

**PHYSICAL ENGAGEMENT IN NURSERY RHYMING GAMES IN
ORAL, PRINT AND DIGITAL MEDIUMS: DATA MATRIX**

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The Academic Faculty

by

Griva Patel

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**PHYSICAL ENGAGEMENT IN NURSERY RHYMING GAMES IN
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Approved by:

Research Project Lead: Dr. Krystina Madej, Advisor
School of Literature, Media, and Communication
Georgia Institute of Technology

Dr. Lisa Yaszek
School of Literature, Media, and Communication
Georgia Institute of Technology

Dr. Angela Dalle Vacche
School of Literature, Media, and Communication
Georgia Institute of Technology

Date Approved: 04/30/2014

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SUMMARY

The first children's video game called Mixed up Mother Goose was created by Roberta Williams in 1987. This game was created for a desktop. Today, many children's games exist on a range of digital platforms. While these platforms offer different types of interactions for engagement and learning, many of these interactions are limited to tapping, dragging and clicking. Current studies have shown that physical interaction is important for young children's development. Traditionally, nursery rhymes have been this source of physical interaction to engage children in the process of learning. This study looks at the physical engagement of children with nursery rhymes in oral, print and digital mediums. Engagement in oral medium consists of learning nursery rhymes through the movement of the body such as action rhymes and finger plays. Engagement in print medium consists of learning nursery rhymes through interactive books that include movable books, puppet books and sound books. Digital medium, including platforms such as touchscreen devices and laptops, continue to evolve from tap and click games to increased physical engagement of children. Although digital medium is a new phenomenon, it is following a similar evolution as print and oral mediums. Digital medium is increasingly engaging children with interactive play. As part of a larger project, this research collects information and provides a matrix that identifies the attributes of physical engagement employed by these three mediums.

CHAPTER 1

INTRODUCTION

Early education has long used nursery rhymes as a developmental tool for toddlers and young children. There is a strong relation between children's early knowledge of nursery rhymes at the age of 3 and their development of phonological skills during subsequent years. A strong relation is also found between the early knowledge of nursery rhymes and success in reading and spelling. These skills are important for children's success in reading, and using nursery rhymes as reading material has a positive effect on children's reading (Bryant et al, 1989).

Nursery rhymes emphasize existing phonological structures in a given language by increasing the prominence of syllables, onsets and rimes. Nursery rhymes such as Humpty Dumpty emphasize the division of words in syllables. 'Humpty' consists of two syllables, 'Hump' and 'ty'. Similarly, 'Dumpty' consists of two syllables, 'Dump' and 'ty'. Onsets and rimes are learning tools to help children read words. An onset is the beginning sound before a vowel in a word and a rime consists of the vowel and the remaining letters. For example, in 'hat', 'h' is the onset and 'at' is the rime. Similarly, in 'star', 'st' is the onset and 'ar' is the rime. In Twinkle, Twinkle Little Star, "star" rhymes with "are", which distinguishes the onset from the rime of the words (Neuman & Dickinson, 2003).

In the twenty-first century, there are many different techniques available for children to engage with nursery rhymes. The techniques that this research focuses on are categorized into three mediums: Oral, print, and digital. These mediums implement different physical interactions to engage children but through similar means. Rhyme and narrative help establish a meaning of the whole concept of a narrative and later the meaning of its specific parts (Egan, 1997, p. 60). The nursery rhyme *Itsy Bitsy Spider*

establishes the concept of a spider trying to reach the waterspout and the different natural elements such as sun and rain that play an important role in the rhyme. The meaning of these specific parts that include waterspout, sun and rain can later be learned by day-to-day experience. Egan's theory informs us that rhymes make it easier to learn a specific concept and narration helps to build a story to revolve around that concept. Rhymes and narration support each other in the different mediums.

Movement strengthens and bonds synapses, which are the connections between neurons that stimulate the development of the brain. Synapses seem to grow most quickly until about the age of nine at which time growth slows. Considering this, movement activities should be introduced early in the lives of children while the window of the growth of synapses is still open (Gabbard and Rodrigues, 2007).

Oral Medium

Oral medium succeeds in encouraging storytelling through activities like action rhymes and finger plays. The medium includes learning rhymes through singing and body movements. Children like to create an environment with their actions when they are engaged with dramatic play. Action rhymes help them create an environment for the nursery rhyme with actions of their hands and feet. *Itsy Bitsy Spider* includes simultaneous actions of singing the rhyme and making hand movements. Another example includes the rhyme *If You're Happy and You Know It* where children make use of both their hands and feet. Children find it exciting to sing this rhyme and perform different body movements. These movements help increase their interactivity towards learning words and effectively internalizing their meaning.

Children find it fun and exciting to explore the world of language in this kinesthetic fashion. Finger plays and actions rhymes help them build word skills that are important for learning. Most of the time, children will continue singing the same rhyme

and making movements with their bodies with a consistent amount of enthusiasm until they become physically tired. Along with singing, they love to combine different rhyming words and make a song containing those words. This helps them become more accustomed to language and learn the different words and their meanings while having fun ("Toddler Fingerplays and Action Rhymes,").

Print Medium

Interactivity through body movements is as important as the narrative and rhyme factors. There are several kinds of nursery rhyme books available that succeed in doing so. Some of them are traditional/classic reading books, movable books, puppet books, sound books, cloth books, books with textures, e-books, and books that include unique interactions through the combination of two or more kinds of books. Every kind of book has some kind of physical interaction involved that helps children learn different body movements. For example, the different kinds of moveable books include pop-ups, lift-the-flap, pull-out, and revolving disks and wheels. Manipulating these parts encourages dialogue and creates interaction. Pop up books, which are a type of movable book have close-to-reality actions and three-dimensional scenes that may help children understand the concept of symbolic representation (McGee & Charlesworth, 1984).

Books provide the interactivity that children experience by reading the rhymes and singing them along with actions of turning the pages, lifting the flaps, pulling the tabs, clicking on buttons to make sounds, feeling textures and playing with puppets. These interactions begin with children experiencing the rhymes by reading the text and then engaging in the actions encouraged by the format of the book. Traditional books without any type of moveable are often a catalyst for social engagement that can be as

simple as a child sitting in a mother's or caregiver's lap and turning the pages together. An oral element is added when reading-aloud, chanting, or singing is added to the action of turning the pages.

Puppet Books such as '*Hey Diddle Diddle: A Hand Puppet Board Book*' by Jill Ackerman teach language development through interactive play. "The puppets make the story very engaging . . . little ones will surely love the interaction that the puppets make possible, while also being able to look at the pictures within the palm-sized board book" (Derbyshire). Puppet books encourage interactions similar to finger plays. These finger plays are a part of the oral medium and they help the child with learning language, physical engagement and social skills. When children make the puppets talk and interact with their friends while doing so, they develop language skills. Children learn to share, take turns and have patience while playing puppets with friends. This experience helps them with development of social skills. Playing with puppets thus increases imaginative play. Puppets help with cognitive development as children not only learn to tell stories and think of creative ideas to act out, but also learn to make spatial connections between their hand or finger and how it fits inside the puppet. Children develop motor skills as they move the different body parts of the puppet and learn hand-eye coordination by moving the puppet to the position where they intend to place it. This is how playing with puppets helps with physical development (Revermann). Use of puppets in oral and print mediums is an example of the kind of physical interaction these mediums encourage to enhance children's literary learning.

Unlike the oral medium, print medium implements rhymes and narration through books that encourage engagement and interactive play in the form of physical

movements. While reading books, children need to be actively engaged in the story line as they display heightened interest and increased desire to improve their literacy skills. The rhyming patterns in these books increase focus time among young children by capturing their attention. In concert with the physical interaction, they create a story line that is more interactive and engaging, and provide a more comprehensive narrative experience (Demoulin, 2003, pp. 663-664).

Digital Medium

Before the late 1980s, apart from television and radio, only oral and print mediums were available for children to learn nursery rhymes. In 1987, Roberta Williams created the first children's video game intended to both entertain and educate. She chose to use the traditional narratives of nursery rhymes in a game called Mixed-Up Mother Goose, which encourages point and click interaction. So similar to the oral and print mediums, it has some level of interactivity through pointing and clicking. It is a simple game about helping Mother Goose find her nursery rhymes. All the nursery rhymes become mixed up and each character is missing an item necessary to complete the rhyme. The player's job is to find those items and return them to their respective characters. Once the item is returned to the character, he/she sings the rhyme that item belongs to. It is an interactive adventure game that encourages problem solving and enhances memory skills. Digital medium is the newest way in which children are introduced to nursery rhymes.

Similar to the oral and print mediums, the digital medium does include physical engagement in its presentation of nursery rhymes through video games.

A recent study from the Education Development Center and the U.S. Congress-supported Ready To Learn (RTL) Initiative found that a curriculum that involved digital media such as video games could improve early literacy skills when coupled with strong parental and teacher involvement. Interestingly, the study focused on young children, and 4- and 5-year-olds who participated showed increases in letter recognition, sounds association with letters, and understanding basic concepts about stories and print ("The Benefits of Video Games,").

This quote mentions that video games help children improve their literacy learning skills due to its high level of interactivity. Video games have positive potential to teach a specific skill through their interactivity and entertainment value. Playing computer games helps reduce reaction times, improve hand-eye coordination and raise a player's self-esteem (Griffiths, 2002). Smartphones have been shown to have great appeal among children. The popularity of smartphones among children is so high that the New York Times called the iPhone the 'toddler's favorite toy' of 2010 ("Children, young people, and a world of apps," 2011).

Among the different kinds of interactive media devices available, tablets offer a new level of engagement for children. They are easy to carry around, have multiple purposes, and offer an accessible media platform. They have large screens, as compared to smartphones, which provide more engagement and easy navigation through the games. In addition, several games available on touchscreen devices encourage interactive play through narration, holding, tilting, dragging, tapping, and swapping (Michael Cohen Group LLC). One of the examples of this combination of interactions that takes advantage of the affordances that touchscreen devices offer is 'Leo's Pad: Preschool Kids Learning Series' by Kidaptive Inc. and Stanford University researchers and Emmy award-winning animators. The app consists of multiple episodes of interactive stories for

preschoolers. In this app, the player joins young Leonardo da Vinci and his friends on interactive adventures and games. It uses narration to educate children. It has many puzzles and games along with songs to keep the children interested and excited to continue playing the game. It gives children the feeling that they are a part of the story. In addition, parents can also keep track of the child's progress with the help of several tools in the game. That way, they can talk to the child about his/her experience and what he/she learned in the game. Even though this app combines a varied range of interactions and represents a step forward in the methodological incorporation of previous research on development and its relation to kinesthetic interactivity, it still does not include the kind of physical engagement that is experienced by singing action rhymes and reading interactive nursery rhyme books.

CHAPTER 2

CURRENT GAP

Physical interactions such as more engaging hand movements and singing rhymes are encouraged through oral and print mediums are missing in most of the video games for children. Even though the games are interactive, children miss the factor of being able to physically manipulate the movables or perform hand movements similar to the ones in puppet books. If children are given the opportunity to experience the real world with their hand movements, then their learning could be enhanced. After the introduction of using the narration of nursery rhymes for children in digital medium through Mixed-Up Mother Goose, many children's games were developed. These games can be played on a variety of different platforms that include devices with touch screen technology such as iPhones, iPods, iPads, Android tablets and Android smartphone, laptops, Wii™, and Xbox Kinect™ intended for the general public. There are also devices designed specifically for children such as VINCI™ tablets, Nabi™ tablets and LeapPads™. All these platforms have interactions that differentiate them from each other. Most of them use simple physical movements such as pointing and clicking. Platforms such as Wii and Kinect, which include opportunities for different physical interaction, are more expensive and not all families can afford to purchase them. VINCI™ tablets, Nabi™ tablets and LeapPads™ face a similar issue. These are devices designed specifically for children and users have to purchase them in order to play the games designed for that platform. Thus, more research needs to be done in the area of creating physically engaging games for general platforms such as touch screen devices so that more equitable access is available to children in all-financial strata.

CHAPTER 3

PURPOSE OF PROPOSED RESEARCH

Today, children in North America are growing up immersed in media. Many children's homes have different devices including TVs, computers, DVD players and video game consoles. Almost all the children in the United States live in homes with a TV set, nearly half have three or more TVs and one third have a TV in their bedroom. Nearly three out of four have a computer at home and about half have a video game player. The time that children spend viewing media also increases as age increases. Parents believe that educational media is very important for children's intellectual development, including educational television and educational videos (Rideout, Vandewater, & Wartella, 2003). Creating learning games for children that engage children through physical interactions that have similar advantages as those of oral and print mediums will have a positive effect on their learning and parents will be more willing to engage their child with playing video games.

This research identifies the characteristics of somatic engagement in oral and print nursery rhyme presentations as well as those in digital games and provides a database of engagement that represents the most physically inclusive activities. This database combines the various concepts that encourage interactive game play in children's games. It is aimed towards bridging the gap that exists in the video game industry by creating games for touchscreen devices that are more physically interactive than the games that currently exist.

CHAPTER 4

METHODS

This research involves four stages. The first stage includes a literature review of existing materials relevant to education, children, reading, gaming, and related topics. This helped understand how children learn nursery rhymes and why physical interaction is important during early childhood stage. This stage also includes review and close reading of a selection of a range of books and video games from recommending bodies such as American Library Association and Children's Technology Review. These books and games were read and played to explore the different physical movements that children engage with.

The second stage includes two parts. The first part involved participating in activities with children in a pre-school under the Jumpstart program in Atlanta. This helped get first-hand experience and explore the different ways in which traditional rhymes are taught to children in a local preschool environment. As children learn how to write and understand words in pre-school, observing them helped understand the different ways in which they learn and the difficulties they face while doing so. This experience proved helpful when developing the matrix of different physical interactions that children engage in while performing nursery rhyme activities.

The second part of the second stage involves the creation of two matrixes. One matrix is for the print medium. It includes information for book type, author, publisher, year published, age, grade level, activity learned, and book description on Amazon. A list of books was created based on the information of shortlisted books gathered from American Library Association. These books were selected based on a specific age range of 3 to 6 years old, which this research focuses on. More information about this matrix can be found in *Appendix A*. The second matrix is for the digital medium. It includes
















information for platform, publisher, age, grade level, activity learned, and ratings on Children's Technology Review. More information about this matrix can be found in *Appendix B*. The games were selected based on the top ratings on Children's Technology Review. All the selected games used for this research were for touchscreen devices. The reason for this is that touchscreen devices are one of the many devices that children play games on. Future work will involve other devices based on results from this research. Information about list of games in other platforms can be found in *Appendix G*. These two matrixes provide information on the engagement and learning planned for by the writer and developer for each book and game respectively.

The third phase includes creating matrixes for oral, print and digital mediums. These matrixes identify the different physical interactions in the three mediums, and give information about interaction through fingers, wrist, hand, leg, eyes, head, and specific body parts. It also includes interactions with external objects and those performed while socializing. The oral, print and digital mediums matrixes consist of 18 classic nursery rhymes, 40 books and 40 games related to nursery rhymes respectively. These rhymes, books and games were selected keeping the level of engagement through physical interaction in mind. More information about the three mediums can be found in *Appendix C.1, C.2, D.1, D.2, E.1, E.2, E.3 and E.4*.

The fourth phase includes taking the information from oral matrix and creating a table of different hand actions that each of the 18 nursery rhymes involve. This table is divided into three sections: Simple, intermediate and complex. As every child learns at different stages depending on his/her physical skills, the three stages suggest a possible set of actions that, when practiced, will help with the process of learning the hand rhyme. Following is an example of hands actions for *Itsy Bitsy Spider* nursery rhyme. While researching the lyrics of different rhymes, it was found that some of the rhymes have multiple versions. The versions of lyrics selected for this research are the commonly used

versions of nursery rhymes. More information about the hand actions of remaining nursery rhymes can be found in *Appendix F*.

The fifth phase is developing a prototype of a video game using the finger actions identified above which will encourage a child to engage in physical activity while reciting the rhyme. This game will be used as an example for future research on how the data from oral and print mediums can be implemented in the digital medium.

Itsy Bitsy Spider			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Itsy Bitsy spider went up the water spout	 <i>Try to bring fingers in contact with each other</i>	 <i>Bring fingers in contact with each other and ben them a little</i>	 <i>Bring last finger and thumb of one hand in contact with thumb and last finger of other hand</i>
Down came the rain	 <i>Show five fingers</i>	 <i>Move five fingers in a random but stiff motion</i>	 <i>Move five fingers in random motion</i>
and washed the spider out	 <i>Show five fingers</i>	 <i>Show five fingers</i>	 <i>Show five fingers</i>
Out came the sun and dried up all the rain	 <i>Point hands in upward direction</i>	 <i>Put one hand on top of the other over the head</i>	 <i>Interlink fingers over the head</i>
Now Itsy Bitsy spider went up the spout again!	 <i>Try to bring fingers in contact with each other</i>	 <i>Bring fingers in contact with each other and bend them</i>	 <i>Bring last finger & thumb of one hand in contact with the thumb and last finger of other hand</i>

CHAPTER 5

RESULTS

Following are charts that show physical activities as identified in the three matrixes created in Phase three. While creating the matrix for digital games, it was found that one-finger interactions such as tapping, swiping and dragging are common among all the video games. Some games have multiple finger interactions such as zooming and pinching but they are not widely used. After playing 40 games, it was found that these games primarily have interactions with fingers, as shown in Figure 1. Hence, the engagement with all the other body parts is neglected. The following chart gives information about the physical involvement of different body part for 40 iPad games. *Appendix C.1* and *C.2* gives detailed information about the specific physical interactions children engage in while playing touchscreen games.

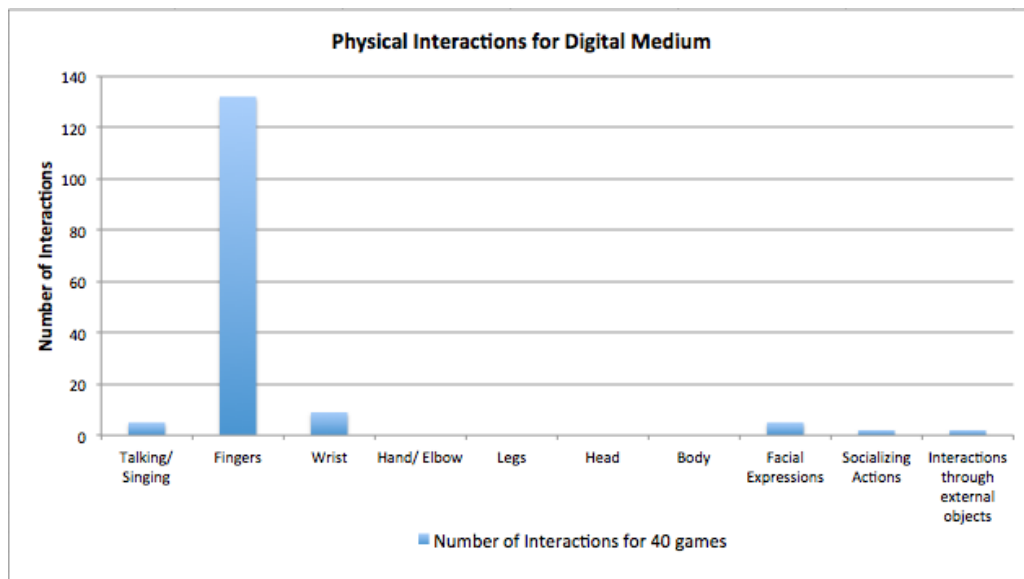


Figure 1: Information gathered from 40 iPad games regarding the number of physical interactions for each body part

Print medium has more interactions than the digital medium. Most of these interactions are focused on talking/singing, fingers, wrist and socializing. As socializing is considered to be an important factor in child's learning, the fact that the print medium takes that into consideration is useful. This factor can be implemented in the digital medium by creating multiplayer games or games that encourage interacting with multiple people for better game play. For example, books encourage a number of children or a child and a parent to read at the same time. Similarly, multiplayer games encourage children to interact with multiple players and hence help them increase their social skills. Following is the chart that gives information about the number of interactions per body part for 40 nursery rhyme books. *Appendix D.1* and *D.2* gives detailed information about the physical interactions children engage in while reading rhyming books.

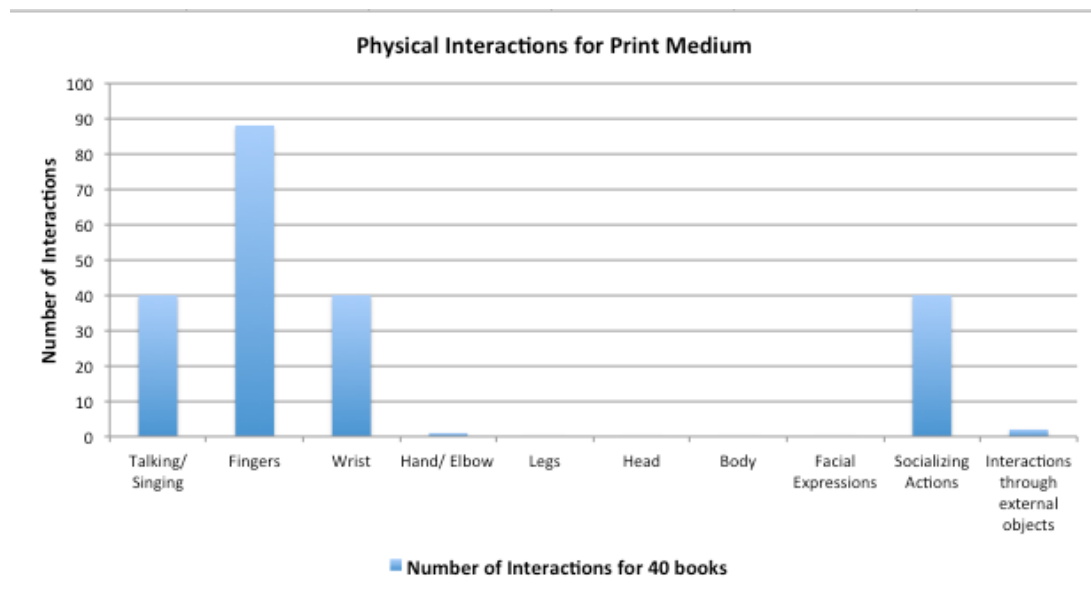


Figure 2: Information gathered from 40 rhyming books regarding the number of physical interactions for each body part

Oral medium has maximum number of interactions among all the mediums. Similar to books, nursery rhymes sung orally are catalysts of action. Singing nursery rhymes involves a lot of body movements, which encourages children to use multiple

body parts, unlike using only fingers while playing games on touchscreen devices. These results show that a lot can be learned from the oral medium that can be implemented in the digital medium. The matrix in *Appendix E.1, E.2, E.3 and E.4* gives more detailed information about the different kinds of interactions each body part can perform while learning nursery rhymes. If most of these interactions are implemented in a game, then its interactivity level will increase significantly. Following chart gives information about the number of interactions of each body part for 18 classic nursery rhymes.

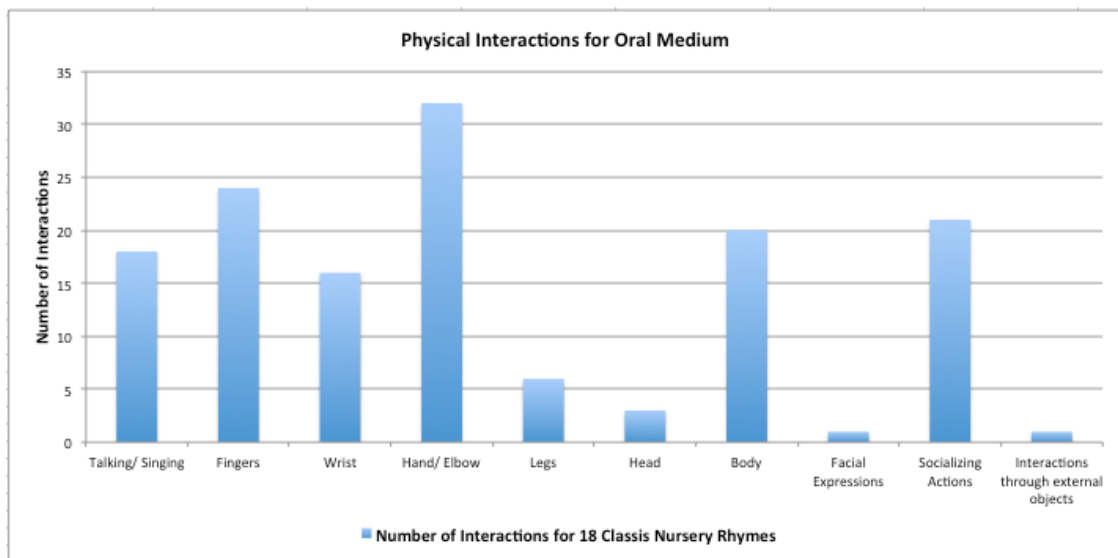


Figure 3: Information gathered from 18 classic nursery rhymes for the oral medium regarding the number of physical interactions for each body part

The following chart combines the information from the above three charts. As can be seen, the maximum number of total interactions is in the oral medium. As mentioned earlier, the digital medium focuses on finger movements, which mainly includes tapping, dragging and swiping. This shows that in order to make games as physically interactive as singing a nursery rhyme with hand and leg movements, certain characteristics from the oral medium need to be taken into consideration.

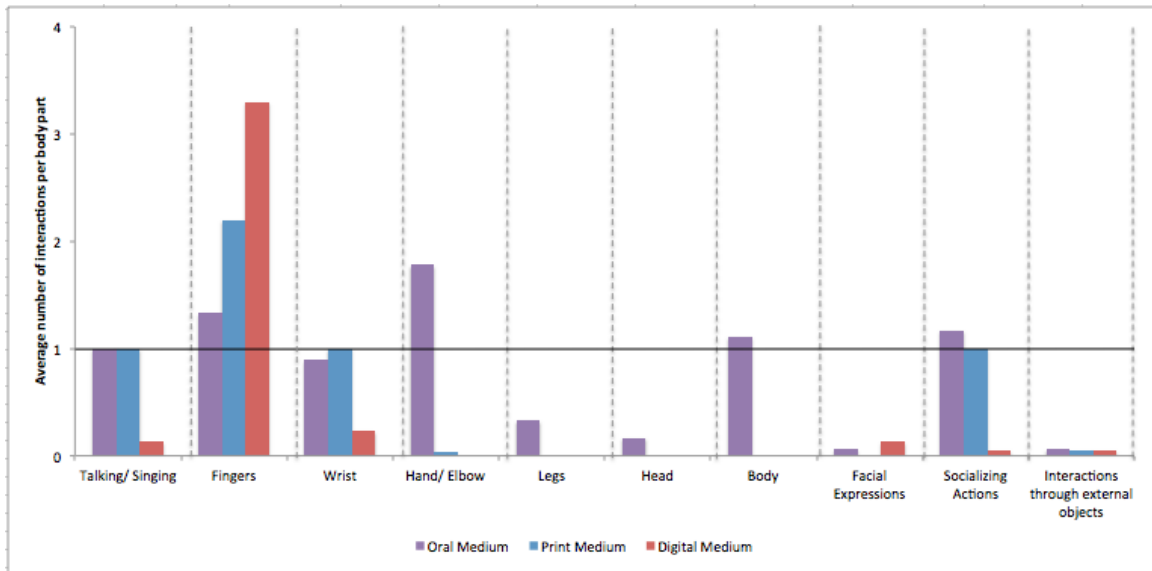


Figure 4: Information about the average number of interactions per body part for each rhyme sang orally, book and game

The following chart helps gain a visual understanding of the average number of interactions per oral rhyme, books and game in oral, print and digital mediums respectively. It shows that instead of the physical interactions increasing with increase in technology, in reality they are decreasing. In order to change that, the activities identified in the oral and print matrix (*Appendix D.1, D.2, E.1, E.2, E.3 and E.4*) should be included in digital medium for the creation of physically interactive games that enhance child learning.

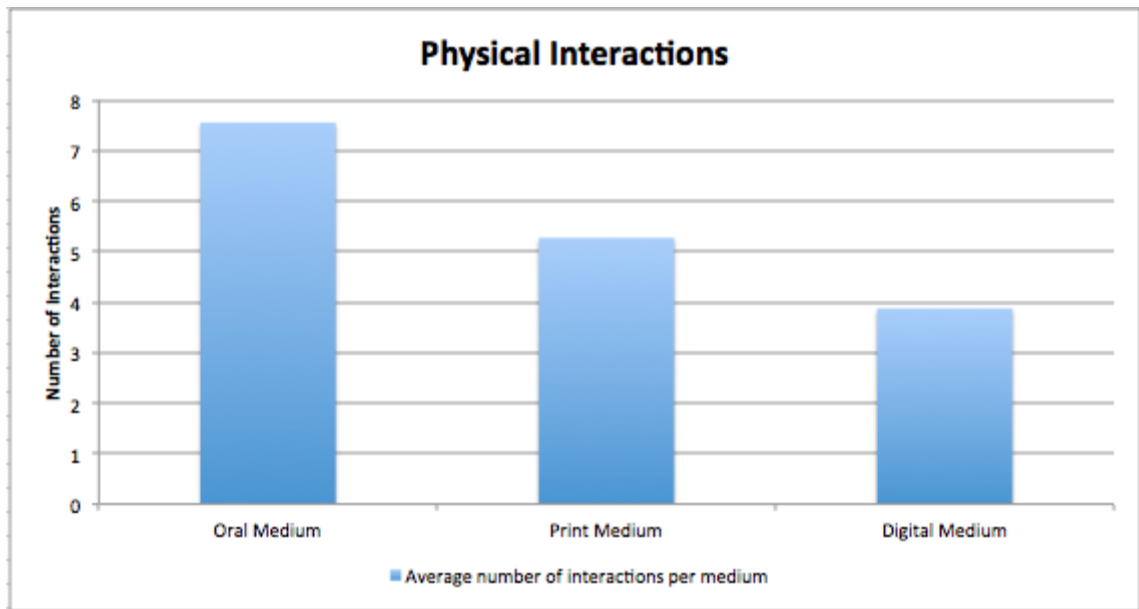


Figure 5: Information about the average number of interactions per medium

CHAPTER 6

FUTURE WORK

Future work will include:

- 1) Completion of the paper prototype and development of a prototype game that can be tested by focus groups.
- 2) Further analysis of the physical characteristics as they can be mapped against new affordances in technology.

APPENDIX A

MATRIX ABOUT NURSERY RHYME BOOKS IN PRINT MEDIUM

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
A Pop Up Dinosaurs Galore	Pop-up/ lift-the-flap/ pull out	Giles Andreae, David Wojtowycz (Illustrator)	ME Media LLC	2008	3 to 6	Preschool, Kindergarten, 1st grade	Motor skills, dinosaurs, rhyming verse	Take the cast of Dinosaur Roar, star them in a fabulously fun pop-up book, and what have you got? Dinosaurs Galore! Everybody's favorite dino family gets big and in your face...but without ever losing their sweetness and endearing charm. At 20 pages with 10 gigantic pop-ups and one huge, colorful panorama, Dinosaurs Galore! out-pops the competition!
A Pop-Up Book of Nursery Rhymes: A Classic Collectible Pop-Up	Pop-up/ lift-the-flap/ pull out	Matthew Reinhart (Author, Illustrator)	Little Simon	2009	3 to 8	Preschool, Kindergarten, 1st grade, 2nd grade, 3rd grade	Nursery rhymes, motor skills	Matthew Reinhart's phenomenal paper engineering, as evidenced in Cinderella and The Jungle Book brings an added dimension -- literally -- to the classic telling of Mother Goose's most treasured nursery rhymes. With six spreads of of pop ups and and mini book, this book is a phenomenal family keepsake to read for years to come.
A Sesame Street Christmas Story	Sound	Editors of Publications International	Publications International	2011	3 to 7	Preschool, Kindergarten, 1st grade, 2nd grade	Sound recognition, language learning	The Sesame Street Christmas Story sound book has an attached eight-button audio module that enables children to add character voice and sound effects to a story featuring Elmo and other favorite Sesame Street characters. This sound book will make a great Christmas gift for any child 18 months and older for loads of interactive fun!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Bedtime Bugs: A Pop-up Good Night Book	Pop-up/lift-the-flap/pull out	David A. Carter (Author, Illustrator)	Little Simon	2010	3 to 7	Preschool, Kindergarten, 1st grade, 2nd grade	Motor skills, night routines	David A. Carter's zany bugs are here to help guide children through their nightly routines. The Bubbly Bugs are taking their baths, the Lullabug is reading a bedtime story, and the Twinkle Bug is shinging bright to grant the wish you wish tonight! This interactive Bugs mini is sure to become a bedtime favorite.
By the Light of the Silvery Moon	Unique combinations	Claire Freedman, Stephen Gulbis (Illustrator)	Sterling	2011	1 to 6	Toddler, preschool, Kindergarten, 1st grade	rhyming words, language development	-
Calm Down, Boris!	Puppet	Sam Lloyd	Silver Dolphin Books	2010	2 to 7	Toddler, Preschool, Kindergarten, 1st grade, 2nd grade	Hand-eye coordination, interactive play, language development	Meet Boris - he's a very loving little monster! Orange, hairy and over-enthusiastic, Boris means well, but always ends up getting carried away and spoiling things. In "Calm Down, Boris!", the reader is asked to help Boris brush his hair ready for his trip to the park - and gets smothered in grateful kisses. The same happens when we feed him, and when he gets to the park none of the other little monsters want to play with him because he's so loud and boisterous. But when a big scary dog jumps over the fence, Boris saves the day by scaring him away with his big, friendly kisses!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Children's Ebook: Row, Row, Row Your Cat	Ebook	Bobby Bishop, Doktor WhoBerry (Illustrator)	-	2013	2 to 5	Toddlers, preschool, kindergarten	Nursery rhymes	-
Clap Your Hands! (Sesame Street)	Puppet	Joseph Ewers, Joseph Ewers (Illustrator)	Random House Children's Books	2002	3 months to 3 years	Toddler, preschool	Hand-eye coordination, interactive play, language development, rhyming words	Toddlers will delight in acting out the words to the song, "If You're Happy and You Know It, Clap Your Hands" with the Elmo puppet attached to this utterly irresistible board book. Clap your hands, rub your tummy, scratch your nose—and laugh along with Elmo and all of his beloved Sesame Street friends!
Finger Puppet Book: The Itsy Bitsy Spider	Puppet	Parragon Books Staff	Parragon, Incorporated	2012	3 months to 3 years	Babies, toddler, preschool	Hand-eye coordination, interactive play, language development	This adorable nursery rhyme board book features a fun spider character finger puppet toy built in to the story, encouraging interactive play, hand-eye coordination, and language development for babies ages 6+ months. The perfect size for little hands, it is ideal for reading and playtime on-the-go. The Little Learners baby and toddler series is fun, engaging, and research-supported. Each book is designed especially to help babies and toddlers development. With cute, contemporary design, memorable stories or rhymes, sturdy construction, and playful elements, Little Learners is designed to stimulate a child's curiosity about life and language. Reading with children has never been more important, more special, or more fun!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Fuzzy bee and friends	Cloth	Roger Priddy	St. Martin's Press	2003	3 months to 2 years	Babies, toddlers	Motor skills, hand coordination, listening skills	Ideal for babies and toddlers. Rhyming text helps kids improve their listening skills.
Fuzzy Yellow Ducklings	Textured	Matthew Van Fleet, Matthew Van Fleet (Illustrator)	Penguin Group (USA) Incorporated	1995	3 to 5	Preschool, kindergarten	Colors, shapes, animals	This charming introduction to colors, shapes, and animals has been delighting children all over the world for ten years! There is a surprise on every peek-a-boo page, where textured shapes magically turn into colorful creatures perfect for toddler's touching.
Goodnight, Goodnight Construction Site	Traditional/Classic	Sherri Duskey Rinker (Author), Tom Lichtenheld (Illustrator)	Chronicle Books LLC	2012	2 to 6	Toddler, preschool, Kindergarten, 1st grade	Rhyming words, language development	As the sun sets behind the big construction site, all the hardworking trucks get ready to say goodnight. One by one, Crane Truck, Cement Mixer, Dump Truck, Bulldozer, and Excavator finish their work and lie down to rest—so they'll be ready for another day of rough and tough construction play! With irresistible artwork by best-selling illustrator Tom Lichtenheld and sweet, rhyming text, this book will have truck lovers of all ages begging for more. Plus, this is a fixed-format version of the book, which looks nearly identical to the print version.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Heads, Shoulders, Knees and Toes	Traditional/Classic	Annie Kubler (Illustrator)	Child's Play-International	2002	1 to 3	Toddlers	Different body parts, language development, muscle development	This award winning series has been specifically designed for babies. A great introduction to books through well-known nursery rhymes and interactive text. Singing songs and rhymes is the perfect way to bond with your baby and share quality time. It also aids language development by introducing them to the natural sounds and patterns of speech. Combining these with actions also stimulates the brain and helps muscle development.
Hey Diddle Diddle: A Hand Puppet Board Book	Puppet	Jill Ackerman, Michelle Berg (Illustrator)	Scholastic, Inc.	2011	3 months to 3 years	Babies, toddler, preschool	Hand-eye coordination, interactive play, language development	Join the cat with her fiddle, the cow and the moon, the little dog laughing at the dish and the spoon as this tactile hand-puppet board book features the beloved cast from HEY, DIDDLE, DIDDLE. Five finger puppets on a soft glove. Cloth-covered board book attached the palm of the glove
Horton Hears A Who! Can You?	Puppet	Dr. Seuss, Jan Gerardi (Illustrator)	Random House Books for Young Readers	2008	3 months to 3 years	Toddler, preschool	Hand-eye coordination, interactive play, language development	-

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
I feel happy	Pop-up/lift-the-flap/pull out	Parragon	Parragon, Incorporated	2012	3 months to 2 years	Babies, Toddlers	Motor skills, opposites	Teach your little one about feelings with this sturdy board book featuring bright, interactive slide out tabs to help children learn hand-eye coordination, first words, and knowledge about the world around them. Friendly, colorful animal characters greet children on every page, and kids will love to slide out the tabs to reveal more fun. Ideal for ages 1+. The Little Learners baby and toddler series is fun, engaging, and research-supported. Each book is designed especially to help babies and toddlers.
Lamaze cloth book: Peek-a-Boo Forest	Cloth	Learning Curve	Lamaze	2011	6 months to 2 years	Babies, toddlers	Motor skills, hand coordination	The Lamaze Infant Development System introduces a comprehensive collection of developmental books designed to help parents and gift-givers choose the right book at the right time. Designed with input from respected child development experts, the program offers books featuring washable fabrics, durable pages, bright contrasting colors, and specially designed developmental features that make it fun for babies and toddlers to discover, learn, and read. Peek-a-Boo forest is a cloth book about different animals in the forest and has a fun, crinkly plush owl on the cover. Each page features a fun peek-a-boo flap and stimulating bright colors.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Monday The Bullfrog	Unique combinations (puppet + texture)	Matthew Van Fleet, Matthew Van Fleet (Illustrator)	Simon & Schuster/Paula Wiseman Books	2010	3 to 5	Preschool, Kindergarten	Hand-eye coordination, language, week days	A puppet, a huggable toy, a pre-school concept book MONDAY THE BULLFROG in a newly designed cuddly edition!
My Favorite Nursery Rhymes	Cloth	-	-	-	1 to 5	Toddlers, preschool, kindergarten	Hand-eye coordination, interactive language development	-
My First Mother Goose Book	Traditional/Classic	Aurelius Battaglia (Illustrator)	Random House Children's Books	1982	4 to 6	Preschool, Kindergarten, 1st grade	Nursery rhymes	An illustrated collection of more than 25 favorite nursery rhymes.
Noisy peek-a-boo! Splash! Splash!	Unique combinations (lift the flap + sound)	Dorling Kindersley	DK Preschool; Brdbk edition	2009	1 to 6	Toddler, preschool, Kindergarten, 1st grade	Sound recognition, interactive language development, motor skills	This series takes DK's popular Peekaboo books to the next level by filling them with sound! On each spread, young readers search for a lost toy, such as a cute puppy, busy truck, or woolly sheep. There are three or four flaps to look under, and when the right flap is lifted, the lost toy is revealed and an appropriate noise is immediately activated: "Woof! Woof!" "Brrm! Brrm!" "Baa! Baa!" Toddlers will be captivated and delighted by the noisy surprise, and will want to find the right toy again and again.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Nursery Rhyme Jazz	Sound	Andy Blackman Hurwitz, Teresa Lester (Illustrator)	Penguin Group (USA) Incorporated	2007	2 to 6	Toddler, Preschool, Kindergarten, 1st grade	Nursery rhymes, language development	Noisy Peekaboo: Splash! Splash! features five noisy sea creatures hiding under ocean-themed flaps
Nursery Rhymes (with sing along CD)	Sound	Roger Priddy	Priddy Books	2006	3 months to 4 years	Babies, toddler, Preschool	Nursery rhymes, language development	Beautiful illustrations of well-known nursery rhyme characters. Touch and feel textures and embossing. Includes a sing-along CD featuring rhymes from the book.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Nursery Rhymes for Children: Complete Mother Goose Nursery Rhymes Collection	Ebook	Jennifer Simmons	-	2013	2 to 5	Toddlers, preschool, kindergarten	Nursery rhymes	The easiest way to teach your kids is to sing them songs that's easy to remember. Nursery rhymes will help you accomplish that Mother Goose - Nursery Rhymes for Children is definitely a book that your kids will love and treasure for the rest of their lives. These rhymes are fun, exciting, wonderful, enjoyable, and memorable. With over 100 of the most popular collection of nursery rhymes lyrics you know. Mother Goose - Nursery Rhymes for Children includes: Jack and Jill, Humpty Dumpty, Ba Ba Blacksheep, Little Jack Horner, Itsy Bitsy Spider, Hey Diddle Diddle, Three Blind Mice, Twinkle Twinkle Little Star, Hickory Dickory Dock, Rock-a-bye Baby, Old McDonald had a Farm, Mary Had a Little Lamb, Hush Little Baby and many more of your favorite rhymes! These classic nursery rhymes are a great way to help your child develop good oral and motor skills. They can also be sung as a lullaby for infants or toddlers. Mother Goose - Nursery Rhymes for Children makes your kids smart and at the same time provide lots of enjoyment. This entire collection is perfect to share with kids under 10 years old.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Old Mother Goose and Other Nursery Rhymes	Traditional/Classic	Alice and Martin Provensen (Illustrators)	Western Publishing Company, Inc.	1988	3 to 5	Preschool, Kindergarten	Nursery rhymes	An illustrated collection of traditional rhymes.
Otto Ocean Adventures	Unique combinations (Moveable Eyes)	Hinkler	Hinkler Books	2010	3 months to 5 years	Baby, toddler, preschool, Kindergarten	interactive language development	-
Pocketful of Posies: A treasury of nursery rhymes	Traditional/Classic	Salley Mavor	Houghton Mifflin Harcourt	2010	3 to 5	Preschool, Kindergarten	Nursery rhymes	This hand-picked collection of classic nursery rhymes, all delicately and painstakingly illustrated by Salley Mavor, who is reknown for her incredibly detailed fabric and cloth scenes. It took Mavor ten years to develop her own fabric relief technique to a level where she felt comfortable even considering illustrating a book. Now, Mavor embroiders and sews illustrations, each scene taking nearly a month to complete. In this book, Mavor renders a new and visionary nursery rhyme world with precision and intricacy for many a generation to treasure for years and years to come.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Press Here	Traditional/Classic	Herve Tullet	Chronicle Books LLC	2011	2 to 5	Preschool, Kindergarten	Pressing, tilting, ribbing, shaking, blowing	Press the yellow dot on the cover of this book, follow the instructions within, and embark upon a magical journey! Each page of this surprising book instructs the reader to press the dots, shake the pages, tilt the book, and who knows what will happen next! Children and adults alike will giggle with delight as the dots multiply, change direction, and grow in size! Especially remarkable because the adventure occurs on the flat surface of the simple, printed page, this unique picture book about the power of imagination and interactivity will provide read-aloud fun for all ages!
Roly Poly Nursery Rhymes	Unique combinations (block + pop up)	Kees Moerbeek (Illustrator)	Child's Play-International	2000	3 to 6	Preschool, Kindergarten, 1st grade	Hand coordination, nursery rhymes	These Roly Poly Box books are a completely original design. They roll out and pop-up to provide a whole host of tactile and visual surprises for children of any age.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Sesame Street Music Player	Sound	Farrah McDoogie, Tom Brannon (Illustrator)	Reader's Digest	2009	2 to 5	Toddler, Preschool, Kindergarten	Sound recognition, nursery rhymes	Kids can join Elmo, Zoe, Abby Cadabby, and all their friends in this delightful 40th anniversary collector's edition that features four favorite songs from the TV show ("Rubber Duckie," "C Is for Cookie," "Sesame Street Theme," and "People in Your Neighborhood") plus 20 popular kids' songs. Music is an important part of every preschoolers life. And every episode of Sesame Street is full of contagious, toe-tapping music that kids love. Now kids can join Elmo, Zoe, Abby Cadabby, and all their friends in this delightful 40th anniversary collector's edition that features four favorite songs from the TV show ("Rubber Duckie," "C Is for Cookie," "Sesame Street Theme," and "People in Your Neighborhood") plus 20 popular kids' songs. The special music player and play CDs contain all the tunes for the lyrics in the book. With fun tunes like "The Muffin Man" and "Five Little Ducks," this book will keep kids singing and dancing for hours!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Simple First Words Lets Say Our Colors	Sound	Roger Priddy	St. Martin's Press	2009	3 months to 3 years	Babies, toddler, Preschool	Sound recognition, colors, basic vocabulary, counting skills	Ideal for babies and toddlers. Tough, sturdy construction. Push-button sound bar with ten words or numbers to hear and say. Teaches basic vocabulary and counting skills.
Sounds Of The Wild: Ocean	Sound	Maurice Pledger	Silver Dolphin Books	2008	5 to 8	Kindergarten, 1st grade, 2nd grade, 3rd grade	Sounds made by aquatic animals and facts about them	Winner of a Parents' Choice Approved Award, this gorgeously illustrated pop-up book takes readers deep beneath the water's surface where they are greeted with a symphony of new sounds. This aquatic adventure features a humpback whale that communicates with noisy roars and sighs and whose "songs" carry for hundreds of miles underwater. Children also discover the playful chattering of dolphins, the boisterous honking of seals, and much more. Maurice Pledger's cunningly engineered pop-ups create an unforgettable 3-D seascape.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Tails	Textured	Matthew Van Fleet, Skip Skywarek (Director), Skip Skywarek (Editor)	Houghton Mifflin Harcourt	2003	3 to 5	Preschool, kindergarten	Texture, hand-eye coordination, counting, opposites, animals	Tails are irresistible to toddlers, and in Matthew Van Fleet's sturdy touch-and-feel board book, preschool-age pokers and prodders can finally tug to their heart's content. Engaging, cartoonish animals from tigers to pangolins romp across the pages as the rhyming text bounces along: "Tails fluffy, / Tails stringy, / Scaled tails strong and—clingy!" Pull tabs, lift-able flaps, tufts of fur, and even a scratch-and-sniff skunk tail provide plenty of tactile surprises. Along the way, youngsters will learn about counting, opposites, and how animals use their tails. A tried and true tail-wagger!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
The Cat in the Hat	Traditional/Classic	Dr. Seuss, Dr. Seuss (Illustrator)	Random House Children's Books	1957	5 to 8	Kindergarten, 1st grade, 2nd grade	Learn to read, words	Join the Cat in the Hat as he makes learning to read a joy! It's a rainy day and Dick and Sally can't find anything to do . . . until the Cat in the Hat unexpectedly appears and turns their dreary afternoon into a fun-filled extravaganza! This beloved Beginner Book by Dr. Seuss, which also features timeless Dr. Seuss characters such as Fish and Thing 1 and Thing 2, is fun to read aloud and easy to read alone. Written using 236 different words that any first or second grader can read, it's a fixture in home and school libraries and a favorite among parents, beginning readers, teachers, and librarians. Originally created by Dr. Seuss, Beginner Books encourage children to read all by themselves, with simple words and illustrations that give clues to their meaning.

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
The Happy Little Yellow Box: A Pop Up Book of Opposites	Pop-up/lift-the-flap/pull out	David A. Carter (Author, Illustrator)	Little Simon	2012	3 to 7	Preschool, Kindergarten, 1st grade, 2nd grade	Motor skills, colors, counting, shapes, opposites	This highly interactive novelty book follows a friendly yellow box as he journeys high and low, near and far—until finally resting in a spot that is “just right.” This fun, engaging read introduces the first concepts of colors, counting, shapes, and opposites through the use of pop-ups, pull-tabs, and more!
The Movable Mother Goose	Pop-up/lift-the-flap/pull out	Robert Sabuda, Robert Sabuda (Illustrator)	Little Simon	1999	3 to 7	Preschool, Kindergarten, 1st grade, 2nd grade	Nursery rhymes, motor skills	Robert Sabuda's The Movable Mother Goose puts a new spin on traditional nursery rhymes as they come alive in a glorious explosion of color! This pop-up extravaganza by award winner Robert Sabuda is destined to become a new classic for all generations.
This little piggy: And other favorite action rhymes	Traditional/Classic	Hannah Wood (Illustrator)	ME Media, LLC	2010	2 to 5	Preschool, Kindergarten	Nursery rhymes	Sing, wiggle, and clap! Little ones can play along with this collection of traditional fingerplays and action verses. Enjoy more than fifteen favorites including "Pat-a-Cake", "The Itsy Bitsy Spider", "I'm a Little Teapot", and "The Wheels on the Bus"! The soft padded covers, rounded corners and sturdy board pages make this title a perfect fit for preschoolers!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Twinkle Twinkle Little Star	Unique combinations (light-up + sound)	Parragon Books	Parragon Books	2012	1 to 3	Toddler, preschool	Nursery rhymes, hand-eye coordination, language skills	This sturdy interactive board book is a wonderful way for early readers to learn words and sounds! With four sound buttons featuring bright colors, this book makes learning basic concepts fun with the classic rhymes of Twinkle Twinkle Little Star. The Little Learners baby and toddler series is fun, engaging, and research-supported. Each book is designed especially to help babies and toddlers development. With cute, contemporary design, memorable stories or rhymes, sturdy construction, and playful elements, Little Learners is designed to stimulate a child's curiosity about life and language. Reading with children has never been more important, more special, or more fun!

BOOK NAME	BOOK TYPE	AUTHOR	PUBLISHER	YEAR PUBLISHED	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	BOOK DESCRIPTION ON AMAZON
Twinkle, Twinkle, Little Star: And Other Favorite Bedtime Rhymes	Traditional/Classic	Sanja Rescek, Sanja Rescek (Illustrator)	ME Media LLC	2006	3 to 5	Preschool, Kindergarten	Nursery rhymes	Little ones can end their day with this beautifully illustrated collection of bedtime nursery rhymes and soothing lullabies. Star Light, Star Bright, Rock-a-bye, Baby and other well-known bedtime rhymes will bring a sense of comfort and rest. The padded covers, rounded corners and sturdy pages make this title a perfect fit for smaller hands!
Vtech - Rhyme and Discover book	Sound	-	VTech	-	6 months to 3 years	Babies, toddler, preschool	Sound recognition, nursery rhymes, hand-eye coordination	Open a page to learning with the Rhyme & Discover Book! Recommended for kids 6 months to 3 years, the Rhyme & Discover Book combines rhythm and rhyme with nursery favorites. The electronic book includes three light-up character buttons on the tabs of the pages. Seven popular nursery rhymes and easy to turn pages encourage playing, thinking, and learning. The Rhyme and Discover Book features four movable pieces that your baby will love. The side of the book features bright colors and a music note button.

APPENDIX B

MATRIX ABOUT GAMES IN DIGITAL MEDIUM

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Animal SnApp: Farm	iPad, iPhone, iPod Touch	Nosy Crow	2 to 6	Toddlers, Preschool, Prekindergarten, Kindergarten, 1st grade	early reading, language, animals, first app	4.6	2012
ABC Wildlife	iPad	Peapod Labs	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	letter and word recognition, animal facts	4.8	2010
Baa Baa Black Sheep	iPhone, iPod Touch	Duck Duck Moose Design	3 to 5	Preschool, Prekindergarten, Kindergarten	cause and effect, classification	4.6	2010
Bizzy Bear on the Farm	iPad	Nosy Crow	2 to 4	Toddlers, Preschool, Prekindergarten	reading, cause and effect	4.8	2011
Blue Hat, Green Hat	iTunes, Nook, Android	Loud Crow Interactive Inc.	2 to 5	Toddlers, Preschool, Prekindergarten, Kindergarten	classification, word recognition, color and clothing related words	4.9	2011
Bob Books: Reading Magic 1	iPad, iPhone, iPod Touch	Learning Touch	4 to 7	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade	reading, phonics, letter recognition	4.7	2011
Brave: Storybook Deluxe	iPad, iPhone	Disney Publishing Worldwide	3 to 12	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	reading, logic, timing, spatial relations, verbal skills	4.8	2013
Bugs and Bubbles	iPad	Little Bit Studio, LLC	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	math, logic, fine motor coordination, classification, patterns, memory	5	2012

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
ChatterPix Kids	iPad, iPhone	Duck Duck Moose	4 to 13	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade, 7th grade, 8th grade	aural communication, creativity, humor	4.6	2013
Cinderella – Nosy Crow Animated Picture Book	iPad	Nosy Crow	3 to 12	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	reading, some creativity	4.9	2011
ColAR Mix	iPad, Android	Puteko Limited	3 to 8	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	creativity, visual relationships	4.5	2013
Curious About Shapes and Colors	iPad, iPhone, iPod Touch	Houghton Mifflin Harcourt	2 to 6	Toddlers, Preschool, Prekindergarten, Kindergarten, 1st grade	logic, colors, shapes, sorting, matching, fine motor development	4.9	2013
Dexteria Jr.	iPad	BinaryLabs, Inc.	2 to 5	Toddlers, Preschool, Prekindergarten, Kindergarten	fine motor skills	4.5	2013
Dr. Seuss Band	iPad	Oceanhouse Media	3 to 8	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	music, timing, coordination	4.9	2011
Drawnimal	iPad	Lucas Zanotto	3 to 5	Preschool, Prekindergarten, Kindergarten	causality, creativity	4.3	2013
Endless Alphabet	iPad, iPhone	Callaway Digital Arts	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	the alphabet, ABC song, reading, letter recognition, music	4.8	2013

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Fairytale Maze 123	iPad	GiggleUp Pty Ltd	4 to 9	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade	logic, memory, spatial relations, fine motor development	4.5	2013
Four Little Corners	iPad, iPhone, Android	DADA Company	3 to 8	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	social skills, inclusion, bullying	4.5	2013
Goosed Up Rhymes	iPad, iPhone, iPod Touch	Brain Freeze Entertainment	3 to 8	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	some reading, logic, fine motor	4.5	2011
Grimm's Sleeping Beauty: A 3D Popup Book	iPad, iPhone	StoryToys	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	reading, logic, spatial relations, memory, fine motor	4.7	2012
It's A Small World	iPhone 3GS, iPhone 4, iPhone 4S, iPod touch (3rd generation), iPod touch (4th generation) and iPad. Requires iOS 4.3 or later.	Disney Publishing Worldwide	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	Geography, causality, language, music	4.7	2012
Itsy Bitsy Spider	iPhone, Android	Duck Duck Moose Design	2 to 5	Toddlers, Preschool, Prekindergarten, Kindergarten	logic, language, counting, causality	4.8	2010
LeapPad Phonics Program	LeapPad or Quantum Pad, Smart Toy	LeapFrog	4 to 7	Prekindergarten, Kindergarten, 1st grade, 2nd grade	reading: letter recognition, alphabet, letter sounds, compound words	4.7	2002

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Kindoma Storytime	iPad	Kindoma	2 to 8	Toddlers, Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	interpersonal development, social play	4.5	2013
Little Fox Music Box	iPad, iPhone	goodbeans	4 to 6	Prekindergarten, Kindergarten, 1st grade	music, rhythm, German or English, language	4.7	2012
Magic Piano	iPad	Smule, Inc.	4 to 12	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	music, rhythm	5	2010
Marvin K. Mooney Will You Please Go Now!	iPad, iPhone, Android	Oceanhouse Media	4 to 8	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	reading	4.7	2012
Match Blitz	iPad	Shiny Things	4 to 11	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	memory, visual perception	4.6	2013
Moo Baa La La La!	iPad	Loud Crow Interactive Inc.	2 to 5	Toddlers, Preschool, Prekindergarten, Kindergarten	language	4.9	2011
Oh, the Thinks You Can Think!	iPad, Android	Oceanhouse Media	3 to 12	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	language, logic, thinking	4.7	2011

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Pat the Bunny	iPad, iPhone iOS 4 or later with camera	Random House Children's Books	1 to 3	Babies, Toddlers, Preschool	language, early reading	4.8	2011
Play Lab	iPad	CJ Educations	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	logic, fine motor, shapes, colors, numbers	4.6	2013
PopOut! The Tale of Peter Rabbit	iPad	Loud Crow Interactive Inc.	4 to 6	Prekindergarten, Kindergarten, 1st grade	reading, language	4.9	2010
Sago Mini Pet Cafe	iPad, iPhone, iPod Touch (iOS 5.0 or later)	Sago Sago	2 to 4	Toddlers, Preschool, Prekindergarten	counting, sorting, fine motor skills, shapes	4.9	2013
StoryBots Tap & Sing	iPad, iPhone	JibJab Media Inc.	2 to 5	Toddlers, Preschool, Prekindergarten, Kindergarten	music, pitch, note recognition	4.8	2013
The Jungle Book	Android, iPad	StoryToys	3 to 9	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade	reading, classification, logic (English, French, German or Spanish)	4.6	2013
Toca Band	iPad, iPhone	Toca Boca	3 and up	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	music, math, patterns	4.9	2012
Wheels on the Bus	iPhone, Android	Duck Duck Moose Design	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	reading, fine motor coordination, word recognition	4.8	2009
Wild About Books	iPad	Random House Children's Books	4 and up	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	reading, language, decoding	4.9	2011

APPENDIX C.1

CHART GIVING INFORMATION ABOUT APPENDIX C.2

Table 1 and Table 2 below provide information about the different concepts taught to the children and the various physical interactions that the children engage in respectively, while playing iPad games. Each number in Table 1 corresponds to a concept taught by these nursery rhymes and similarly, each number in Table 2 corresponds to a physical interaction taught. These numbers are used in the matrix found in Appendix C.2 to refer back to the specific concept/physical interaction they correspond to. For example, ‘TOP/ BOTTOM (TAPPING)’ is in blue and is mentioned under the number 10. So it goes in the place of number 10 in blue in the matrix in Appendix C.2. Similarly, ‘SWIPING’ is in blue and is mentioned under 13B. So it goes in the place of number 13B in blue in Appendix C.2.

TEACH					
01	02	03	04	05	06
SHAPES	COLORS	LETTERS/ WORDS	NUMBERS	MEMORY	RHYMING (LANGUAGE)

Table 1: Concepts taught to children through iPad games

PHYSICAL MOVEMENTS											
TALKING/ SINGING	FINGERS								WRIST	FACIAL EXPRESSIONS	
	1 FINGER				14	2 FINGERS	2/3/4 FINGERS	5 FINGERS			
	10	11	12	13		15	16	17	18	19	
				13A							13B
	TOP/BOTTOM (TAPPING)	RANDOM DIRECTION (DRAGGING)	CLOCKWISE/ ANTICLOCKWIS E (DRAGGING)	LEFT-RIGHT/ TOP-BOTTOM		TRACE A SHAPE/ LETTER (specific direction)	DRAG FINGERS IN RANDOM DIRECTION	TAP MULTIPLE FINGERS ON THE SCREEN	PERFORM THE ZOOMING ACTION WITH ALL FINGERS	CLOCKWISE/ ANTICLOCKWISE (TILTING DEVICE)	(MIRROR)/ PHOTO
				DRAGGING	SWIPING						

Table 2: Physical Interactions children engage in while playing iPad games

APPENDIX C.2

MATRIX ABOUT PHYSICAL INTERACTIONS IN DIGITAL MEDIUM

[illegible]

APPENDIX D.1

CHART GIVING INFORMATION ABOUT APPENDIX D.2

Table 1 and Table 2 below provide information about the different concepts taught to the children and the various physical interactions that the children engage in respectively, while reading rhyming books. Each number in Table 1 corresponds to a concept taught by these nursery rhymes and similarly, each number in Table 2 corresponds to a physical interaction taught. These numbers are used in the matrix found in Appendix D.2 to refer back to the specific concept/physical interaction they correspond to. In Table 2, some of the words are in red and some are in blue. The ones in red refer to the physical interaction that is similar to the physical interaction in iPad games. The ones in blue refer to the physical interaction unique to the print medium, which are not currently implemented in the iPad games. For example, ‘MOVING FINGER OVER WORDS/ PRESSING BUTTON’ is in blue and is mentioned under the number 11A. So it goes in the place of number 11A in blue in the matrix in Appendix D.2. Similarly, ‘CLOCKWISE/ ANTICLOCKWISE’ is in red and is mentioned under 17. So it goes in the place of number 17 in blue in Appendix D.2.

TEACH					
01	02	03	04	05	06
SHAPES	COLORS	LETTERS/ WORDS	NUMBERS	MEMORY	RHYMING (LANGUAGE)

Table 1: Concepts taught to children through books

PHYSICAL MOVEMENTS										SOCIALIZING	
TALKING/ SINGING	FINGERS						WRIST	HAND/ ELBOW			TALKING/ PLAYING WITH MULTIPLE PEOPLE
	1 FINGER				2 FINGERS	2/3/4 FINGERS					
10	11	12	13	14	15	16	17	18	19		20
	11A	12A	13A	14A	15A	16A					20A
	TAPPING	RANDOM DIRECTION (DRAGGING)	CLOCKWISE/ ANTICLOCKWISE (DRAGGING)	LEFT-RIGHT/ TOP-BOTTOM (DRAGGING)	RANDOM DIRECTION (DRAGGING)	RANDOM DIRECTION (TAPPING)	CLOCKWISE/ ANTICLOCKWISE	TILTING BOOK (TILTING DEVICE)	READ BOOK WITHOUT TRADITIONAL PAGES		INTERACTION WITHOUT CONTACT
	MOVING FINGER OVER WORDS/ PRESSING BUTTON	FEELING OF TOUCH (IN TEXTURED/ CLOTH/ PUPPET BOOKS)	SPIN TABS WITH FINGER	OPEN FLAP/ PULL TABS	FLIPPING PAGES	FINGER MOVEMENTS IN PUPPETS				READING TOGETHER	

Table 2: Physical Interactions children engage in while reading rhyming books

APPENDIX D.2

MATRIX ABOUT PHYSICAL INTERACTIONS IN PRINT MEDIUM

BOOK NAME	TEACH						TALKING/ SINGING	PHYSICAL MOVEMENTS										SOCIALIZING			INTERACTION THROUGH EXTERNAL OBJECTS USING DIFFERENT OBJECTS TO READ THE BOOK	TOTAL INTERACTIONS PER BOOK
								FINGERS							WRIST		HAND/ ELBOW					
								1 FINGER			2 FINGERS		2/3/4 FINGERS									
	0 1	02	03	0 4	05	06		10	11	12 12A	13 13A	14 14A	15 15A	16 16A	17	18	19	TALKING/ PLAYING WITH MULTIPLE PEOPLE	20 20A			
A Pop Up Dinosaurs Galore																		5				
A Pop-Up Book of Nursery Rhymes: A Classic Collectible Pop-Up																		5				
A Sesame Street Christmas Story																		5				
Bedtime Bugs: A Pop-up Good Night Book																		5				
By the Light of the Silvery Moon																		5				
Calm Down, Boris!																		5				
Children's Ebook: Row, Row, Row Your Cat																		5				
Clap Your Hands! (Sesame Street)																		7				
Finger Puppet Book: The Itsy Bitsy Spider																		5				
Fuzzy bee and friends																		6				
Fuzzy Yellow Ducklings																		7				
Goodnight, Goodnight Construction Site																		5				
Heads, Shoulders, Knees and Toes																		5				
Hey Diddle Diddle: A Hand Puppet Board Book																		5				
Horton Hears A Who! Can You?																		5				
I feel happy																		5				
Lamaze cloth book: Peek-a-Boo Forest																		5				
Monday The Bulfrog																		5				
My Favorite Nursery Rhymes																		5				
My First Mother Goose Book																		5				
Noisy peek-a-boo! Splash! Splash!																		5				
Nursery Rhyme Jazz																		6				
Nursery Rhymes (with sing along CD)																		6				

BOOK NAME	TEACH						TALKING/ SINGING	PHYSICAL MOVEMENTS										SOCIALIZING			INTERACTION THROUGH EXTERNAL OBJECTS	TOTAL INTERACTIONS PER BOOK
								FINGERS						WRIST		HAND/ ELBOW						
								1 FINGER			2 FINGERS		2/3/4 FINGERS									
	0 1	02	03	0 4	05	06	10	11	12 12A	13 13A	14 14A	15 15A	16 16A	17	18	19	20 20A					
Nursery Rhymes for Children: Complete Mother Goose Nursery Rhymes Collection																			5			
Old Mother Goose and Other Nursery Rhymes																			5			
Otto Ocean Adventures																			5			
Pocketful of Posies: A treasury of nursery rhymes																			5			
Press Here																			5			
Roly Poly Nursery Rhymes																			7			
Sesame Street Music Player																			5			
Simple First Words Lets Say Our Colors																			5			
Sounds Of The Wild: Ocean																			5			
Tails																			6			
The Cat in the Hat																			5			
The Happy Little Yellow Box: A Pop Up Book of Opposites																			5			
The Movable Mother Goose																			6			
This little piggy: And other favorite action rhymes																			5			
Twinkle Twinkle Little Star																			5			
Twinkle, Twinkle, Little Star: And Other Favorite Bedtime Rhymes																			5			
Vtech - Rhyme and Discover book																			5			
Average number of Interactions per book																			5.275			
Total Interactions for 40 books	1	1	40	0	0	6	40	40	4	0	3	40	1	40	0	1	40	2				
Average number of Interactions per body part for each book							1				2.2		1	0.03		1		0.05				

APPENDIX E.1

MATRIX ABOUT PHYSICAL INTERACTIONS IN ORAL MEDIUM

Table 1 and Table 2 below provide information about the different concepts taught to the children while learning nursery rhymes orally. Each number in Table 1 corresponds to a concept taught by these nursery rhymes. These numbers are used in the matrix in Table 2 to refer back to the specific concept they correspond to. For example, in Table 1 ‘SHAPES’ is in blue and is mentioned under the number 01. So it goes in the place of number 01 in blue in Table 2. Similarly, in Table 1 ‘ANIMALS’ is in red and is mentioned under 06. So it goes in the place of number 06 in blue in Table 2.

TEACH								
01	02	03	04	05	06	07	08	09
SHAPES	COLORS	LETTERS/ WORDS	OPPOSITE S	NUMBERS	ANIMALS	BODY PARTS	MEMORY	RHYMING (LANGUAGE)

Table 1: Concepts taught to children through books

RHYME NAME	TEACH									
	01	02	03	04	05	06	07	08	09	
Baa Baa Black Sheep										
Baby Bumble Bee										
Bingo										
Five Little Ducks										
Five Little Monkeys										
Head, Shoulders, Knees and Toes										
Hickory, Dickory, Dock										
Humpty dumpty										
I am a Little Tea Pot										
If You Are Happy And You Know It										
Itsy Bitsy Spider										
Jack and Jill										
London Bridge is Falling Down										
One, Two, Buckle My Shoe										
Ring Around the Roses										
Row, Row, Row, Your Boat										
Twinkle Twinkle Little Star										
Wheels on the Bus										
Average number of interactions per rhyme										
Total Interactions for 18 rhymes	0	0	1	2	5	2	1	0	18	
Average number of interactions per body part for each rhyme										

Table 2: Matrix about the different concepts each rhyme teaches

APPENDIX E.2

MATRIX ABOUT PHYSICAL INTERACTIONS IN ORAL MEDIUM

Table 1 and Table 2 below provide information about the various physical interactions that the children engage in while reading rhyming books. Each number in Table 1 corresponds to a physical interaction taught. These numbers are used in the matrix named Table 2 to refer back to the specific physical interaction they correspond to. In Table 2, some of the words are in red and some are in blue. The ones in red refer to the physical interaction that is similar to the physical interaction in iPad games. The ones in blue refer to the physical interaction unique to the oral medium, which are not currently implemented in the iPad games. For example, in Table 1 ‘LEFT/RIGHT’ is in blue and is mentioned under the number 23. So it goes in the place of number 23 in blue in Table 2. Similarly, in Table 1 ‘CLOCKWISE/ANTICLOCKWISE (TILTING DEVICE)’ is in red and is mentioned under 25. So it goes in the place of number 25 in blue in Table 2.

PHYSICAL MOVEMENTS															
TALKING/ SINGING	FINGERS (TAPPING/ DRAGGING)														
	1 FINGER							2 FINGERS	2/3/4/5 FINGERS						
	10	11	12	13	14	15	16	17	18	19	20		21	22	
												20A	20B		22A
	POINTING 1 FINGER	CLOCKWISE/ ANTICLOCKWISE	TRACE A SHAPE/ LETTER (specific direction)	SIMPLE CONTACT OF ONE FINGER WITH ANOTHER	MOVING FINGER LEFT /RIGHT (SWIPING)	MOVING FINGER TOP/ BOTTOM (SWIPING)	PRESSING FINGER OF ONE HAND WITH PALM OF ANOTHER HAND	POINTING THUMB AND LAST FINGER	POINTING FINGERS (TAPPING)	SHAKING FINGERS IN RANDOM DIRECTION (TAPPING)	SIMPLE CONTACT WITH FINGERS OF BOTH HANDS		SIMULTANEOUS FORWARD/ BACKWARD (TAPPING)	OPENING/CLOSING PALM (ZOOMING)	
											INDEX FINGERS + THUMB	ALL FINGERS			USING 4 FINGERS FOR OPEN/ CLOSE

PHYSICAL MOVEMENTS										
WRIST					HAND/ ELBOW					
23	24	25	26	27	28	29	30	31	32	33
LEFT/ RIGHT	TOP/ BOTTOM	CLOCKWISE/ ANTICLOCKWISE (TILTING DEVICE)	CUPPING HANDS	PRETEND TO HOLD SOMETHING	UP/DOWN	CLAPPING HANDS	FORWARD/ BACKWARD	LEFT/ RIGHT	HOLDING HANDS	CLOCKWISE/ ANTICLOCK WISE

Table 1: Physical Interactions children engage in while learning nursery rhymes orally

RHYME NAME	TEACH									TALKING/ SINGING	PHYSICAL MOVEMENTS																									
											FINGERS (TAPPING/ DRAGGING)											WRIST					HAND/ ELBOW									
											1 FINGER					2 FINGERS		2/3/4/5 FINGERS																		
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20		21	22		23	24	25	26	27	28	29	30	31	32	33		
																			20A	20B		22A	22B													
Baa Baa Black Sheep																																				
Baby Bumble Bee																																				
Bingo																																				
Five Little Ducks																																				
Five Little Monkeys																																				
Head, Shoulders, Knees and Toes																																				
Hickory, Dickory, Dock																																				
Humpty dumpty																																				
I am a Little Tea Pot																																				
If You Are Happy And You Know It																																				
Itsy Bitsy Spider																																				
Jack and Jill																																				
London Bridge is Falling Down																																				
One, Two, Buckle My Shoe																																				
Ring Around the Roses																																				
Row, Row, Row, Your Boat																																				
Twinkle Twinkle Little Star																																				
Wheels on the Bus																																				
Average number of interactions per rhyme																																				
Total Interactions for 18 rhymes	0	0	1	2	5	2	1	0	18	18	7	0	0	0	2	0	1	1	4	2	1	1	1	1	3	4	5	3	3	1	11	5	1	11	1	3
Average number of interactions per body part for each rhyme										1							1.33								0.89					1.78						

Table 2: Matrix about the different physically interactions children engage in orally

APPENDIX E.3

MATRIX ABOUT PHYSICAL INTERACTIONS IN ORAL MEDIUM

Table 1 and Table 2 below provide information about the various physical interactions that the children engage in while reading rhyming books. Each number in Table 1 corresponds to a physical interaction taught. These numbers are used in the matrix named Table 2 to refer back to the specific physical interaction they correspond to. In Table 2, some of the words are in red and some are in blue. For example, in Table 1 ‘KNEE UP/DOWN’ is in blue and is mentioned under the number 36. So it goes in the place of number 36 in blue in Table 2. Similarly, in Table 1 ‘LEFT/RIGHT’ is in blue and is mentioned under the number 35 and 43A. So it goes in the place of number 35 and 43A in blue in Table 2.

PHYSICAL MOVEMENTS										
LEGS							HEAD			
34			35	36	37	38	39	40	41	42
34A	34B	34C								
JUMPING			LEFT/ RIGHT	KNEE UP/ DOWN	CLOCKWIS E/ ANTICLOC KWISE	RUNNING	FORWARD/ BACKWARD	UP/ DOWN	LEFT/ RIGHT	CLOCKWISE/ ANTICLOCK WISE
LEFT/ RIGHT LEG MOVEME NT	CRISS/ CROSS	SIMPLE JUMPING								

PHYSICAL MOVEMENTS											FACIAL EXPRESSIONS (MIRROR)/ PHOTO
BODY											
43				44	45	46	47			48	
43A	43B	43C	43D	44A	45A	46A	47A	47B	47C		
BENDING BACK				LEGS + HANDS	SHOULDER S	STOMACH	SITTING/ STANDING			CONTACT WITH OTHER BODY PARTS	
LEFT/ RIGHT	UP/ DOWN	FORWARD/BACK WARD	UP/DOWN +BENDING KNEE	WALKING WITH LEGS AND HANDS ON THE FLOOR	UP/DOWN	LYING ON STOMACH ANF MOVING HIPS AND SHOULDER S	STANDING + PRETEND SLEEPING	STANDING + SITTING	EITHER STANDING OR SITTING		

Table 1: Physical Interactions children engage in while learning nursery rhymes orally

RHYME NAME	PHYSICAL MOVEMENTS																							
	LEGS									HEAD			BODY											FACIAL EXPRESSIONS (MIRROR)/ PHOTO
	34			35	36	37	38	39	40	41	42	43				44	45	46	47			48		
	34A	34B	34C									43A	43B	43C	43D				44A	45A	46A		47A	47B
Baa Baa Black Sheep																								
Baby Bumble Bee																								
Bingo																								
Five Little Ducks																								
Five Little Monkeys																								
Head, Shoulders, Knees and Toes																								
Hickory, Dickory, Dock																								
Humpty dumpty																								
I am a Little Tea Pot																								
If You Are Happy And You Know It																								
Itsy Bitsy Spider																								
Jack and Jill																								
London Bridge is Falling Down																								
One, Two, Buckle My Shoe																								
Ring Around the Roses																								
Row, Row, Row, Your Boat																								
Twinkle Twinkle Little Star																								
Wheels on the Bus																								
Average number of interactions per rhyme																								
Total Interactions for 18 rhymes	0	0	1	0	2	1	2	0	1	2	0	4	1	1	3	0	1	0	0	1	4	5		1
Average number of interactions per body part for each rhyme	0.33									0.17			1.11											0.06

Table 2: Matrix about the different physically interactions children engage in orally

APPENDIX E.4

MATRIX ABOUT PHYSICAL INTERACTIONS IN ORAL MEDIUM

Table 1 and Table 2 below provide information about the different ways children socialize and interact with objects while reading rhyming books. Each number in Table 1 corresponds to an interaction related to socializing or interacting with objects. For example, in Table 1 ‘HOLDING HANDS’ is in blue and is mentioned under the number 49. So it goes in the place of number 49 in blue in Table 2. Similarly, in Table 1 ‘FINGER PUPPETS’ is in blue and is mentioned under the number 52. So it goes in the place of number 52 in blue in Table 2.

SOCIALIZING		INTERACTION THROUGH EXTERNAL OBJECTS		
TALKING/ PLAYING WITH MULTIPLE PEOPLE		USING OBJECTS FOR PRETEND PLAY		
49	50	51	52	53
	50A			
HOLDING HANDS	INTERACTION WITHOUT CONTACT	PLUSHIES	FINGER PUPPETS	TSHIRT COLORS
	SINGING TOGETHER			

Table 1: Physical interactions children engage in while socializing and interacting with objects




RHYME NAME	SOCIALIZING		INTERACTION THROUGH EXTERNAL OBJECTS			TOTAL INTERACTIONS
	FACIAL EXPRESSIONS (MIRROR)/ PHOTO	TALKING/ PLAYING WITH MULTIPLE PEOPLE	USING OBJECTS FOR PRETEND PLAY			
	49	50 50A	51	52	53	
Baa Baa Black Sheep						11
Baby Bumble Bee						10
Bingo						4
Five Little Ducks						8
Five Little Monkeys						11
Head, Shoulders, Knees and Toes						7
Hickory, Dickory, Dock						8
Humpty dumpty						7
I am a Little Tea Pot						6
If You Are Happy And You Know It						6
Itsy Bitsy Spider						8
Jack and Jill						4
London Bridge is Falling Down						6
One, Two, Buckle My Shoe						8
Ring Around the Roses						4
Row, Row, Row, Your Boat						7
Twinkle Twinkle Little Star						10
Wheels on the Bus						11
Average number of interactions per rhyme						7.556
Total Interactions for 18 rhymes	1	3	18	0	1	0
Average number of interactions per body part for each rhyme	0.06	1.17		0.06		





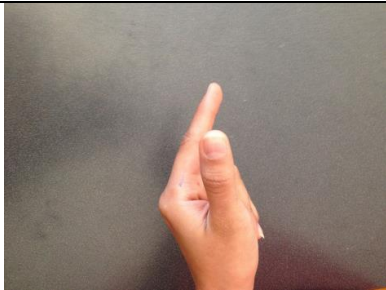




Table 2: Matrix about the different physically interactions children engage in orally


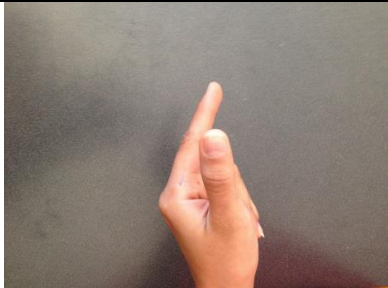







APPENDIX F




HAND ACTIONS FOR NURSERY RHYMES







These are preliminary photos of hand movements done by an adult without reference to any analysis of a child's hand movements. The three phases mentioned in each table relate to the different skill levels of each child. When a child learns a nursery rhyme, he/she goes through different phases of performing actions from simple to complex. The photos show the preliminary hand movements for each phase and line of a nursery rhyme.




Baa Baa Black Sheep			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Baa baa black sheep,	 <i>Hold head with hands</i>	 <i>Put hands straight on head</i>	 <i>Point index finger while in contact with head</i>

have you any wool?	 <p><i>Move hands in random motion</i></p>	 <p><i>Move hands left to right</i></p>	 <p><i>More structured hand position and movement</i></p>
Yes sir, yes sir,	 <p><i>Move hands top to bottom</i></p>	 <p><i>More structured movement</i></p>	 <p><i>Point index finger and move hand top to bottom</i></p>
three bags full!	 <p><i>Try to point three fingers</i></p>	 <p><i>Almost pointing three fingers</i></p>	 <p><i>Point three fingers</i></p>





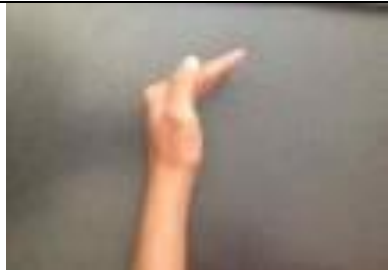
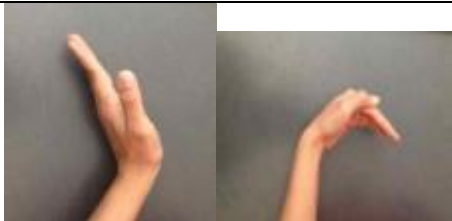
One for the master,	 <i>Move hands top to bottom</i>	 <i>More structured movement</i>	 <i>Point index finger and move hand top to bottom</i>
one for the dame,	 <i>Move hands top to bottom</i>	 <i>More structured movement</i>	 <i>Point two fingers and move hand top to bottom</i>
And one for the little boy	 <i>Move hands top to bottom</i>	 <i>More structured movement</i>	 <i>Point three fingers and move hand</i>

			<i>top to bottom</i>
who lives down the lane.	 <p><i>Move hands left to right</i></p>	 <p><i>Move wrist with hands</i></p>	 <p><i>Smooth wrist and hand movement</i></p>






Baby Bumble Bee			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
I'm bringing home a baby bumblebee, Won't my mommy be so proud of me, I'm bringing home a baby bumblebee,	 <p><i>Hold fists together</i></p>	 <p><i>Put one palm beneath the other</i></p>	 <p><i>More structured position of one palm under the other</i></p>
Spoken: Ouch! It stung me!	 <p><i>Hold both palms</i></p>	 <p><i>Try to press thumb of one hand on the palm of other</i></p>	 <p><i>Press thumb of one hand on palm of other</i></p>

<p>I'm squishing up the baby bumblebee, Won't my mommy be so proud of me, I'm squishing up a baby bumblebee,</p>			
Spoken: Ooh! It's yucky!	<i>Speak</i>	<i>Speak</i>	<i>Speak</i>
<p>I'm wiping off the baby bumblebee, Won't my mommy be so proud of me, I'm wiping off the baby bumblebee,</p>	<p><i>Perform action of wiping hands on the t-shirt</i></p>	<p><i>Perform action of wiping hands on the t-shirt</i></p>	<p><i>Perform action of wiping hands on the t-shirt</i></p>
<p>Spoken: Now my mommy won't be mad at me!</p>	<i>Speak</i>	<i>Speak</i>	<i>Speak</i>






Bingo			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
There was a farmer had a dog, And Bingo was his name-o.	<i>Speak</i>	<i>Speak</i>	<i>Speak</i>
B-I-N-G-O! B-I-N-G-O! B-I-N-G-O!	<i>Clap</i>	<i>Clap</i>	<i>Clap</i>
And Bingo was his name-o!	<i>Speak</i>	<i>Speak</i>	<i>Speak</i>



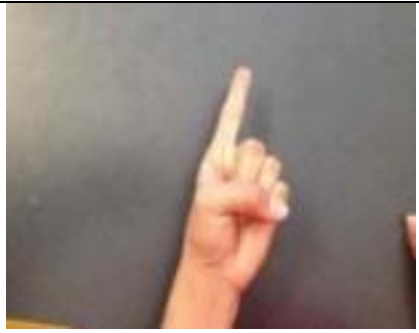


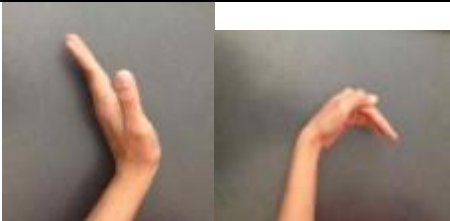



Five Little Ducks			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Five little ducks Went out one day	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>
Over the hill and far away	 <p><i>Stiff wrist and palm movement</i></p>	 <p><i>Bend the palm a little,</i></p>	 <p><i>Flexible wrist and palm movement</i></p>

<p>Mother duck said "Quack, quack, quack, quack."</p>	 <p><i>No touch between fingers and thumb</i></p>	 <p><i>Fingers touch thumb but are stiff</i></p>	 <p><i>Fingers touch thumb and all of them bend a little</i></p>
<p>But only four little ducks came back. Four little ducks Went out one day</p>	 <p><i>Show four fingers will straight thumb</i></p>	 <p><i>Show four fingers with thumb bent a little</i></p>	 <p><i>Show four fingers with thumb bent to its maximum ability</i></p>
<p>Over the hill and far away</p>	 <p><i>Stiff wrist and palm movement</i></p>	 <p><i>Bend the palm a little,</i></p>	 <p><i>Flexible wrist and palm movement</i></p>







<p>Mother duck said "Quack, quack, quack, quack."</p>	 <p><i>No touch between fingers and thumb</i></p>	 <p><i>Fingers touch thumb but are stiff</i></p>	 <p><i>Fingers touch thumb and all of them bend a little</i></p>
<p>But only three little ducks came back. Three little ducks Went out one day</p>	 <p><i>Three fingers with third finger bent a little and not much interaction between thumb and last finger</i></p>	 <p><i>Third finger not straight and more structured interaction between thumb and last finger</i></p>	 <p><i>All three fingers standing straight and structured interaction between thumb and last finger</i></p>





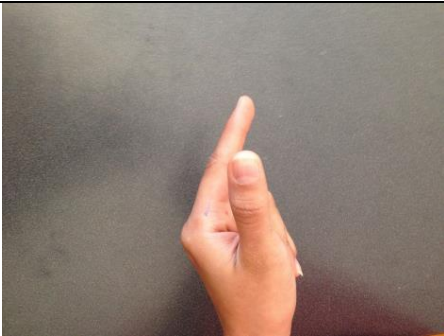

Over the hill and far away	 <i>Stiff wrist and palm movement</i>	 <i>Bend the palm a little,</i>	 <i>Flexible wrist and palm movement</i>
Mother duck said "Quack, quack, quack, quack."	 <i>No touch between fingers and thumb</i>	 <i>Fingers touch thumb but are stiff</i>	 <i>Fingers touch thumb and all of them bend a little</i>
But only two little ducks came back. Two little ducks Went out one day	 <i>Two fingers with third and fourth</i>	 <i>Two fingers with third and fourth</i>	 <i>Two fingers with third and fourth</i>



	<i>fingers bent a little and not much interaction between them and the thumb</i>	<i>fingers bent a little and a little interaction between them and the thumb</i>	<i>fingers bent with maximum interaction between them and the thumb</i>
Over the hill and far away	 <p><i>Stiff wrist and palm movement</i></p>	 <p><i>Bend the palm a little,</i></p>	 <p><i>Flexible wrist and palm movement</i></p>
Mother duck said "Quack, quack, quack, quack."	 <p><i>No touch between fingers and thumb</i></p>	 <p><i>Fingers touch thumb but are stiff</i></p>	 <p><i>Fingers touch thumb and all of them bend a little</i></p>





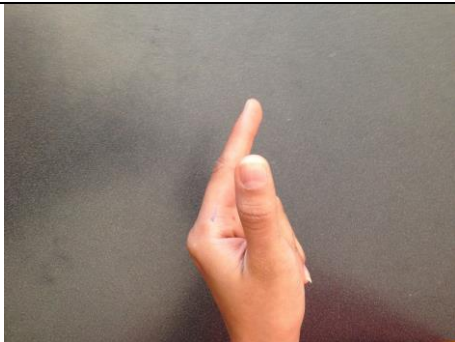

<p>But only one little duck came back. One little duck Went out one day</p>	 <p><i>Index finger now straight and minimal interactions between the remaining fingers</i></p>	 <p><i>First finger not straight and a little more interaction between the remaining fingers</i></p>	 <p><i>First finger straight and maximum interaction between the remaining fingers</i></p>
<p>Over the hill and far away</p>	 <p><i>Stiff wrist and palm movement</i></p>	 <p><i>Bend the palm a little,</i></p>	 <p><i>Flexible wrist and palm movement</i></p>
<p>Mother duck said "Quack, quack, quack, quack."</p>	 <p><i>No touch between fingers and</i></p>		

	<i>thumb</i>	<i>Fingers touch thumb but are stiff</i>	<i>Fingers touch thumb and all of them bend a little</i>
And all the five little ducks came back.	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>





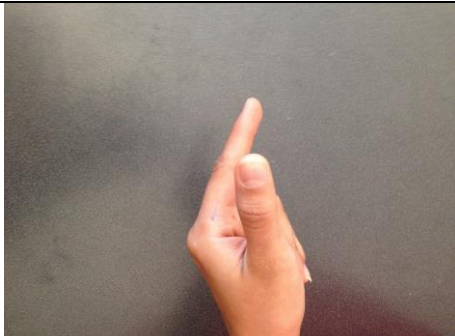

Five Little Monkeys			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Five little monkeys jumping on the bed	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>
One fell off and bumped his head	 <p><i>Put fist anywhere on head</i></p>	 <p><i>Put fist on the left side of the head</i></p>	 <p><i>Put fist on the left side of the head and tilt the head a little</i></p>







<p>Mama called the doctor, And the doctor said</p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb sticking out</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb and last fingers in opposite directions</i></p>
<p>No more monkeys jumping on the bed</p>	 <p><i>Move hands top to bottom</i></p>	 <p><i>More structured movement</i></p>	 <p><i>Point index finger and move hand top to bottom</i></p>





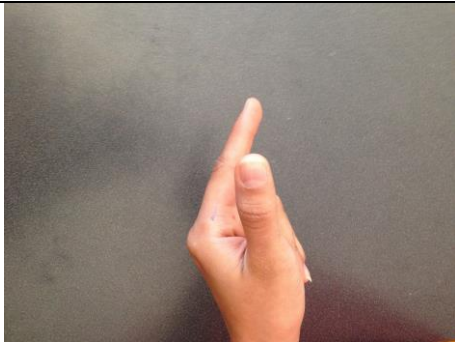

<p>Four little monkeys jumping on the bed</p>	 <p><i>Show four fingers will straight thumb</i></p>	 <p><i>Show four fingers with thumb bent a little</i></p>	 <p><i>Show four fingers with thumb bent to its maximum ability</i></p>
<p>One fell off and bumped his head</p>	 <p><i>Put fist anywhere on head</i></p>	 <p><i>Put fist on the left side of the head</i></p>	 <p><i>Put fist on the left side of the head and tilt the head a little</i></p>



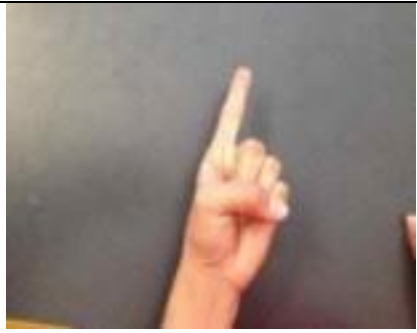



<p>Mama called the doctor, And the doctor said</p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb sticking out</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb and last fingers in opposite directions</i></p>
<p>No more monkeys jumping on the bed</p>	 <p><i>Move hands top to bottom</i></p>	 <p><i>More structured movement</i></p>	 <p><i>Point index finger and move hand top to bottom</i></p>




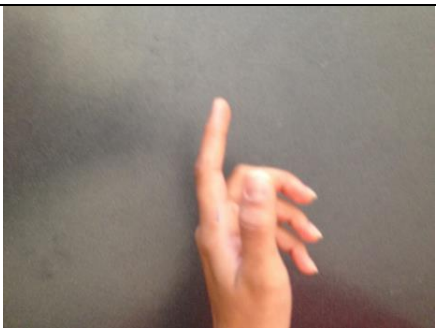
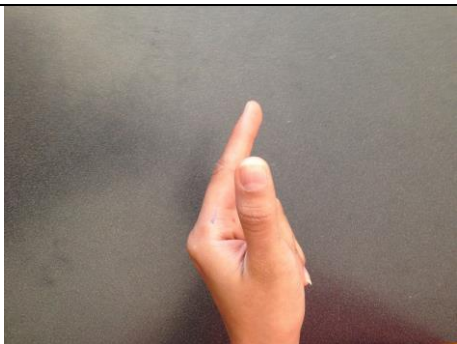
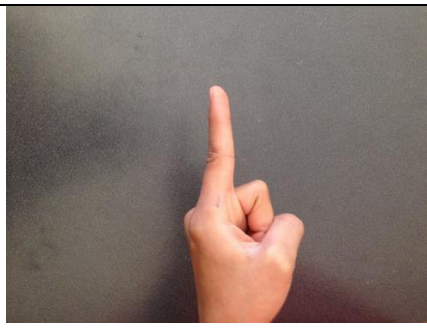
<p>Three little monkeys jumping on the bed</p>	 <p><i>Three fingers with third finger bent a little and not much interaction between thumb and last finger</i></p>	 <p><i>Third finger not straight and more structured interaction between thumb and last finger</i></p>	 <p><i>All three fingers standing straight and structured interaction between thumb and last finger</i></p>
<p>One fell off and bumped his head</p>	 <p><i>Put fist anywhere on head</i></p>	 <p><i>Put fist on the left side of the head</i></p>	 <p><i>Put fist on the left side of the head and tilt the head a little</i></p>

<p>Mama called the doctor, And the doctor said</p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb sticking out</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb and last fingers in opposite directions</i></p>
<p>No more monkeys jumping on the bed</p>	 <p><i>Move hands top to bottom</i></p>	 <p><i>More structured movement</i></p>	 <p><i>Point index finger and move hand top to bottom</i></p>

<p>Two little monkeys jumping on the bed</p>	 <p><i>Two fingers with third and fourth fingers bent a little and not much interaction between them and the thumb</i></p>	 <p><i>Two fingers with third and fourth fingers bent a little and a little interaction between them and the thumb</i></p>	 <p><i>Two fingers with third and fourth fingers bent with maximum interaction between them and the thumb</i></p>
<p>One fell off and bumped his head</p>	 <p><i>Put fist anywhere on head</i></p>	 <p><i>Put fist on the left side of the head</i></p>	 <p><i>Put fist on the left side of the head and tilt the head a little</i></p>







<p>Mama called the doctor, And the doctor said</p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb sticking out</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb and last fingers in opposite directions</i></p>
<p>No more monkeys jumping on the bed</p>	 <p><i>Move hands top to bottom</i></p>	 <p><i>More structured movement</i></p>	 <p><i>Point index finger and move hand top to bottom</i></p>







<p>One little monkey jumping on the bed</p>	 <p><i>Index finger now straight and minimal interactions between the remaining fingers</i></p>	 <p><i>First finger not straight and a little more interaction between the remaining fingers</i></p>	 <p><i>First finger straight and maximum interaction between the remaining fingers</i></p>
<p>He fell off and bumped his head</p>	 <p><i>Put fist anywhere on head</i></p>	 <p><i>Put fist on the left side of the head</i></p>	 <p><i>Put fist on the left side of the head and tilt the head a little</i></p>







<p>Mama called the doctor, And the doctor said</p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb sticking out</i></p>	 <p><i>Fist is not clenched and fingers are relaxed with thumb and last fingers in opposite directions</i></p>
<p>Put those monkeys right to bed</p>	 <p><i>Move hands top to bottom</i></p>	 <p><i>More structured movement</i></p>	 <p><i>Point index finger and move hand top to bottom</i></p>










Head, Shoulders, Knees and Toes			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Head,	<i>Touch head</i>	<i>Touch head</i>	<i>Touch head</i>
Shoulders,	<i>Touch shoulders</i>	<i>Touch shoulders</i>	<i>Touch shoulders</i>
Knees	<i>Touch knees</i>	<i>Touch knees</i>	<i>Touch knees</i>
and Toes,	<i>Touch toes</i>	<i>Touch toes</i>	<i>Touch toes</i>
Knees	<i>Touch knees</i>	<i>Touch knees</i>	<i>Touch knees</i>
and Toes,	<i>Touch toes</i>	<i>Touch toes</i>	<i>Touch toes</i>
Head,	<i>Touch head</i>	<i>Touch head</i>	<i>Touch head</i>
Shoulders,	<i>Touch shoulders</i>	<i>Touch shoulders</i>	<i>Touch shoulders</i>
Knees	<i>Touch knees</i>	<i>Touch knees</i>	<i>Touch knees</i>
and Toes,	<i>Touch toes</i>	<i>Touch toes</i>	<i>Touch toes</i>
Knees	<i>Touch knees</i>	<i>Touch knees</i>	<i>Touch knees</i>
and Toes,	<i>Touch toes</i>	<i>Touch toes</i>	<i>Touch toes</i>
And eyes	<i>Touch eyes</i>	<i>Touch eyes</i>	<i>Touch eyes</i>
and ears	<i>Touch ears</i>	<i>Touch ears</i>	<i>Touch ears</i>
and mouth	<i>Touch mouth</i>	<i>Touch mouth</i>	<i>Touch mouth</i>
and nose	<i>Touch nose</i>	<i>Touch nose</i>	<i>Touch nose</i>







Hickory, Dickory, Dock







LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Hickory dickory dock, The mouse ran up the clock.	 <p><i>Clenched fists</i></p>	 <p><i>Relax the fists a little</i></p>	 <p><i>Relax the fists a little and bend thumbs</i></p>
The clock struck one,	 <p><i>Index finger now straight and minimal interactions between the remaining fingers</i></p>	 <p><i>First finger not straight and a little more interaction between the remaining fingers</i></p>	 <p><i>First finger straight and maximum interaction between the remaining fingers</i></p>







<p>The mouse ran down, Hickory dickory dock.</p>	 <p><i>Clenched fists</i></p>	 <p><i>Relax the fists a little</i></p>	 <p><i>Relax the fists a little and bend thumbs</i></p>
<p>Tic toc tic toc tic</p>	 <p><i>Point the index finger and thumb along with bending the remaining fingers a little</i></p>	 <p><i>Point the index finger and thumb along with bending the remaining fingers in a more structured way</i></p>	 <p><i>Point the index along with bending the remaining fingers and thumb in the most structured way</i></p>




<p>Hickory dickory dock, The mouse ran up the clock.</p>	 <p><i>Clenched fists</i></p>	 <p><i>Relax the fists a little</i></p>	 <p><i>Relax the fists a little and bend thumbs</i></p>
<p>The clock struck two,</p>	 <p><i>Two fingers with third and fourth fingers bent a little and not much interaction between them and the thumb</i></p>	 <p><i>Two fingers with third and fourth fingers bent a little and a little interaction between them and the thumb</i></p>	 <p><i>Two fingers with third and fourth fingers bent with maximum interaction between them and the thumb</i></p>

And down he flew,	 <i>Show five fingers</i>	 <i>Show five fingers</i>	 <i>Show five fingers</i>
Hickory dickory dock.	 <i>Clenched fists</i>	 <i>Relax the fists a little</i>	 <i>Relax the fists a little and bend thumbs</i>
Tic toc tic toc tic	 <i>Point the index finger and thumb</i>	 <i>Point the index finger and thumb</i>	 <i>Point the index along with bending the remaining fingers and thumb in</i>

	<i>along with bending the remaining fingers a little</i>	<i>along with bending the remaining fingers in a more structured way</i>	<i>the most structured way</i>
Hickory dickory dock, The mouse ran up the clock.	 <p><i>Clenched fists</i></p>	 <p><i>Relax the fists a little</i></p>	 <p><i>Relax the fists a little and bend thumbs</i></p>
The clock struck three,	 <p><i>Three fingers with third finger bent a little and not much interaction between thumb and last finger</i></p>	 <p><i>Third finger not straight and more structured interaction between thumb and last finger</i></p>	 <p><i>All three fingers standing straight and structured interaction between thumb and last finger</i></p>

<p>The mouse went weee,</p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>
<p>Hickory dickory dock.</p>	 <p><i>Clenched fists</i></p>	 <p><i>Relax the fists a little</i></p>	 <p><i>Relax the fists a little and bend thumbs</i></p>

Humpty Dumpty			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Humpty Dumpty sat on a wall	 <p><i>Put palms together but fingers are not in direct contact with each other</i></p>	 <p><i>Hold both hands in an unstructured way</i></p>	 <p><i>Hold hands such as fingers in each hand are in opposite direction of each other</i></p>
Humpty Dumpty had a great fall	 <p><i>Move hands in random direction</i></p>	 <p><i>Make an attempt to move hands in clockwise direction</i></p>	 <p><i>Move hands in clockwise direction</i></p>










<p>All the king's horses and all the King's men</p>	 <p><i>Move both fists randomly in up-down motion</i></p>	 <p><i>Move both fists together in up-down motion</i></p>	 <p><i>Move both fists together in up-down motion</i></p>
<p>Couldn't put Humpty together again</p>	<p><i>I don't know gesture</i></p>	<p><i>I don't know gesture</i></p>	<p><i>I don't know gesture</i></p>







I am a Little Tea Pot			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
I'm a little teapot Short and stouts	<i>Put both hands at a random distance in front of stomach</i>	<i>Put both hands at a random distance in front of stomach</i>	<i>Put both hands at about half feet distance in front of stomach</i>
Here is my handle	<i>Put left hand on hip</i>	<i>Put left hand on hip</i>	<i>Put left hand on hip</i>
Here is my spout	<i>Point right hand straight</i>	<i>Bend right hand a little from elbow</i>	<i>Bend right hand from elbow and wrist</i>
When I get all steamed up Hear me shout	<i>Continue putting left hand on hip and pointing right hand straight</i>	<i>Continue putting left hand on hip and bending right hand a little from elbow</i>	<i>Continue putting left hand on hip and bending right hand from elbow and wrist</i>
Tip me over and pour me out	<i>Bend a little to the right</i>	<i>Bend a little to the right</i>	<i>Bend a little to the right</i>




If You Are Happy And You Know It			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
If you're happy and you know it, clap your hands If you're happy and you know it, clap your hands If you're happy and you know it, then your face will surely show it If you're happy and you know it, clap your hands.	<i>Clap hands</i>	<i>Clap hands</i>	<i>Clap hands</i>
If you're happy and you know it, stomp your feet If you're happy and you know it, stomp your feet If you're happy and you know it, then your face will surely show it If you're happy and you know it, stomp your feet.	<i>Stomp feet</i>	<i>Stomp feet</i>	<i>Stomp feet</i>
If you're happy and you know it, nod your head If you're happy and you know it, nod your head If you're happy and you know it, then your face	<i>Nod head</i>	<i>Nod head</i>	<i>Nod head</i>







will surely show it If you're happy and you know it, nod your head.			
If you're happy and you know it, turn around If you're happy and you know it, turn around If you're happy and you know it, then your face will surely show it If you're happy and you know it, turn around.	<i>Turn around</i>	<i>Turn around</i>	<i>Turn around</i>
If you're happy and you know it, shout "Hurray!" If you're happy and you know it, shout "Hurray!" If you're happy and you know it, then your face will surely show it If you're happy and you know it, shout "Hurray!"	<i>Shout "Hurray"</i>	<i>Shout "Hurray"</i>	<i>Shout "Hurray"</i>
If you're happy and you know it, do all five If you're happy and you know it, do all five If you're happy and you know it, then your face will surely show it If you're happy and you know it, do all five.	<i>Perform actions in this order: Clap hands, stomp feet, nod head, turn around, shout "Hurray"</i>	<i>Perform actions in this order: Clap hands, stomp feet, nod head, turn around, shout "Hurray"</i>	<i>Perform actions in this order: Clap hands, stomp feet, nod head, turn around, shout "Hurray"</i>







Itsy Bitsy Spider			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Itsy Bitsy spider went up the water spout	 <p><i>Try to bring fingers in contact with each other</i></p>	 <p><i>Bring fingers in contact with each other and ben them a little</i></p>	 <p><i>Bring last finger and thumb of one hand in contact with the thumb and last finger of the other hand respectively</i></p>
Down came the rain	 <p><i>Show five fingers</i></p>	 <p><i>Move five fingers in a random but stiff motion</i></p>	 <p><i>Move five fingers in random motion</i></p>







and washed the spider out	 <i>Show five fingers</i>	 <i>Show five fingers</i>	 <i>Show five fingers</i>
Out came the sun and dried up all the rain	 <i>Point hands in upward direction</i>	 <i>Put one hand on top of the other over the head</i>	 <i>Interlink fingers over the head</i>
Now Itsy Bitsy spider went up the spout again!	 <i>Try to bring fingers in contact with each other</i>	 <i>Bring fingers in contact with each other and ben them a little</i>	 <i>Bring last finger and thumb of one hand in contact with the thumb and last finger of the other hand respectively</i>










Jack and Jill			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Jack and Jill went up the hill to fetch a pail of water	 <p><i>Show both hands moving in upward direction together</i></p>	 <p><i>Show both hands moving in upward direction together</i></p>	 <p><i>Show both hands moving in upward direction simultaneously</i></p>
Jack fell down and broke his crown	 <p><i>Show five fingers moving in downward direction</i></p>	 <p><i>Show five fingers moving in downward direction</i></p>	 <p><i>Show five fingers moving in downward direction</i></p>







<p>And Jill came tumbling after.</p>	 <p><i>Move hands in random direction with fingers pointing straight</i></p>	 <p><i>Make an attempt to move hands in clockwise direction with fingers pointing straight</i></p>	 <p><i>Move hands in clockwise direction with fingers pointing straight</i></p>
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London Bridge is Falling Down			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
London Bridge is falling down, Falling down, falling down. London Bridge is falling down,	 <p><i>Make contact with both palms</i></p>	 <p><i>Interlink fingers of both hands randomly</i></p>	 <p><i>Hold both hands properly</i></p>
My fair lady.	 <p><i>Make contact with both palms</i></p>	 <p><i>Interlink fingers of both hands randomly</i></p>	 <p><i>Hold both hands properly</i></p>







One, Two, Buckle My Shoe				
LYRICS	SIMPLE		INTERMEDIATE	COMPLEX
One,	 <p><i>Index finger now straight and minimal interactions between the remaining fingers</i></p>		 <p><i>First finger not straight and a little more interaction between the remaining fingers</i></p>	 <p><i>First finger straight and maximum interaction between the remaining fingers</i></p>
two	 <p><i>Two fingers with third and fourth fingers bent a little and not much interaction between them and the</i></p>		 <p><i>Two fingers with third and fourth fingers bent a little and a little interaction between them and the</i></p>	 <p><i>Two fingers with third and fourth fingers bent with maximum interaction between them and the</i></p>







	<i>thumb</i>	<i>thumb</i>	<i>thumb</i>
Buckle my shoe	 <p><i>Unstructured position of one hand on top of the other</i></p>	 <p><i>Place fingers of one hand on top of fingers of the other hand</i></p>	 <p><i>Place one hand on top of the other</i></p>
Three,	 <p><i>Three fingers with third finger bent a little and not much interaction between thumb and last finger</i></p>	 <p><i>Third finger not straight and more structured interaction between thumb and last finger</i></p>	 <p><i>All three fingers standing straight and structured interaction between thumb and last finger</i></p>




four			
Open the door	 	 	 

	 <p><i>Place both hand facing each other and then make them face the front</i></p>	 <p><i>Place both hand facing each other and then make them face the front</i></p>	 <p><i>Place both hand facing each other and then make them face the front</i></p>
Five,	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>




Six	 <p><i>Left hand: show five fingers Right hand: Bend all the fingers a little with thumb pointing out a little</i></p>	 <p><i>Left hand: show five fingers Right hand: Bend all the fingers a little more with thumb pointing out a little</i></p>	 <p><i>Left hand: show five fingers Right hand: Bend all the fingers with thumb pointing out</i></p>
Pick up sticks	 <p><i>Make contact of thumb with all fingers</i></p>	 <p><i>Fists are not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>	 <p><i>Fists are not clenched and fingers are relaxed with thumb in contact with the index finger</i></p>

Seven,	 <p><i>Left hand: Show five fingers Right hand: Try to point index finger and thumb out and bend the remaining fingers a little</i></p>	 <p><i>Left hand: Show five fingers Right hand: Point index finger and thumb out and bend the remaining fingers a little</i></p>	 <p><i>Left hand: Show five fingers Right hand: Point index finger and thumb out and bend the remaining fingers</i></p>
eight	 <p><i>Left hand: Show five fingers Right hand: Try to point two fingers and thumb out and bend the remaining fingers a little</i></p>	 <p><i>Left hand: Show five fingers Right hand: Point two fingers and thumb out and bend the remaining fingers a little</i></p>	 <p><i>Left hand: Show five fingers Right hand: Point two fingers and thumb out and bend the remaining fingers</i></p>




<p>Close the gate</p>	 <p><i>Touch palms and align fingers randomly</i></p>	 <p><i>Touch palms and try aligning all fingers with each other</i></p>	 <p><i>Touch the palms such as all fingers as aligned</i></p>
<p>Nine,</p>	 <p><i>Left hand: Show five fingers Right hand: Bend all the fingers with the last finger bending comparatively more</i></p>	 <p><i>Left hand: Show five fingers Right hand: Bend the last finger a little more and try to straighten the remaining fingers</i></p>	 <p><i>Left hand: Show five fingers Right hand: Bend the last finger and straighten the remaining fingers</i></p>




ten			
Lets do it again.	<i>Clap</i>	<i>Clap</i>	<i>Clap</i>

Ring Around the Roses
(pictures show hands of two different people)

LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Ring around the roses A pocketful of posies "Ashes, Ashes"	 <p><i>Make contact with both palms</i></p>	 <p><i>Interlink fingers of both hands randomly</i></p>	 <p><i>Hold both hands properly</i></p>
We all fall down	<i>Fall down</i>	<i>Fall down</i>	<i>Fall down</i>

Row, Row, Row, Your Boat
(pictures show hands of two different people)

LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
<p>Row, row, row your boat, Gently down the stream. Merrily, merrily, merrily, merrily, Life is but a dream.</p>	 <p><i>Touch fingers of both hands</i></p>	 <p><i>Hold fingers of both hands</i></p>	

Twinkle Twinkle Little Star			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
Twinkle, twinkle, little star,	 <p><i>First picture: Straighten all the fingers</i> <i>Second picture: Try to touch all fingers with thumb</i></p>	 <p><i>First picture: Straighten all the fingers</i> <i>Second picture: Bend the fingers a little and try to touch them with thumb</i></p>	 <p><i>First picture: Straighten all the fingers</i> <i>Second picture: Touch all fingers with thumb</i></p>

<p>How I wonder what you are.</p>	 <p><i>Left hand: Show five fingers Right hand: Show five fingers</i></p>	 <p><i>Left hand: Bend the last two fingers a little and try to straighten the remaining ones Right hand: Bend the last two fingers a little and try to straighten the remaining ones</i></p>	 <p><i>Left hand: Bend the last two fingers and straighten the remaining ones Right hand: Bend the last two fingers and straighten the remaining ones</i></p>
<p>Up above the world so high,</p>	 <p><i>Left hand: Show five fingers Right hand: Show five fingers</i></p>	 <p><i>Left hand: show five fingers and bend the wrist outward a little Right hand: show five fingers and bend the wrist outward a little</i></p>	 <p><i>Left hand: show five fingers and bend the wrist outward Right hand: show five fingers and bend the wrist outward</i></p>

Like a diamond
in the sky.









*Touch all the fingers with each
other*












*Touch the index finger and thumb of
both hands and try to bend the
remaining fingers*









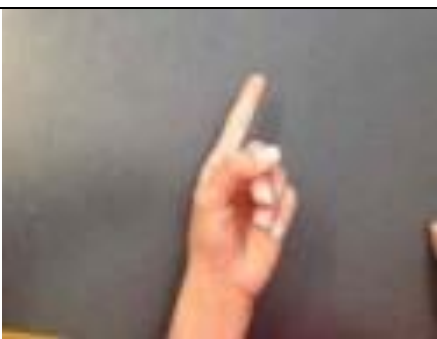
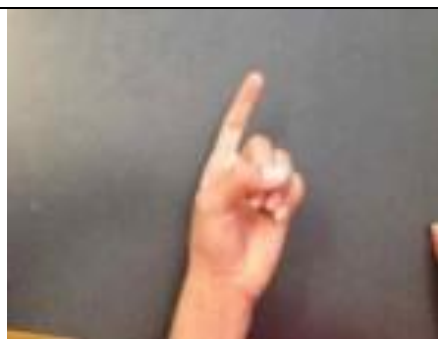
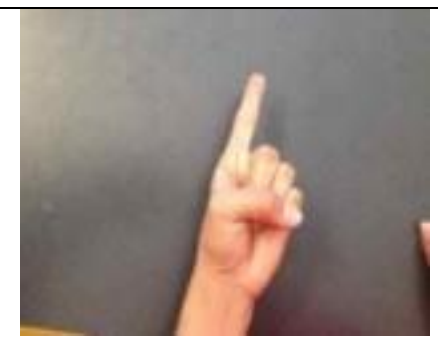
*Touch the index finger and thumb of
both hands and bend the remaining
fingers*




Wheels on the Bus			
LYRICS	SIMPLE	INTERMEDIATE	COMPLEX
<p>The wheels on the bus go round and round, round and round, round and round.</p> <p>The wheels on the bus go round and round, all through the town.</p>	 <p><i>Move hands in random direction</i></p>	 <p><i>Make an attempt to move hands in clockwise direction</i></p>	 <p><i>Move hands in clockwise direction</i></p>
<p>The wipers on the bus go Swish, swish, swish; Swish, swish, swish; Swish, swish, swish.</p> <p>The wipers on the bus go Swish, swish,</p>	 <p><i>Show five fingers and move both hands left-right randomly</i></p>	 <p><i>Show five fingers and move both hands left-right randomly</i></p>	 <p><i>Show five fingers and move both hands left-right</i></p>

swish, all through the town.			
The horn on the bus goes Beep, beep, beep; Beep, beep, beep; Beep, beep, beep. The horn on the bus goes Beep, beep, beep, all through the town..	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>	 <p><i>Show five fingers</i></p>
The doors on the bus go open and shut; open and shut; open and shut; The doors on the bus go open and shut; all through the town..			

	  <p><i>Place both hand facing each other and then make them face the front</i></p>	  <p><i>Place both hand facing each other and then make them face the front</i></p>	  <p><i>Place both hand facing each other and then make them face the front</i></p>
<p>The people on the bus go up and down; Up and down; Up and down; The people on the bus go up and down; all through the</p>	<p><i>Straighten and bend the back simultaneously</i></p>	<p><i>Straighten and bend the back simultaneously</i></p>	<p><i>Straighten and bend the back simultaneously</i></p>

town..			
<p>The Driver on the bus says "Move on back, move on back, move on back;"</p> <p>The Driver on the bus says "Move on back", all through the town.</p>	<i>Speak 'Move on back'</i>	<i>Speak 'Move on back'</i>	<i>Speak 'Move on back'</i>
<p>The money on the bus goes, Clink, clink, clink;</p> <p>Clink, clink, clink;</p> <p>Clink, clink, clink.</p> <p>The money on the bus goes, Clink, clink, clink, all through the town.</p>	 <p><i>Place both the hands next to each other and move hands left-right randomly</i></p>	 <p><i>Place both the hands next to each other and move hands left-right</i></p>	 <p><i>Place both the hands next to each other and move hands left-right</i></p>

<p>The baby on the bus says "Wah, wah, wah; Wah, wah, wah; Wah, wah, wah".</p> <p>The baby on the bus says "Wah, wah, wah", all through the town.</p>	 <p><i>Move both fists randomly in up-down motion</i></p>	 <p><i>Move both fists together in up-down motion</i></p>	 <p><i>Move both fists together in up-down motion</i></p>
<p>The mommy on the bus says "Shush, shush, shush; Shush, shush, shush; Shush, shush, shush."</p> <p>The mommy on the bus says "Shush, shush, shush" all through the town.</p>	 <p><i>Index finger now straight and minimal interactions between the remaining fingers</i></p>	 <p><i>First finger not straight and a little more interaction between the remaining fingers</i></p>	 <p><i>First finger straight and maximum interaction between the remaining fingers</i></p>

<p>The daddy on the bus says "I love you; I love you; I love you." The daddy on the bus says " I love you " all through the town.</p>	 <p><i>Ben all fingers except thumb</i></p>	 <p><i>Try to bend only the second and third fingers</i></p>	 <p><i>Bend only the second and third fingers</i></p>
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APPENDIX G

MATRIX ABOUT GAMES IN ALL PLATFORMS EXCEPT TOUCHSCREEN DEVICES

This matrix gives information about the games for children that have high ratings on Children's Technology Review and currently exist on all the platforms except touchscreen devices.

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Bartleby's Book of Buttons	iPad	Octopus Kite/Big D TV, Inc.	2 to 10	Toddlers, Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	reading, logic	4.7	2010
Bartleby's Book of Buttons Vol. 2	iPad, iPhone	Octopus Kite/Big D TV, Inc.	5 to 9	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade	logic, reading, language	4.9	2011
Boogie Bopper	iPad	zinc Roe Design	2 to 4	Toddlers, Preschool, Prekindergarten	music, melody, rhythm, causality	4.8	2010
Color Collector	iPhone	zinc Roe Design	3 to 5	Preschool, Prekindergarten, Kindergarten	colors, visual discrimination	4.8	2010
Dance Dance Revolution Disney Grooves	Wii	Konami Digital Entertainment, Inc.	4 to 10	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	rhythm, gross motor coordination for both upper and lower body	4.6	2009
Giggles Computer Funtime for Baby - My Musical World	Windows, Mac OSX	Leveractive, LLC	0 to 3	Babies, Toddlers, Preschool	casality, music, notation, Spanish, English, timing, classification	5	2009

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Giggles Computer Funtime for Baby - Nursery Rhymes	Windows, Mac OSX	Leveractive, LLC	0 to 3	Babies, Toddlers, Preschool	causality, early learning	4.9	2008
Go, Diego, Go!: Great Dinosaur Rescue (Console Version)	Wii*, PlayStation 2*, Nintendo DS	2K Play	3 to 6	Prekindergarten, Kindergarten, 1st grade	language (Spanish, English), dinosaur facts.	4.7	2008
I Spy Fun House	Windows, Mac OSX	Scholastic, Inc.	6 to 10	1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	problem solving, logic, classifying & sorting, reading, vocabulary and memory	4.7	2008
Kinectimals	XBox Kinect, Xbox 360	Microsoft Game Studios	4 to 9	Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade	movement, physical coordination, gross motor movement, lower body movement, following directions	4.7	2010
Kirby's Epic Yarn	Wii	Nintendo of America	3 and up	P, K, 1, 2, 3, 4, 5, 6, 7, 8, 9, S, Jr, Sr.	Sidescroller	4.9	2010
LeapPad "Record and Play" Microphone	LeapPad	LeapFrog	3 to 8	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	reading	4.8	2003
Old MacDonald -- by Duck Duck Moose	iPhone	Duck Duck Moose Design	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	causality, languages	4.7	2009
Old MacDonald Piano	iPhone, iPad	Kiboomu Inc.	3 to 7	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade	music, piano	4.8	2010

GAME NAME	PLATFORM	PUBLISHER	AGE (YEARS)	GRADE LEVEL	ACTIVITY LEARNED	TECHNOLOGY REVIEW RATINGS (OUT OF 5 STARS)	
						STARS	YEAR OF REVIEW
Sesame Street: Once Upon a Monster	Xbox Kinect	Warner Brothers Interactive Entertainment, Inc.	3 to 6	Preschool, Prekindergarten, Kindergarten, 1st grade	classification, large motor coordination, collaborative play, socialization	4.6	2011
SmackTalk (App) 1.3	iPad, iPhone, iPod Touch (microphone is required)	Marcus Satellite	3 to 8	Preschool, Prekindergarten, Kindergarten, 1st grade, 2nd grade, 3rd grade	audio, pronunciation, verbal skills	4.7	2010
Sound Shaker	iPhone, iPod touch	zinc Roe Design	3 to 5	Preschool, Prekindergarten, Kindergarten	music, scales, causality, logic, fine motor skills	4.8	2009
Up!	Wii, Windows, Xbox 360, iPhone	THQ, Inc.	5 to 10	Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade	cooperation, logic, problem solving	4.75	2009

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