THE EFFECTS OF EVENT KNOWLEDGE AND PARENT INPUT ON THE
LANGUAGE SKILLS OF CHILDREN WITH AND WITHOUT LANGUAGE
IMPAIRMENT

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ABSTRACT

The role of event knowledge and parent input in early language acquisition was investigated in the current project. Event related language and tense were used as measures of language development and parental input. Eleven typically developing children and four children with language impairment, each group an average of about four years of age, were observed during play sessions with one of their parents over a five week period. Each play session consisted of an event context and a novel context. These contexts were created with toys, with the event context consisting of the same toy each session. The novel context consisted of a new toy each session, to be used as a control. The pattern of results suggests that parent input and event knowledge do effect the development of language seen in the children. However, the extent to which each measure affects language development has yet to be determined, and each child’s response is variable as language itself is variable. Clinical implications and future directions are discussed.
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CHAPTER I: INTRODUCTION

Language development in children has been of interest to researchers for many years. Communication is an integral part of everyday life for humans and the manner in which this complex system develops needs to be understood in order to help children and others who might be experiencing difficulties. Because of this need, researchers interested in child language have developed theories with which to explain the mechanisms of this development. These theories have been, and continue to be, tested, creating ever-changing ideas and furthering the knowledge of how language emerges during childhood.

One part of language development that currently is of great interest to researchers involves the development of language in children who have language impairments. These children do not follow the typical language learning pattern, particularly in the areas of phonological, grammatical, and lexical development (Bishop & Adams, 1990; Conti-Ramsden, 2003; Conti-Ramsden & Jones, 1997; Ekelman & Aram, 1983; Mortimer & Rvachew, 2010; Moyle, Weisemer, Evans, & Lindstrom, 2007; Munson, Edwards, & Beckman, 2005; Schuele & Dykes, 2005; Storkel, 2004). Researchers are working to find out what the differences in development are as well as why these differences are occurring. The following sections review the theories and literature that contribute to understanding language development in typically developing children as well as children with language impairments. The current work, also detailed below, expands on these investigations
to include the effects of event knowledge, or event experience, and parent language input on the language development of both of these groups of children.

Theoretical Background

Vygotsky, Nelson, and Tomasello - three theorists that ground their theoretical work within the social-pragmatic approach – have created work that provides insight into the types of communicative events and situations children may have that can help them acquire language. One idea that emerged through theory was the zone of proximal development as proposed by Vygotsky. Vygotsky explained that this zone was the distance between what a child could do on his own and what he was able to do with the help from adults or peers (Vygotsky, 1978, p. 86). For example, a child may not have been able to use the possessive ‘s’ on his own. However, if the child was asked to imitate a parent, this ‘s’ might have indeed appeared. This would show that the skill of showing possession was on the verge of completion. According to Vygotsky, all that was needed in this type of situation was a learning environment in which this skill would be supported.

Vygotsky believed that learning aided development and therefore learning should focus on functions that were in the process of development and maturation in order to further the skill and bring it to full maturation (Vygotsky, 1978, p. 87). He also believed that these learning environments aided the development of skills that might not occur if the learning environment was not provided. In other words, it would be possible for children to never learn a particular skill if they were not provided a situation in which to learn it. If this is the case, there are important applications that
can be made. One is that when helping a child learn language, the focus should be on emerging language skills and not skills that are already mature. Focusing on mature skills would not benefit the developing child in any way. In addition, the role that the parent can play in this situation is clear. The parent is able to create these types of learning environments for the child and provide the type of input that helps the child develop the emerging skills. For instance, if the child was having difficulties learning the regular past tense form -ed, the parent could create a play situation in which they focused on the past events of the toys at hand, providing a situation in which the child was being exposed often to that particular grammatical item on varying verbs.

Similar to Vygotsky, Nelson believed that both language and cognition work together; they are intertwined (Nelson, 1996, p. 3). Indeed, language is an integral part of cognitive development. One example of how language plays a role in cognition is in the child’s development of theory of mind. Theory of mind is the understanding that other people have thoughts and experiences separate from one’s own. If there is no way for others to communicate their own thoughts and experiences, there is no way for a child learning theory of mind to know that others do actually hold their own.

Keeping this connection between language and cognition in mind, Nelson also explained the ‘experiential view’ which she believed to be the main way through which learning and development occur in children. Under the experiential view, a child learns through their own personal experiences which are reflective of the cultural, social, and physical world in which the child develops (Nelson, 1996, p. 4). Others influence the child’s representations and language by providing linguistic input based
upon their own experiences and cultural ideas. It is important as well to remember that every child is unique in addition to what they experience, including different rates and manners of development. Because each child is unique and learns from their experiences, an important application would be to provide experiences to children that benefit their emerging language skills and are tailored specifically to each child’s individual needs.

When considering Vygotsky and Nelson together, it would make sense that the experiences from which children learn promote the development of language when the experience, or opportunity for learning, focuses on the emerging skills of the child. It also follows that these experiences will be specific to the culture and society in which the child lives. Based on this idea, the mental and linguistic representations that children learn through these experiences will reflect the cultural, social, and physical world in which the child resides as well. The formation of these socially shared representations creates the foundation for language, as language is a set of agreed upon, socially shared symbols.

Nelson wrote that event knowledge is social knowledge (Nelson, 1996, p. 15). This event knowledge is formed through repeated event experiences, such as getting ready for bed, lunch time, and bath time. These could also be viewed as routines. Another way that events can be represented is through play. Vygotsky theorized that play is a stage in which a child moves from prioritizing action and objects over meaning to prioritizing the opposite – meaning over action and objects (Vygotsky, 1978, p. 96). This is done when the child separates the physical meaning from the
object that is being played with. This frees the child from the situational constraints that exist in everyday life for the child. For example, a child may be playing with two blocks that are being used for a mother and father. This separates the meaning from the actual object, the block, and instead replaces it with the symbolic meaning of mother and father. As the child plays with the ‘mother’ and ‘father’, he is able to achieve things not allowed in his current environment such as acting older than his age or performing daily behaviors of which he is not yet capable. This play situation can create a zone of proximal development for learning to move from actions and objects to meaning. It also provides a learning situation in which the skills being represented through play will eventually become realities in the child’s life.

In addition to the creation of a zone of proximal development, Nelson theorized that play anticipated language through the turn-taking and symbolism that takes place when a child is playing with a parent or peers (Nelson, 1996, p. 98). Turn-taking occurs all the time in conversation, while symbolism is represented through the agreed upon linguistic system as mentioned earlier. These social play experiences therefore provide a situation in which cognitive and linguistic abilities can be advanced while helping the child form mental and linguistic representations for the objects and abstract ideas in his environment.

Nelson expanded on her idea of representations formed through experience by relating it directly to the development of linguistic representations and language. The goal of language according to Nelson is to use one’s own linguistic representations of mental representations that were formed previously about an event or idea and to be
able to convey the information to listeners (Nelson, 1996, p. 120, 128). These representations, as mentioned earlier, are formed through events and experiences.

Nelson created four levels of representation through language. The first, titled ‘undifferentiated’, consists of the ability to form representations based on one’s own direct experiences. The second level, ‘transformation’, occurs when a child has the ability to convey information to others using only his direct experience and representation. ‘Opening to language’ occurs when the ability to use others’ linguistic representations to add to and alter one’s own mental representations has formed. Finally, ‘language modeling’ is achieved when new representations are able to be formed through the use of others’ linguistic representations while holding onto the prior representation in order to compare the representations among each other. This requires the ability to keep multiple representations separate from each other, an ability not yet formed in the prior level ‘opening to language’. As explained before, Nelson believed that experience promotes development. Vygotsky believed that focusing on emerging skills would promote development of said skills. Taken together with this linguistic representation model, it would follow that the possibility to promote maturation of these stages could occur with increased experiences in which parents and caregivers focus on the learning of the next level which the child needs to achieve.

A more recent theory developed by Tomasello (2006), the usage based theory, also directly opposes the idea of an innate universal grammar and is anchored in the social-pragmatic realm. The universal grammar theory, which proposes that every
child is born with the knowledge of grammar rules not specific to any language, contains a discontinuity between child and adult language; where one part ends the other does not begin. There is simply no way to explain how a child can move from an innate universal grammar specific to no language to a specific adult-like language, much less an explanation as to why a child wouldn’t have adult-like language to begin with if possessing a universal grammar. Another aspect of the theory cannot be adequately explained: that a child would automatically understand adult-like grammar of a specific language, having no experience with it. The usage based theory suggests that children, instead of having any kind of innate grammar, simply learn language the way they learn everything else: through experience with what is to be learned.

The learning process that is suggested through the usage based theory consists of two main processes: intention reading and pattern finding. Intention reading is what a language learner uses to identify what the intention of an utterance or message is from a speaker. Many times, children’s first utterances consist of a holophrase, or a single word or phrase utterance, which they have identified as the word or phrase containing most of the intention from what they have heard a speaker saying. This is what the child picks up and uses to relay that same or closely related message. Intention reading is what children use to figure out what a speaker is really trying to say, to figure out what parts of speech may be more important than others in relaying that specific information, and also to learn the linguistic symbols for the items in their environment.
For example, in *The dog barked*, the main point may be that the dog barked, and not that there was a dog. In that case, children should pick up on the word and meaning of *barked*. Intention reading also requires that another person is speaking to or around the person who is learning the particular language. This is where the importance of the parent or caregiver comes in when regarding the language development of children— the child will listen to what the parent or caregiver is saying and will pick up on the intention of that person’s utterance. The more opportunity that is given a child to determine the intent of any specific word, the greater chance there is that they will pick up on the correct intent and meaning. This can be done through event experiences and play – and because this situation describes one in which the child does not yet know a word but is in the process of learning it, the situation also is an environment in which the child is in the zone of proximal development.

Pattern finding is when language learners identify reoccurring patterns in language construction, allowing them to form categories through analogy and schematization, such as lexical categories. Continuing the example from above, the word *barked* would come to be realized as a verb after hearing its use in the verb position over multiple occurrences. Event experiences, as suggested by Nelson, can provide a usage-based learning situation in which to learn the vocabulary surrounding an event and to find patterns in the language to which children are exposed. It is also important to keep in mind, once again, that much of a child’s experience with language in the early stages of development frequently involves the parent. Hence, parent input can be a main source of information and language through which children
identify intent and patterns. Providing children with linguistic information surrounding daily events that they are knowledgeable about may help them learn these categories and constructions with greater ease.

Following the acquisition of these linguistic symbols is the gradual development of specific ordered language constructions that children hear used every day. As time passes and children continue to learn through language use, these constructions are built upon and become much more complex and abstract. These complex and abstract constructions lead to the gradual formation of the system of grammar that adults use – the system they hear their parents and caregivers using – and the system which universal grammar theories cannot reach in a sensible manner.

Constraining processes of the usage-based theory are found in entrenchment and preemption. Entrenchment is the process by which something is so familiar, repetitive and frequently occurring that it becomes habitual – this is the process by which constructions are created and the right word choices are made. For example, the more a child hears verbs used with the past tense –ed when referring to something that happened in the past, the better they will understand that –ed is used when referring to an action that happened the past. This seems like common sense, and to the advanced language learner it is, but to the child who is just beginning to learn language it is a huge feat in language understanding. However, the past tense –ed is not always used for action verbs in the past tense. This can be learned by the child through preemption.

Preemption is searching for the reason why a speaker chose one way to say something instead of another. This constraining process can prevent children from
overgeneralizing constructions and grammatical entities after they understand why a certain choice was made – including the past tense –ed. For instance, the child might want to tell someone that someone *rided* his bike. If they hear someone using *rode* instead of *rided*, they may pick up that the past tense –ed is not used in all situations and begin to pay attention to which verbs do and do not apply the past tense –ed rule. Again, the information needed for these processes to occur can be readily provided from the language input of a parent or caregiver.

The ability to form mental and linguistic representations as well as the language skills explained by Nelson are very important for a child’s ability to communicate and think critically about the representations that they are being presented with. Communication is a vital ingredient in surviving everyday life. It allows a person to communicate needs, form social relationships, and learn and advance ideas. Helping children achieve these levels of language, therefore, should be of vital importance. Event experience through play, creating a learning environment for children, can potentially advance them from one level to the next by helping them form first mental and then linguistic representations.

In order to understand how to best provide aid in the development of language in children and which areas to focus on, knowledge of how language develops and what kinds of problems are prevalent in both children with language impairments and typically developing children is necessary. It is also important to understand the role that parent language input can play regarding the development of language in children.
CHAPTER II: LITERATURE REVIEW

Literature Supporting the Usage Based Theory

Much research has been done that supports the theory of usage based language learning. One of the main focuses of this theory is that the learning that takes place is a gradual process. A study done by Akhtar (1999) researched children’s use of canonical word order. Canonical word order is the most typical word order of a certain language. In English this is subject-verb-object. It was found that children who were younger (in the age groups of 2 and 3) were much more willing to use non-canonical word order, such as verb-subject-object. However, the children in the age 4 group were unlikely to use non-canonical word order. This showed how children gradually develop the word order for the language they are learning and come to prefer it over other, less prevalent orders.

How children come to acquire this word order is through their communicative environment. Through searching for the intention and patterns in messages children are able to acquire language and then grammar. One study that shows that children do indeed pick up on intention was completed by Ninio (1992). This study found that 97% of the single word utterances and intention in the utterances spoken by the children came directly from single word utterances and intentions that had been expressed by mothers. The intentions chosen by the children tended to be the ones that were used most frequently by the mothers – showing that once again parent input is a key component in determining the language that children develop. Clearly children are
paying attention to what is being said to them and picking up on the information it carries.

Children are aware of much more than only a speaker’s intention. A study performed by Fisher (2002) found that children are also influenced by a sentence’s structure in addition to intention and word order. A specific structure that children seem to pick up on is the number of noun phrases that a sentence contains in relation to the number of verb phrases. Fisher (1996) also found that children use analogy from conceptual representations of events to infer meaning onto sentence structure. This would explain why children do not always have the same intention or meaning in their speech as their parents and instead may produce novel utterances. With the close observation of conceptual representations and language, and the gradual development of lexical and grammatical knowledge, it would make perfect sense that children are able to infer some meanings of their own and create utterances that they have not heard spoken – but only after using the information and language in their environment to aid them in this development.

*The Role of Parent Language Input in the Language Development of Children*

As research supporting the usage based theory shows, linguistic input provided to children is very important. Because parents typically spend substantial amounts of time with their children, it is important to learn more about the ways that their linguistic input directly supports the language development of their children.

Multiple studies have shown that linguistic input from parents does indeed aid in the lexical development of children. Theakston et al. (2003) found that for novel
verbs, the inflections that were used most in the input from their parents when using the verbs were the inflections that were learned and used by the children with greater success. This study also found that the children were actually learning the verbs – when prompted to use the new verbs in a different tense, the majority of the children were able to do so. Rowe (2012) also found that parent input affected the vocabulary development of children. This longitudinal study found that in early language development, the quantity of input is most important. However, for later development the quality of the input is the most important, including diversity in the lexicon, use of words less familiar with adolescents, and use of narratives and explanations. Quantity and quality of input can be provided from parents; their language is a key factor for children developing language.

Another study, although not using parent input directly, showed that verb learning in children is affected by the frequency and spacing of language input (Riches, Tomasello, & Conti-Ramsden, 2005). In particular, when learning verbs, children with specific language impairment benefited greatly from an increased number of exposures to a new verb in addition to increased amounts of time during which they were being exposed to the new verb. This is called distributable learning (Riches, Tomasello, & Conti-Ramsden, 2005). Again, although parent input was not used in the study, it is easy to see how parents could implement distributed learning into their daily activities. Because parents have more time with their children and know which verbs are not yet mastered by their children, they would be able to present the verb to their children numerous times over however long it took for the child to master the
verb. Based upon these studies, it can be seen that the language that parents use with their children can have a very positive affect on their children’s language development.

More recent work on parental input examines the role that tense provided by parents plays on young children’s early language skills. A study conducted by Walsh (2010) found that when parents were instructed to use toy talk an increase in their input informativeness occurred. Toy talk is when a speaker uses the third person or the name of a particular item or toy as the subject of a sentence or utterance. The ratio of overt and ambiguous tense is known as input informativeness or the amount of information about tense that a parent is providing through their language. Ambiguous tense is tense that provides no or very limited information about the actual tense a verb holds, such as no-change past tense verbs like hit and put. Overt tense is tense that clearly shows the tense of the verb, such as a past-tense –ed verbs like walked and played. Toy talk leads to a higher use of overt tense on verbs. This study suggests that people can be trained to increase the level of input informativeness in their speech, which would aid in the language development of children. Additionally, a study by Hadley and colleagues (2011) investigated which type of tense input from parents aided children the most in the development of their morphosyntax, or grammar. The results showed that parent input consisting of verbs with ambiguous tense slowed down the rate of morphosyntactic growth in the children, while overt tense aided their development, supporting the idea of increasing overt tense input in parents.
Event Knowledge

It is easy to see from the above studies that parental input affects the linguistic development of children. As theorized by Nelson, event knowledge is also very important for their language development.

One study that supports this theory was conducted by McRae and colleagues (2001). The study investigated the ability of event schemas, or nouns related to the agent, patient, instrument, or location of an event, to activate verbs that were related to the event as well. In order to do this, the researchers used short stimulus onset asynchrony priming from nouns to verbs. This involved the pairing of nouns such as specific entities, objects and locations to either related or unrelated verbs. Participants were presented with the word representing the entity, object, etc. visually and then asked to say the second word, the verb, aloud. It was predicted that for words presented that were related to each other, the latency from the onset of the stimulus to the spoken target would be shorter than two words that were unrelated. The researchers did in fact find that the verbs that were preceded by related nouns were named more quickly than when verbs were preceded by unrelated nouns (McRae, Ferretti, & Elman, 2001). This study was grounded in previous research that has shown verbs to generate expectation of related words. The results from this study, and the previous research, show that events carry specific related vocabulary. This would explain why event knowledge is very important for language development. The event knowledge and event specific vocabulary that a child gains would also support the surrounding vocabulary, increasing the child’s lexicon.
According to Farrar, event knowledge “provides knowledge of the actors, actions, and props associated with routine events, such as going to the park, as well as the casual and temporal links between event actions” (Farrar, Friend, & Forbes, 1993). To investigate the direct relationship of event knowledge on language acquisition, Farrar and colleagues analyzed the language samples of 13 mother-child dyads over a period of five 40 minute play sessions. The sessions were divided into 20 minutes with a familiar toy, representing the event experience, and 20 minutes with an unfamiliar toy, or the control. Six novel toys were used for the experiment, so that the children would not have had the advantage of previous experience with the toy or event. These sessions were video-recorded and audio-recorded. After all of the data was collected for participants, the audio-recordings were transcribed and then checked with the video-recordings. The researchers were looking for development in the type and token of words used, event related and general verbs, superordinate, basic, and subordinate nouns, and the MLU of the child. They found that more word types, amount of words in general, MLU, and more action verbs were used from session 1 to session 5 in the familiar event but not the unfamiliar event. No increase in superordinate or subordinate nouns was found; only basic nouns continued to be used by the children.

This study provides evidence that event knowledge does indeed support the language development of children.

Because many routine events that are in a child’s life likely involve the parent or caregiver, it is important to research the interaction and effects of parent input and event experience together on the language development of children.
Language Development of Children with Language Impairments

Although we now know that parent input and event knowledge aids the development of language in children who are typically developing, children who have language impairments may need the most aid of all (Farrar, Friend, & Forbes, 1993; Hadley, Rispoli, Fitzgerald, & Bahnsen, 2011; McRae, Hare, Ferretti, & Elman, 2001; Riches, Tomasello, & Conti-Ramsden, 2005; Rowe, 2012; Theakston, Lieven, Tomasello, 2003; Walsh, 2010). Children who have language impairments struggle in one or all of the phonological, grammatical, and lexical areas of language development. Appendix F provides a table that summarizes these according to impairment. Although each impairment presents different struggles, the majority of children who have language impairment are presented with the challenge of learning language under added stress. Past research has looked into which areas children with specific disorders struggle with, and how.

Children who have a phonological disorder, or PD, have been found to have difficulties in phonological production accuracy (Munson, Edwards, & Beckman, 2005; Storkel, 2004). Specifically, in a study conducted by Munson and colleagues in 2005, children with PD performed with less accuracy in a nonword repetition task when compared to children who were typically developing, or TD. An interesting finding was that vocabulary size and production accuracy were related; the larger the size of the vocabulary, the higher the accuracy scores.

Similarly, Storkel (2004) found that children with PD performed poorly when compared to age and vocabulary matched peers when asked to repeat back words
provided in stories. The words included both those which the children may or may not have known and contained either rare or common sequences of sounds. What these studies tell us is that children with PD tend to have poorer production accuracy of speech sounds than typically developing children who are the same age, even when the size of the children’s vocabulary has been controlled. However, it is important to keep in mind that a larger vocabulary increased the rate of production accuracy.

An interesting study conducted by Mortimer and Rvachew (2010) investigated the effect of phonological disorders in children on the development of their grammatical skills, specifically complex syntax, instead of their phonological production accuracy. After comparing four groups of children – typically developing, those with PD and a high MLU, those with PD and an improving MLU, and those with PD and a low MLU – they concluded that PD does indeed have an effect on complex syntax development, particularly if a child has both PD and a low MLU (Mortimer & Rvachew, 2010). The main areas that were difficult for the children were finite embedded clauses and finite verb morphology. This study shows us that not only do children with PD struggle in speech sound production accuracy, but they also struggle in the development of their grammatical skills.

Difficulties with grammar do not exist solely in children with phonological disorders. It has been found that children who have specific language impairment, or SLI, and developmental apraxia express these difficulties as well (Ekelman & Aram, 1983; Conti-Ramsden & Jones, 1997; Schuele & Dykes, 2005). Although the exact
difficulties may be different, persistent grammatical difficulties have been found across the board in children with language impairments.

For example, a study conducted by Conti-Ramsden and Jones (1997) found that in children with SLI, the use of uninflected verbs in situations where inflected verbs were needed occurred often. In addition, expressive verbs were used less when compared to usage by the TD children. The children with SLI were behind on use of auxiliaries and copulas and tended to have more dependence on the input they were receiving from parents. Conti-Ramsden (2003) also found that when comparing children with SLI to children who were typically developing, poor performance in past tense markers and non-word repetition were the most predictive.

Studies by Schuele and Dykes (2005) and Ekelman and Aram (1983) found similar patterns in the persistence of grammatical errors as well as delayed grammatical acquisition. The information from all of these studies provides us with the understanding that for children who have language impairments such as specific language impairment, developmental apraxia of speech, and phonological disorders, grammar is a major area of difficulty. It also tells us that linguistic input from parents may be heavily relied upon by children with language difficulties.

A study conducted by Bishop and Adams (1990) investigated the relationship between SLI, PD, and lexical difficulties. The results from this study showed that children who had a language delay persisting at 4.5 years of age had lower lexical understanding than children who were typically developing. Grammatical and semantic abilities were found to be the main predictors for low lexical understanding,
while phonological difficulties were not. Similar to this study, a study by Moyle and colleagues (2007) found that for children who were language delayed and expressed no other difficulties, that lexical development was associated with later grammatical development. However, grammatical development did not seem to have an effect on lexical development. These studies provide us with the knowledge that in children who do express grammatical difficulties, advances in lexical development are very important and may eventually improve the grammatical abilities of children with language impairment.

**General Information Processing in Children**

The study by Conti-Ramsden and Jones (1997), discussed in the previous section, found that children with language impairments may rely more on their linguistic input than children who are typically developing. Clearly parent input is important. However, it is unclear at the present moment if event experiences as theorized by Nelson and researched by Farrar and colleagues (1993) are just as helpful for children with language impairments. It is important to consider possible mechanisms through which event experience situations may help as well as reasons why it is a tool that should continue to be considered.

Recent literature has investigated the theory that children who have language impairment might be experiencing this impairment due to general processing difficulties (Finneran, Francis, & Leonard, 2009; Hayiou-Thomas, Bishop, & Plunkett, 2004; Hick, Botting, & Conti-Ramsden, 2005; Montgomery, Magimairaj, & Finney, 2010; Spaulding, Plante, & Vance, 2008). These studies have found that some of the
main struggles that children with SLI have appear to originate from limited short term memory capacity, limited working memory capacity, stressors such as a fast rate of speech and an overload of information, and poor central executive functioning including attention tasks such as updating, inhibition, sustained attention, and information processing speed.

One particular study was conducted by Finneran and colleagues (2009). The researchers compared the sustained attention abilities of children who were typically developing and children who had specific language impairment. Participants included 26 4-6 year old children and were divided in half to create each test group. They were asked to complete an attention task requiring them to pay attention to stimuli for 5 minutes and press a button when the target stimuli appeared. The target stimuli were red balls while the distracting stimuli were red squares. Fast and slow conditions were used. It was found that children who had specific language impairment generally had poorer sustained attention as could be seen in less accurate responses and decrease in speed of responses over time, possibly contributing to general processing difficulties.

*Significance*

Limitations in processing can cause a child to have incredible difficulty when trying to understand and produce spoken language. However, it is very possible that reduced complexity may aid these children by making the interaction easier and placing fewer processing demands on the child. Before we can be sure that reduced complexity will aid these children, more research must be done to support the theory that general processing deficits are the cause of specific language impairment. In
addition to more evidence for the theory, research into how to reduce complexity of interactions for children with language impairments is also very important if it is found to be one of the main causes.

One possible way to reduce processing complexity, as hinted at previously, is through event knowledge. Event knowledge provides a person with the ability to know what to expect during a particular event. Because of this, these event experiences can also guide actions and interactions throughout the event. With this knowledge a decrease in processing demands occurs through the formation of a frame of reference and reduced memory demands, allowing children to better learn the language that is associated with a particular event. However, it is currently unknown just how much aid this reduction in complexity offers children with language impairments.

Once more evidence based information is found on the effect of event experience on complexity reduction, the possibility exists that language interactions experienced by children with language impairment will not be as detrimental as they are currently if the results are positive. Potentially, reducing the processing load for these children to make language learning easier will be able to be used in clinical, school, and home settings. As suggested by the studies above, once language learning is easier and lexical development increases in these children, grammatical development, a struggle that affects the majority of children with language impairment, may improve as well.

Parents and caregivers may be a key factor in easing the processing load for children with language impairments. As suggested by the theories and studies above,
the input that parents provide aid in the lexical and grammatical development of children. Because of the potential of parents to help children in their language development, it is important to research how this aid can be increased to benefit children to the fullest extent.

Current Study

In order to address the level of aid that parent input and event experience provided children with language impairments, the current study aimed to investigate the effects of event experience and parent input informativeness on language development in both children who were typically developing and those who had language impairments, as these children were not included in the Farrar study.

The first specific aim of the current research was to determine the effect of parent input informativeness as portrayed through overt and ambiguous tense, of event experience, and of language status on children’s use of tense across sessions.

One hypothesis for this aim was that parent input informativeness would have a positive relationship with tense production of the children and a greater correlation would be seen in the later sessions for the event toy but not the novel toy, which would stay at a steady level. This hypothesis was based on past research showing that parent input informativeness provided the children with information on the correct tense to use with specific subjects, allowing the children to learn the correct use. Because the parents had more opportunity with the event toy to provide their input informativeness, the children also had more opportunity to pick up on the correct tense to use and incorporate it into their own language knowledge and speech. However,
since the novel toy was different every time, this same opportunity would not be available. Finally, more input in certain tenses from parents would provide more information and opportunity for children to learn its correct use, resulting in better production of the specific tense in the children.

The second hypothesis for this aim was that differences between typically developing children and children with language impairment would be seen in the input informativeness measures, with those with language impairment improving at a proportionally greater rate than those with typical development. The rationale for this hypothesis was that children with typically developing language would likely already have developed some skill in the area of tense, but those with language impairment may have not had this skill prior to the study. The opportunity to play with the same toy five weeks in a row in the same situation would allow these children to be exposed to a greater level of high input informative language from the parent, affecting the children with language impairment’s tense use positively.

The second aim was to determine the effect of parent event related language as portrayed through event related nouns and verbs, of event experience, and of language status on the use of vocabulary and potentially tense by children across sessions.

The first hypothesis for the second aim was that the use of event related language by parents would be positively correlated to the development of child language across sessions, particularly in the children’s own use of nouns and verbs. This positive correlation would be seen in the event, but not the novel, toy. This was rationalized because talking about the toys was directly related to the event at hand. Event
experiences provided the opportunity for and made it easier to learn the vocabulary surrounding a particular event. The repeated event toy sessions would provide more opportunity for this learning to occur, but the novel would not as it was only used once.

The second hypothesis was that differences between typically developing children and children with language impairment would be seen in the vocabulary measures, with those with language impairment improving at a proportionally greater rate than those with typical development. This was rationalized because the children with typical development would likely already have developed more vocabulary that was related to the toys being used in the study, but those with language impairment might not have developed much vocabulary prior to the study regarding these events. The opportunity to play with the same toy five weeks in a row would allow these children to be exposed to a greater level of event related language from the parent. This would positively affect the use of event related language by the children with language impairment.
CHAPTER III: METHOD

The methodology for this research was a replication and extension of the work done by Farrar, Friend, and Forbes (1993) and Hadley, Rispoli, and Fitzgerald (2011).

Participants

Eleven typically developing children and 4 children with language impairment between the ages of 2 and 5 years and their parents were included this study. Two groups were formed according to language status, with no significant difference in age between the two (see table 1 below). Recruiting methods included the use of flyers placed in clinic locations, preschools, and community centers located around the Athens, Ohio area.

Inclusionary Criteria

In order to participate in this study, the children were required to have no known visual, hearing, or cognitive impairments, and speak and understand English. A child who scored one or more standard deviations below the mean on the production portion of this test was considered to have language impairment, as this study specifically aims to investigate the grammatical and lexical production of the children and not their comprehension. The tests that were administered are detailed in a following section.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>LI</th>
<th>TD</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Age in months</td>
<td>42.50 (14.57)</td>
<td>45.64 (9.46)</td>
</tr>
<tr>
<td>Gender</td>
<td>3 m, 1 f</td>
<td>6 m, 5 f</td>
</tr>
<tr>
<td></td>
<td>PLS-4 receptive score</td>
<td>PLS-4 expressive score</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td></td>
<td>75.25 (8.50)</td>
<td>106.91 (11.79)</td>
</tr>
<tr>
<td></td>
<td>77.75 (6.40)</td>
<td>110.82 (11.94)</td>
</tr>
<tr>
<td></td>
<td>76.50 (23.30)</td>
<td>107.45 (8.98)</td>
</tr>
</tbody>
</table>

*Note.* LI = language impairment; TD = typically developing.

**Materials**

Seven different toy sets were used in this study, similar to those used by Farrar et al. These included a camping set, an amusement park set, a birthday set, an airport set, a fire station set, a zoo set, and a garage set. All of the toys represented an event that the parent of the child were most likely familiar with and knew specific vocabulary related to the toy. In addition, these toys were novel for the child in that none of the children who participated in the study had owned the toy previously, creating a level playing field for all participants.

**Procedure**

**Observational Sessions**

The observational procedure for this study was derived from the study conducted by Farrar et al (1993). The parent-child dyads participated in five 40 minute video recorded sessions, covering a time span of about five weeks. During the first session, the children were given the Preschool Language Scale-4, or PLS-4, and the Goldman Fristoe Test of Articulation-2, or the GFTA-2. These are explained in later sections and child scores are provided.

During all of the sessions (1-5), the parent-child dyads participated in two 20 minute play sessions. Parents were instructed to play with their child as they normally would at home. One of the two sessions involved the use of an event-toy, or familiar event, and the other used of a novel toy which was the unfamiliar event. The novel toy
represented the control condition in this study. The event-toy in each session was the item that was under investigation in this study, as the use of the same toy across sessions allowed us to create an event-like situation during which the child could develop event-related language as suggested by theorists of the field. These two sessions were counterbalanced across sessions to prevent one event from overly influencing the other.

*Standardized Tests*

The Preschool Language Scale 4th Edition (PLS-4; Zimmerman, I. L., Steiner, V. G., & Pond, R. E., 2002) is a standardized test which investigates the language comprehension and production of the child. The production, or expressive, part of the test asks children to do tasks such as naming and describing objects. For older children, this section has more advanced tasks such as completing analogies. The comprehension, or receptive, section of the PLS-4 looks at areas such as the understanding of vocabulary, syntactic relations, and concepts.

The Goldman-Fristoe Test of Articulation-2 (GFTA-2; Goldman, R. & Fristoe, M., 2000) was also given during the first session, testing the child’s articulation. On this test, consonant phonemes in the English language, in each possible position, are sampled through selected words and the production by the child is noted. Pictures are used to elicit the names of objects. Ultimately, 53 target words are potentially spoken to check the production of the consonant sounds and clusters by the child. This provided us with knowledge of the children’s production abilities.
**Parent Questionnaire**

The Demographic Questionnaire that was provided to parents in this study asked for the education level of the parents, whether the child in the study had attended speech therapy, if the child had been exposed to any language other than English, and whether the child had any other types of impairments such as visual or behavioral.

**Language Coding**

After the data at sessions 1 and 5 was gathered, trained research assistants transcribed each dyad’s data. After being transcribed and checked by a second assistant, the transcriptions were processed through the Systematic Analysis of Language Transcripts (SALT). This allowed us to compare language averages of the children with language impairment to their age-matched typically developing peers. Specific measures through SALT included the mean length of utterance (MLU), the number of total words (NTW), the number of different words (NDW), and the type-token ratio (TTR).

For the tense coding scheme, total numbers of ambiguous and overt tense were counted for the parents and then a ratio was calculated accordingly. For the children, up to five different uses of each code were counted, for a maximum allotted score of 25 for each session and context. This followed the methods conducted by Hadley and colleagues (2011).

For the event language coding, total number of uses of general and event related language were counted. Unique uses of event related language only were
counted as well, as this was the item of the most interest within this coding scheme.

Appendices C through E provide detailed information of all codes for the parent and child measures.

Reliability

Because this study is still ongoing, reliability analyses have not yet been completed. Fifteen percent of transcripts will be coded for scorer reliability for each of the coding schemes. Procedural reliability will also be analyzed.
CHAPTER IV: RESULTS

*General Measures*

General measures were produced by descriptive statistics analyses through the SPSS program. Means and standard deviations for general measures are provided in Table 2 below.

The mean length of utterance (MLU) was higher in the children with typical development than the children with language impairment. Increases in the MLU were seen for both groups of children within the event and novel context from session one to session five. The children with language impairment made the greatest gains in the event context, increasing their MLU by 0.50 from session one to session five.

The total number of words (TNW) was higher in the children with typical development than the children with language impairment. Increases in TNW were seen for both groups of children within the event and novel context from session one to session five. The greatest gains were seen within the event context for both groups of children.

The number of different words (NDW) was higher in children with typical development. Increases in NDW were seen in all contexts and groups except for the children with typical development in the novel context.

The type-token ratio (TTR) was similar for both groups of children across sessions and context, and no significant increases were seen.
### General Measures by Session and Context

<table>
<thead>
<tr>
<th>Measure</th>
<th>LI</th>
<th>TD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>session</td>
<td>event</td>
</tr>
<tr>
<td>MLU</td>
<td>1</td>
<td>2.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.19)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>2.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.30)</td>
</tr>
<tr>
<td>TNW</td>
<td>1</td>
<td>301.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(293.36)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>415.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(346.09)</td>
</tr>
<tr>
<td>NDW</td>
<td>1</td>
<td>82.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(71.40)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>92.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(69.83)</td>
</tr>
<tr>
<td>TTR</td>
<td>1</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.12)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.07)</td>
</tr>
</tbody>
</table>

*Note. LI = language impairment, TD = typically developing; MLU = mean length of utterance; TNW = total number of words; NDW = number of different words; TTR = type-token ratio.*

### Child Tense Output and Parent Input Informativeness

#### Child and Parent Tense Means

The tense productivity scores, which could be a maximum of 25 with up to 5 uses of 5 items, were higher in children with typical development than children with language impairment. Group means showed improvement only for the children with typical development within the event context.
Parents’ input informativeness rates were similar to those found by Hadley and colleagues (2011). Parents of children with typical development did show averages of input informativeness higher than those of parents with children who had language impairment, suggesting that parents of children who are typically developing may provide more tense input in their speech when conversing with their children.

Table 4

Parents’ Input Informativeness Ratios

<table>
<thead>
<tr>
<th></th>
<th>LI M (SD)</th>
<th>TD M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1 Event</td>
<td>0.50 (0.06)</td>
<td>0.56 (0.05)</td>
</tr>
<tr>
<td>Session 5 Event</td>
<td>0.48 (0.11)</td>
<td>0.57 (0.08)</td>
</tr>
<tr>
<td>Session 1 Novel</td>
<td>0.48 (0.03)</td>
<td>0.58 (0.08)</td>
</tr>
<tr>
<td>Session 5 Novel</td>
<td>0.47 (0.19)</td>
<td>0.56 (0.07)</td>
</tr>
</tbody>
</table>

**Note.** LI = language impairment; TD = typically developing.

**Correlational Analyses: Child and Parent Tense**

Given the directional nature of the hypotheses, one-tailed Pearson correlations were used. For children with language impairment, within the event context, parent input informativeness at session five was significantly related to child tense production at sessions one and five ($r = 0.96$ and $r = 0.97, p < 0.05$). Parent input informativeness at session five was also significantly related to child tense production at sessions one
and five in the novel context ($r = 0.97$ and $r = 0.96$, $p < 0.05$). In contrast, no significant relations were revealed between parents and children with typically developing language.

*Event Related Language*

This study was particularly interested in examining the children’s and parents’ use of unique event related vocabulary. Changes in the diversity of the nouns and verbs participants produced are described in the subsequent sections.

*Child and Parent Event Related Language Means*

Unique uses of event related vocabulary were calculated. The means for the children with typical development were higher than those for children with language impairment for both nouns and verbs. Increases in unique uses of nouns were seen in the event context for children with language impairment and the novel context for children with typical development, however these findings were not significant. No increases were seen for unique uses of event related verbs.

Table 5

*Children’s Unique Event Related Language by Session and Context*

<table>
<thead>
<tr>
<th>Session</th>
<th>LI Event</th>
<th>Novel</th>
<th>TD Event</th>
<th>Novel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td></td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Event related nouns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5.50 (4.80)</td>
<td>7.25 (6.70)</td>
<td>12.55 (4.76)</td>
<td>10.45 (5.11)</td>
</tr>
<tr>
<td>5</td>
<td>6.25 (4.92)</td>
<td>7.00 (6.48)</td>
<td>10.73 (4.17)</td>
<td>11.27 (4.54)</td>
</tr>
<tr>
<td>Event related verbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2.50 (3.00)</td>
<td>3.00 (4.24)</td>
<td>5.09 (2.98)</td>
<td>4.36 (4.15)</td>
</tr>
<tr>
<td>5</td>
<td>2.25 1.25</td>
<td>3.55 4.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Note. LI = language impairment; TD = typically developing.

The means suggest that use of unique event related language by parents of typically developing children was higher than that by parents with children language impairment. No increases across sessions were seen for either nouns or verbs in either context.

Table 6

Parents’ Unique Event Related Language by Session and Context

<table>
<thead>
<tr>
<th>Session</th>
<th>LI Event M (SD)</th>
<th>Novel M (SD)</th>
<th>TD Event M (SD)</th>
<th>Novel M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event related nouns 1</td>
<td>12.50 (2.52)</td>
<td>13.00 (4.08)</td>
<td>19.00 (6.26)</td>
<td>17.00 (8.41)</td>
</tr>
<tr>
<td>5</td>
<td>11.25 (2.63)</td>
<td>12.75 (4.65)</td>
<td>16.00 (8.36)</td>
<td>16.55 (10.51)</td>
</tr>
<tr>
<td>Event related verbs 1</td>
<td>6.00 (3.92)</td>
<td>5.50 (2.52)</td>
<td>7.55 (3.45)</td>
<td>6.18 (4.14)</td>
</tr>
<tr>
<td>5</td>
<td>5.75 (3.30)</td>
<td>4.75 (3.59)</td>
<td>5.73 (3.50)</td>
<td>5.91 (3.39)</td>
</tr>
</tbody>
</table>

Note. LI = language impairment; TD = typically developing.

Correlational Analyses: Unique Child and Parent Event Related Language

Given the directional nature of the hypotheses, one-tailed Pearson correlations were used.

For children with language impairment in the novel context, at session one child use of verbs was significantly related to parent use of verbs at sessions one and five \( (r = 0.94, p < 0.05 \text{ and } r = 0.98, p < 0.01) \). At session five child use of nouns was significantly related to parent use of nouns \( (r = 0.99, p < 0.01) \). In the event context, at session one child verb use was related to parent verb use at sessions one and five \( (r = \ldots \))
.91 and \( r = 0.96, p < 0.05 \). At session five child use of nouns was related to parent use of nouns at session five \( (r = 0.97, p < 0.05) \), and child verb use was related to parent use of verbs at sessions one and five \( (r = 0.91 \text{ and } r = 0.97, p < 0.05) \).

For children with typically developing language in the novel context, at session one child use of nouns was related to parent use of nouns \( (r = 0.92, p < 0.01) \) and child use of verbs was related to parent use of verbs at sessions one and five \( (r = 0.91, p < 0.01 \text{ and } r = 0.62, p < 0.05) \). At session five, child noun use was related to parents’ noun use at sessions one and five \( (r = 0.74, p < 0.01 \text{ and } r = 0.65, p < 0.05) \). In the event context, child use of nouns at session one was related to parent use of nouns at session one \( (r = 0.77, p < 0.01) \) and child verb use was significantly related to parent verb use at session one \( (r = 0.73, p < 0.01) \). At session five, child use of nouns was related to parent use of nouns \( (r = 0.91, p < 0.01) \).
CHAPTER V: DISCUSSION

Patterns showed an increase in the general language measures across sessions. Of particular interest is the mean length of utterance, in which children with language impairment showed the greatest gains in the event context. For tense measures, parent input informativeness were at rates similar to those found in the study by Hadley et all (2011). However, children showed no significant increases in their tense productivity. Interestingly, only children with language impairment showed significant relations between parent input and child production when correlations were conducted. For the event related language measures, no significant increases were found in child vocabulary production. Patterns suggest that parents of typically developing children may provide greater diversity of event related vocabulary. Correlational analyses suggest that event related vocabulary has strong bidirectional effects on production by both parents and children. The following sections will discuss in greater detail the results from the general, tense, and event related language measures. In addition, limitations, future directions, and clinical implications will be discussed.

General Measures

The mean length of utterance in both groups of children increased from session one to session five. This was expected due to the nature of the study and the time span of five weeks, as MLU tends to increase as ages increases. However, an interesting finding was that the greatest gain in MLU was seen in the children with language impairment over the event context sessions. Although the MLU was not one of the main event related language measurements being analyzed in this study, the gain seen
in the children with language impairment appears to support the hypothesis that an event context will aid in language development.

The total number of words increased in both contexts across sessions, and the greatest gains were seen in the event context. However, of greater interest and relativity to the aim of the study was the number of different words produced by the children. General increases were seen, but these increases did not appear to be context related. This shows that while children may have been talking more in the event context across sessions, the variability and growth in their speech did not appear to be event related as well. This went against the general hypothesis that an event context would aid in the language development of children. However, this was looking at general vocabulary instead of event specific nouns and verbs.

*Tense Measure Results*

When means were compared between the two language status groups, it was found that for the event context only the children who were typically developing saw improvement. This was particularly interesting as it was the children with language impairment who saw the greatest gains in their MLU in the same context. However, MLU accounts for all morphemes while the tense productivity score only accounted for five uses of tense on verbs, potentially causing the discrepancy seen between the two measures.

When looking at the parents’ input informativeness ratios, it was seen that the parents of typically developing children had higher input than the parents of children
with language impairment. However, both of the parents’ rates were similar to those found by Hadley and colleagues (2011).

Because the input informativeness focused on the tense on verbs, similar to the focus of the tense productivity of children, it would make sense that it was the children with typical development who saw the greatest gains. However, because the rates were similar to Hadley et al.’s study (2011), such discrepancy would require further investigation. It is possible that the children with language impairment are not as receptive to the tense that parents’ use on their verbs and therefore did not increase their tense productivity accordingly. Again, further investigation is necessary to determine the source of variability in output from the two groups of children.

Looking at individual children led to the same conclusions. No children with language impairment improved their tense productivity across sessions or context, but several typically developing children did. One in particular was a 34-month old male. He increased his tense productivity in the novel context from a score of 1 at session one to a score of 3 at session five. However, in the event context, he went from a score of 1 to a score of 6. This was double the effect in the event context than the novel context. An interesting finding was that his parent had the lowest input informativeness ratio among all parents of typically developing children. However, her input informativeness followed a similar pattern to her son’s, increasing in both contexts from session one to session five with the greatest increase in the event context.

When looking at the correlations for the tense measures, it was found that the
tense productivity of the children with language impairment in both contexts and sessions affected the input informativeness that their parents’ provided. This could be explained with the theory that language that children provide affects what language the parents choose to use, in addition to the opposite effect. This was also seen in a study conducted by Huttenlocher, Waterfall, Vasilyev, Vevea, and Hedges (2010), where the main language measurements were diversity of vocabulary and syntactic structure. The language that children produced affected the parents’ language and vice versa. However, in the current study, the same effect was not seen in the typically developing children and their parents. No significant correlations between parent input and child production were seen.

One reason this discrepancy may have occurred would be if event context aids children with typical development while parent input aids children with language development more. Further investigation should be conducted to determine if this might be the case.

*Event Knowledge and Event Related Language*

The means of the event related language production by the children showed that there were no significant differences between groups in terms of numbers of production of event related language, although the patterns of means suggested that children with typical development had a higher level of output than those with language impairment. No significant increases were seen from session one to session five for either context consistently. The parents’ data was very similar to their children’s. No significant differences in production or significant increases were seen.
The same results were found with the unique production of event related nouns and verbs. However, it was seen that typically developing children had a pattern of means that was generally higher than the children with language impairment. Although this was the case, neither the children with typical development or language impairment were found to have significant increases from session one to session five.

These results were not similar to those found by Farrar and colleagues (1993), in which unique uses of verbs was seen to increase significantly across sessions by the event context in children who had typical development. It is very possible that the results in the current study did not follow the same pattern due to the small and unequally divided sample size of children. An increased sample size should be studied before making any conclusive statements.

Investigations of individual children found that although the averages did not show a general increase in event related language, some children did show improvement. One typically developing child, a 52-month old female, went from 6 unique event related nouns in the session one event context to 14 at session five. Her verbs did, however, did not improve. Interestingly, her mother also increased use of unique event related nouns from session one to session five in the event context, but her number of unique uses of verbs stayed the same.

One child with language impairment, a 54-month old male, went from 6 unique event related nouns in the event context at session one to 10 at session five, with no change at all in verbs, staying at a steady 4 unique uses. Again the parent followed the same pattern, increasing the number of unique uses of nouns but with no
change for the verbs.

After viewing the individual cases, it would seem as though child and parent language influence each other. In fact, the correlations between parent and child data for unique uses of event related nouns and verbs showed that for both children with and without language impairment, for both contexts and language measurements, parent and child language mutually influenced each other. In addition, it was found that the language that children produced at one session was influenced by the other, suggesting that the event context may also have some effect that is not able to be seen through means.

Another study comparing event related language and parent input should be conducted to determine if this effect is persistent in both groups of children, as the sample size was small. However, these initial findings are very exciting and suggestive that both event related language and parent input can influence the development of expressive language.

Limitations

The small sample size, particularly for the group with language impairment, limited the sophistication of the analyses. However, descriptive analyses of this data set provided a rich set of results for preliminary exploration, such as the correlations between the parent and child measures. In addition, because of the nature of the study, even with a small sample size the number of tokens was quite large. A small sample size reduces the power of a study, and we consequently unpacked the types of statistical analyses that could be used. In addition to the small sample size, the
typically developing group was nearly three times as large as the group of children with language impairment. This could have also led to skewed results.

*Future Directions*

One future direction that can be taken is an expansion of the current project. Particularly, increasing the sample size for children with language impairment as well as running younger children with typically developing language would be ideal. Younger children with typical development would likely have language statuses that are closer to the children with language impairment, making for more clear comparison between groups. This would lead to more stable, accurate, and powerful results. It would also provide an opportunity to run more detailed analyses, such as those conducted by Farrar et al (1993) and Hadley et al (2011), than were able to be run in the current project.

Additionally, analyzing all of the sessions that the parent and child dyads participated in may reveal patterns that could not be revealed by looking solely at sessions one and five. It would be interesting to see if the children who showed improvement were consistent in their language development across all sessions.

Additional analyses can be run to further consider the role of parent input, as the preliminary correlations were suggestive. If parent input is found to consistently aid in children’s language development, a parent training study could be conducted as well to see if parents’ use of event-context would aid their children in the language learning process at home as well.

child language.
Clinical Implications

Wide variety exists in the language skills of children with and without impairment. Consequently, support for language development and therapy in the clinical setting also varies according to what works for each individual child relative to their own strengths and skills. This is reflected in the sample of children with language impairment in the current study. Two of four children with language impairment demonstrated increases in the diversity of their event related nouns across sessions.

If event related language continues to show an effect with particular children, a form of evidence based therapy may arise in which event contexts and event related vocabulary can potentially be used with children who have expressive language disorders.

In addition to event related language, the parents did have an effect on the children’s language. A very real possibility in the clinical context involves parent training (Roberts & Kaiser, 2011). Parents are typically with their children for frequent and prolonged periods of time during with language can be a key event that is ongoing. Training parents to use language that benefits their children’s development would allow children to not only work on improvement of their language skills while they are in the clinic, but also while they are at home. This would be very beneficial for these. If parents were trained to use a set of core vocabulary centered on a specific “event”, children may show greater or quicker progress in their language development.

A study conducted by Allen and Marshall (2011) showed that parent training does actually work. They were able to track the progress of children whose parents
had been either trained or not trained, and the trained parents’ children demonstrated
the most improvement in their language. The study by Huttenlocher and colleagues
(2010) also suggests that parents do have an effect on their children’s language,
showing that parents can potentially be very beneficial for children working towards
improvement of their language skills. Specifically, the diversity of words used by
parents in an earlier session predicted the diverse language used by their children in
later sessions.

Conclusion

The pattern of results in the current study suggests that event related language
and parent input may aid the development of language in both children with and
without language impairment. These results follow the theories set forth by Nelson
and Tomasello suggesting that children learn from the input that is provided to them in
their environments, specifically through event knowledge and experience. Questions
remain regarding the effectiveness of event knowledge for children with language
impairment. However, this is a fruitful direction for further study. If future studies also
show a suggested positive relationship, it may be the case that event knowledge does
indeed help reduce the information processing that occurs with language, thereby
aiding and easing the learning of language for the children who need it.
REFERENCES


APPENDIX A

Ohio University Consent Form

Title of Research: Language and Play

Principal Investigator: Joann P. Benigno, Ph.D.
Co-Investigators: Lauren Yontz, Amanda Culley, Megan Switzer, LeAnne Dosch
Department: Communication Sciences and Disorders

Federal and university regulations require signed consent for participation in research involving human subjects. After reading the statements below, please indicate your consent by signing this form.

Explanation of Study
Although numerous studies examine children’s language and play, the purpose of this study is to examine how children’s language and play changes as they gain experience with a particular set of toys.

Procedures:
As a participant in this study, you and your child will visit Ohio University for a total of five sessions. The sessions will occur approximately one week apart, within a 5-7 week time period. Each visit will last approximately 45 minutes, with the exception of session one, which will last approximately 1 ½ hours. Throughout the sessions, you will be in the room with your child. If you permit your child to participate, you and your child will play with two sets of toys at each session. One set of toys will be the same at each session and the other set of toys will be different. Your child also will also complete a hearing screening and a standardized language test which measures his/her understanding and production of language. Your child will also be asked to imitate sentences. You also will be asked to complete questionnaires about your child’s activity experiences and a demographics questionnaire. All five sessions will be videotaped. The tapes will be used to systematically observe, transcribe, and code the language use of your child.

Risks and Discomforts
Participation in the study involves minimal risk to your child; every attempt has been made to make the procedures play-like and enjoyable. There is a risk of discomfort and frustration (possibly fatigue due to the full test schedule) since your child is asked to complete a series of tests for language ability.

Benefits
The researchers’ work is designed to answer some very basic questions about early cognitive development. Therefore, what the researchers are doing in no way should be perceived as therapy.
Confidentiality and Records
The videotapes will be used for research purposes, and your child will be identified by first name, last initial, and age only. The tapes will be retained for 10 years, after which time they will be destroyed. Finally, your child’s name will be withheld from all published reports of this work. The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

Compensation
You will receive payment. As tokens of our appreciation, you will receive a $10 at the end of today’s session and at the end of session 3. Upon completing the study, you will receive $30. Your child will also receive a small gift at the end of each session. With this exception, participation in the study will provide no direct benefit to you or your child.

Contact Information
If you have any questions regarding this study, please contact Joann P. Benigno, Ph.D. at Ohio University: e-mail: benigno@ohio.edu. Phone: (740) 593-4149.

If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740)593-0664.

☐ I agree to allow the researcher to contact me regarding participation in future, related studies. However, I understand that future contact will only be an invitation to participate and does not obligate me to participate in future studies.

I certify that I have read and understand this consent form and agree to participate as a subject in the research described. I agree that known risks to me have been explained to my satisfaction and I understand that no compensation is available from Ohio University and its employees for any injury resulting from my participation in this research. I certify that I am 18 years of age or older. My participation in this research is given voluntarily. I understand that I may discontinue participation at any time without penalty or loss of any benefits to which I may otherwise be entitled. I certify that I have been given a copy of this consent form to take with me.

Signature________________________ Date____________________

Printed Name________________________
APPENDIX B

Ohio University Assent Form

Title of Research: Language and Play

Principal Investigator: Joann P. Benigno, Ph.D.
Co-Investigators: Lauren Yontz, Amanda Culley, Megan Switzer, LeAnne Dosch
Department: Communication Sciences and Disorders

Verbal assent for preschoolers (age 3 and up)
For session 1: We will make a movie of you playing these games with me
And then we will make a movie of you playing with your [caregiver]!” Do you want
to make a movie today? Do you want to play some games with me today?/Do you
want to play with these toys with your [caregiver] ? For remaining sessions: We are
going to make a movie of you playing with your [caregiver] again. Do you want to
play with these toys and make a movie with your [caregiver]?
## APPENDIX C

### Parent and Child Tense Measures

<table>
<thead>
<tr>
<th>Verb Form</th>
<th>Parent Tense Measures</th>
<th>[+Tense]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Past Tense</strong></td>
<td>No change irregulars (e.g., hit, put)</td>
<td>All the rest (e.g., jumped, ate)</td>
</tr>
<tr>
<td>Present</td>
<td>All the rest</td>
<td>Third person singular (e.g., likes, has)</td>
</tr>
<tr>
<td>Tense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modals</td>
<td>All (e.g., can, can’t, should)</td>
<td>All (e.g., is, are, was)</td>
</tr>
<tr>
<td>Copula</td>
<td>Ambiguous (e.g., __ you coming?; where __ you going?)</td>
<td>Overt (e.g., are you coming?; You’re feeding the baby.)</td>
</tr>
<tr>
<td>Auxiliary</td>
<td>Ambiguous (e.g., I __ gotta go. I __ better go.)</td>
<td>Overt (e.g., He/’s gotta go. Have you finished?)</td>
</tr>
<tr>
<td>BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary</td>
<td>Ambiguous (e.g., __ you want some? __ you put it in there?)</td>
<td>Overt (e.g., do you want some? Don’t touch that!)</td>
</tr>
<tr>
<td>HAVE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary</td>
<td>Ambiguous (e.g., want more?)</td>
<td></td>
</tr>
<tr>
<td>DO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bare Stem</td>
<td>Imperative/affirmative (e.g., put your shoes on; let’s put them on.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Serial verbs (e.g., go get your shoes.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bare infinitives (e.g., let’s put them on. You made me put them on.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single words used to refer to actions (e.g., wiggle, eat)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Telegraphic/ungrammatical (e.g., baby need a nap.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child Tense Measures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>3rd person present singular –s</td>
</tr>
<tr>
<td>ED</td>
<td>Past tense –ed</td>
</tr>
<tr>
<td>DO</td>
<td>Auxiliary do</td>
</tr>
<tr>
<td>CB</td>
<td>Copula be</td>
</tr>
<tr>
<td>AB</td>
<td>Auxiliary be</td>
</tr>
</tbody>
</table>

* tense measures an expansion from Hadley, Rispoli, and Fitzgerald (2011) study
** event related language measures taken from Farrar, Friend, and Forbes (1993) study
### APPENDIX D

**Detailed Noun Coding Scheme**

<table>
<thead>
<tr>
<th>Code</th>
<th>Explanation</th>
<th>Nouns</th>
</tr>
</thead>
</table>
| ERN  | Event Related Noun. *Nouns that are specifically related to the event at hand and are used in regard to the event context. Words must be determined to be related based on the context in which they are located. Food words are particularly important in this category, as many may not be considered related.* | **ZOO:** animal, ball, bear, berries, bird, bucket, bunny, cage, camel, carnivore, cow, elephant, fence, fish, frog, fur, gate, giraffe, horse, kangaroo, leaf, lion, meat, monkey, neck, nest, peanut, penguin, polar bear, pond, rock, salamander, seal, slide, snack, spot, stripe, tail, tree, water, zebra, zoo, zookeeper  
**CAMP:** animal, apple, baby, bear, bed, binoculars, bird, blanket, bonfire, butterfly, cabin, camper, campfire, campout, can, car, car seat, caterpillar, chocolate, cookies, cooler, cracker, driver, food, fire, fish, fishing pole, hedgehog, hike, hotdog, ice, log, luggage rack, marshmallow, mom, olive, pickles, phone, pop, porcupine, radio, sandwich, sleeping bag, s’more, spine, star, stone, stroller, tent, trailer, vacation, van, watermelon  
**CARNIVAL:** balloons, airplane, car, carnival, circus, clown, cone, fair, Ferris wheel, food, fries, frog, fun-house, game, ice-cream (flavor) (scoop), line, lollipop, measuring-stick(ruler)(thing), mechanic, Merry Go-Round, mirror, money, monkey, popcorn, prize, ride, rollercoaster, rules, seat, slide, teacups, ticket, tricks, turn, winner  
**FIRE STATION:** ambulance, band-aid, bed, boot, building, cat, doctor, EMS station, fire, fire alarm, fire extinguisher, fire hose, fire hydrant, fireman, fire truck, flashlight, gas(oline), gas station, gas tank, gate, hospital, house, kit(ty/ten), ladder, light, mechanic (tow guy), medicine, nurse, paramedic, patient, rescue, road, roof, siren, stethoscope, tow truck, vehicles, water, window  
**AIRPORT:** accident, air, airport, (air)plane, air-traffic controller, |
bag, brake, bridge, cab, car, carrier, cent, coffee (break), cop, (co)pilot, dollars, driver’s license, driveway, emergency, engine, flight, gas(oline), gas station, gate, helicopter, hot chocolate, jail, jet, landing (pad), light, luggage (rack), mechanic, money, passenger, picnic (area/table), police, propeller, ramp, resistance, road, runway, satellite, sheriff (department), seatbelt, sky, speed, speeding ticket, station, street, suitcase, tail, take off, taxi (driver), ticket, tire, (traffic) light, tow truck (driver), umbrella, uniform, vacation, wheel, wind, wing, wrench, x-ray machine

**BIRTHDAY**: balloon, birthday, cake, candle, candy, clown, cupcake, dog, hat, horse (ride), hot-air balloon, ice cream, magician, magic (trick), noise maker, party, piñata, pony, present, puppy, rabbit, wrapping paper, song

**GARAGE**: car, car wash, elevator, gas, hook, keys, ladder, mechanic, oil (change), ramp, tire, tools, tow truck, truck
APPENDIX E

Detailed Verb Coding Scheme

<table>
<thead>
<tr>
<th>Code</th>
<th>Explanation</th>
<th>Verbs</th>
</tr>
</thead>
</table>
| ERV  | Event Related Verbs. *Verbs that are specifically related to the event at hand and serve a particular function or action that cannot be described adequately by use of a general verb. Typically an action verb.* | ZOO: attack, bounce, build, climb, destroy, feed, fix, flip, fly, hide, jump, repair, ride, sleep, swim  
CAMP: bird-watch, camp, climb, cook, drive, fish, fold, hike, listen, pull, push, roast, set up, share, sit, sleep, start, swim, wake  
CARNIVAL: buy, break, check, climb, cost, drive, fix, flip, fly, knock, line up, measure, order, pay, race, ride, scream, sell, spin, swing, tip, win  
FIRE STATION: burn, catch, climb, crash, drive, fight, fix, fuel, help, put out, race, rescue, save, sleep, spray, squirt, take care of, tow, water  
AIRPORT: break, break down, crash, drive, fill up, fix, fly, gain, land, owe, park, pay, pull over, ride, run out of, speed, take off, tow, wear  
BIRTHDAY: blow out, cut, open, paint, ride, rip, sing, slice  
GARAGE: break, drive, fill, fix, lift, pull, pump, tow |
APPENDIX F

*Language Difficulty Areas of Children with Language Impairment*

<table>
<thead>
<tr>
<th>Language Impairment</th>
<th>Description</th>
<th>Difficulty Area(s)</th>
<th>Supporting Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonological Disorder</td>
<td>The inability to articulate speech at a level expected of the age of the child because of an inability to form the necessary sounds.</td>
<td>articulation accuracy and phonological representations, expressive syntax, finite verb morphology,</td>
<td>Mortimer &amp; Rvachew, 2010; Munson, Edwards, &amp; Beckman, 2005; Storkel, 2004;</td>
</tr>
<tr>
<td>Developmental Apraxia</td>
<td>The difficulty to say what is wanted to be said due to impairment in the brain’s ability to coordinate muscle movements.</td>
<td>pronoun errors, verb omissions, incorrect grammatical markers, incorrect use or omission of auxiliaries in questions</td>
<td>Ekelman &amp; Aram, 1983</td>
</tr>
<tr>
<td>Specific Language Impairment</td>
<td>Difficulty with language not due to a known neurological, sensory, intellectual, or emotional deficit.</td>
<td>verb markings (particularly past tense), pronoun case errors, subject-auxiliary inversion, infinitives, relative clauses, subordinate clauses, reduced verb use</td>
<td>Schuele &amp; Dykes, 2005; Conti-Ramsden &amp; Jones, 1997; Conti-Ramsden, 2003</td>
</tr>
</tbody>
</table>