Gestures Used by ESL Children to Resolve Lexical Ambiguity

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This thesis titled

Gestures Used by ESL Children to Resolve Lexical Ambiguity

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ABSTRACT

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Director of Thesis: Scott H. Jarvis

Gestures are known to precede speech in language development of monolingual children and assist in speech for second language learners of English. However, there is a lack of research on gestures in children learning a second language. This thesis analyzes the types of gestures used by ESL children when retelling stories with lexical ambiguity. This study recruited seven L1 Arabic speaking children from the ages of five to seven with beginner to advanced English proficiencies. The participants were read three different stories that incorporated a pair of homonyms in each story. Then, the subjects retold the stories and were asked to explain the difference in the homonym pairs. This data analysis examined the types of gestures the children used during story retelling, while disambiguating homonyms, and the strategies employed to resolve the lexical ambiguity. The results suggest that the children with lower language abilities use more iconic gestures when they are unable to articulate the words. The older children had more successes resolving the lexical ambiguity using speech alone. The data argues that language proficiency and age related metacognitive abilities play a role in whether children who are second language learners of English can successfully disambiguate homonyms.
DEDICATION

To Keith, Dwayne, Lori, and Zack
For love and support

To my participants
For patience and laughter
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I am grateful for the assistance of my committee. I want to thank Dr. Jarvis, my committee advisor, for all of his support throughout my career as a graduate student. A sincere thank you for all of his encouraging feedback, proofreading, and listening to my ideas. It was an honor to be supervised by you. Also, thank you to Dr. O’Malley and Dr. Bell for their assistance throughout the last two years. Dr. O’Malley’s knowledge in child language development and Dr. Bell’s experience in research were immensely appreciated for this study.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>3</td>
</tr>
<tr>
<td>Dedication</td>
<td>4</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>5</td>
</tr>
<tr>
<td>List of Tables</td>
<td>8</td>
</tr>
<tr>
<td>List of Figures</td>
<td>9</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>10</td>
</tr>
<tr>
<td>General Background</td>
<td>10</td>
</tr>
<tr>
<td>Statement of Problem</td>
<td>14</td>
</tr>
<tr>
<td>Significance</td>
<td>15</td>
</tr>
<tr>
<td>Research Questions</td>
<td>16</td>
</tr>
<tr>
<td>Research Question 1</td>
<td>16</td>
</tr>
<tr>
<td>Research Question 2</td>
<td>17</td>
</tr>
<tr>
<td>Research Hypotheses</td>
<td>17</td>
</tr>
<tr>
<td>Hypothesis 1</td>
<td>17</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>17</td>
</tr>
<tr>
<td>Key Terms</td>
<td>18</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>21</td>
</tr>
<tr>
<td>Organization of Thesis</td>
<td>21</td>
</tr>
<tr>
<td>Chapter 2: Literature Review</td>
<td>22</td>
</tr>
<tr>
<td>Introduction</td>
<td>22</td>
</tr>
<tr>
<td>Gestures in Monolingual Children</td>
<td>25</td>
</tr>
<tr>
<td>Gestures in Second Language Acquisition</td>
<td>41</td>
</tr>
<tr>
<td>Gestures in Arabic Speakers</td>
<td>50</td>
</tr>
<tr>
<td>Resolving Lexical Ambiguity</td>
<td>52</td>
</tr>
<tr>
<td>Gestures and Resolving Lexical Ambiguity</td>
<td>56</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>61</td>
</tr>
<tr>
<td>Chapter 3: Method</td>
<td>62</td>
</tr>
<tr>
<td>Introduction</td>
<td>62</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Participants</td>
<td>63</td>
</tr>
<tr>
<td>Materials</td>
<td>66</td>
</tr>
<tr>
<td>Procedure</td>
<td>68</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>73</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>75</td>
</tr>
<tr>
<td>Chapter 4: Results And Interpretations</td>
<td>77</td>
</tr>
<tr>
<td>Results</td>
<td>77</td>
</tr>
<tr>
<td>Gestures and Story Retelling</td>
<td>78</td>
</tr>
<tr>
<td>Attempts at Resolving Lexical Ambiguity</td>
<td>84</td>
</tr>
<tr>
<td>Successes at Resolving Lexical Ambiguity</td>
<td>90</td>
</tr>
<tr>
<td>Interpretations</td>
<td>99</td>
</tr>
<tr>
<td>Research Question 1</td>
<td>99</td>
</tr>
<tr>
<td>Research Question 2</td>
<td>108</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>115</td>
</tr>
<tr>
<td>Chapter 5: Conclusion</td>
<td>117</td>
</tr>
<tr>
<td>Summary of Thesis</td>
<td>117</td>
</tr>
<tr>
<td>Contributions</td>
<td>118</td>
</tr>
<tr>
<td>Limitations</td>
<td>122</td>
</tr>
<tr>
<td>Recommendations for Further Research</td>
<td>122</td>
</tr>
<tr>
<td>Conclusion</td>
<td>123</td>
</tr>
<tr>
<td>References</td>
<td>126</td>
</tr>
<tr>
<td>Appendix A: Questionnaire To Parents</td>
<td>131</td>
</tr>
<tr>
<td>Appendix B: Institutional Research Board Approval</td>
<td>132</td>
</tr>
<tr>
<td>Appendix C: Amendment Approval</td>
<td>133</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Description of Participants</td>
</tr>
<tr>
<td>Table 2</td>
<td>Significance of Deictic and Iconic Gestures</td>
</tr>
<tr>
<td>Table 3</td>
<td>Significance for Gesture Rates</td>
</tr>
<tr>
<td>Table 4</td>
<td>Significance for Gesture Only Attempts</td>
</tr>
<tr>
<td>Table 5</td>
<td>Significance of Speech and Gesture Attempts</td>
</tr>
<tr>
<td>Table 6</td>
<td>Significance of Speech Attempts</td>
</tr>
<tr>
<td>Table 7</td>
<td>Examples of the Level of Successes</td>
</tr>
<tr>
<td>Table 8</td>
<td>Significance of Successes</td>
</tr>
<tr>
<td>Table 9</td>
<td>Significance of Speech and Gesture Successes</td>
</tr>
<tr>
<td>Table 10</td>
<td>Significance of Speech Successes</td>
</tr>
<tr>
<td>Table 11</td>
<td>Gesture Rate</td>
</tr>
<tr>
<td>Table 12</td>
<td>Overall Success Rate</td>
</tr>
<tr>
<td>Table 13</td>
<td>Success Rates of Three Participants</td>
</tr>
<tr>
<td>Table 14</td>
<td>Success Rates of the Kindergarten Participants</td>
</tr>
<tr>
<td>Table 15</td>
<td>Success Rates of First Grade Participants</td>
</tr>
<tr>
<td>Table 16</td>
<td>Success Rates of All Participants: Lowest to Highest</td>
</tr>
<tr>
<td>Table 17</td>
<td>Speech Only Success Rates of Groups</td>
</tr>
</tbody>
</table>
### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Amount of Deictic and Iconic Gesture Per Story</td>
<td>79</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Each Group’s Overall Gesture Amount</td>
<td>81</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Word Tokens for Each Group</td>
<td>82</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Gesture Rates for Each Group</td>
<td>83</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Speech, Gestures, and Both for Each Story</td>
<td>84</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Gesture Only Attempts</td>
<td>85</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Speech and Gesture Attempts</td>
<td>87</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Speech Only Attempts</td>
<td>89</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Successes Using Speech, Gesture, or Both</td>
<td>93</td>
</tr>
<tr>
<td>Figure 10</td>
<td>The Rate of Success</td>
<td>95</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Successes Using Speech and Gesture</td>
<td>96</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Speech Successes</td>
<td>98</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Comparing Speech and Gesture Attempts in Beginner Kindergarteners and First Graders</td>
<td>100</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Comparing Speech and Gesture Attempts in Beginner Kindergarteners and Advanced Kindergarteners</td>
<td>101</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Gesture and Speech Success of Beginner Kindergarteners and First Graders</td>
<td>102</td>
</tr>
<tr>
<td>Figure 16</td>
<td>Speech and Gesture Success Between Kindergarten groups</td>
<td>103</td>
</tr>
<tr>
<td>Figure 17</td>
<td>Success Rates of All Three Groups</td>
<td>104</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Each Group’s Attempts Categorized into Levels of Success</td>
<td>115</td>
</tr>
</tbody>
</table>
CHAPTER 1: INTRODUCTION

It is with children that we have the best chance of studying the development of logical knowledge, mathematical knowledge, physical knowledge, and so forth. (Piaget, 1969, p.4)

General Background

In 1992, McNeill’s book *Hand and Mind* was a breakthrough in the area of gestures. McNeill (1992) clearly defined gestures as co-existing with speech and he developed a classification system that is widely used today. Since then, most researchers in this area have followed McNeill’s framework. The majority of such research has focused on the use of gestures by monolingual speakers but interest has also been growing in the acquisition and use of gestures by adult second-language learners. Past research has nevertheless given little attention to the acquisition and use of gestures by children acquiring a second language. The present study will help fill this gap.

Gestures have been linked to the acquisition of early language development in children (Iverson & Goldin-Meadow, 2005; Özçalişkan & Goldin-Meadow, 2005). More importantly, children who gesture more score higher on language ability tests (Goodwyn, Acredolo, & Brown, 2000). Gestures have been shown to precede and predict the onset of spoken language in first language learners of English. Gestures align with the language developmental stages children pass through in first language acquisition. Additionally, deictic gestures (pointing gestures) have been linked specifically to the development of vocabulary in children (Iverson, Capirci, Volterra, & Goldin-Meadow, 2008).
Do gestures continue to positively impact a child’s language development?

Studies have shown that gestures do not stop once a child develops into a competent speaker. Research argues that iconic gestures appear later in child language development because young children lack understanding of multimodal communication (Behne, Carpenter & Tomasello 2014; Stanfield, Williamson, and Özçalişkan 2014; Özçalişkan, Gentner, & Goldin-Meadow, 2014). Alibali, Kita, and Young (2000) demonstrated that children that are five years of age gesture more during explanation tasks than in description tasks. Furthermore, Pine, Bird, and Kirk (2007) showed that children could name a picture easier when they gestured. Additionally, research suggests that gestures reflect implicit knowledge; thus, leading to learning for elementary school children in math class (Broaders, Cook, Mitchell, & Goldin-Meadow, 2007). Even more importantly, research argues that mismatch speech and gestures are a bridge for children that do not understand a concept to learning the idea (Alibali & Goldin-Meadow, 1993; Breckinridge Church & Goldin-Meadow, 1986). These mentioned studies propose that gestures positively impact children as they age.

Additionally, there are many benefits of gestures for second language learners. Gestures have been found to help learners with memorization and comprehension (Khalil, Rahmany, & Zarei, 2014; Macedonia & Knösche, 2011; Sueyoshi & Hardison, 2005). A study by Macedonia and Knösche (2011) suggests that when learners receive both aural and visual input (meaning through a gesture) they score higher on vocabulary memorization tasks than learners who only have aural input. Similarly, Sueyoshi and Hardison (2005) indicated that lower level learners remember the content better when the
material is presented with gestures and visible cues. Additionally, results from a study by Khalil, Rahmany, and Zarei (2014) suggest encouraging gesture use when teaching homonyms to second language learners. The researchers had two groups of learners: the first group was taught homonyms with gestures and the second group was only taught the homonyms. At the end of the lesson, learners were given an assessment on their ability to identify homonyms. The group that was taught homonyms with gestures scored higher on the tasks. These studies indicate a relationship between gestures, memorization, and aiding comprehension; therefore, leading to long term learning and understanding.

Furthermore, gestures provide insight into the proficiency level of a learner. Gregerson, Olivares-Cuhat, and Storm (2009) demonstrated that more advanced level learners used gestures to reinforce their ideas and help facilitate the learning process for lower level learners. In their study, they had beginner, intermediate, and advanced Spanish learners perform a role-play. The researchers were specifically looking at speech-dependent gestures (such as pointing to oneself when saying “I”) and speech-independent gestures (for example the thumbs-up symbol in America). The more advanced speakers used speech-dependent gestures while the beginner students used more speech-independent gestures. The advanced speakers used speech-dependent gestures to help other students comprehend the speech, whereas the beginner students used speech-independent gestures because they were nervous speaking in their L2.

In fact, gestures can aid an L2 speakers’ speech. Nicoladis, Pika, Yin, and Marentette (2007) had native speakers of Chinese watch the cartoon, “The Pink Panther”, and retell the cartoon events in English and Chinese. The participants used more gestures
in their second language, English, suggesting that the gestures assisted in the story retelling. Similarly, research by Sherman and Nicoladis (2004) indicated that second language learners of Spanish used more deictic gestures in Spanish than English. Moreover, Cotrău (2009) demonstrated that L2 learners of Romanian use more gestures when given an impromptu speaking task rather than a speaking activity that they prepare for before class. The author gave her students the two different speaking tasks to complete in class and the students performed more gestures during the impromptu speaking act. As a result of these studies, these authors (Cotrău, 2009; Nicoladis, Pika, Yin, & Marentette, 2007; Sherman & Nicoladis, 2004) propose that gestures are beneficial to second language speakers because they assist learners in communicating their ideas and thoughts more coherently.

While the focus of this research is on gestures in children learning English as a second language, this thesis also looks at how children resolve lexical ambiguity. Past research has indicated that children, as young as four, are aware that a word can have two meanings, such as a homonym (Backsheider & Gelman, 1995; Doherty, 2000; Peters & Zaidal 1980). Mazzocco (1999) presented children with pseudo-homonyms in stories and asked them to choose the target pseudo-homonym from a list of pictures. The study suggests that even children as old as seven struggle to solve the correct meaning of a targeted homonym. Furthermore, research indicates that the problem with homonyms for young children is that they lack essential metacognitive skills to solve the lexical ambiguity (Mazzocco, Myers, Thompson, & Desai, 2003); thus, children struggle with this phenomenon until the age of ten (Doherty, 2004). Even more importantly, a study by
Holler and Beattie (2003) propose the idea that adult speakers use gestures to clarify the meaning of a homonym for their listener; thus, demonstrating that while adults have the metacognitive skills to solve lexical ambiguity, they want to make clear the meaning of an ambiguous word to their listener. However, do children use gestures to clarify the meaning of a homonym? A study by Kidd and Holler (2009) tested children’s methods of solving lexical ambiguity by having them retell stories with homonyms. Their results demonstrated that children who cannot articulate the difference in homonyms use gestures to describe the differences. The previous mentioned studies on lexical ambiguity focus on native English speakers; therefore, there is an evident lack of research on lexical ambiguity in children learning English as a second language.

Statement of Problem

The present study examines the role of gestures in children learning English as a second language. The specific aim of this study is to research gestures used when children have to resolve lexical ambiguity in their L2, such as when a child is presented with homonyms. This study will focus on native Arabic speaking children. The purpose of focusing on children is that there is a lack of research on the gestures used by children learning English as a second language. Furthermore, this study compares the different gestures used between beginner level kindergarten ESL students, intermediate/advanced kindergarten ESL students, and beginner/intermediate first grade ESL students. Past research (Kidd & Holler, 2009) has indicated that older children with more cognitive and linguistic abilities are able to disambiguate homonyms with the most success and with the fewest number of gestures. Furthermore, studies suggest that children struggle with
ambiguity in homonyms up until the age of ten (Doherty, 2004; Mazzocco, 1999); but how they cope with resolving lexical ambiguity is still in question. This study will further explore this issue by looking at ESL children.

Significance

This study acknowledges past research regarding gestures aiding vocabulary development in monolingual children (Iverson & Goldin-Meadow, 2005; Özçalişkan & Goldin-Meadow, 2005) and furthermore, gestures continue to be a part of children’s speech as they develop into fully competent speakers (Alibali, Kita, & Young, 2000; Broaders, Cook, Mitchell, & Goldin-Meadow, 2007; Gullberg & Narasimhan, 2010; Kidd & Holler, 2009). Additionally, past research on gestures relating to the proficiency level of a SLA learner and specifically the types of gestures these learners use are taken into consideration for the importance of the current study (Graziano & Gullberg, 2013; Gregerson, Olivares-Cuhat, & Storm, 2009; Nicoladis, Pika, Yin & Marentette, 2007; Sherman & Nicoladis, 2004). These contributions to the area of gestures are critical. However, past research lacks information on gestures in children learning English as a second language.

Furthermore, this study recognizes that past research indicates that native English speaking children are aware that a word can have two different meanings at four years old or younger (Peters & Zaidel 1980; Backsheider & Gelman, 1995; Doherty, 2000). However, children struggle with these differences in meaning until the age of ten (Mazzocco, 1999, & Doherty, 2004). The study of homonyms and how children learning
English as a second language might resolve lexical ambiguity is lacking in the field of SLA.

This present study is different from past research because it focuses on the gestures used by children learning English as a second language in an American ELL (English Language Learner) program. This research can provide beneficial information in the area of SLA and the use of children’s gestures. If gestures provide insight into adult learners’ proficiency levels then gestures can also provide insight into young children’s proficiency levels. Additionally, this information can help teachers of young ESL children be more aware of their proficiency and development in English by the use of their gestures. For example, if a child is using deictic gestures to resolve the lexical ambiguity in homonyms, they are aware that the word has two meanings but are still struggling to articulate the difference. This would tell a teacher that a child understands the difference and should be able to express the differences soon. Furthermore, the information in this study will provide a better understanding of whether age-related metacognitive or linguistic abilities affect children’s use of gestures when they disambiguate homonyms.

Research Questions

This thesis seeks to answer the following questions:

Research Question 1

Do kindergarten children enrolled in the beginning level ELL class use more deictic gestures when disambiguating homonyms compared to the intermediate/advanced kindergarten and first grade ELL children?
Research Question 2

Do children enrolled in the first grade ELL class have more successes using gestures and speech to resolve the lexical ambiguity when compared to lower level learners?

Research Hypotheses

In order to examine the previous mentioned research questions, the following hypotheses were formulated.

Hypothesis 1

Hypothesis 1 was formed to address research question 1. Many studies argue that gestures anticipate the articulation of speech in young children (Iverson & Goldin-Meadow, 2005; Özçalişkan & Goldin-Meadow, 2005); as a matter of fact, deictic gestures have been credited with vocabulary growth in young children (Iverson, Capirci, Volterra, & Goldin-Meadow, 2008). In Kidd and Holler’s (2009) study the younger children often used deictic gestures to unsuccessfully solve the ambiguity in the homonyms. Therefore, because the kindergarten children in the present study have not mastered the English language and are being exposed to English homonyms for the first time, they might use more deictic gestures than the first grade children.

Hypothesis 2

Hypothesis 2 was formed to address research question 2. Past research on lexical ambiguity indicates that while children struggle with the ambiguity in homonyms until the age of ten, seven year olds have more advanced metacognitive skills and a better understanding of the difference in meanings and score higher on ambiguity tasks than
children below seven years of age (Doherty, 2004; Mazzocco, 1999; Mazzocco, Myers, Thompson, & Desai, 2003). Kidd and Holler’s (2009) results support these studies because the older children were more successful at resolving the ambiguity than the younger children; even more importantly, their study showed the older children were able to successfully disambiguate the homonyms through speech and gestures. Therefore, it is predicted that the first graders who are six and seven year olds will be able to articulate and use gestures to aid in the understanding of the different meanings of homonyms for their listener.

Key Terms

Conventional Gesture: Nicoladis, Pika, Yin, and Marentette (2007) define conventional gestures as follows, “Conventional gestures are established as the conventions of specific speech communities, and can usually be understood without speech” (p. 726). The authors go onto state an example, “‘the thumb-up gesture’ is used in some cultures to signal ‘okay’” (p. 726).

Deictic Gesture: McNeill (1992) defines deictic gestures as “pointing movements, which are prototypically performed with the pointing finger, although any extensible object or body part can be used, including the head, nose, or chin, as well as manipulated objects” (p. 80). Furthermore, Goldin-Meadow (2003) describes deictic gestures as, “gestures used to indicate objects, people, and locations in the real word” (p. 7). In this study deictic gestures will be referred to as any gestures the child uses with his or her pointing finger.

Familiar Referents: Mazzocco (1999) and Doherty (2004) define familiar referents as meanings children have most likely learned before participation in their studies; some
examples are clown, cage, ball, and spade. The authors created pseudo-homonyms for familiar referents.

**Gesture:** Gesture is defined as hand or body movements occurring with our speech (Kendon, 1978, 2004; McNeill, 1992). Goldin-Meadow (2003) describes gestures as being dependent on the speech and content. Hand movements occurring without speech are emblems and have meaning all on their own; an example is the “thumbs up” sign. Therefore, in this study hand movements occurring in the context of speech will only be labeled as gestures.

**Homonyms:** The Ohio board of education defines a homonym as “a word with different origin and meaning but the same oral or written form as one or more other words, as bear (an animal) vs. bear (to support) vs. bare (to expose)” in their standards for the ELL curriculum (2010, p. 102).

**Homophones:** The Ohio board of education defines a homophone as “a word with different origin and meaning but the same pronunciation as another word, whether or not spelled alike (eg., hair and hare)” in their standards for the ELL curriculum (2010, p. 102). This study will focus on words that are spelled and pronounced the same.

**Iconic Gesture:** McNeill (1992) describes a gesture as being iconic “if it bears close formal relationship to the semantic content” (p. 78). He goes on to state, “iconic gestures display, in their form and manner of execution, aspects of the same scene that speech also presents” (p. 78). Iconic gestures represent real world objects that occur at the same time in a person’s speech as the person is discussing the real world objects. A clear example of this is when a child describes playing with a ball and forms their hands to resemble a ball.
This study will classify gestures as iconic when they resemble real world objects that the child is discussing in the recording session.

*Nonsense-words*: Mazzocco (1999) and Doherty (2004) describe non-sense words as words that do not exist in the English language; however, the phoneme combinations are plausible in English. Some examples are blas, gler, spef, and slor. The authors used the nonsense-words as pseudo-homonyms to refer to familiar referents.

*Pseudo-Homonym*: According to studies by Mazzocco (1999) and Doherty (2004) pseudo-homonyms are unreal homonyms; however, they are words that already exist in English. For example, using the word cake for spade; therefore, the word cake now has two meanings: the tool one digs with and the dessert one eats.

*Representational Gestures*: Iverson, Capirci, Volterra, and Goldin-Meadow (2008) define representational gestures as gestures that “refer to an object, person, location, or event through hand movement, body movement or facial expression” (p. 168). They go onto explain that “their forms vary with their meanings; as a result, they are less dependent on context for interpretation” (p. 168). They further explain that representational gestures fall into one of two categories: (1) iconic gesture and (2) conventional gestures (ex: shaking head for “no”).

*Symbolic Gesture*: Goodwyn, Acredolo and Brown (2000) define symbolic gestures as similar to iconic gestures and they often represent a real world referent. However, unlike iconic gestures, these gestures often “frequently serve nominal rather than predicate functions and substitute for, rather than accompany, speech” (pg. 83). An example of a symbolic gesture is a thumb to the mouth to represent wanting a bottle.
Unfamiliar Referents: According to Mazzocco (1999) and Doherty (2004) unfamiliar referents are objects that children have most likely never encountered. For example, the word Tapir which is a type of animal from South America. The authors created pseudo-homonyms for unfamiliar referents to be used in the story.

Summary

This chapter has introduced the topic of gestures in children acquiring English as a second language. It has outlined the background in gestures, gestures in monolingual children, gestures in second language learners, and research in lexical ambiguity. The research questions that this study seeks to answer have been provided along with the hypotheses for each research question, the statement of problem and significance of the study. Furthermore, this chapter has defined the key terms for this study.

Organization of Thesis

This study contains five chapters. Chapter One introduces the topic, statement of problem, significance of study and key terms. Chapter Two provides the rationale for the study and focuses on five parts: 1) research on gestures in monolingual children; 2) research on gestures in second language acquisition; 3) research on gestures in Arabic speakers; 4) research on children’s difficulties with homonyms; 5) research on gestures and lexical ambiguity. Chapter Three provides a description of the methods including the participants, materials, procedure, and data analysis. Chapter Four presents the results and interpretations. In Chapter Five the contributions of the study, limitations, recommendations for further research, and conclusions are provided.
CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter reviews research that demonstrates the necessity for more research into the gestures of children acquiring English as a second language and the ways ESL children resolve lexical ambiguity. This chapter is guided by the following questions: 1) What is the importance of gestures in first language acquisition? 2) What role do gestures play in second language acquisition? 3) How are gestures similar between Arabic and English speakers? 4) How do speakers resolve lexical ambiguity? 5) Do gestures accompany speech to clarify the distinct meaning of a homonym? This chapter will highlight the importance of the current study, which is to research gestures used by children learning English as a second language to resolve lexical ambiguity.

Gesture is defined as hand or body movements occurring with speech (Kendon, 1978, 2004; McNeill, 1992). McNeill argues that gestures and speech work together to create a single system. This argument is supported by five crucial presuppositions: “1) Gestures occur only during speech; 2) Gestures and speech are semantically and pragmatically co-expressive; 3) Gestures and speech are synchronous; 4) Gestures and speech develop together in children; 5) Gestures and speech break down together in aphasia” (McNeill, 1992, p.23-24).

Additionally, McNeill (1992) created a classification system to define the different types of gestures. Iconic gestures represent actions or objects, such as taking your arms to the side and waving them to represent a bird. Metaphoric gestures represent abstract ideas. McNeill (1992) provides the example of a speaker moving their hands up
and down when discussing a cartoon, while the cartoon event is concrete, the genre is an abstract idea. The gesture reflects the representation of the genre cartoon. Beats are quick movements of the hand that move with the rhythm of speech. Deictic gestures are pointing gestures, for instance a speaker might point to an object while talking about the object. Classifying gestures by McNeill’s (1992) classification is widely used today. This is present in many monolingual children studies (e.g. Iverson, Capirci, Volterra, & Goldin-Meadow, 2008; Kidd & Holler, 2009) and research in gestures in SLA (e.g. Smithson, Nicoladis, and Merentette, 2011) and is evident in the following literature review.

In this study, there will be examples of gestures appearing without speech; nonetheless, these are still gestures true to McNeill’s (1992) framework. McNeill (1992) states, “90% of all gestures by speakers occur when the speaker is actually uttering something” (p. 23). He goes onto say, “the acts of speaking and gesturing are bound to each other in time” (p. 23). Therefore, 10% of gestures appear without speech. However, McNeill (1992) accounts for these 10% of gestures as being exhibited by the listener in the conversation. To clarify, Goldin-Meadow (2003) terms gesture in her book, “Hearing Gestures” as appearing in speech; thus, gestures that do not accompany speech are labeled as emblems, which are gestures like the “okay” sign or “thumbs up”. Therefore, for this study, a gesture is defined as a hand or body movement occurring within a speech context, such as the conversation between the assistant and the child or during the story retelling. For example, during the study when a child uses an iconic gesture, a listener needs to know the content to understand their gesture.
Goldin-Meadow (2003) focuses more of her research on gestures in children whereas McNeill’s (1992) research concentrates on adult speakers. Therefore, it is necessary to include some of the implications she has brought forth about gestures and children. More specifically, Goldin-Meadow (2003) says she focuses a chapter of her book on, “children who for one reason or another are limited in the use of speech and thus must turn to gesture” (p.208). It is important to note that Goldin-Meadow (2003) does center her research on monolingual children and this study focuses on ESL children; however, the implications she brings forth about monolingual children using gestures could be extended to children learning a second language. Goldin-Meadow (2003) states that the following three situations are the reasons why monolingual children may use gesture when communicating:

- Children at the earliest stages of language learning, when they have to break into the spoken system and often use gesture to help them do it;
- Children who are having difficulty acquiring spoken language and often turn to gesture as a supplement or alternative;
- Children whose hearing losses prevent them from acquiring spoken language and whose hearing parents have not yet exposed them to a conventional sign language—they too turn to gesture (p. 208)

These statements are vital to the current study. The ESL children in this study are typically developing children similar to their peers; however, they do lack the same level of English as their peers. Therefore, if monolingual children use gestures to compensate for the difficulties in acquiring spoken language, will the ESL children in this study do
the same? This thesis plans to gather more information on ways children learning English as a second language use gestures.

Furthermore, this study seeks to answer questions regarding how ESL children resolve the lexical ambiguity in a pair of homonyms. Kidd and Holler’s (2009) study implies that younger children who are monolingual English speakers use more gestures to explain the differences between homonyms whereas older children can successfully explain the differences in speech alone. Young children’s difficulties with homonyms have been well documented (Doherty, 2004; Mazzocco, 1999; Mazzocco, Myers, Thompson & Desai, 2003); however, there is a lack of research in ESL children’s abilities to resolve lexical ambiguity in general and homonyms in particular. As a result, this literature review will discuss the critical studies in the following areas: gestures of monolingual children, gestures in SLA, gestures in Arabic speakers, resolving lexical ambiguity, and gestures and lexical ambiguity. This literature review will examine the important research in the area of gestures and homonyms. While demonstrating the need for additional studies focusing on ESL children using gestures to disambiguate homonyms.

**Gestures of Monolingual Children**

Research on gestures has led scholars to question if they have a purpose in first language acquisition. Early on it was suggested that gestures and speech develop together in children (McNeill, 1992; Riseborough, 1982). Acredolo and Goodwyn (1988) examined the importance of gesture and speech developing together in typical infants. In the article “Symbolic Gesturing in Normal Infants” Acredolo and Goodwyn (1988)
describe two studies that examine symbolic gestures in infants. In each study, the infants were between the ages of 11 months to 20 months and the authors relied on the parent’s reports of their children’s gestures and speech. However, the first study also included a one-time interaction with the infant and the second study was a nine-month longitudinal study. The results of each study suggested that the infants’ gestures and words appeared early together, the words and gestures arise in similar context. For example, the first words of children’s speech are nouns and the gestures represent nouns, and gestures may reflect early language development in infants. The authors note that using two gestures together before hitting the two-word stage in development. This article demonstrated the importance of gestures for typically developing children.

Butcher and Goldin-Meadow (2000) described the relationship between gestures and speech during the transition from the first-word and second-word stage in child language development. The authors’ research demonstrated that the gestures of children in the earliest period of the one-word stage are independent of speech. Then, as they keep progressing through the one-word stage, their gestures start to appear with speech before children reach the two-word milestone in language development. Children at first cannot work the mouth and hand together to form a single meaning; however, before they hit the two word stage children can convey the same information in two distinct modalities (gesture and speech). This reinforces McNeill’s (1992) theory that speech and gesture come together to form a single integrated unit. Furthermore, this study demonstrates a positive connection between gestures and speech of young children. Once the children
produce gestures and speech simultaneously they transition into the two-word stage of speaking. This suggests gesture precedes the articulation of words in children.

The research of Butcher and Goldin-Meadow (2000) still leaves open the following question: Do gestures have a specific purpose in children’s first language development? Goodwyn, Acredolo, and Brown (2000) compared the differences between children who were intentionally taught gestures along with speech and children who had no extra attention on gestures but the focus was on speech. The authors followed the development of language in 103 children from 11 months until 36 months. The children were divided into two groups. In one group, the parents were taught symbolic gestures, which represent real world objects similar to iconic gestures, and encouraged the children to use them. The other group did not know about the authors’ interests in symbolic gestures and were not told to use them anymore or any less than normal. The parents kept notes of their child’s development and the children were given a standardized language test by the researchers every 5-6 months. The results showed that children who used symbolic gestures surpassed children with no attention to symbolic gestures on the language test. The authors suggested that symbolic gestures benefit language development because gestures allow children to express themselves even when they cannot vocalize.

Similarly, Özçalışkan and Dimitrova (2013) demonstrated that the gestures of parents provide a model for the gestures of children thus helping children develop their gestures and early language skills. This is comparable to the way parents use their speech as a model for their children, which is better known as “motherese” talk. Furthermore,
Rowe and Goldin-Meadow (2009) argued that children from families of lower socioeconomic status struggle in language related tasks in elementary school because of the lack of gestures provided during language development. While these studies show a strong correlation between language development and gestures, they fail to provide a guideline for gestures in typically developing children.

It is known that children progress through developmental milestones in acquiring their first language. Researchers have investigated whether the gestures of children aid speech development within these milestones. Özçalişkan and Goldin-Meadow (2005) demonstrated that gestures are related to the development of early speech in young children. The authors observed 40 typically developing English monolingual children between the ages of 14 and 22 months. The children were video recorded for 90 minutes at the ages of 14, 18, and 22 months interacting in their homes with their caregiver. Most of the interactions occurred during play time, story time or a snack time. The authors divided all communicative acts the children produced into three categories: 1) gesture only acts; 2) speech only acts; 3) speech and gesture acts. The authors focused their attention on the relationship between the types of gestures the children produced and the type of words and phrases the child produced. The authors’ data confirmed that gesture indicates a child is getting ready to speak and will add to their vocabulary. For example, children rarely produced utterances with two arguments (“mommy the bell”) until the age of 22 months, but children often used speech and a gesture (“mommy + point to bell”) to express the same meaning at 18 months. This article suggests that gesture precedes the usage of two-word phrases in children.
Similar studies have discovered the same results of gestures occurring along with speech developments. Iverson and Goldin-Meadow (2005) video recorded the gestures and speech of 10 typically developing children across a 12-month span. They observed the gestures of children preceding and predicting the onset of spoken language. Children who first conveyed a word using a gesture soon used that word in their speech. Additionally, children who used gesture and speech combinations to convey a two-word phrase were the first to produce two word phrases in speech. For example, before a child could produce a subject and predicate phrase (“girl run”) he/she would combine gesture and speech to convey the information (point at girl and say “run”). This article has significant implications for second language acquisition. If young children learning English as a second language use gesture to help communicate words they cannot vocalize similar to monolingual English speakers, then gestures could predict the acquisition of more complex vocabulary and phrases in English.

Comparably, Huttunen, Pine, Thurnham, and Khan (2013) observed that the relationship between gestures and speech changes for children as the size of their vocabulary knowledge increases. The authors included children from both English and Finnish backgrounds; however, the children were monolingual. In this study, the English speakers are known to have a culture where gestures are used frequently whereas, the Finnish speakers are known to gesture far less. This study examined the role of gestures in children ages two to five years old. The children were given a picture-naming task to elicit gestures. Both groups of children frequently gestured before saying a word at the age of two, which leads to the suggestion that gesture helps in word retrieval for children.
However, when the children hit three years of age, Finnish speaking children gestured far less than English speaking children, suggesting that cultural norms of gesture started to affect the children.

These studies serve as a foundation for the ongoing research into the process of gesture development in children. Previous research has shown a relationship between gestures and language development in first language acquisition of English speakers. These studies suggest that gestures precede the spoken word in English and will predict the next language structure the child will produce. However, this raises the question about children acquiring L1s other than English. Do gestures precede and predict the onset of speech in L1s other than English?

Italian is known for its rich gesture culture. Iverson, Capirci, Volterra, and Goldin-Meadow (2008) compared the differences in language development between groups of children acquiring Italian and American English as the first language. The study focused on video recording, every 5 months, three Italian children and three American children as they grew from 8 months to 22 months. The children were video recorded for 30 minutes in their homes in three different situations: 1) playing with a set of toys provided by the researcher; 2) playing with their own toys; 3) interacting during a meal. The results showed that American children used more deictic gestures (pointing at objects) and Italian children used more representational gestures (having the hands form real world objects like a ball). Additionally, the Italian children do gesture more overall; however, the Italian children did not have more words than the American children. This seems to contradict past studies that suggest that gestures are related to children having
large vocabularies. The authors suggested deictic gestures are related to vocabulary
development because of the American children using more deictic gestures and studies
pertaining to English speaking children show gestures are related to vocabulary growth.
Because the Italian children used more representational gestures, this suggests they help
children overcome boundaries in communicating. Gestures aid when they cannot yet
speak, and are not related to vocabulary acquisition. More importantly, the authors
concluded that their results should be taken lightly because of the small sample size.

The aforementioned studies suggest that deictic gestures relate to vocabulary
growth in English speaking children. However, the question remains if iconic gestures
play a role in language development of monolingual English children. Özçalişkan,
Gentner, and Goldin-Meadow (2014) examined the use of iconic gestures with verbs in
typically developing monolingual English children ages 14 to 34 months. They
videotaped the children interacting with their parents for 90 minutes every 4 months from
14 to 34 months. The authors saw that the children communicated verb meanings in
speech before they conveyed the meanings in iconic gestures. Additionally, the amount of
iconic gestures grew as the child aged and began to speak with more verbs. Therefore,
Özçalişkan, Gentner, and Goldin-Meadow (2014) maintained the theory that deictic
gestures do precede and predict the onset of language in monolingual English children.
Nevertheless, iconic gestures assist young children in communicating their thoughts to a
listener, but only when they have learned the syntax of verbs in the target language.

Behne, Carpenter and Tomasello (2014) explored the purpose of iconic gestures
in 36 monolingual German children with a mean age of 27 months. The children were
split into two groups: 1) the first group watched a puppet struggle to complete a task and the children were asked to help the puppet with it’s difficulties; 2) the control group watched the puppet struggle and resolve it’s own mistakes to complete the task. The explanation of completing the task was linguistically complicated for children of this age; therefore, it was predicted the children would use gestures to assist the puppet. The results showed that the majority of the children helped the puppet to solve the problem with the use of iconic gestures because they could not explain the resolution in speech alone. Thus, this research supports the previous research by Özçalişkan, Gentner, and Goldin-Meadow (2014) that young children produce iconic gestures to fill in the missing gaps in spoken language. Even more important, children who speak English and German use iconic gestures when they can not verbalize their ideas.

Iconic gestures appear later in child language development. Therefore, do young children understand iconic gestures and their meanings? Stanfield, Williamson, and Özçalişkan (2014) tested children’s understanding of iconic gestures. They recruited 36 children ranging in ages from two to four to complete tasks relating to the comprehension of iconic gestures. The children interacted one on one with a researcher. The researcher would state a sentence but leave one word out and replace it with an iconic gesture (example: I am eating+ iconic gesture for sandwich). Then, the child would be presented with two pictures and asked to identify the picture representing the iconic gesture. The results revealed that the older children had more successes in comprehending the meaning of the iconic gesture; thus, the authors put forward the argument that iconic
gestures pose great difficulty to young children. As a result, iconic gestures may be related to children’s abilities to comprehend multimodal communication.

Italian children have been the focus of several gesture studies in language development. Longobardi, Rossi-Arnaud, and Spataro (2012) attempted to replicate findings found between gestures and speech in monolingual English children but applied these methods to monolingual Italian children. The researchers recruited 104 Italian speaking children who were evaluated between 12 and 23 months. The parents of the children were instructed to evaluate their children’s gestures and speech using the Questionnaire for Communication and Early Language development and the Italian version of the MacArthur-Bates Communicative Development Inventory: Words and Sentences at 23 months (Fenson, Bates, Dale, Marchman, Reznick, & Thal, 2007). The results were similar to the previous findings that children with more gestures and more words had higher linguistic abilities; more importantly, their results did not indicate that children who produce more gestures will have a larger vocabulary. However, the researchers only relied on parents’ evaluations and did not videotape the children for their own observations.

Results similar to ones found in English speaking children have also been found in Estonian speaking children. Schults, Tulviste, and Konstabel (2012) investigated language development in Estonian speaking children. The participants in the study included 592 infants between the ages of 8 months and 16 months. Vocabulary and gestures of the infants were collected and recorded using an Estonian version of the MacArthur-Bates Communicative Development Inventory (Fenson, Bates, Dale,
Marchman, Reznick, & Thal, 2007). Similar to English speaking children, Estonian-speaking children with a wider range of gestures had larger vocabularies for speech.

Young children often overgeneralize words and grammar rules suggesting they do not imitate adult speakers (Berko, 1958). More specifically, children go through language development milestones to become fully competent speakers in their native language. However, do children overgeneralize in their gestures and go through similar developmental stages in gesture? Gullberg and Narasimhan (2010) studied the difference of gestures between Dutch adults and children (ages three and five). Their study concentrated on the use of gestures when using two Dutch verbs zetten (set) and leggen (lay) in speech. Dutch children often over-extend leggen to all placement events and rarely use the verb zetten. However, adult speakers of Dutch use these two verbs for specific placements of object (leggen for horizontal placed objects and zetten for vertical placed objects). When Dutch speakers use these verbs they often incorporate more gestures relating to the object such as its shape or function and fewer gestures relating to path such as the hand being flat and depicting a vertical object by the fingers facing towards the sky.

The authors recruited three year olds, five year olds, and adult native speakers of Dutch to participate in the study. They had the participants watch a video of a woman placing objects around a room. After watching the video, the participants were asked to give the order of events in the video. The results suggested that adult and children speakers of Dutch use gestures differently because children lack the linguistic knowledge to use zetten and leggen correctly. The three year olds over-extended leggen to both
horizontal and vertical placements and used mostly path gestures. The majority of five year olds used *zetten* and *leggen* correctly; but, only some object gestures appeared in relation to the verbs and they often relied on the gestures indicating path. Even though the five year olds were more aware of the difference between *zetten* and *leggen* their preferred gestures were still not adult-like when compared to the Dutch adult native speaker who showed a strong liking for the object gestures. The authors concluded that these results demonstrated that gestures provide an insight into semantic development in children. Examining gestures in children acknowledges other aspects of language and doesn’t focus on error analysis only; thus, moving from a statement of simply children’s verbs differ from adults and concentrating on how they differ from adults. This research shows that studying the gestures of children is important in understanding language development.

Gestures are seen in children acquiring their first language as they develop and grow into fully competent speakers. However, do gestures continue to be prevalent in the speech of children and do they continue to aid linguistic abilities as the children grow? Alibali, Kita, and Young’s (2000) research demonstrated that native English speaking children use less redundant gestures when explaining rather than describing. The authors wanted to test the Information Package Hypothesis that states, “[s]patio-motoric thinking, which underlies representational gestures, helps speaking by providing an alternative informational organization that is not readily accessible to analytic thinking, the default way of organizing information in speaking (Kita, 2000, p. 163).” Because of this
hypothesis, the authors had the idea that children would use more representational gestures in the explanation tasks rather than the description tasks.

The children completed two tasks; one an explanation task and the other a description task. During the explanation task, children were shown two identical amounts of sand, then the researcher poured one into a bowl and the other into a glass. Children were asked if they were the same quantity or not; then the children had to explain why or why not. During the description task, children were asked to describe the differences between the two quantities of sand. Children used a variety of gestures and specifically, more representational gestures in the explanation task; for example, children would show the size of the glass with their hands. Children used more deictic gestures in the description tasks by simply pointing at each quantity of sand and saying “this one”. This study suggests that gesture not only influences speaking but also plays a role in the development of a thought to be verbalized. The current study focuses on children explaining the difference between two homonyms.

Furthermore, Breckinridge Church and Goldin-Meadow (1986) expressed the significance of gestures in learning in two different studies in their article “The mismatch between gesture and speech as an index of transitional knowledge.” Children between the ages of five and eight completed the same explanation tasks as the participants in Alibali, Kita, and Young’s (2000) study. The first study demonstrated that children who could not articulate that the quantities were equal could gesture that the quantities were the same. For example, a child might say, “the glass is tall” but gesture reversibility between the glass and dish, which shows the child understands they are equal amounts. More
importantly, the children who used mismatched speech and gestures expressed the quantities being equivalent more accurately in one of the mediums of communication, speech or gesture, than the children who produced matched speech and gestures.

This led the researchers to question if the children with the mismatched gestures and speech can learn that the amounts are of equal equivalences easier than the other children. In the second study, they instructed both groups of children (children who produced mismatched gesture and speech and children who produced matched gesture and speech) in learning that the water quantity was the same in both containers. The children were put through a training session with one researcher and a manipulation session with a second researcher. The results reflected that the children who had mismatched speech and gestures indicated higher correct results, that the quantities of water were the same in each container during the manipulation session; thus, the researchers suggested that mismatched gestures and speech indicate novice learners who are ready to begin learning explicitly about the target concepts. More importantly, this study implies that gestures are a link between transitional knowledge in children.

The previous mentioned study demonstrates the importance in gestures in explanation tasks; however, do gestures play a significant part in lexical access? Pine, Bird, and Kirk (2007) developed lexical tasks for children to complete, while some of the tasks they were able to gesture, the other tasks limited their ability to gesture. The authors created picture-naming tasks that elicited tip-of-the-tongue (ToT) states in the participants. According to Brown (1991) ToT is, “being sure that the information is in memory but… temporarily unable to access it” (p. 204). The authors chose 50 words that
were used in a pilot study that triggered ToT states in children who were monolingual English speakers ranging in ages six to eight.

After choosing the 50 words, the authors recruited sixty-five monolingual English-speaking children from two primary schools in Hertfordshire with a mean age of 6.63 years old. The authors split the picture cards into two sets: one for the gesture allowed condition and the other set for the gesture prohibited condition. The researcher would hold up a card with a picture and the children would have to name the picture on the card. During the gesture prohibiting condition, children’s hands were placed in mittens that were secured on a board in front of them with Velcro strips. The results concluded that children were able to name the picture while in the ToT state easier when they were allowed to gesture. This study demonstrates that gestures are involved in all stages of speech production from thinking to the utterance even in children.

Research on children explaining the differences in quantities have been discussed; however, a discussion is needed whether single and duel representations have an impact on children’s gesture production. Thurnham and Pine (2006) created three stories, one was a false belief story, one was a true belief story, and the last was an extended belief story. All the stories focused on a little girl named Suzy who had left her kitten in a basket in her bedroom. Thus, the true belief story ended with Suzy retrieving the kitten from her bedroom and the false-belief story ended with the kitten jumping out of the window and Suzy finding nothing in the bedroom. The extended true-story added a page about Suzy and the kitten playing in the garden. All the stories were on 4 pages with
colored pictures and no words, the extended-true story had the extra page, resulting in 5 pages; the researcher would read the story and have the child retell the story.

All speech and gestures were transcribed; however, only iconic gestures were used for the analysis. The results showed the children used 52 gestures during the false-belief story, 14 gestures during the true-belief story, and 10 gestures were produced during the extended true-belief story; thus, these results show a strong suggestion that children produce more gestures during the duel representation story. The current research uses duel representation of words; therefore, it is hypothesized that children should produce more gestures when retelling stories that incorporate the multiple meanings of homonyms.

Gestures are not only valuable in language development but research shows that gestures reflect implicit knowledge and lead to learning. Broaders, Cook, Mitchell, and Goldin-Meadow (2007) tested the effect of gestures in aiding elementary school aged children in solving math problems. Their study involved forcing children to either gesture or not gesture in explaining how they solved a math problem to know whether gestures bring out implicit knowledge. First, the researchers had 106 children solve six math problems, involving questions such as $6+3+7=\_\_+7$. None of the children got the questions correct and were thus put through the manipulation phase.

During the manipulation phase three groups were created: 1) a group where the children were told to gesture when explaining how they solved the problem; 2) a group where the children were told to hold their hands still; 3) a control group where children were not instructed to move or not move their hands. After the child solved the problem
on a chalkboard, they were instructed to tell the researcher how they got their answer. Therefore, the focus was on if the child could explain successful problem-solving strategies for the equation even though they produced an incorrect result for the equation. The children repeatedly expressed unsuccessful problem-solving strategies when only relying on speech; however, the children who were allowed to articulate and gesture produced gestures that reflected correct problem-solving strategies which suggests implicit knowledge was used to solve the equation. For example, a child said, “Both sides have to be the same” while taking their palm and moving it from the left to the right side of the problem. This study demonstrates gestures help children express complex ideas; furthermore, this research suggests a connection between gesturing and implicit knowledge. Additionally, this supports the ideas by Pine, Bird, and Kirk (2007) that gestures help children resolve problems easier.

Breckinridge Church and Goldin-Meadow (1986) found a positive correlation between mismatch gestures-speech and learning. However, the question remains on if children pass through this phase of mismatch speech and gestures before learning a concept. Alibali and Goldin-Meadow (1993) tested if children often go through the milestone of mismatch speech and gestures when learning a new idea. Similarly, to the previous discussed study by Broaders, Cook, Mitchell, and Goldin-Meadow (2007), Alibali and Goldin-Meadow (1993) gave children math equations to solve in three different phases. In the first phase children were asked to solve and explain the math equation, which the majority produced incorrect results with matched speech-gestures. In the next phase, some of the children were able to explain the equation correctly in either
speech or gesture; as a result, their speech and gestures did not match. In the final state, some children could successfully explain the equation correctly through matched speech and gesture. Throughout the study, 11 children progressed through the first two stages (incorrect to mismatch) and 15 passed through the last two steps (mismatch to match). Therefore, this signifies that children who use mismatch gestures when explaining information are in the process of mastering a task; in fact, this study demonstrates that most children pass through the mismatch gesture-speech phase before fully comprehending an idea. This could explain the children in the current study using mismatch gesture-speech when explaining homonyms; while they have not yet mastered the ambiguity in meanings, they are still developing as typical children.

The literature reviewed so far has indicated gestures are crucial to language throughout the developmental of a child. Gestures in children display language milestones, aid in children’s articulation of ideas, and assist in learning new concepts. However, are gestures still relevant to adult speakers? Gesture research in adult second language learners determines gestures are crucial to adults as well. The present study is designed to combine research on monolingual children and adult SLA learners to investigate the role of gestures in children learning English as a second language.

Gestures in Second Language Acquisition

A majority of research in gestures has focused on monolingual speakers. However, this section will highlight the significance of research on gestures in the field of second language acquisition. Gullberg (2009) addressed the importance of gestures in studies of language development and acquisition. The author argued that gestures are part
of our lexicons and they cannot be forgotten while studying language acquisition.

Gestures have provided insights into how transfer can affect the second language, the proficiency level of the learner, and the process a learner is going through to recall a word while speaking.

In studying second language acquisition, special attention is paid to what a learner knows and does not know to determine language abilities. Gregerson, Olivares-Cuhat, and Storm (2009) compared gesture use and proficiency level among 75 L2 Spanish speakers at a Midwestern US university. The participants’ levels varied from beginning to intermediate to advanced levels. The participants were given the task of performing a role-play in front of the classroom. This study focused on speech-dependent gestures (such as pointing to myself when referring to “I” in a sentence) and speech independent gestures (such as the “thumbs-up” symbol in America). Advanced learners used more speech-dependent gestures to help make the message clearer by reinforcing grammar and vocabulary through their gestures. These learners helped facilitate the learning process for others in the room. Beginning students used more speech independent gestures causing them to appear more nervous in the classroom. While this study shows a link between proficiency level and gesture use in the case of role-play, it fails to track the evolution of gestures as learners continue to progress in the language learning process.

Additionally, Nicoladis, Pika, Yin and Marentette (2007) focused on native Mandarin Chinese speakers retelling stories in English and Mandarin. The authors concentrated on the types of gestures used when retelling stories in the participants L1 and L2. The authors also accounted for the gestures used depending on the complexity of
the tasks. Furthermore, the authors wanted to explore the idea that gender may affect gesture use in story retelling.

This study recruited sixteen adults whose native language was Mandarin Chinese with an intermediate level of English. The participants were classified as intermediate speakers of English by the author who had extensively worked with non-native speakers of English. The participants were graduate students who had passed the TOEFL test. The participants were asked to watch a six-minute cartoon of the Pink Panther and retell the story in Mandarin to a native speaker and in English to a native speaker. The participants engaged in the study twice within a one-week time frame, both times watching the video and retelling the story in the targeted language.

The authors looked at three types of gestures: iconic gestures that represent real world objects, deictic or pointing gestures, and conventional gestures that are specific to certain communities. The authors state that conventional gestures are, “For example, the ‘thumps-up gesture’ is used in some cultures to signal ‘okay’” (p. 726). For the purpose of analysis, they classified the gestures as iconic or non-iconic. Furthermore, the authors measured the length of the stories retold by the amount of token words and the number of scenes recalled. The results showed the more iconic gestures were used in the speakers’ second language when compared to their L1. The participants recalled slightly more information in their L1 and the women’s stories were somewhat longer than the men’s when speaking in English; but, the difference was not significant. However, the women participants did use almost twice the amount of iconic gestures in English and Mandarin when compared to the men’s rate of using iconic gestures.
This study demonstrates that iconic gestures help enhance the comprehensibility of their message when retelling stories in their second language. The current research looks at how gestures differentiate according to proficiency level among ESL children. Furthermore, these results suggest a gender difference relating to gestures in adults, and this idea is lacking in the area of gestures in ESL children. The current research focuses on both girls and boys for the study of gestures in children learning English as a second language.

Sherman and Nicoladis (2004) conducted similar story retelling tasks on advanced Spanish speakers of English and English speakers of Spanish. Their results showed that the participants used more deictic gestures in their L2 and the use of symbolic gestures (iconic gestures) did not differ greatly between the use of L1 and L2. Furthermore, Nagpal, Nicoladis, and Merentette (2011) describe similar results to the previously mentioned studies. They found that Hindi speakers of English used more gestures in retelling the Pink Panther story in English when compared to retelling the story in Hindi. The aforementioned studies suggest there is some relationship between a learner’s proficiency level and the type and amount of gestures a speaker uses in story retelling.

Research also indicates speakers may transfer gestures from their native language to their second language. A study by Smithson, Nicoladis, and Merentette (2011) had bilingual children complete the same story retelling tasks as previously mentioned. The study’s participants were monolingual English children, French-English bilingual children, and Mandarin-English bilingual children. The children watched the cartoon and retold the cartoon in both languages. The French-English bilinguals used about 50% more
iconic gestures in English than the English monolingual speakers; additionally, they used about four times the amount of gestures in their L1 and L2 compared to the Mandarin-English bilinguals. The French are a very gesturally rich culture whereas the Chinese tend to use fewer gestures. This suggests that the French-English children were transferring gestures used in the French language into the English language.

Gullberg (2009) examined gesture transfer more closely in adult L1 speakers of English and L2 speakers of Dutch. As previously explained in the review of Gullberg and Narasimhan’s (2010) article, Dutch has two verbs for placement leggen (lay) and zetten (set) and when using these verbs Dutch speakers use more gestures relating to the object and less relating to the path. However, English speakers tend to use the verb put for placement of objects which does not translate directly into Dutch. The question Gullberg (2009) raises is will English speakers of Dutch transfer the path gestures from the English verb put onto the Dutch verbs zetten and leggen which are used with object gestures? The participants had to watch movie clips with people placing objects around a room and describe the placement of those objects. The results showed that the speakers would use path gestures more often representing the verb put when using zetten, which is a verb used with a path gesture. This suggests the speakers have not mastered the use of the L2 verbs and have not reconstructed their mental representations for the two different verb placements because their gestures do not match the target language. However, some participants did use object gestures indicating that L2 speakers can successfully reconstruct their representations of the meanings of the verbs.
Additionally, Pika, Nicoladis, and Merentette (2006) looked at cross-linguistic transfer in gestures in adult bilingual speakers. Again, they had English-Spanish speakers, French-English speakers, and English monolingual speakers watch the Pink Panther cartoon and retell the story. They found that the bilinguals used more gestures in English than English monolingual speakers. This supports the idea that the bilinguals are transferring gestures from the high frequency gesture language to the low frequency gesture language and do not suppress their gestures from one language to the next. The previously discussed research outlines the importance in gestures for second language speakers and bilingual speakers. However, it is evident that there is a lack of research in gestures in Arabic speakers of English; thus, this thesis will help fill the gap in literature for Arabic speakers of English.

The previously mentioned studies demonstrated that gestures help L2 speakers of a language communicate ideas and thoughts more clearly to their listener. Cotrău (2009) examined how second language learners use gestures in the classroom during different speech acts. She video-recorded a Romanian adult language class in Romania. The students had two different speaking tasks for the day. The first involved the students discussing the similarities and differences in St. Nicolas day comparing their home country’s traditions to the traditions in Romania; this task was an impromptu speech activity. The second task was for the students to bring in an article from a Romanian newspaper to discuss with the class. Therefore, this task was known to students ahead of time allowing for students to practice what they wanted to say. The results by Cotrău (2009) displayed that the learners used more gestures during the impromptu activity
leading the author to suggest that the gestures helped the students communicate their ideas and thoughts more fluently to the class.

The research discussed suggests that learners use more gestures during dis-fluent speech. However, Graziano and Gullberg (2013) demonstrated that learners often use more gestures in fluent speech. Their research involved both children and adults retelling a cartoon. The children used more gestures during fluent speech while adult L2 learners were more likely to use gestures during dis-fluencies. This research suggests that more gestures in children acquiring a second language can demonstrate their fluency in the target language.

Research has suggested that gestures can help the SLA learner in the classroom. When both teachers and students use gestures they can aid in comprehension. A study by Sime (2006) discussed the importance of gestures in the SLA classroom. This study focused on what the learners perceive from their teachers’ gestures. Sime (2006) videotaped lectures in five EFL classes at an academic summer school. The classes included intermediate and advanced speakers of English. After videotaping the lectures, Sime (2006) asked students from the class to re-watch the lecture and comment on the teacher’s gestures. The researcher concluded that learners attribute gestures to helping them learn. The students acknowledged that gestures help with recognition of a newly introduced word or concept, gestures facilitate the learning process, and gestures provide feedback in the classroom. Similarly, Lazaraton (2004) showed that the connection of gestures and L2 input in the SLA classroom is positive for students’ learning in the
classroom. These studies reveal that gestures are very important for the second language learners’ comprehension.

Comparably, Kida’s (2008) study discussed the role of gestures in L1 and L2 discourse comprehension. The author collected data between native French speakers and non-native French speakers in a variety of settings; these included face-to-face conversations and acts where the participants could not see each other. The results showed that when the participants were interacting in face-to-face conversations they had a better understanding of the target language-French. This suggests that gestures aid in comprehension for the L2 learners.

Gestures have been credited with enhancing comprehension and memorization. For example, a study by Macedonia and Knösche (2011) demonstrated how a phenomenon known as enactment helps with foreign language comprehension, memorization, and learning. Enactment was defined as involving cases where gestures and words are communicated to the learner together. Macedonia and Knösche’s (2011) results show that learners whose input was both aural and visual (in reference to the gestures) scored higher in remembering vocabulary. Furthermore, Sueyoshi and Hardison’s (2005) findings indicated a connection between memory and gestures, and that learners from lower levels remembered the content better when presented with gestures and visible cues.

An article by Morett (2014) examined the effects of gestures in learning basic Hungarian words. The study recruited 52 participants and the research was conducted in pairs of two. One participant was taught twenty Hungarian words through videos on a
computer screen, sometimes with gesture and sometimes without gesture, leading to participant one to teach participant two the new word. The results showed a strong correlation between gestures and encoding for L2 words because participants were able to learn the words with higher success when presented with a gesture to accompany the word. Thus, the author argued that gestures facilitate learning in the beginning stages of L2 learning.

Additionally, Tellier (2008) researched memorization and gesture on French speaking children learning English vocabulary. Children were split into two categories to learn eight English words: one group learned the English word with a picture of the meaning of the word presented and the other group learned the word with a gesture presented to represent the word. The children who learned the word with a gesture scored higher in recalling the word later on in different naming tasks. These previous studies (Macedonia & Knösche, 2011; Morett, 2014; Sueyoshi & Hardison, 2005; Tellier, 2008) establish a connection between gestures and cognitive functions in regards to memorization.

The studies discussed in regards to second language acquisition highlight the importance of gesture in second language acquisition. Gestures can aid comprehension, speaking, and memorization for the learner. Furthermore, gestures can provide an insight into a learner’s proficiency level. This thesis will examine the gestures of children acquiring English as a second language by applying past methods of gesture research in first and second language learners to young ESL children.
The present study recruited seven participants who were native Arabic speakers. Therefore, the need to review gestures in speakers of Arabic is crucial; however, there is a gap in the literature regarding gesture use by native Arabic speakers. Nevertheless, Aboudan and Beattie (1996) address the similarities in gesture between adult Arabic and English speakers in their article “The deep relationship between gestures and speech which transcends language barriers.”

Aboudan and Beattie (1996) recruited a speaker from Syria who spoke colloquial Arabic. They recreated a study that had been used in previous research for English speakers by Beattie and Aboudan (1994). This allowed for comparison between the gestures used by Arabic and English speakers in the same conditions. The authors gave the participant a task of retelling cartoons that were presented in sequences. The subject retold the cartoons in three different situations which are as follows:

1. A nonsocial condition in which the speaker sat alone in a room without any audience, and, narrated a story based on a cartoon comic in front of a wall-mounted video camera with full awareness that he was being video taped.

2. A social/monologue condition where the speaker narrated the story in the presence of a silent interviewer who neither interrupted nor made any verbal exchanges with the speaker. Also aware that he was being video taped, the speaker in this situation was asked to sit facing the interviewer whilst telling his story. The confederate avoided nonverbal back channels and reactive behaviors.
3. A *social/dialogue* condition in which the speaker narrated the story to an ‘active’ and contributing confederate. The confederate, in this situation, asked questions during the course of the narrations to clarify the story, using interruption whenever necessary. In this situation, the speaker again sat facing the confederate, and both were aware of the filming (p. 275-276).

After the subject completed the three tasks, all speech and gestures were transcribed and coded. The authors noted that the Arabic speaker had a higher rate of gestures when compared to the English speakers. Even more important is that the speaker used more gestures in the social/dialogue condition. The use of iconic gestures was higher in the social/dialogue condition when the speaker had fluent phases of speech with shallow hesitant phases. This was also true for the English speakers. These results suggest that the use of gesture is cognitively based and similar across cultures.

More importantly, the speakers from both languages used similar gestures accompanying comparable words. Arabic has a verb-subject-object sentence structure, whereas English has a subject-verb-object pattern. However, the two sets of speakers still used gestures at the same time. For example, when describing a splash with water, both groups used one or more gestures with this word. This demonstrates that speech and gestures act together across languages. In conclusion, this study showed a connection between iconic gestures and the encoding of speech across languages.

The current study examines the use of gestures in Arabic speaking children learning English. The children in the present study are from Saudi Arabia, whereas the subject in Aboudan and Beattie’s (1996) study is from Syria; therefore, gestures relating
to cultural differences could exist. However, given that the subject used similar gestures as English speakers, the children in the present study may use similar gestures to the English monolingual children in Kidd and Holler’s (2009) study. While the use of encoding gestures may be the same in the languages, the use of these gestures in a second language is still in question.

**Resolving Lexical Ambiguity**

Learning homonyms is a part of the Ohio kindergarten curriculum; thus, children who are attending Ohio public schools are exposed to homonyms explicitly starting in kindergarten. But, when do children learn homonyms? Research has shown that children are aware that a word can have two distinct meanings starting at age four (Backsheimer & Gelman, 1995; Doherty, 2000; Peters & Zaidel 1980); more importantly, children continue to struggle with the differences past the age of four. This is exhibited in the following example from Campbell and Brown (1983) with a four-year-old child who is shown pinecones:

**Interviewer:** What are these things?

**Child:** Cones

**Interviewer:** Where do you get cones?

**Child:** In the (ice cream) shop.

The child is aware that cones have more than one meaning but does not know how to articulate the differences in the meanings. Furthermore, research indicates that children have difficulties resolving the lexical ambiguity in homonyms until the age of ten (Mazzocco, 1997; 1999).
Mazzocco (1999) tested children’s understanding of homonyms in four different target age groups: two to three-year-olds, four-year-olds, seven-year-olds, and ten-year-olds; altogether 112 American children participated in the study. The children listened to stories containing pseudo-homonyms, nonsense words, and familiar words. Pseudo-homonyms were “familiar nouns used to simulate a child’s first encounter with a homonym’s less familiar meaning” (p. 398). An example of a pseudo-homonym is the word chain referring to a kite. The non-sense words (ex: flig) were “used to stimulate a child’s first encounter with a new unfamiliar word” (p. 398). These stories contained no pictures. Children had to understand the meaning of the homonym using the context clues from the story. After listening to the stories, the children were shown four colorful illustrations containing pictures from the stories and they were asked to identify the picture corresponding to the target word. For example the interviewer would read, “Ann opened a package she got and said, ‘Look, Aunt Beth sent me a cloth chain and some string so that I can fly the chain on a windy day,’” (p. 398). Then the child would be shown four pictures relating to the story. Next, the child would need to choose the picture that shows Ann with a kite; then the child would be asked to point to the target word. For example the child would be asked to point to the chain and then would point to the kite.

The children’s response times were recorded for identifying the target word. The results showed that the response times for the two oldest groups of children were longest for the pseudo-homonyms when compared to the nonsense words and familiar words. Additionally, the results showed the seven-year-olds had a longer response time for pseudo-homonyms than any age group. This indicates that seven-year-olds may be more
aware of homonyms having two different meanings but struggle to accurately identify the homonyms. This study is crucial to the current research because the children’s ages range from five to seven; thus, the older children could be more aware of the difference of meanings in the homonyms but still struggle to identify the differences.

Furthermore, Mazzocco, Myers, Thompson and Desai (2003) recreated the study by Mazzocco (1999) with similar results; however, the authors added a new element by asking the children why they chose the picture for each key word. This task was to seek more information on children’s literal interpretations of homonyms. The children were given the same pseudo-homonyms, non-sense words, and familiar words from the stories in the study by Mazzocco (1999). Children’s responses were coded into categories and the categories were analyzed using Chi-square analysis. The results indicated that the children were more likely to give a correct definition using the context clues for the non-sense words and familiar words than the pseudo-homonyms. Children who correctly identified the pseudo-homonym often could not give a response to why they chose that picture. This suggests that the context for a homonym is necessary but not sufficient enough for children to be able to grasp why that is the meaning of the homonym. Thus, learning homonyms relies on knowledge of context clues and essential metacognitive skills that children this age may not have developed yet.

Although the studies by Mazzocco (1997; 1999) have great implications on the role of homonyms in children’s learning process, she did not take into account that the pseudo-homonyms were also pseudo-synonyms. For example, the word rope was used for the word spade, children already know the meaning of spade; therefore the word rope
becomes a pseudo-homonym and pseudo-synonym for the word spade. Doherty (2004) examined this more closely by giving children a task where they had to identify a pseudo-homonym when used for a familiar word (ex: cake for spade) and an unfamiliar word (ex: cake for Tapir). The author then gave the children non-sense words (ex: spef) as a pseudo-homonym for both the familiar and unfamiliar referent. He examined the differences between difficulties in homonyms in children ages five to ten at a Scottish primary school. The author created two different experiments based on stories using pseudo-homonyms, unfamiliar referents, familiar referents, and nonsense words. In experiment one, children were asked to identify the pseudo-homonym or non-sense words for the target referent for each story. They were asked to identify the target word on pictures. The results showed the children could correctly identify the non-sense words easily. However, children struggled with answering the pseudo-homonym targets correctly and there were no significant disparities between the ages in indicating the difference between the pseudo-homonyms.

In experiment 2, children were trained on understanding the differences of homonyms before the experiment. The children were shown cards with homonyms and distractors (ex: letter (A), addressed letter, fish, and bicycle), the researcher gave the child a homonym where they had to identify the meaning that was illustrated on one of the pictures, and then the experimenter explained some words have two different meanings. After the training, the children were read the exact stories from the first experiment but this time the primary pseudo-homonym referents were absent from the first story set. However, during the reading of the second story set the pseudo-homonym
referents were present. The children’s scores improved drastically when the primary referent was absent and they were able to identify the target pseudo-homonym with 70% accuracy. The children’s accuracy did improve with age but the results were not significant.

This study suggests that children can accurately identify a homonym when the first meaning is absent which is commonly how children learn the second meaning of a homonym. Also, this study shows that children’s difficulties with homonyms continue until the age of ten. The current research looks into how children deal with those difficulties when presented with the two homonyms at one time.

The studies reviewed in relation to young children’s difficulties in disambiguating homonyms have been well documented; even more important, the aforementioned studies demonstrate that children ages five to seven are at a critical age for learning homonyms and express difficulties with these concepts. However, there is a clear lack of focus on children learning English as a second language and their struggles with lexical ambiguity. This research will seek to fill this gap by examining the ways ESL children handle the dilemma of retelling stories with two ambiguous words.

Gestures and Resolving Lexical Ambiguity

The research reported so far in this literature review has focused on gestures and lexical ambiguity as separate entities. However, the current study proposes the idea that speakers use gestures when resolving lexical ambiguity. While this view has not been heavily researched, there are a few studies with a focal point on speakers using gestures to aid in resolving lexical ambiguity.
Holler and Beattie (2003) questioned whether representational gestures are used to clarify ambiguity in adult native English speakers. They conducted two studies to examine the use of representational gestures in resolving lexical ambiguity. The first study had ten undergraduate students from the University of Manchester and all were native English speakers. The participants were asked to sit down across from the researcher and had to read sentences containing ambiguous words projected on the wall behind the researcher. The participants had to clarify the meanings of the words for the researcher. One example from the study is: The old man’s glasses were filthy; this allowed for two interpretations, which could be eyeglasses or drinking glasses. After the participant read the sentence, they were asked to give the two meanings of the word. Their speech and gestures were coded; however, only the attempts where they were attempting to resolve the ambiguity were analyzed. The results showed that the speakers produced 140 instances where they used speech, gesture, or both to resolve the ambiguity; however, out of the 140 situations where they were solving the ambiguity, they used gestures 65 times to accompany their speech. This suggests that gestures are used by speakers to clarify the meaning of words when asked to give interpretations of homonyms.

In the second study, Holler and Beattie (2003) sought to investigate the use of gestures when people are presented with homonyms in discourse. This research had 18 native English speakers sit across from each other; pictures and words were projected onto the wall for one participant to see and this participant had to tell a story using the pictures and words being projected to the other participant. The pictures and words
contained homonyms forcing the participants to resolve the ambiguity to their listener. All the gestures were coded as iconic, metaphoric or deictic; furthermore, they divided the gestures into total number of gestures used and gestures used with the homonyms. The total number of gestures used were 51 with 13 being used with a homonym; this is a 25.5% usage of gestures with homonyms. This number increased when they looked at the number of times a homonym was spoken compared to the number of times a gesture was used with a homonym; the participants mentioned the homonyms 40 times and used 13 gestures with homonyms. This means participants used a gesture 32.5% of the time when discussing a homonym. This suggests that while adult speakers of English know the difference between homonyms, they still use gestures to help aid in resolving the ambiguity to their listener.

This leads to questions about how children, who often struggle with the ambiguity in homonyms, use gestures to aid in the resolution of homonyms for their listener. Kidd and Holler (2009) were the first to investigate the topic of children (3-6 years old) using gestures to explain the differences in homonyms. The authors created three stories that included four pages with hand drawn pictures but no words were on the pictures. The stories focused on different homonym pairs. Each story presented the homonym pairs separately in the story and the last page included the two homonyms in the same sentence (example: the mouse ran across the mouse). After one researcher read the child the story, another researcher would enter and the child would retell the story. The focus was on how the children disambiguated the homonyms in the story. However, most of the children did not resolve the ambiguity on their own; thus, the researcher elicited
responses from children about the differences in the homonyms. For example the researcher would say, “I’m really confused. Why are there two bats in the story?” This allowed for more natural speech while focusing the child’s attention on the ambiguity in the two homonyms.

The authors transcribed all speech and gestures; however, they focused their attention on the gestures and speech the child used to explain the difference in the homonyms. The authors grouped the speech and gestures into four categories: 1) deictic gestures, 2) iconic gestures, 3) speech only, and 4) speech and gesture. The results showed that the three year olds used the most deictic gestures to explain the difference in the homonyms, but it was the most ineffective method. At four years, children displayed a greater sense of the listener not knowing the homonyms and used more iconic gestures to explain the difference. By five years, children could explain the difference in speech and did not have to rely on gestures as often as the younger children. This study demonstrates a significant connection between language development and gestures. The younger children lacked the linguistic competence to explain the difference in speech, but their gestures exhibited that their minds were working towards solving the ambiguity.

This article is beneficial to the field of second language acquisition because it shows that, while learners may have difficulty vocalizing their ideas, their gestures can tell us their minds are focused on resolving the ambiguity even if they cannot articulate the differences. This study provides the basic framework for the current research.

After Kidd and Holler’s (2009) discovery of the relationship between gestures and resolving lexical ambiguity Khalili, Rahmany, and Zarei (2014) tested the effects of
gestures on learning homonyms. The authors taught two adult English as a foreign language classes in Iran. One class focused on the use of gestures while teaching homonym pairs. The other class focused on teaching homonyms through the typical Audio-lingual method through repetition, memorization, and illustration and used only pictures to explain any differences between homonym pairs. The students were taught homonym pairs in six different classes in two weeks. After the six classes, the students were given assessments to test their knowledge in understanding the difference between homonym pairs. The results showed the experimental class that was taught through gesture did better on resolving the lexical ambiguity than did the control group. The authors advocate for the use of gestures for teaching homonyms and indicate that gestures are beneficial for resolving lexical ambiguity. This is connected to the current research because the children may use gestures to aid in disambiguating lexical ambiguity.

Furthermore, to the best of my knowledge the studies by Holler and Beattie (2003), Kidd and Holler (2009) and Khalili, Rahmany, and Zarei (2014) are the only articles that focus on gestures and homonyms; thus, calling for more research in the area of gestures and homonyms.

This section highlights the importance for more research in gestures and homonyms. Adult native speakers of English use gestures to explain homonyms to their listeners and children do the same. Additionally, the ability to understand the variation in meanings of homonyms is difficult for adults learning English as a second language. The above studies focus on monolingual speakers of English and adult learners of English; thus, leaving open questions about how children learning English as a second language
express the different meanings of homonyms when presented with the two referents in one story.

Chapter Summary

This chapter has reviewed past research on gestures and homonyms. Specifically, this chapter highlighted studies focusing on gestures in monolingual speaking children, gestures in second language acquisition, gestures in Arabic speakers, research in resolving lexical ambiguity and gestures with lexical ambiguity. The connection to the previous studies and the current research was presented. Additionally, research on gestures in ESL children and their ability to resolve lexical ambiguity is lacking in this review; thus, this study is beneficial to the area of gestures and differentiating homonyms in children acquiring English as a second language.
CHAPTER 3: METHOD

Introduction

In the previous chapter, the importance of studying gestures and homonym difficulties in ESL children was outlined in five different sections: 1) gestures in monolingual children 2) gestures in second language learners 3) gestures in Arabic speakers 4) resolving lexical ambiguity and 5) gestures and resolving lexical ambiguity. The research reviewed earlier suggests that gestures predict the onset of spoken language in monolingual children (Iverson & Goldin-Meadow, 2005; Özçalişkan, & Goldin-Meadow, 2005). Furthermore, research demonstrates that deictic gestures contribute to vocabulary growth in children (Iverson, Capirci, Volterra & Goldin-Meadow, 2008) and children go through developmental stages in gestures similar to speech (Gullberg & Narasimhan, 2010).

Besides the importance of gestures for development, gestures are credited with helping monolingual and second language learners learn new material, aid in comprehension, and memorization (Broaders, Cook, Mitchell & Goldin-Meadow, 2007; Khalili, Rahmany, & Zarei, 2014; Lazaraton, 2004; Macedonia & Knösche, 2011; Sime, 2006; Sueyoshi & Hardison, 2005). Past research specifies the use of story retelling as a preferred method for eliciting gestures from second language learners (Nagpal, Nicoladis, & Marentette, 2011; Nicoladis, Pika, Yin, and Marentette, 2007; Pika, Nicoladis, Marentette, 2006; Sherman & Nicoladis, 2004); thus, this research focuses on story retelling as one method to elicit gestures from the participants. Additionally, past research on children resolving lexical ambiguity has concentrated on participants choosing the
correct referent for the homonyms when read a story with a homonym (Doherty, 2004; Mazzocco, 1999; Mazzocco, Myers, Thompson, & Desai, 2003). With regards to children resolving lexical ambiguity, the present study will follow past research by using a task that draws the child’s attention to two homonyms interacting in one story and retelling the story to another individual similar to the method by Kidd and Holler (2009). This thesis has relied upon the methodologies from previously mentioned literature and the method of this thesis is designed to answer the following questions:

1) Do kindergarten children enrolled in the beginning level ELL class use more deictic gestures when disambiguating homonyms compared to the intermediate/advanced kindergarten and first grade ELL children?

2) Do children enrolled in the first grade ELL class have more successes using gestures and speech to resolve the lexical ambiguity when compared to lower level learners?

This chapter is organized into the following subsections: participants, materials, procedure, and data analysis.

Participants

This study recruited nine participants from East Elementary in Athens, Ohio. However, to keep the L1 of the participants the same, two students were not included in the final data analysis, leaving seven children in total. The participants were native Arabic speakers and second language English learners in the kindergarten and first grade classes. Additionally, the participants were part of the pullout program, English Language Learning (ELL), designed to give second language learners supplementary lessons in
English. The participants were typically developing children in regards to their peers; thus, their only difference in education compared to their classmates was their English language classes.

The ELL program consisted of two classes of kindergarten ESL students and one first grade class. In the kindergarten classes, one class was designed for beginner learners and the other class was designed for intermediate/advanced learners. However, the first grade class consisted of beginner and intermediate learners because the more advanced first grade learners joined the second grade ELL class. The students in the beginner level kindergarten class were new to an English-only learning environment while the intermediate/advanced students have had some experience with English in their home countries. The first grade class consisted of students new to an English-only learning environment and students who have been exposed to English only classes in kindergarten. Furthermore, this study relied on the school’s placement of the child’s ELL class to determine their proficiency level. The children were placed in the ELL class levels according to their score on the OTELA (Ohio Test of English Language Acquisition) test and grade in school.

These lessons were taught by M.A. Linguistics students from Ohio University. The researcher has access to the students through her past teaching of kindergarten and first-grade ELL classes at East Elementary. The students in the ELL program came from different L1 backgrounds. However, this study focused only on the children whose L1 was Arabic. At school, the children were instructed in and interacted primarily in English and used Arabic mainly at home to interact with family and friends. The children’s ages
ranged from five to seven. Further information gathered revealed that the four kindergarteners and one first grader were new to English only classrooms, whereas the other two first graders had completed kindergarten at an English only school. Table 1 indicates the name of each child, age, and ELL class. Additionally, the children who had completed a year of English only classes are indicated on the table.

Table 1.

Description of Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>ELL Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habib</td>
<td>5</td>
<td>Beginner Kindergarten</td>
</tr>
<tr>
<td>Mahmoud</td>
<td>5</td>
<td>Beginner Kindergarten</td>
</tr>
<tr>
<td>Aden</td>
<td>5</td>
<td>Advanced Kindergarten</td>
</tr>
<tr>
<td>Ahmad</td>
<td>5</td>
<td>Advanced Kindergarten</td>
</tr>
<tr>
<td>Laela</td>
<td>7</td>
<td>First Grade</td>
</tr>
<tr>
<td>Shula*</td>
<td>7</td>
<td>First Grade</td>
</tr>
<tr>
<td>Majid*</td>
<td>7</td>
<td>First Grade</td>
</tr>
</tbody>
</table>

*Indicates that the child had a year of English only instruction before the 2014-2015 school year.
This study had a limited number of participants. However, this is an exploratory study into the area of gestures in ESL children. Furthermore, this study focuses on children with an L1 of Arabic and L2 of English to gather more data into the types of gestures and strategies these learners use to resolve the lexical ambiguity. The results and interpretations should be taken lightly because of the small sample size. Even though the sample size is small, the data collected does have notable results that can add to the literature of gestures in ESL children.

Materials

Each participating child’s parents signed a consent form and filled out a questionnaire regarding the child’s proficiency level. The questionnaire pertained to their native language, past English lessons, exposure to English outside of school and time spent in an English speaking country.

This study used stories containing homonyms. A pair of homonyms in this study is defined as a pair of words that are spelled the same and sound the same. The following pairs of homonyms were adapted from Kidd and Holler’s (2009) study where children had to disambiguate homonyms. This study changed some of the words from Kidd and Holler’s (2009) study to reflect American English and not British English; however, the concepts of the stories and the homonym pairs stayed the same. Also, the structure of the stories containing four pages and the homonym pairs being used in the last sentence stayed the same. The researcher created hand drawn pictures; the pictures represented the sentence for each page showing the people, animals, or objects. For example, the sentence “So they could keep playing, Tom’s father tried to hit the bat with the bat”, 
showed a baseball bat hitting an animal bat. The pictures did not contain any words; thus, the child needed to focus on listening to the story and not reading the story. While the pictures were not included in Kidd and Holler’s (2009) study, they describe a similar method of creating the pictures for their stories. These stories were used for the individual sessions with the children. Every child was read the stories in the same order as shown below. Additionally, the content of the stories is shown below.

**Book 1 - homonym pair for bat (baseball bat/the animal bat)**

<table>
<thead>
<tr>
<th>Page</th>
<th>Picture description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tom went to the park with his father.</td>
</tr>
<tr>
<td>2</td>
<td>They were playing baseball with Tom’s favorite bat (baseball bat)</td>
</tr>
<tr>
<td>3</td>
<td>Suddenly, a bat (mammal) appeared above them stopping the game.</td>
</tr>
<tr>
<td>4</td>
<td>So they could keep playing, Tom’s father tried to hit the bat with the bat.</td>
</tr>
</tbody>
</table>

**Book 2 - homonym pair for glasses (eye glasses/drinking glasses)**

<table>
<thead>
<tr>
<th>Page</th>
<th>Picture description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kim was eating cookies, while watching television.</td>
</tr>
<tr>
<td>2</td>
<td>She was getting used to her new glasses (eye glasses).</td>
</tr>
<tr>
<td>3</td>
<td>She started to clean up her plates and glasses (drinking glasses).</td>
</tr>
<tr>
<td>4</td>
<td>Suddenly, her glasses (eye glasses) fell off and hit the glasses (drinking glasses).</td>
</tr>
</tbody>
</table>
Book 3- homonym pair for mouse (computer mouse/animal mouse).

Page 1

Picture description

1 Ben was doing homework on the computer (picture shows computer mouse).

2 All of a sudden he heard a noise.

3 Suddenly a mouse (animal mouse) appeared.

4 The mouse (animal mouse) ran across the mouse (computer mouse).

This study used two Flip cameras to video record the participants’ gestures and speech. One camera was placed on the side of the participant and the other in front of the participant. Additionally, a laptop was placed in front of the student for backup video and audio recording. By having two cameras and a laptop with audio/video recording, it allowed for three different angles of the gestures.

Procedure

Before beginning the study, the researcher gained permission to carry out the study from the principal at East Elementary and the head director of the ELL program. Furthermore, an agreement was reached between the researcher and the superintendent to perform the study within the Athens City School District. After this, a consent form was sent to the parents explaining the study and asking for permission for their child 1) to participate and 2) to be video-recorded. Additional consent forms were translated into Arabic and sent to L1 Arabic speakers in the kindergarten and first grade ELL programs. Once informed consent was given the researcher began one-on-one sessions with the
students. All sessions with the child were during school hours in the elementary ELL classroom and the school cafeteria. The sessions lasted approximately 30 minutes and to ensure accuracy, the researcher had the cameras recording the entire time. However, between each story the cameras were stopped to save the individual video files for each story.

When beginning the session the researcher made the child feel comfortable by asking questions about their everyday life. The researcher introduced the assistant to whom the child would retell the stories to so the child was familiarized with this person before the story retelling took place. Additionally, all sessions took place in the ELL classroom or the school cafeteria so the child was comfortable and familiar with the setting.

Next, the researcher explained to the child they were going to be read a story and that they had to retell the story afterwards. Retelling stories and identifying elements is part of the kindergarten and first grade ELL curriculum. As a result, the children were familiar with this routine. Additionally, the child was told that the assistant really wanted to hear the story but could not make it for story time. The child was told they were going to retell the story to the assistant so they needed to listen very carefully. The pages had each picture drawn similar to Kidd and Holler’s (2009) pictures. The pictures were created using the descriptions in Kidd and Holler’s (2009) study. The pictures were drawn on pages without the words; this allowed for the child to focus on the pictures and listening without worrying about the words on the pages.
After the child was read the story the researcher called the assistant into the room so the child could retell the story. The assistant sat across from the child and the researcher left the room to not distract the child. The child was able to hold the pictures to help with retelling the story. In Kidd and Holler’s (2009) study, the researcher held the pictures and sat beside the child for the story retelling; however, during the piloting stages of this study when the participant did not hold the pictures the child told a completely different story during the retelling. When the child was allowed to hold the pictures they stayed on task and were able to successfully retell the story. The assistant was instructed to elicit disambiguation in the homonyms from the child. If the child said, “He hit the bat with the bat” the assistant asked questions to prompt the child to focus on disambiguating the homonyms. For example, the assistant would say, “Wow, he hit a bat with a bat? I don’t understand. Can you help me understand? Which bat did he use to hit which bat? Can you explain to me the difference?” This pushed the child to explain the difference to the assistant. After the child explained the difference, the assistant congratulated the child with a response, “Good job! Now I understand he used a baseball bat to hit an animal bat. That sounds like a silly story to me!” If the child struggled to retell the story or to disambiguate the homonyms the assistant asked simpler questions to allow for the child to feel comfortable and not anxious. The assistant would say, “Do you mean an animal bat? Wow! I’m scared of bats! Have you ever seen a bat?” Additionally, the assistant asked general questions about the story to elicit story retelling from the child. The story retelling was loosely structured so the child could speak freely.
The child was not limited on the amount of times they could try to disambiguate the homonyms. This study focused on communication skills and measures were taken to allow for the conversation to be as natural as possible. Once the researcher and assistant felt the child had successfully explained the difference between the homonyms or the child ran out of information to give the assistant, the assistant left the room and the researcher read the next story to the child. Once the child felt comfortable to retell the story the assistant entered the room again. The same procedure as the first story was used again.

Once the child had retold all three stories the child was praised for their work. The assistant and researcher told the child, “That was great work! I hope we can have story time again.” After this the child returned back to their classroom. The two examples below demonstrate when the assistant had to elicit more information for the child to explain the difference between the homonyms. Additionally, the examples show when the assistant felt the child had successfully resolved the ambiguity and when the child had reached a point where they were no longer able to resolve the ambiguity.

Example 1 - The child successfully resolved the lexical ambiguity.

Majid: Sam watch TV and eats cookies. Then, Sam cleans the glasses. Then, he returning to the new glasses. Then, his glasses fell off into the dishes.

Assistant: Wait. But you said two glasses? I’m confused. Can you explain?

Majid: Because that glasses for your eye (points to eyeglasses in picture) and before cup called glasses.

Assistant: Oh ok. So one’s for your eyes?
Example 2 - The child struggled to resolve the lexical ambiguity

Habib: A boy. A bat and ball. A bat is coming.
Assistant: I don’t understand. How many bats in the story?
Habib: two.
Assistant: Two bats? But why are there two bats?
Habib: bat and ball
Assistant: But you said two bats?
Habib: Bat
Assistant: But you told me there were two bats in the story. Are they different?
Habib: A bat is coming.
Assistant: Oh ok. A bat is coming. Great story!

There was no transcript for the assistant to follow. This allowed for natural speech and conversation between the child and the assistant. Furthermore, this provided the child to have more control over the conversation. The examples illustrate how the assistant did handle asking the child for more details about the homonyms. In example 1, Majid, a first grade student, quickly understood what the assistant was asking and was able to explain the difference between the homonyms. In contrast, example 2, demonstrates Habib, a beginner kindergartener, struggling to describe the difference between baseball bat and animal bat. When the assistant noticed him struggling with the questions, the child was told he did well retelling the story and the next story was read.
Data Analysis

After each recording session, any meaningful sounds and communicative gestures were transcribed. All speech and gestures were transcribed from the start of story number one to the end of the assistant leaving the room for story number three; thus, the researcher, the child, and the assistant’s speech and gestures were transcribed. However, this study focused only on the gestures and speech the child used to disambiguate the homonyms. In Kidd and Holler’s (2009) study, the child’s disambiguating only took place in the story retelling; however, in the current study some children tried to resolve the lexical ambiguity during the story reading which resulted in the researcher to consider gestures and speech during the story reading and the story telling. The gestures were categorized according to McNeill’s (1992) classification system: iconic, beats, deictic, and metaphoric. Given the fact that the study focused on the semantic information, if a child gave beats, which are gestures that appear with the rhythm of one’s speech, they were excluded for the second and third analysis of this study. Furthermore, since abstract ideas were not used in the stories, metaphoric gestures were not prominent in the child’s gestures. However, if a child used these types of gestures, it will be noted in chapter four.

To explain an attempt at disambiguation the following examples have been provided: giving a synonym or near synonym for the word (stick for bat), describing or defining the word (a bat you use to hit baseball), using pronouns in place of the homonym (he hit the bat with it), pointing to reference a word (pointing to the baseball bat in the picture), or using the hands to represent objects (using the hands to resemble a baseball bat). Furthermore, attempts were classified into successful or unsuccessful
disambiguation efforts for the second and third part of the analysis. An example of a successful disambiguation would be a child flapping their arms for bat and an example of an unsuccessful attempt would be using pronouns since this could refer to either homonym or other objects in the book.

First, to get a gestural rate, this study uses the same measure by Nicoladis, Pika, Yin, and Marentette (2007). To do this, the number of gesture are counted and totaled, divided by the word tokens, and multiplied by a hundred. Then, there is a percentage that is the gestural rate. This was done for each story the child participated in.

The purpose of this study is to come to a better understanding of iconic and deictic gestures in ESL children. To do this, the words and gestures used in the disambiguation attempts were classified according to Kidd and Holler’s (2009) study as follows: 1) speech only acts, 2) iconic gesture only, 3) deictic gesture only, 4) iconic gesture and speech, and 5) deictic gesture and speech. Bar graphs were made to illustrate the differences in successful and unsuccessful attempts and between the beginning level kindergarten students, intermediate/advanced kindergarten level students and the first grade beginner/intermediate level students. The bar graphs in Chapter Four show the following:

1) Disambiguating attempts using speech only acts, gesture only, speech + gesture acts
2) Disambiguating attempts using only iconic and only deictic gestures
3) Disambiguating attempts using iconic and speech and deictic and speech
4) Successful disambiguating using speech only acts, gesture only, speech +
gesture acts

5) Successful disambiguating using only iconic and only deictic gestures

6) Successful disambiguating using iconic and speech and deictic and speech

Since Kidd and Holler’s (2009) study did not involve any comparisons of speech,
this study also uses a strategy employed by Holler and Beattie’s (2003) method section to
look more closely at verbal success between the groups, which is the number of
ambiguities that were resolved by verbal means only. By analyzing and looking at the
data in these categories, it allows for a better understanding of whether the child used
gestures, speech, or both to disambiguate the gestures.

After the bar graphs, which are presented in Chapter Four, were made the
comparisons between the three groups (beginning kindergarten ESL, advanced
kindergarten ESL and beginning/intermediate first grade ESL) were analyzed to answer
the research questions. This study used Kruskal-Wallis tests to find any significant
differences between the groups. By looking at the gesture rate, the disambiguating
attempts, and specifically at the iconic and deictic gestures the research questions are able
to be fully answered and implications can be drawn for teaching young ESL children.

Chapter Summary

This study addresses the ways children learning English as a second language use
gestures to retell stories and resolve lexical ambiguity. This study created two tasks for
children to complete; the first was a retelling of stories using homonyms and the second
was the same set of stories with the ambiguity resolved in the story retelling. This study
followed similar procedures according to the study by Kidd and Holler (2009). After the data was collected the speech and gestures were categorized and bar graphs were used to compare the differences in the children. This study used both qualitative data and quantitative.
CHAPTER 4: RESULTS AND INTERPRETATIONS

The purpose of this study was to determine if differences between gestures and speech used by kindergarteners and first graders in ELL classes exist when they retell stories using homonyms. More importantly, the present study was designed to focus on how ESL children use gestures and speech to resolve lexical ambiguity. This study used three different tasks to gather data on speech and gestures. Each child was read three different stories containing a homonym pair and after each reading they had to retell the story to a third person. All speech and gestures were transcribed and compared across proficiency levels to determine differences in the levels. This chapter is divided into two sections: the first section presents the statistical information and bar graphs; the second section presents the interpretations of the results.

Results

To answer both research questions non-parametric tests were used because the data was not normally distributed. Furthermore, Kruskal-Wallis tests were used for comparing all three groups. The results of these tests are represented in the tables. However, because of the small sample size, the statistics alone do not fully represent the difference between groups; therefore, bar graphs have also been used to compare and highlight the differences. The bar graphs represent the raw number of occurrences. The results are presented in three subcategories: gestures used during the retelling of the story; attempts at disambiguating the homonyms; successes at resolving the lexical ambiguity.
Gestures and Story Retelling

The analysis focuses first on comparing the gestures used between the groups. To this end, the deictic and iconic gestures were counted during the story retelling. It is important to note that these results only reflect the gestures and speech the child used while they were retelling the story and interpreting the homonyms. The children did not use beats and only one metaphoric gesture was observed. However, the metaphoric gesture was used when the researcher asked the child, “Do you want to hear the story again?” For this reason, it is not included in this data analysis. Furthermore, the results of the gesture analysis reflect the gestures they used during the entire story-retelling process, whereas the second analysis only includes the gestures and speech used to disambiguate the homonyms. Figure 1 represents the frequency of occurrence for deictic and iconic gestures used by each group during each story. Figure 1 shows that the beginner kindergartens were the only group to use iconic gestures during the study. Also, both groups of kindergarteners were the only subjects to gesture during story three.
Additionally, in figure 1, it is important to see that the first graders only used deictic gestures in stories one and two, whereas the kindergarten groups used deictic gestures for each story.

After the amounts of gestures were counted, Kruskal-Wallis tests were used to compare the amount of gesture use between the three groups and each story. Table 2 shows any significant differences between deictic gestures and iconic gestures between the groups for each story.
Table 2.

Significance of Deictic and Iconic Gestures

<table>
<thead>
<tr>
<th>Gesture Type and Story</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deictic Gestures Story 1</td>
<td>.125</td>
</tr>
<tr>
<td>Deictic Gestures Story 2</td>
<td>.482</td>
</tr>
<tr>
<td>Deictic Gestures Story 3</td>
<td>.089</td>
</tr>
<tr>
<td>Iconic Gestures Story 1</td>
<td>.287</td>
</tr>
<tr>
<td>Iconic Gestures Story 2</td>
<td>.050*</td>
</tr>
<tr>
<td>Iconic Gestures Story 3</td>
<td>.287</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.

Table 2 displays that the test showed a significant difference for iconic gestures in story two. The gestures used overall by each group were also counted. Figure 2 represents the overall number of gestures that each group used. Deictic gestures appeared the same between all three groups, whereas iconic gestures were only exhibited by the beginner kindergarteners.
To gain more information on the amount of gestures the children used, the gesture rate was calculated by dividing the word tokens by the amount of gestures. To obtain an accurate gesture rate for the groups, the total amount of gestures for each group were added and divided by the total amount of word tokens. This was done for each story. The word tokens are displayed in figure 3. Figure 4 represents the gesture rates in a bar graph and table 3 shows the results of the Kruskal-Wallis test. The beginner kindergarteners had a higher gesture rate in each story; however, there were no significant differences between the gesture rates and the three groups.

Figure 2. Each group’s overall gesture amount
As shown in figure 3, the beginner kindergarteners were not able to implement as many words into their story retelling as the more proficient and older ELL learners.

*Figure 3. Word tokens for each group*
Because the beginner kindergarteners used so few words in the story retelling and more gestures per words, they had higher gesture rates. Figure 4 demonstrates that the beginner kindergarteners had to rely on the use of gestures to retell the stories and communicate their ideas.

Table 3.

Significance for Gesture Rates

<table>
<thead>
<tr>
<th>Story</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1</td>
<td>.368</td>
</tr>
<tr>
<td>Story 2</td>
<td>.368</td>
</tr>
<tr>
<td>Story 3</td>
<td>.368</td>
</tr>
</tbody>
</table>
Attempts at Resolving Lexical Ambiguity

The second part of this study involves looking at how children learning English as a second language resolve lexical ambiguity. To do this, first their attempts at resolving the lexical ambiguity were counted. Then they were divided into four categories: overall attempts which include speech, gestures, and gestures and speech; attempts using deictic and iconic gestures; attempts using speech and iconic gestures; attempts using speech and deictic gestures; attempts using speech and both types of gestures; attempts using speech only. The following figure and tables represent these attempts. An attempt is an equivalent to a sentence. Therefore, a child might have used two gestures in one sentence; however, it was labeled as one attempt. First, the attempts per story are shown. As is displayed in figure 5, the first graders had more attempts.

![Figure 5. Attempts using speech, gestures, and both for each story](image_url)
Figure 5 demonstrates that the first graders had more attempts in each story with the exception of story 2 where the advanced kindergarteners had more attempts. Additionally, the beginner kindergarteners had the least amount of attempts overall.

The attempts using only deictic or iconic gestures without speech are shown in figure 6. It is important to note that only the beginner kindergarten group had gesture only attempts. Table 4 indicates there was no significant difference revealed in the statistics tests for deictic or iconic gesture only attempts.

![Figure 6. Gesture Only Attempts](image)

As shown in figure 6, the beginner kindergarteners were the only group to attempt disambiguation with gesture only. However, they had few gesture only attempts and only relied on this strategy in stories two and three.
Table 4.

*Significance for Gesture Only Attempts*

<table>
<thead>
<tr>
<th>Gesture Type and Story</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1 Deictic</td>
<td>1.000</td>
</tr>
<tr>
<td>Story 1 Iconic</td>
<td>1.000</td>
</tr>
<tr>
<td>Story 2 Deictic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 2 Iconic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 3 Deictic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 3 Iconic</td>
<td>1.000</td>
</tr>
<tr>
<td>Total Deictic Attempts</td>
<td>.368</td>
</tr>
<tr>
<td>Total Iconic Attempts</td>
<td>.368</td>
</tr>
</tbody>
</table>

The statistic test showed no significant difference between the gesture types and each story.

When looking at both speech and gesture attempts, this study found instances where the children were attempting to disambiguate the homonym with both types of gestures. Therefore, there are three categories for speech and gesture for each story: 1) speech and deictic gesture; 2) speech and iconic gesture; 3) speech and both types of gestures. A clear example of one attempt using two types of gestures is when Habib, a beginner kindergartner, said “bat (points to picture of animal) and ball (places palms together and laces fingers to represent a ball).”
Figure 7 shows the bar graphs for the gesture and speech attempts. The bar graph displays all the stories with the type of attempt and the total amounts. Table 5 shows that there was a significant difference between the groups in attempting to disambiguate the homonyms using both types of gestures.

![Bar Graph](image)

**Figure 7.** Speech and Gesture Attempts

The first grade subjects had the most speech and deictic attempts. Only the beginner kindergarteners used iconic gestures and both types of gestures to attempt disambiguating the homonyms. Also, figure 6 shows that the beginner kindergarteners were the only group to use gestures in story three.
Table 5.

*Significance of Speech and Gesture Attempts*

<table>
<thead>
<tr>
<th>Story and Gesture/Speech</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1 Speech and Deictic</td>
<td>.175</td>
</tr>
<tr>
<td>Story 1 Speech and Iconic</td>
<td>1.000</td>
</tr>
<tr>
<td>Story 1 Speech and Both Gesture</td>
<td>.050*</td>
</tr>
<tr>
<td>Story 2 Speech and Deictic</td>
<td>.920</td>
</tr>
<tr>
<td>Story 2 Speech and Iconic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 2 Speech and Both Gesture</td>
<td>1.000</td>
</tr>
<tr>
<td>Story 3 Speech and Deictic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 3 Speech and Iconic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 3 Speech and Both Gesture</td>
<td>1.000</td>
</tr>
<tr>
<td>Total Speech and Deictic</td>
<td>.368</td>
</tr>
<tr>
<td>Total Speech and Iconic</td>
<td>.368</td>
</tr>
<tr>
<td>Total Speech and Both Gesture</td>
<td>.368</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.

Table 5 exhibits a significant difference in story 1 between the participants using speech and both types of gestures among the other stories. The last category of attempts is speech only attempts. The beginner kindergarteners had the least amount of speech only attempts, whereas the first graders had the most speech only attempts. Figure 8
indicates that the beginner kindergarteners had only one speech attempt and the first graders had 15 speech attempts.

![Figure 8. Speech Only Attempts](image)

It is notable in figure 8 that the beginner kindergarteners really struggled with verbalizing the disambiguations compared to the more proficient advanced kindergarteners and the older first graders. However, the statistics test revealed no significant differences, which is exhibited in table 6.
Table 6.

*Significance of Speech Attempts*

<table>
<thead>
<tr>
<th>Story</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1</td>
<td>.214</td>
</tr>
<tr>
<td>Story 2</td>
<td>.080</td>
</tr>
<tr>
<td>Story 3</td>
<td>.238</td>
</tr>
<tr>
<td>Total</td>
<td>.368</td>
</tr>
</tbody>
</table>

Successes at Resolving the Ambiguity

This study will present the successes the groups of children had in resolving the lexical ambiguity. Again, these successes are divided into four groups: the overall successes using speech, gesture, or speech and gesture; successes using only deictic or iconic gestures; successes using speech and iconic gestures; successes using speech and deictic gestures; successes using speech and both types of gestures; speech only successes. However, no child successfully explained the difference between the homonyms using gesture only or both types of gestures and speech; therefore, the data for successes using deictic and iconic gestures and speech and both types of gestures were excluded. This study categorized the strategies into different levels. By categorizing the different strategies, it assisted the researcher in understanding which attempts were successful and which were unsuccessful. The successful disambiguations came from level two and three. The following are descriptions of the different levels:
Level 0: The child had no success at disambiguating the homonyms. The child often pointed or did not acknowledge the homonym at this level.

Level 1: The child tried to describe the differences but struggled to clarify the distinction to the listener.

Level 2: The child made it clear that the two words were different. However, they had to be prompted to express the difference.

Level 3: The child was fully aware that the two words had separate meanings and could disambiguate them together in one sentence.

Table 7 indicates examples of attempts at disambiguations at each level. The examples represent actual utterances and gestures from the participants in the study.
Table 7.

Examples of the Level of Successes

<table>
<thead>
<tr>
<th>Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0</td>
<td>That (points to animal bat)</td>
</tr>
<tr>
<td></td>
<td>That (points to baseball bat)</td>
</tr>
<tr>
<td>Level 1</td>
<td>It’s a fat bat (pointing to baseball bat) and bat bat (pointing to animal bat).</td>
</tr>
<tr>
<td>Level 2</td>
<td>(points to drinking glass) This holds water.</td>
</tr>
<tr>
<td></td>
<td>(points to eye glasses) This makes people see.</td>
</tr>
<tr>
<td>Level 3</td>
<td>A mouse is on the computer (iconic gesture representing moving a computer mouse).</td>
</tr>
</tbody>
</table>

It is important to note that this research did not limit the amount of times a participant could resolve the lexical ambiguity. A child could have multiple unsuccessful attempts and multiple successful attempts at disambiguating the homonym in one story. Therefore, to account for this, the number of attempts were divided by the total successes. This gave a number between 0-1 and this study will refer to this number as rate of success. Furthermore, this number better explains what group had the most successes in each category. First, the raw number of successes for each group is presented with the results from the Kruskal-Wallis test and then the rate of success is shown. As is displayed in figure 9, the first graders had the greatest amount of success at disambiguating the
homonyms. The beginner kindergartens were the only group to have no successes in story one.

Figure 9. Successes Using Speech, Gesture, and Both

Figure 9 demonstrates that the beginner kindergarteners really struggled. The bar graphs show that the first graders excelled at disambiguating the homonyms compared to the other two groups.
Table 8.

*Significance of Successes*

<table>
<thead>
<tr>
<th>Story</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1</td>
<td>.417</td>
</tr>
<tr>
<td>Story 2</td>
<td>.358</td>
</tr>
<tr>
<td>Story 3</td>
<td>.238</td>
</tr>
<tr>
<td>Total</td>
<td>.368</td>
</tr>
</tbody>
</table>

There were no significant differences between the raw numbers of successes.

Here the rate of successes is shown in figure 10. The first graders had the highest rate of success at .69 and the beginner kindergarteners had the lowest rate of success at .28.
Figure 10. The Rate of Success

The successes with gestures and speech are presented. It is important to mention that no child resolved the lexical ambiguity using speech and both types of gesture; therefore, this bar graph only represents the successes using speech and deictic gestures and speech and iconic gestures. The Kruskall-Wallis test showed no significant differences; however, figure 11 displays that the first graders had three times the amount of successful attempts using deictic gestures and speech compared to the other groups.
As shown in figure 11, the first graders employed successful speech and deictic strategies in stories one and two; however, they did not use gestures in story three. The advanced kindergarteners only used successful gestures in story two. Additionally, the beginner kindergarteners used successful gestures in stories two and three; more importantly, they used successful deictic and iconic gestures to disambiguate the homonyms in story three.
Table 9.

*Significance of Speech and Gestures Successes*

<table>
<thead>
<tr>
<th>Story</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1 Speech and Deictic</td>
<td>.202</td>
</tr>
<tr>
<td>Story 1 Speech and Iconic</td>
<td>1.000</td>
</tr>
<tr>
<td>Story 2 Speech and Deictic</td>
<td>.535</td>
</tr>
<tr>
<td>Story 2 Speech and Iconic</td>
<td>1.000</td>
</tr>
<tr>
<td>Story 3 Speech and Deictic</td>
<td>.287</td>
</tr>
<tr>
<td>Story 3 Speech and Iconic</td>
<td>.287</td>
</tr>
<tr>
<td>Total Speech and Deictic</td>
<td>.368</td>
</tr>
<tr>
<td>Total Speech and Iconic</td>
<td>.368</td>
</tr>
</tbody>
</table>

Table 9 displays the Kruskall-Wallis results for speech and gesture successes; however, there are no significant differences between the successes of speech and gestures in the stories.

The successes with speech are shown below. Again, there were no significant differences; but the bar graphs in figure 12 exhibit that the first graders had a higher amount of speech successes compared to the kindergarten subjects.
As noted in figure 12, the beginner kindergarteners only had one speech success, the advanced kindergarteners had five speech successes and the first graders had a notable amount of speech successes at twelve.

Table 10.

Significance of Speech Successes

<table>
<thead>
<tr>
<th>Story</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1</td>
<td>.577</td>
</tr>
<tr>
<td>Story 2</td>
<td>.384</td>
</tr>
<tr>
<td>Story 3</td>
<td>.180</td>
</tr>
<tr>
<td>Total Speech</td>
<td>.368</td>
</tr>
</tbody>
</table>
Table 10 indicates there were no significant differences in the Kruskall-Wallis results.

Interpretations

The research questions in this study focused on two different areas of children acquiring English as a second language: gestures and lexical ambiguity. Previous studies have focused little attention on ESL children in these aspects. In this section, the main findings will be discussed in relation to the research question.

Research Question 1

Do kindergarten children enrolled in the beginning level ELL class use more deictic gestures when disambiguating homonyms compared to the intermediate/advanced kindergarten and first grade ELL children?

The initial hypothesis was that the ESL children with lower-level proficiency of English would use more deictic gestures to resolve the lexical ambiguity when compared to the higher-level and older ESL children. To examine this question more closely, this study compared the beginner kindergarten students with the advanced kindergarten students and the beginner kindergarteners with the first graders. To answer the research question, the study looked more closely at the following: the overall amount of deictic and iconic gestures the child produced during the story-retelling; the number of attempts using gesture alone or gestures and speech; and the number of successes using gesture and speech. Even more importantly, the rate of success using gesture and speech is evaluated and discussed.
Figure 13 compares the gestures used between the beginner kindergarteners and first graders; figure 14 compares the gestures used between the beginner and advanced kindergarteners. As is displayed in figure 13, the first graders demonstrated a higher use of deictic gestures when attempting to disambiguate the homonyms. Figure 14 shows that both kindergarten groups exhibited the same amount of deictic gestures when attempting to disambiguate the homonyms. Both figures present that the beginner kindergarteners were the only group to use iconic gestures.

Figure 13. Comparing Speech and Gesture Attempts in Beginner Kindergarteners and First Graders
Looking at the results in figures 13 and 14, it is evident that the more proficient kindergarteners and the older first graders actually used the same amount of deictic gestures to retell the stories. Equally apparent is that the first graders had more deictic and speech attempts than the beginner kindergarteners. These results indicate that the lower English proficient children did not use more deictic gestures when retelling the stories or when disambiguating the homonyms. Nevertheless, the results do show a measurable difference in the beginner kindergarteners using the gesture only attempts and more specifically using iconic gestures more often than deictic gestures.

The beginner kindergarteners were the only group to use iconic and deictic only attempts when trying to disambiguate the homonyms, whereas neither the first graders nor the advanced kindergarten group used this strategy. Furthermore, the beginner
kindergarteners were the only group to use any iconic gestures throughout the study. Discussion on whether deictic gestures or iconic gestures are related to lower level language learners is presented later in this chapter. Closer examination on the successes for gestures and speech between the groups is presented in the bar graphs in figures 15 and 16. In the bar graphs below, it is clear that the first graders actually had more successes using deictic gestures and speech to resolve the lexical ambiguity.

Figure 15. Gesture and Speech Success of Beginner Kindergarteners and First Graders
The bar graphs in figures 15 and 16 represents the success rate for speech and gestures. Again this number is formulated by dividing the number of successes with the attempts. For example the total of speech and deictic successes were divided by the total speech and deictic attempts. As displayed in figure 17 below, the first graders had the highest rate of success using speech and deictic gesture, whereas the beginner kindergarteners were the only group to have success in using iconic gestures and speech.
The success rates in figure 17 demonstrate an even clearer view that there is no significant difference between the groups using deictic gestures with homonyms. The success rate even shows that first graders had more successes with solving the lexical ambiguity with deictic gestures. However, these results do propose that there is a difference between iconic gestures and proficiency levels.

Past research indicates deictic gestures are related to the development of vocabulary in children (Iverson, Capirci, Volterra, & Goldin-Meadow, 2008). Furthermore, Kidd and Holler’s (2009) study showed that the younger children use significantly more deictic gestures to disambiguate homonyms when compared to older children. However, past research focuses on English monolingual children and presents little evidence that this occurs for L2 learners of English. Furthermore, the study by Iverson, Capirci, Volterra, and Goldin-Meadow (2008) had two groups: American
children and Italian children. The American children had larger vocabularies and more deictic gestures, whereas the Italian children had far more iconic gestures with smaller vocabularies. Thus, the conclusion was deictic gestures are related to vocabulary size in young children. But, Italian children do develop into competent speakers with large vocabularies. Could this mean that monolingual English children use more deictic gestures that relate to vocabulary and other languages use different gestures?

To make this point more clear, some of the children recognized the ambiguity during the reading of the story. Some of the children did this through speech and others did this through gestures. For example, during the third story, Aden asked aloud, “But, why are there two mouses?” More importantly, the beginner kindergarteners performed twenty iconic gestures during the story reading. For example, during the second story, Habib represented drinking glasses by putting his index finger to his thumb, forming circles, which he placed in front of him similar to setting glasses on a table. Then, to represent eyeglasses he formed the same gesture but placed them over his eyes. Mahmoud represented throwing a baseball when the word *bat* was read during story one.

Mahmoud and Habib spoke mostly in nouns and struggled to form sentences. Despite their spoken language abilities, their use of iconic gestures demonstrated their ability to comprehend the language. While the iconic gestures aided the reader in realizing they understood the story, the iconic gestures alone did not make the meaning between the homonyms clear to the listener. However, with the use of gestures and speech, Mahmoud and Habib were able to solve some of the ambiguities, but their total of successes were lower compared to the older children.
Mahmoud and Habib had been studying English for four months at the time of the study. Their parents revealed that they rarely speak English at home but the children do use some nouns at times. Past research indicates that gestures precede and predict the onset of speech, and it is clear in Mahmoud and Habib’s case that while they couldn’t speak the language their gestures did tell the researcher that they comprehended the story. These results suggest that in Arabic speaking children learning English as a second language iconic gestures may be more prevalent and useful at the early stages of speech development. The iconic gestures displayed their knowledge of the topic but iconic gestures alone could not differentiate the meaning between the two homonyms for the listener.

Research on monolingual children suggests that children use iconic gestures only after they have learned the meaning of a word (Behne, Carpenter & Tomasello 2014; Özçalişkan, Gentner, & Goldin-Meadow 2014). More importantly, research indicates that when children ages two to four are tested on the meanings of iconic gestures, the older participants have the most success with comprehending the iconic gestures (Stanfield, Williamson, & Özçalişkan 2014). The children in this study were five to seven years old; thus, they were at the age where they can understand iconic gestures. Because Mahmoud and Habib were using iconic gestures during the story reading and retelling, this study suggests it is possible that they understood the meaning of the word. Therefore, these results suggest ESL children may use iconic gestures to fill in the gaps of their spoken vocabularies. Furthermore, it demonstrates they are using iconic gestures for both receptive and productive vocabulary.
The results of this study do support past research that lower level language learners might use gestures to compensate for their lack of vocabulary and gestures can assist learners in communicating their ideas (Cotrău, 2009; Nicoladis, Pika, Yin, & Marentette 2007; Sherman & Nicoladis, 2004). Table 11 compares the gesture rates between the three groups. The table indicates that the beginner kindergarteners had the highest gesture rate in each story.

Table 11.

*Gesture Rate*

<table>
<thead>
<tr>
<th>Group</th>
<th>Gesture Rate Story 1</th>
<th>Gesture Rate Story 2</th>
<th>Gesture Rate Story 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten-</td>
<td>18.6</td>
<td>18.1</td>
<td>13.8</td>
</tr>
<tr>
<td>Beginners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten-</td>
<td>8.6</td>
<td>3.3</td>
<td>4.09</td>
</tr>
<tr>
<td>Advanced</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Graders</td>
<td>8.1</td>
<td>4.27</td>
<td>0</td>
</tr>
</tbody>
</table>

In all three stories, the beginner kindergarteners had a notably higher gesture rate compared to the other three groups. The beginner kindergarteners used fewer words and more gestures to compensate for their lack of spoken language abilities. Even more importantly, the Kruskall-Wallis test showed a significant difference (.05) between all three groups for story two in iconic gestures and a significant difference (.05) between all
three groups for story number one in attempting to disambiguate the homonyms with speech and both types of gestures. Therefore, this study supports the idea that children learning English as a second language might use gestures to compensate for their lack of language abilities and to aid in resolving lexical ambiguity. However, deictic gestures, which are often exhibited by younger English monolingual children, may not be the significant type of gesture these children produce. Iconic gestures might better represent Arabic children learning English as an L2 compensating for a lack of ability in the target language.

*Research Question 2*

Do children enrolled in the first grade ELL class have more successes using gestures and speech to resolve the lexical ambiguity when compared to lower level learners?

The present studied compared the number of successes by dividing the successes by the attempts. Then, the successes were totaled in each story to compare the differences to answer research question two.

Table 12.

*Overall Success Rate*

<table>
<thead>
<tr>
<th>Group</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner-Kindergarteners</td>
<td>.28</td>
</tr>
<tr>
<td>Advanced-Kindergartners</td>
<td>.35</td>
</tr>
<tr>
<td>First Graders</td>
<td>.69</td>
</tr>
</tbody>
</table>
Table 12 shows that the older children could resolve the lexical ambiguity with more successes using speech and gestures. More importantly, this research supports past research that argues that older children will resolve lexical ambiguity more successfully than younger children (Doherty, 2004; Mazzocco, 1999; Mazzocco, Myers, Thompson, & Desai, 2003; Kidd & Holler, 2009). However, past research indicates that younger children do not have the essential metacognitive abilities to resolve the lexical ambiguity (Mazzocco, Myers, Thompson, & Desai, 2003). The results in this study support the argument that the first graders might have solved the lexical ambiguity due to age related metacognitive skills. The first graders were possibly more aware of strategies to employ to disambiguate the homonyms. Children are explicitly taught the difference in homonyms starting in kindergarten. However, at the time of the study, there is a possibility that the kindergarten children had had little instruction on homonyms. Additionally, the first graders had more success with speech disambiguations; thus, it is possible that their proficiency in spoken language assisted them in disambiguating the homonyms.

This study also looks at the fact that the children are second language learners. The advanced kindergarteners were slightly better at resolving the lexical ambiguity when compared to the beginner kindergarteners. More importantly, parents of six of the eight children in this study indicated that their child had only begun to learn English at the start of the school year. Therefore, these children should be at the same level of English, with the exception of Majid, a first grader who was in his second year of studying English and Shula, a first grader who had been studying English for four years.
Looking at the results, this strongly suggests that age and language abilities play a role in solving lexical ambiguity. However, it was evident that the younger children understood the difference but could not clearly define the differences to the listener. Therefore, this study argues that age and language skills might work together to help children articulate the differences in homonyms to a third person.

Past research indicates that metacognitive abilities and age related metacognitive skills play a role in English monolingual children’s abilities to disambiguate homonyms (Mazzocco, 1999, & Doherty, 2004). However, the idea that language proficiency in the target language can also affect their success at resolving the ambiguity has not been examined. The present study had to account for both of these variables. Thus, this study will now look at individual children.

Mahmoud, Habib, and Laela’s parents indicated that they had only begun to learn English at the start of the school year. At the time of the study, they had been learning English for four months; however, Mahmoud and Habib were in the beginner kindergarten ESL group and Laela was in the first grade beginner/intermediate ESL group. However, Laela had a higher success rate than the other two younger children. Table 13 displays the difference between success rates for the three subjects. Laela had the highest rate of success even though she had started learning English at the same time as the beginner kindergarten group.
Table 13.

*Success Rates of Three Participants*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahmoud</td>
<td>.5</td>
</tr>
<tr>
<td>Habib</td>
<td>.2</td>
</tr>
<tr>
<td>Laela</td>
<td>.71</td>
</tr>
</tbody>
</table>

These results suggest that age does play an important part in resolving lexical ambiguity. Furthermore, Laela did not have to use iconic gestures to retell the story or to resolve the lexical ambiguity, whereas Mahmoud and Habib had to use iconic gestures to fill in the missing gaps of their spoken vocabularies.

Mahmoud, Habib, Ahmad, and Aden were all the same age at the time of the study. Ahmad and Aden were in the advanced kindergarten class; therefore, their language skills were higher than Mahmoud and Habib’s. As shown in table 14, there was not a significant difference between the lower proficient group and the more proficient group.
Majid and Shula were in their second year of English only education at the time of the study. Even though Laela had only begun to learn English, she was still able to resolve the ambiguities similar to Majid and Shula. Table 15 indicates that Laela actually had a higher rate of success than Shula. However, it is not very significant.

When looking at all the success rates together, the only participant to come close to a first grade success rate was Aden, a more advanced kindergartener. Table 16 shows...
the participants in order from the lowest success rate to the highest success rate. As is in table 16, Ahmad the advanced kindergartener has the lowest success rate whereas Majid, a first grader had the highest success rate. Therefore, these results suggest that the first graders compared to the kindergartens were able to solve more ambiguities because of age related metacognitive skills and that they were more proficient in the target language.

Table 16.

*Success Rates of All Participants: Lowest to Highest*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Success Rate</th>
<th>Group</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmad</td>
<td>.1</td>
<td>Advanced</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kindergarten</td>
<td></td>
</tr>
<tr>
<td>Habib</td>
<td>.2</td>
<td>Beginner</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kindergarten</td>
<td></td>
</tr>
<tr>
<td>Mahmoud</td>
<td>.5</td>
<td>Beginner</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kindergarten</td>
<td></td>
</tr>
<tr>
<td>Aden</td>
<td>.6</td>
<td>Advanced</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kindergarten</td>
<td></td>
</tr>
<tr>
<td>Shula*</td>
<td>.64</td>
<td>First Grade</td>
<td>7</td>
</tr>
<tr>
<td>Laela</td>
<td>.71</td>
<td>First Grade</td>
<td>7</td>
</tr>
<tr>
<td>Majid*</td>
<td>.8</td>
<td>First Grade</td>
<td>7</td>
</tr>
</tbody>
</table>

* Indicates the child was in their second year of an English only school.
In the study by Kidd and Holler (2009) the five year olds were able to employ more speech only strategies to resolve the lexical ambiguity. The results in the present study indicate that the more proficient children were able to explain the differences in the homonyms by using speech only successes. As is exhibited on table 17, the beginner kindergarteners had the highest rate of success using speech only; nevertheless, the beginner kindergarteners had one speech only attempt and success. Therefore, the number is misleading and the first graders really demonstrated a higher relationship between speech and successful disambiguations. This demonstrates that spoken language abilities do indeed play a role in resolving lexical ambiguities because the first graders were able to fully communicate the meanings between the homonyms.

Table 17.

*Speech Only Success Rates of Groups*

<table>
<thead>
<tr>
<th>Group</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner Kindergarteners</td>
<td>1</td>
</tr>
<tr>
<td>Advanced Kindergarteners</td>
<td>.35</td>
</tr>
<tr>
<td>First Graders</td>
<td>.8</td>
</tr>
</tbody>
</table>

This research created a rubric for examining the multiple strategies that the children employed to successfully disambiguate the homonyms. This study did not ask a question specifically relating to the approaches ESL children take to differentiating homonyms; however, the data collected can draw upon these strategies. Figure 18
displays each group’s categorized attempts by the levels. As shown in figure 18, the first
graders had the most attempts in levels two and three.

![Figure 18. Each Group’s Attempts Categorized into Levels of Success]

Figure 18 clearly shows that the first graders were able to employ more strategies
that fell into level two and three, which are the most successful levels, whereas both
kindergarten groups had a strong relationship between their attempts at level 1. This
demonstrates that kindergarten children may not be able to access the higher levels
because of age related metacognitive abilities and language abilities.

Chapter Summary

This chapter first presented statistical results and bar graphs to answer the
research questions and then discussed the interpretations of the data. These results
supported past research that L2 learners use gestures when re-telling stories. Specifically,
iconic gestures were often utilized by the beginner kindergarten learners. However, these results do not support past research that younger children use more deictic gestures to resolve lexical ambiguity. Furthermore, the results do support past research that indicates that older children have more successes in resolving lexical ambiguity, possibly due to age related metacognitive skills. More importantly, the older children were able to solve the ambiguities with more speech successes whereas the younger children had to use more gestures and speech to resolve the ambiguity. The next chapter will present the conclusions, the study’s implications, contribution, limitations and recommendations for further research will be presented.
CHAPTER 5: CONCLUSIONS

Summary of Thesis

This study focused on gestures children learning English as a second language use to resolve lexical ambiguity. The data and results presented in Chapter Four provide implications for the research questions in this study. The majority of research associated with children using gestures or solving lexical ambiguity focuses on monolingual children. This left a need for more research in these areas for understanding gestures and lexical ambiguity in ESL children; therefore, this study was conducted. This chapter is divided into the following sections: summary of the thesis, contributions of this study, limitations of the present study, recommendations for further research, and a conclusion for the chapter. The present study addressed two research questions:

1) Do kindergarten children enrolled in the beginning level ELL class use more deictic gestures when disambiguating homonyms compared to the intermediate/advanced kindergarten and first grade ELL children?

2) Do children enrolled in the first grade ELL class have more successes using gestures and speech to resolve the lexical ambiguity when compared to lower level learners?

Chapter One presented the introduction. This included background knowledge in the topic, key terms, and the significance of the study. The research questions and the hypotheses were presented. Furthermore, chapter one outlined the thesis and gave a brief description for each chapter.

Chapter Two focused on the literature involving gestures used by monolingual children, gestures in second language acquisition, gestures used by Arabic speakers and
research on lexical ambiguity. Chapter Two pointed out that there was a gap in the literature regarding the way ESL children use gestures and speech to resolve lexical ambiguity; the present study was designed to fill this gap.

Chapter Three described the methodology. This included the description of participants, procedure, and analyses of data.

Chapter Four presented the results and the interpretations of the results. The interpretations were formulated and discussed in relation to the research questions and other findings were also discussed. The results indicated that the lower proficient English speakers indeed tended to gesture more in retelling stories. More importantly, the results showed that iconic gestures might be more prominent in Arabic speaking child learners of English who are struggling to communicate in their L2. While the iconic gestures could not resolve the lexical ambiguities to a third person, they did demonstrate the child’s comprehension during the reading of the stories. Furthermore, the results showed that metacognitive skills related to age and language abilities play a role in ESL children resolving lexical ambiguity. As a result, the first graders had more successes than the beginner kindergartners at resolving the lexical ambiguity and the advanced kindergarteners had a slight increase in resolving the lexical ambiguity when compared to the beginner kindergarteners.

Contributions

This study offers four contributions to the area of ESL children using gestures to resolve lexical ambiguity. The first contribution that this thesis made is that it added empirical findings in the area of gestures in children learning English as a second
language. There is limited research on gestures children use in their L2. Furthermore, it shed light on lexical ambiguity in children who are L2 speakers of English.

The second contribution is to the area of gestures in Arabic-English speakers. There is an evident lack of research in the gestures that Arabic speakers use in their native and second language. The third contribution is to the types of gestures ESL children use when disambiguating homonyms and retelling stories. Past research demonstrates that younger children use more deictic gestures to differentiate the two homonym meanings when they are unable to articulate the differences in speech (Kidd & Holler, 2009). However, this study demonstrated that younger children with lower English abilities used more iconic gestures. Therefore, iconic gestures might help ESL children overcome the difficulties of using spoken language. Iconic gestures may help them communicate their ideas more clearly because iconic gestures represent real world objects. The example that follows shows that Mahmoud, a beginner kindergartener, was able to use deictic and iconic gestures to aid him in articulating his ideas for retelling story one. Mahmoud, “It goes (points to picture of animal bat and baseball bat) bat (forms hands to represent the wings of a bat) boom (takes arm and mimics swinging a baseball bat).”

Mahmoud was not able to verbalize that the baseball bat hit the animal bat; however, his use of iconic gestures aided him in trying to explain the situation between the two homonyms for the listener. The iconic gestures presented a visual representation for the listener. Another example illustrates Habib, the other beginner kindergartener, using deictic and iconic gestures without speech when he didn’t know the word for a
homonym. When asked, “how many glasses?” Habib responded with first pointing to the picture of the girl wearing eye glasses, then formed circles with his index finger and thumb, and he placed them over the girl’s face to represent eye glasses. While Habib understood the word glasses, his use of iconic gestures suggests he was struggling to articulate the word alone to the listener.

The fourth contribution is to the literature on ESL children resolving lexical ambiguity. There is a lack of research on how children learning English as a second language attempt to disambiguate homonyms. This study created a rubric for categorizing the success of each attempt. Furthermore, this study explored whether language abilities or age affect a child learning English as a second language to resolve the lexical ambiguity. The results demonstrate that both language abilities and metacognitive skills affect the child. The beginner kindergarteners struggled to resolve the ambiguity, whereas the advanced and more proficient kindergartners had only a slightly higher success rate than the beginner kindergarteners. However the older and more proficient first graders were able to resolve almost all the ambiguities in the stories. Therefore, both language abilities and age-related metacognitive skills appear to play a role in determining how well ESL children will resolve the lexical ambiguity. The following dialogue between the assistant and Shula demonstrate a clear example of how her spoken language abilities and her awareness of words having two meanings helped her solve the lexical ambiguity.

Shula: Sam was doing his homework on the computer. Suddenly, he heard a sound. He saw a mouse. And then the mouse ran over the mouse.

Assistant: The mouse ran over the mouse? What does that mean?
Shula: Because they’re both the same words?
Assistant. Yeah, because they’re both the same words. Do they mean the same thing?
Shula: No.
Assistant: So how are they different?
Shula: Because one is a mouse and another is a computer mouse.

Shula appeared to have a higher awareness that the words are homonyms. She was also able to use speech to explain this to the listener.

When, Ahmad, an advanced kindergartener, was presented with resolving the ambiguity in eyeglasses and drinking glasses, he concluded that there was only one type of glasses; even though, he mentioned the two glasses in his story retelling.

Ahmad: He’s eating cookies. His mom wears her new glasses. She was washing her plates and glasses. Her glasses falled off.
Assistant. Wait. Two glasses?
Ahmad: No one glass.
Assistant. But you said two glasses. I don’t understand.
Ahmad: No, I don’t have two eyes. It’s only one, two. It’s not three. All of us. I don’t have lots of eyes like a monster.

Ahmad had a large vocabulary and didn’t need to compensate by using gestures.
However, he demonstrated that he had little awareness that the word had two meanings.
Even though he used the word twice, he was not aware it had two meanings; therefore, he
resorted in saying that there was one type of glasses. These contributions are important for further research in this area.

Limitations

Kidd and Holler (2009) recruited 61 children to participate in their study. However, the present study did not have access to a large amount of ESL children aged five to seven. Therefore, the conclusions are based on a limited number of children. The present study did not take into account the gestures the child uses in their L1. To the best of my knowledge, there are no articles on the gestures Arabic speaking children use; thus, there could be no conclusion drawn on whether the children were transferring gesture patterns from their first to second language. In addition, this study did not focus on gestures children use to tell a story without homonyms. The question as to whether homonyms or the difficulty to retell a story affect the use of gestures in ESL children is yet to have been answered. Finally, this study did not account for whether the child knew the vocabulary present in the story or not. For example, baseball is an American game and the children seemed to lack this concept at times. During the reading, some even asked, “What is baseball?” Therefore, if they didn’t know the vocabulary before the reading then they might have been using gestures to compensate for their lack of vocabulary and not for the homonym pairs.

Recommendations for Further Research

This study provided a foundation for future studies on gestures children use to resolve lexical ambiguity. This study presents several recommendations for further research on this topic. First, research should be done on the types of gestures these
children use in their L1. Research has shown that speakers may transfer gesture use from their L1 to L2 (Nicoladis, Pika, Yin & Marentette, 2007; Nicoladis & Merentette, 2011; Gullberg 2009; Pika, Nicoladis, & Merentette 2006); thus, by having the children retell similar stories in their L1 and L2 more insights can be gained about the use of their gestures in English. Even more important than this would be research on gestures the children use to disambiguate homonyms in their L1 compared to homonyms in their L2.

Second, more research on the use of ESL children using gestures in story retelling is needed. This study focused on how the children used gestures in L2 stories containing homonyms. However, the question remains whether the children’s use of gestures was driven by the presence of homonyms or because the children struggled in retelling the stories. Further research in this area is needed to better examine this question.

Conclusion

Gestures are an important part of language development in children (Iverson & Goldin-Meadow, 2005; Iverson, Capirci, Volterra, & Goldin-Meadow, 2008; Özçalışkan & Goldin-Meadow, 2005). Gestures aid second language learners’ speech (Cotrău, 2009; Nicoladis, Pika, Yin & Marentette, 2007; Sherman & Nicoladis, 2004). Gestures can even help children and adults comprehend language and memorize words in L2 (Khalil, Rahmany, & Zarei, 2014; Sueyoshi & Hardison, 2005). Monolingual children struggle with the ambiguity of homonyms and research suggests that this corresponds to age-related metacognitive abilities (Dohery, 2004; Mazzocco, Myers, Thompson, & Desai, 2003). However, there is a lack of research on gestures and lexical ambiguity in L2.
English speaking children. Therefore, the research presented in this thesis helps fill this gap in the literature.

The results demonstrated that beginner kindergarteners had a higher rate of gestures in story retelling than the more proficient advanced kindergartners and the older first graders. Therefore, this thesis supports past research that L2 speakers use gestures to compensate for their lack of spoken language abilities. Gestures assisted the children in retelling the stories. Even though their gestures alone were confusing to the listener, their gestures did demonstrate their comprehension of the story to the person who read the story.

Also, the results indicated that the younger children struggled to resolve the lexical ambiguity. The first graders had a high success rate when compared to both kindergarten groups. The results also indicate that both age-related metacognitive abilities and language proficiency affect the disambiguation of homonyms. This is supported by the advanced kindergartners having a slight increase in success when compared to the beginner kindergarteners. Even though they are the same age, the more proficient kindergarteners did not struggle as often with the ambiguities as the lower proficient kindergarteners. The fact that the first graders resolved the ambiguities with such a high rate of success suggests that they could resolve the lexical ambiguities since they were older and more proficient in English.

Furthermore, the results showed a difference between the use of deictic and iconic gestures. Past studies have noted an increase in deictic gestures for monolingual children who are struggling with communicating their ideas through speech. However, this study
suggests that children who speak Arabic as an L1 and English as an L2 use more iconic gestures when they are struggling to verbalize. This is demonstrated by the fact that the beginner kindergarteners were the only participants to use iconic gestures throughout the study.

This study has contributed to the research into gestures and lexical ambiguity in Arabic speaking children learning English as a second language. This chapter acknowledges the thesis’s limitations and provides recommendations for further research. In conclusion, this study presents evidence that gestures are important in child ESL learners and can assist them in resolving lexical ambiguity.
REFERENCES


Ohio Department of Education. (2010). *Ohio English proficiency standards for limited English proficiency students*. Columbus, Ohio.


APPENDIX A: QUESTIONNAIRE TO PARENTS

Name of child: ________________________

Dear parents,

Thank you for allowing your child to participate in my study. His or her contribution to the field of linguistics is greatly appreciated! I would like to learn more about your child’s language background. This information will be kept confidential. Please fill out the questionnaire below and return to the ELL teacher.

Thank you,
Michelle Ray
ev279908@ohio.edu

What is your home country?
________________________________________________________________

What is your child’s first language?
________________________________________________________________

What is your child’s age?
________________________________________________________________

How long has your child been studying English?
________________________________________________________________

Before the 2014 school year, had your child attended other English classes?
________________________________________________________________

How often does your child speak English outside of school?
________________________________________________________________
APPENDIX B: INSTITUTIONAL RESEARCH BOARD APPROVAL

The following research study has been approved by the Institutional Review Board at Ohio University for the period listed below. This review was conducted through an expedited review procedure as defined in the federal regulations as Category(ies):

6 7 0

Project Title: Gestures in Children Learning English as a Second Language

Primary Investigator: Elizabeth Michelle Varney
Co-Investigator(s):

Faculty Advisor: Scott Jarvis
(If applicable)
Department: Linguistics

Rebecca Cale, AAB, CIP
Office of Research Compliance

Approval Date: 5/15/14
Expiration Date: 5/14/15

This approval is valid until expiration date listed above. If you wish to continue beyond expiration date, you must submit a periodic review application and obtain approval prior to continuation.

Adverse events must be reported to the IRB promptly, within 5 working days of the occurrence.

The approval remains in effect provided the study is conducted exactly as described in your application for review. Any additions or modifications to the project must be approved by the IRB (as an amendment) prior to implementation.
APPENDIX C: AMENDMENT APPROVAL

The amendment, detailed below, and submitted for the following research study has been approved by the Institutional Review Board at Ohio University.

Project: Gestures in Children Learning English as a Second Language

Amendment: Addition of 1st graders as participants; Change to researcher surname due to marriage

Primary Investigator: Elizabeth Michelle Varney Ray
Co-Investigator(s):

Advisor: Scott Jarvis
(If applicable)

Department: Linguistics

Rebecca G. Cale, AAB, CIP
Office of Research Compliance

Protocol Expiration Date: 5/14/2015

Date 9/30/14