held valuable information to the researcher. Does age affect perception? Are older parents as opposed to parents with more children make parents more unaware of developmental milestones or more aware of them? Do life experiences necessarily indicate an increase in the knowledge of these things?

This was a study of how much parents know about speech and language development in their children. It would be an interesting study to follow up on this and find out specifically what the parent knows and does not know. What are the strengths and weaknesses of the parental knowledge? What areas of speech and language development are least known by parents? What areas of speech and language development are most known by parents? What are teachers doing to foster this learning? What should speech pathologists do to help educate parents? What should parents do to learn more? What happens when the speech pathologist educates parents adequately on speech and language development? Are fewer speech and language disorders found?

Possible Improvements

Any activity done for the first time can understandably stand improvement. There are several factors that could be implemented to improve or broaden the scope of this project.

Wording could have been changed to be more direct and clear. Perhaps due to my inexperience, both the questions and the answers from the survey seemed vague and confusing. More simple wording and more relevant questions would have allowed a better depiction of parental knowledge and would have greatly contributed to the accuracy of this study.

In addition to improved wording, the questions could also have been more focused. The survey results may have been more reflective of parents' knowledge if the topic questioned had been narrowed to only language questions rather than both speech and language. The two topics cover a wide range of information, but having only one topic to question would possibly allow for better results.

Asking the parent to "circle one answer only" would have simplified data compilation. Problems were faced when the parent filled out all three possibilities or only the first and last. Also, the data was not tabulated in an easily changeable manner. Information derived should have been tabulated in such a way that several different types of tests could be run on the data. This would involve planning

prior to tabulation concerning what the desired information to be described involves.

Data compilation, tabulation, and interpretation would have been simplified if I had written out questions I would want to derived from the survey before administered the survey to parents. I had a general idea of the information I wanted to gather, but it would have been better to be more specific and probe more deeply into exactly what questions I wanted to find. Of course, it is inevitable that new questions arise as research and development on the project progresses, but more thought should have been given specifically in regard to results at the beginning of the process of passing out surveys.

Appendix 1: Survey

The following survey is for an undergraduate thesis. It will help compile information helpful to speech and language pathologists. It will take only a few minutes to fill out. Thank you for your time!

County of Residence_____

Education level:
a. less than a high school b. high school graduate c. some college d. College degree
e. graduate school and beyond

Income per year:
a. under $10,000 b. $10,000-20,000 c. $20,000-40,000 d. $40,000-60,000 e. $60,000 and over

Please circle what you consider the most appropriate answer to the following statements.

1. By the age of one, a child should be able to speak about _____ words.

   a. Five b. One c. None d. Ten

2. The sounds children typically make first are _____.

   a. /p/, /b/, /m/ b. /k/, /g/, /s/ c. /l/, /r/, /f/

3. Children are able to put events in order and follow simple directions by the age of ___.

   a. one b. eight c. three d. Eleven

4. By the age of two, a normally developed child has a _____ word vocabulary.

   a. 15-20 b. 4-5 c. 200-300 d. 50-100

5. Shortly after the first year, a child can typically _____.

   a. make two word utterances b. verbalize ideas c. form 3-4 word sentences

6. The preschool child is able to improve the quality of messages through _____.

   a. emphasis and stress b. well formed sentences c. use of prepositions

7. Babies vocalize pleasure and displeasure by the age of _____.

   a. 2 weeks b. 18 months c. six months d. 3 months

8. By the age of _____, children are able to put two words together.

a. 3 years b. 18 months c. 4 years d. 10 years

9. By three years of age, _____ can be expected.

a. two word combinations b. increased talkativeness c. verbalized ideas

10. Children gain the ability to discuss grammatical concepts by the age of _____.

a. two b. eight c. five d. twelve

11. Babbling usually begins at

a. one month b. 6-7 months c. 9-10 months d. 12-16 months

Appendix 2: raw data

	county	children	child1	child2	child3	child4	child5
1	1	2	5	5	99	99	99
2	1	4	22	19	16	4	99
3	2	2	5	6	99	99	99
4	2	2	98	5	99	99	99
5	1	4	6	5	3	2	99
6	1	2	5	7	99	99	99
7	1	2	18	7	99	99	99
8	2	1	5	99	99	99	99
9	1	1	4	99	99	99	99
10	99	2	4	98	99	99	99
11	1	2	8	2	99	99	99
12	1	2	4	12	99	99	99
13	2	2	5	2	99	99	99
14	1	4	25	22	12	5	99
15	1	3	5	4	1	99	99
16	2	3	20	18	5	99	99
17	1	2	5	2	99	99	99
18	1	2	12	5	99	99	99
19	1	3	5	3	1	99	99
20	1	1	5	99	99	99	99
21	1	1	5	99	99	99	99
22	1	2	11	4	99	99	99
23	1	2	9	4	99	99	99
24	3	3	14	12	5	99	99
25	1	2	10	5	99	99	99
26	1	1	5	99	99	99	99
27	4	1	5	99	99	99	99
28	2	2	5	7	99	99	99
29	1	1	5	99	99	99	99
30	1	2	3	5	99	99	99

	daycare	typecare	namecare	educate	income	words	sounds
1	1	2	1	4	5	1	1
2	2	99	99	4	4	4	1
3	1	2	2	2	3	1	1
4	2	99	99	.	3	1	1
5	1	2	3	2	1	1	1
6	1	2	1	3	3	1	1
7	1	3	99	4	1	3	3
8	2	99	99	3	4	4	1
9	1	2	4	4	3	1	1
10	1	3	99	1	.	1	1
11	1	2	3	3	3	1	1
12	1	2	2	3	3	4	3
13	2	99	99	2	2	1	1
14	1	3	99	3	1	4	1
15	2	99	99	3	3	4	1
16	2	99	99	4	4	1	1
17	1	4	99	4	3	4	3
18	1	2	5	5	4	4	1
19	1	2	5	4	4	1	1
20	1	2	4	2	3	2	1
21	1	2	6	2	5	1	1
22	2	99	99	3	2	1	1
23	1	2	7	4	3	1	1
24	2	99	99	4	5	4	1
25	1	2	1	5	4	4	1
26	1	4	99	3	2	4	1
27	1	3	99	4	3	1	1
28	2	99	99	2	3	4	1
29	1	2	8	3	1	1	2
30	2	99	99	2	4	4	1

	sequence	vocab	after1	message	vocalize	twoword	bythree
1	3	4	1	1	3	2	3
2	3	4	1	1	4	2	3
3	3	4	3	2	4	2	2
4	3	1	1	2	1	2	2
5	3	1	1	3	2	2	2
6	3	1	1	1	2	3	3
7	3	2	3	2	1	2	4
8	3	4	5	1	4	2	3
9	3	3	3	1	1	1	2
10	3	3	3	2	1	2	3
11	3	4	2	1	2	1	2
12	3	4	3	3	2	2	2
13	3	4	1	2	4	2	2
14	3	1	3	2	99	2	2
15	3	4	3	1	2	2	2
16	3	4	1	1	3	2	3
17	3	4	1	2	3	2	2
18	1	3	1	2	1	1	3
19	1	4	1	2	4	1	3
20	3	1	3	2	3	2	3
21	3	4	1	1	3	2	2
22	3	4	2	1	3	2	2
23	3	4	2	1	4	2	4
24	1	3	3	2	1	2	3
25	3	4	1	2	4	2	3
26	2	4	3	99	99	99	99
27	3	3	1	1	4	2	3
28	3	4	3	1	1	1	3
29	3	4	3	2	1	2	2
30	1	4	3	2	3	2	3

	grammar	babbling	var00002	rwords	rsounds	rsequenc	rvocab
1	3	2	.	1	1	1	1
2	99	2	.	0	1	1	1
3	3	1	.	1	1	1	1
4	2	1	.	1	1	1	0
5	3	2	.	1	1	1	0
6	3	3	.	1	1	1	0
7	1	2	.	0	0	1	0
8	1	2	.	0	1	1	1
9	1	2	.	1	1	1	0
10	1	3	.	1	1	1	0
11	3	1	.	1	1	1	1
12	3	2	.	0	0	1	1
13	3	2	.	1	1	1	1
14	99	1	.	0	1	1	0
15	3	2	.	0	1	1	1
16	3	2	.	1	1	1	1
17	3	1	.	0	0	1	1
18	3	2	.	0	1	0	0
19	3	1	.	1	1	0	1
20	3	1	.	0	1	1	0
21	1	2	.	1	1	1	1
22	1	2	.	1	1	1	1
23	2	1	.	1	1	1	1
24	3	1	.	0	1	0	0
25	3	2	.	0	1	1	1
26	99	99	.	0	1	0	1
27	2	2	.	1	1	1	0
28	3	2	.	0	1	1	1
29	3	1	.	1	0	1	1
30	1	2	.	0	1	0	1

	rafter1	rmessage	rvocaliz	rtwoword	rbythree	rgrammar	rbabblin
1	1	1	0	1	0	1	1
2	1	1	0	1	0	9	1
3	0	0	0	1	1	1	0
4	1	0	1	1	1	0	0
5	1	0	0	1	1	1	1
6	1	1	0	0	0	1	0
7	0	0	1	1	0	0	1
8	0	1	0	1	0	0	1
9	0	1	1	0	1	0	1
10	0	0	1	1	0	0	0
11	0	1	0	0	1	1	0
12	0	0	0	1	1	1	1
13	1	0	0	1	1	1	1
14	0	0	0	1	1	9	0
15	0	1	0	1	1	1	1
16	1	1	0	1	0	1	1
17	1	0	0	1	1	1	0
18	1	0	1	0	0	1	1
19	1	0	0	0	0	1	0
20	0	0	0	1	0	1	0
21	1	1	0	1	1	0	1
22	0	1	0	1	1	0	1
23	0	1	0	1	0	0	0
24	0	0	1	1	0	1	0
25	1	0	0	1	0	1	1
26	0	0	0	0	0	9	0
27	1	1	0	1	0	0	1
28	0	1	1	0	0	1	1
29	0	0	1	1	1	1	0
30	0	0	0	1	0	0	1

	correct	rchild
1	9	2
2	.	3
3	7	2
4	7	2
5	8	3
6	6	2
7	4	2
8	6	1
9	7	1
10	5	2
11	7	2
12	6	2
13	9	2
14	.	3
15	8	2
16	9	2
17	6	2
18	5	2
19	5	2
20	4	1
21	9	1
22	8	2
23	6	2
24	4	2
25	7	2
26	.	1
27	7	1
28	7	2
29	7	1
30	4	2

	county	children	child1	child2	child3	child4	child5
31	1	1	5	99	99	99	99
32	1	2	8	5	99	99	99
33	2	3	2	5	10	99	99
34	1	2	4	2	99	99	99
35	1	2	5	98	99	99	99
36	1	4	9	6	4	98	99
37	1	1	5	99	99	99	99
38	1	2	8	4	99	99	99
39	2	1	5	99	99	99	99
40	1	1	5	99	99	99	99
41	1	1	5	99	99	99	99
42	2	2	5	2	99	99	99
43	1	1	5	99	99	99	99
44	1	2	9	4	99	99	99
45	1	1	4	99	99	99	99
46	2	2	5	1	99	99	99
47	1	1	5	99	99	99	99
48	1	2	4	6	99	99	99
49	1	2	5	1	99	99	99
50	1	2	8	4	99	99	99
51	1	2	5	3	99	99	99
52	1	1	5	99	99	99	99
53	1	1	5	99	99	99	99
54	1	2	98	4	99	99	99
55	2	1	4	99	99	99	99
56	11	2	5	8	99	99	99
57	1	2	4	1	99	99	99
58	1	2	5	3	99	99	99
59	1	1	5	99	99	99	99
60	2	3	9	5	98	99	99

	daycare	typecare	namecare	educate	income	words	sounds
31	1	2	5	2	2	1	2
32	1	2	7	4	4	4	1
33	1	1	99	3	3	4	3
34	1	3	99	2	2	1	1
35	1	2	5	4	4	1	1
36	1	2	5	4	3	4	1
37	1	2	5	3	4	1	1
38	1	2	9	5	3	1	2
39	1	4	99	2	3	1	2
40	1	2	99	3	1	1	1
41	1	2	10	4	3	1	1
42	2	99	99	3	3	4	1
43	2	99	99	.	.	4	3
44	1	2	1	4	4	1	1
45	1	1	99	3	3	4	1
46	1	3	99	2	4	1	2
47	1	4	99	4	3	2	1
48	2	99	99	2	2	1	3
49	1	3	99	2	3	1	1
50	1	2	5	4	.	2	1
51	1	2	4	5	3	4	1
52	2	99	99	3	1	1	1
53	1	3	99	5	3	4	1
54	1	2	4	4	4	2	3
55	1	4	99	3	3	4	2
56	1	2	7	3	2	4	1
57	1	2	1	5	5	1	2
58	1	2	5	3	3	1	1
59	1	2	99	4	5	4	2
60	1	1	0	4	3	1	1

	sequence	vocab	after1	message	vocalize	twoword	bythree
31	3	1	1	2	4	2	2
32	3	4	1	2	4	2	3
33	3	4	2	2	1	2	2
34	3	4	1	3	4	2	3
35	3	1	1	2	3	1	2
36	3	4	1	1	3	1	2
37	3	1	1	2	1	99	3
38	3	1	1	2	4	2	3
39	3	4	2	2	3	2	2
40	2	1	2	2	3	1	2
41	3	1	1	2	4	1	3
42	1	3	3	2	4	2	3
43	3	1	1	2	1	1	2
44	3	4	1	1	1	2	2
45	3	4	3	1	1	2	3
46	3	1	1	3	4	2	2
47	3	4	1	3	2	2	3
48	3	34	3	99	99	99	99
49	3	1	1	2	4	1	2
50	3	1	3	1	1	1	2
51	3	4	1	2	4	2	2
52	3	3	3	2	2	2	3
53	3	4	3	1	1	2	2
54	3	1	1	3	4	2	2
55	1	3	3	2	1	2	3
56	3	4	3	2	4	2	2
57	3	3	5	5	1	2	3
58	3	4	1	2	1	2	2
59	3	1	2	1	1	1	1
60	3	4	3	2	3	2	3

	grammar	babbling	var00002	rwords	rsounds	rsequenc	rvocab
31	3	3	.	1	0	1	0
32	3	2	.	0	1	1	1
33	3	1	.	0	0	1	1
34	3	2	.	1	1	1	1
35	3	1	.	1	1	1	0
36	3	2	.	0	1	1	1
37	3	2	.	1	1	1	0
38	3	1	.	1	0	1	0
39	3	2	.	1	0	1	1
40	3	2	.	1	1	0	0
41	1	2	.	1	1	1	0
42	3	2	.	0	1	0	0
43	3	1	.	0	0	1	0
44	1	2	.	1	1	1	1
45	2	1	.	0	1	1	1
46	2	2	.	1	0	1	0
47	3	2	.	0	1	1	1
48	99	99	.	1	0	1	.
49	3	1	.	1	1	1	0
50	3	1	.	0	1	1	0
51	99	2	.	0	1	1	1
52	3	3	.	1	1	1	0
53	3	2	.	0	1	1	1
54	3	2	.	0	0	1	0
55	3	2	.	0	0	0	0
56	3	2	.	0	1	1	1
57	1	1	.	1	0	1	0
58	3	2	.	1	1	1	1
59	1	2	.	0	0	1	0
60	3	2	.	1	1	1	1

	rafter1	rmessage	rvocaliz	rtwoword	rbythree	rgrammar	rbabblin
31	1	0	0	1	1	1	0
32	1	0	0	1	0	1	1
33	0	0	1	1	1	1	0
34	1	0	0	1	0	1	1
35	1	0	0	0	1	1	0
36	1	1	0	0	1	1	1
37	1	0	1	0	0	1	1
38	1	0	0	1	0	1	0
39	0	0	0	1	1	1	1
40	0	0	0	0	1	1	1
41	1	0	0	0	0	0	1
42	0	0	0	1	0	1	1
43	1	0	1	0	1	1	0
44	1	1	1	1	1	0	1
45	0	1	1	1	0	0	0
46	1	0	0	1	1	0	1
47	1	0	0	1	0	1	1
48	0	0	0	0	0	9	0
49	1	0	0	0	1	1	0
50	0	1	1	0	1	1	0
51	1	0	0	1	1	9	1
52	0	0	0	1	0	1	0
53	0	1	1	1	1	1	1
54	1	0	0	1	1	1	1
55	0	0	1	1	0	1	1
56	0	0	0	1	1	1	1
57	0	0	1	1	0	0	0
58	1	0	1	1	1	1	1
59	0	1	1	0	0	0	1
60	0	0	0	1	0	1	1

	correct	rchild
31	6	1
32	7	2
33	6	2
34	8	2
35	6	2
36	8	3
37	7	1
38	5	2
39	7	1
40	5	1
41	5	1
42	4	2
43	5	1
44	10	2
45	6	1
46	6	2
47	7	1
48	.	2
49	6	2
50	6	2
51	.	2
52	5	1
53	9	1
54	6	2
55	4	1
56	7	2
57	4	2
58	10	2
59	4	1
60	7	2

	county	children	child1	child2	child3	child4	child5
61	1	3	6	4	3	99	99
62	1	3	9	6	5	99	99
63	1	2	6	4	99	99	99
64	1	2	5	9	99	99	99
65	1	2	8	5	99	99	99
66	1	3	16	13	4	99	99
67	1	1	5	99	99	99	99
68	1	6	13	10	8	4	2
69	1	1	5	99	99	99	99
70	1	3	9	2	4	99	99
71	1	1	4	99	99	99	99
72	1	3	14	8	5	99	99
73	1	1	5	99	99	99	99
74	1	2	7	4	99	99	99
75	1	2	5	6	99	99	99
76	2	3	9	7	5	99	99
77	1	1	5	99	99	99	99
78	1	2	4	5	99	99	99
79	2	3	3	5	98	99	99
80	1	1	5	99	99	99	99
81	1	2	4	10	99	99	99
82	1	3	5	4	1	99	99
83	1	2	5	1	99	99	99
84	1	3	7	5	98	99	99
85	1	2	8	4	99	99	99
86	2	2	3	5	99	99	99
87	1	2	4	11	99	99	99
88	2	2	5	7	99	99	99
89	1	4	18	9	5	2	99
90	2	1	5	99	99	99	99

	daycare	typecare	namecare	educate	income	words	sounds
61	1	2	4	3	1	1	1
62	2	99	99	2	3	4	1
63	2	99	88	1	1	4	99
64	1	2	5	3	3	4	1
65	1	2	1	4	5	1	1
66	1	2	10	3	3	4	2
67	1	2	1	3	4	4	1
68	1	2	3	2	1	2	1
69	1	2	5	5	5	1	1
70	2	99	99	3	4	4	1
71	1	3	99	3	2	1	1
72	2	99	99	4	1	4	1
73	.	99	99	2	3	99	99
74	1	2	7	3	3	4	1
75	1	2	8	2	1	1	1
76	2	99	99	2	3	4	1
77	1	2	7	4	2	1	1
78	1	2	8	3	3	4	3
79	1	2	11	2	2	4	1
80	1	2	6	3	3	1	1
81	1	2	7	3	4	4	1
82	2	99	99	1	3	1	1
83	1	2	5	4	4	1	1
84	1	3	99	1	2	1	1
85	1	2	1	5	5	4	1
86	1	4	99	3	4	1	1
87	2	99	99	5	5	1	1
88	1	1	99	4	3	4	1
89	2	99	99	3	2	1	1
90	1	4	99	3	4	1	1

	sequence	vocab	after1	message	vocalize	twoword	bythree
61	2	4	3	1	2	2	1
62	3	3	3	99	1	2	2
63	3	99	99	99	99	99	99
64	1	4	3	3	1	2	3
65	3	4	1	1	4	1	1
66	3	1	1	2	3	2	2
67	3	3	3	2	4	2	1
68	3	1	1	1	4	1	2
69	3	3	3	99	99	99	99
70	3	4	1	2	1	1	3
71	3	4	3	1	1	2	3
72	3	3	3	2	3	2	2
73	1	4	3	2	4	2	2
74	3	4	3	1	3	2	2
75	1	4	1	2	1	2	2
76	1	3	3	2	1	2	3
77	3	4	1	1	1	2	2
78	3	4	2	2	1	2	2
79	1	99	3	3	1	2	3
80	3	1	1	3	4	2	2
81	3	1	1	2	4	2	2
82	3	4	99	2	4	2	3
83	3	1	1	2	1	2	2
84	3	4	3	2	1	2	5
85	3	3	1	2	4	2	3
86	3	1	4	1	2	5	2
87	3	4	1	4	4	2	5
88	3	4	3	2	4	2	2
89	1	4	1	1	1	2	3
90	3	4	1	1	4	2	2

	grammar	babbling	var00002	rwords	rsounds	rsequenc	rvocab
61	1	1	.	1	1	0	1
62	2	2	.	0	1	1	0
63	99	99	.	0	0	1	.
64	1	2	.	0	1	0	1
65	3	1	.	1	1	1	1
66	3	2	.	0	0	1	0
67	3	1	.	0	1	1	0
68	2	2	.	0	1	1	0
69	99	99	.	1	1	1	0
70	3	1	.	0	1	1	1
71	3	1	.	1	1	1	1
72	3	2	.	0	1	1	0
73	1	1	.	0	0	0	1
74	1	1	.	0	1	1	1
75	1	1	.	1	1	0	1
76	1	2	.	0	1	0	0
77	2	2	.	1	1	1	1
78	2	2	.	0	0	1	1
79	3	2	.	0	1	0	.
80	1	2	.	1	1	1	0
81	3	1	.	0	1	1	0
82	1	2	.	1	1	1	1
83	3	1	.	1	1	1	0
84	3	2	.	1	1	1	1
85	3	2	.	0	1	1	0
86	2	1	.	1	1	1	0
87	2	1	.	1	1	1	1
88	1	1	.	0	1	1	1
89	1	1	.	1	1	0	1
90	3	2	.	1	1	1	1

	rafter1	rmessage	rvocaliz	rtwoword	rbythree	rgrammar	rbabblin
61	0	1	0	1	0	0	0
62	0	0	1	1	1	0	1
63	0	0	0	0	0	9	0
64	0	0	1	1	0	0	1
65	1	1	0	0	0	1	0
66	1	0	0	1	1	1	1
67	0	0	0	1	0	1	0
68	1	1	0	0	1	0	1
69	0	0	0	0	0	9	0
70	1	0	1	0	0	1	0
71	0	1	1	1	0	1	0
72	0	0	0	1	1	1	1
73	0	0	0	1	1	0	0
74	0	1	0	1	1	0	0
75	1	0	1	1	1	0	0
76	0	0	1	1	0	0	1
77	1	1	1	1	1	0	1
78	0	0	1	1	1	0	1
79	0	0	1	1	0	1	1
80	1	0	0	1	1	0	1
81	1	0	0	1	1	1	0
82	0	0	0	1	0	0	1
83	1	0	1	1	1	1	0
84	0	0	1	1	0	1	1
85	1	0	0	1	0	1	1
86	0	1	0	0	1	0	0
87	1	0	0	1	0	0	0
88	0	0	0	1	1	0	0
89	1	1	1	1	0	0	0
90	1	1	0	1	1	1	1

	correct	rchild
61	5	2
62	6	2
63	.	2
64	5	2
65	7	2
66	6	2
67	4	1
68	6	3
69	.	1
70	6	2
71	8	1
72	6	2
73	3	1
74	6	2
75	7	2
76	4	2
77	10	1
78	6	2
79	.	2
80	7	1
81	6	2
82	6	2
83	8	2
84	8	2
85	6	2
86	5	2
87	6	2
88	5	2
89	7	3
90	10	1

	county	children	child1	child2	child3	child4	child5
91	1	2	12	5	99	99	99
92	1	3	6	5	4	99	99
93	1	2	4	8	99	99	99
94	1	1	5	99	99	99	99
95	1	2	99	99	99	99	99
96	1	2	6	5	99	99	99
97	1	1	4	99	99	99	99
98	1	3	12	9	5	99	99
99	1	2	1	5	99	99	99
100	1	1	5	99	99	99	99
101	1	2	5	98	99	99	99
102	1	2	6	3	99	99	99
103	1	2	5	98	99	99	99
104	1	3	23	5	4	99	99

	daycare	typecare	namecare	educate	income	words	sounds
91	1	3	99	.	3	2	2
92	1	4	99	4	5	4	1
93	1	2	5	4	5	4	1
94	1	4	99	4	3	1	1
95	1	3	99	3	1	1	1
96	1	3	99	2	3	4	1
97	1	2	5	3	3	4	1
98	2	2	5	5	5	4	1
99	1	2	8	5	3	1	1
100	1	3	99	4	1	1	1
101	2	99	99	2	3	4	1
102	2	99	99	3	3	1	1
103	1	2	1	4	3	4	1
104	2	99	99	3	1	4	1

	sequence	vocab	after1	message	vocalize	twoword	bythree
91	3	1	3	3	2	1	1
92	3	4	2	1	2	2	3
93	1	3	1	1	1	2	3
94	3	1	2	2	4	1	2
95	1	1	1	1	4	1	2
96	1	1	1	1	3	1	1
97	3	4	1	1	4	2	3
98	1	3	1	1	3	2	3
99	1	1	1	1	1	2	6
100	3	1	3	1	4	2	2
101	1	4	3	1	1	2	2
102	1	4	1	1	4	2	3
103	1	3	1	3	4	2	2
104	1	2	1	2	4	2	3

	grammar	babbling	var00002	rwords	rsounds	rsequenc	rvocab
91	3	2	.	0	0	1	0
92	3	2	.	0	1	1	1
93	1	2	.	0	1	0	0
94	3	1	.	1	1	1	0
95	3	2	.	1	1	0	0
96	1	1	.	0	1	0	0
97	3	2	.	0	1	1	1
98	2	2	.	0	1	0	0
99	1	2	.	1	1	0	0
100	1	2	.	1	1	1	0
101	1	1	.	0	1	0	1
102	3	2	.	1	1	0	1
103	3	1	.	0	1	0	0
104	1	2	.	0	1	0	0

	rafter1	rmessage	rvocaliz	rtwoword	rbythree	rgrammar	rbabblin
91	0	0	0	0	0	1	1
92	0	1	0	1	0	1	1
93	1	1	1	1	0	0	1
94	0	0	0	0	1	1	0
95	1	1	0	0	1	1	1
96	1	1	0	0	0	0	0
97	1	1	0	1	0	1	1
98	1	1	0	1	0	0	1
99	1	1	1	1	0	0	1
100	0	1	0	1	1	0	1
101	0	1	1	1	1	0	0
102	1	1	0	1	0	1	1
103	1	0	0	1	1	1	0
104	1	0	0	1	0	0	1

	correct	rchild
91	3	2
92	7	2
93	6	2
94	5	1
95	7	2
96	3	2
97	8	1
98	5	2
99	7	2
100	7	1
101	6	2
102	8	2
103	5	2
104	4	2

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