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Study Of The Ability To Detect Humor In Visual Images By 2-5 Year Olds

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ABSTRACT

STUDY OF THE ABILITY TO DETECT HUMOR

IN VISUAL IMAGES BY 2-5 YEAR OLDS

by

Sonovia Latoya McFall

Chair: Dr. D'Jaris Coles-White, Ph. D.

ABSTRACT OF GRADUATE STUDENT RESEARCH

Thesis

Andrews University

School of Health Professions

Title: ABILITY TO DETECT HUMOR BY YOUNG CHILDREN, 2-5 YEARS OLD

Name of researcher: Sonovia Latoya McFall

Name and degree of faculty chair: D'Jaris Coles-White, Ph. D.

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Problem

Understanding the impact that humor can have as a form of therapy has been studied mostly in relation to mental and spiritual healing. As a result, little focus has been given to understanding the types of humor and how one's understanding of and appreciation for types of humor develop over time. Gaining an understanding of humor development is important due to discoveries that the use of humor is a great intervention tool when working with children. Nevertheless, the use of pictures (with humor) is often used within speech therapy sessions, but seldom used correctly due to the lack of understanding of humor development in children.

Method

This study was carried out by individually removing each participant from the classroom A total of 12 pictures were presented to each child (i.e. three groups of four pictures) via the iPad. When the first photo grid was presented, the experimenter directed the participant's attention to the reference picture, and created a story line to explain the reference picture. Then the experimenter directed the participant's attention to the other three pictures by saying, "…Point to the picture that makes you laugh the most." The participant then selected from the three alternatives, with the expected selection to be the one of incongruency. Each participant was given a range of 0 to 90 seconds to observe each photo grid and select a response.

Results

A Pearson product-moment correlation coefficient showed that there was a positive correlation on all of the dependent variables (types of humor) and some independent variables (i.e. language and gender), as well as between gender and hyperbolic humor type. Repeated measures ANOVA resulted in significant difference in participants' ability to correctly identify incongruent elements in types of humor based on gender, language and age. A multiple regression analysis was done and resulted in there being a high level of significance for the independent variables age grouping, gender and language skills to operate as successful predictors of overall correct identification of incongruence in the dependent variables.

Conclusion

It is important to take into consideration the age, gender and type of humor as well as the language skill level of each client, because these aspects could have a major impact on the success or failure of a session and overall work with a client.

Andrews University

School of Health Professions

ABILITY TO DETECT HUMOR BY YOUNG

CHILDREN 3-5 YEARS OLD

A Thesis

Presented in Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Sonovia L. McFall

2017

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CHILDREN, 3-5 YEARS OLD

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APPROVAL BY THE COMMITTEE:

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Dr. D'Jaris Coles-White, Ph.D., Chair

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Heather Ferguson, MS-CCC/SLP   Date approved

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LIST OF ABBREVIATIONS

ASD   Autism Spectrum Disorder

PPVT-4   Peabody Picture Vocabulary Test 4th edition

CHAPTER 1

INTRODUCTION AND HISTORICAL BACKGROUND

Definition of Humor

Humor has been defined generally as "any communication that leads to an emotional experience of amusement, pleasure and/or mirth. It usually involves any element of surprise and results in smiling and/or laughter" (Southam, 2005 p. 106). However, as it pertains to the development, as it progresses and matures with age, it has been defined as "the mental experience of discovering or appreciating ludicrous or absurdly incongruous ideas, events or situations" (McGhee, 1979, p. 6). Humor is experienced when one expects a series of events to unfold in a logical manner, but experiences an unexpected turn in events, also referred to as incongruity, which is seen as humorous. Simply put, humor can be explained as a surprise in our thoughts of expectations. For example, imagine that you are looking at a video of a little boy struggling to climb a tree. He misses his grip of a branch in one hand on several occasions, but still manages to hang on to the tree. As you continue to watch the clip, and the little boy's struggle, you observe that the camera is zooming out on the event, allowing you to see more details of what is surrounding this little boy, only to realize that the tree that he was struggling to climb was just has tall as him, resulting in no struggle at all. This surprising addition to your view of the events would be a surprise, and result in you finding the event… humorous.

Purpose of Study

The purpose of this study was to determine if age, gender, and language skills play a role in one's ability to understand and appreciate varying types of humor (i.e. mentalistic, substitution, and hyperbolic) through visual representation. Understanding the role of humor in relation to children is essential, due to the findings that humor is extremely important to health and has a major impact on both language and affective elements of the human development (Joshua, Controneo, & Clarke, 2005, p. 646; Koller & Gryski, 2008, p. 20).

Statement of the Problem

Understanding the impact that humor can have as a form of therapy has been studied mostly in relation to mental and spiritual healing. With most studies geared towards that direction, little focus has been given to understanding the types of humor and how one's understanding of and appreciation for types of humor develop over time. Gaining an understanding of this avenue of humor development, understanding, and appreciation is important due to discoveries that the use of humor is a great intervention tool when working with children (Joshua et al., 2005, p. 646; Koller & Gryski, 2008, p. 20). Therefore, as speech therapists, to improve therapy sessions, with children, for efficiency and effectiveness, the matter of whether humor should be included as a part of the treatment process is a question that requires evidence-based responses. The use of pictorial humor within speech therapy is often used but seldom used correctly due to the varying levels of humor development in children.

Research Questions and Hypotheses

This research study sought to determine the correlation of the dependent variables, mentalistic, substitution, and hyperbolic humor with the independent variables age, gender, and language abilities. The following research questions were addressed:

Question1: Are there correlations between mentalistic, substitution, and hyperbolic types of humor?

Hypotheses

H_0: There is no correlation between mentalistic, substitution and hyperbolic types of humor.

H_1: There is a correlation between mentalistic, substitution and hyperbolic types of humor.

Question 2: Is there a difference in ability among participants to identify incongruent elements within various types of humor?

Hypotheses

H_0: There is no difference in ability among participants to identify incongruent elements within various types of humor.

H_1: There is a difference in ability among participants to identify incongruent elements within various types of humor.

Question 3: Are age, gender and language skills predictors in understanding mentalistic, substitution, and hyperbolic types of humor?

Hypotheses

H_0: Age, gender and language skills are not predictors in understanding mentalistic, substitution, and hyperbolic types of humor.

H_1: Age, gender and language skills are predictors in understanding mentalistic, substitution, and hyperbolic types of humor.

CHAPTER 2

LITERATURE REVIEW

Development of Humor

Filoppova and Astington (2010, p. 916) found that "social-communicative abilities such as theory of mind and understanding of humor develop throughout middle childhood". However, a definite age was not provided. Gaining an understanding of the timeframe of its development is important because, according to Lecce, Caputi, and Hughes (2011, p. 320), understanding theory of mind assists children in their ability to "self-monitor and regulate their language process and to engage in reflexive thinking", which are essential components to understanding humor. From the perspective that humor is a result of incongruities in a series of events, it was believed by McGhee (1979, p. 25), that a person is unable to develop even a perception of incongruities before the age of 18-24 months of development. This age range was believed to be the time that a child was able to demonstrate an understanding of fantasy and make-believe, thus showing signs of appreciation of humor.

Nevertheless, it is expected by pediatricians and parents, that children as young as six to eight months of age would be able to appreciate incongruities through experiencing surprises (as would be existent in a game of "peek-a-boo"). So, the question remains, exactly when does humor develop? What McGhee (1979, p. 10) found and shared about his observations was that, the level of a child's understanding about a concept is a major

determiner for how they perceive humor. This is seen in the statement presented where he stated, "a two-year-old will find it funny to call a ball an apple or a pumpkin, whereas a three-year-old will find it funny if the ball has ears and a nose or says 'ouch' when kicked" (McGhee, 1979, pg. 35). This is due to the level of understanding that children find humor based on their ages. Two year olds are only able to perceive incongruities in relation to the shape of the ball and the pumpkin, whereas three-year-olds could distinguish between other characteristics that are not expected to be on or heard from by a ball. Additionally, it was observed by Southam (2005) that the comprehension of humor is not the only difference in relation to the age of the child, but also the appreciation of it (p. 106). He alluded to the fact that children two-years-old and younger tend to appreciate visual humor more, and that three and four-year-olds tend to enjoy verbal humor more such as silly songs, and rhymes (p. 107). This observation is consistent with that of McGhee's study (1979) 25 years earlier.

Additionally, in Table 1, Southam (2005) presented a parallel of language and humor development, by Piaget and McGhee, whose expectations mirror each other based on the stages and ages of language and humor development (p. 109). Because of this consistency, further research was done, which showed that "humor comprehension is a two-stage process", which divides incongruity into two different functions that work towards understanding a humorous concept. Firstly, the person identifies the incongruity, and secondly, links it with the expectation, which then "resolves the incongruity" (Suits Tulviste, Ong, Tulviste, & Kolk, 2011, p. 311). Due to the fact that jokes are considered to be complex mental operations, (Puche-Navarro, 2004 p. 343) assumptions were made that it be due to age, previous research, which depended solely on verbal explanations,

proved to be true. However, speech and language are not the same functional domains, therefore, one should not depend on the other.

Table 1

Parallels Between Cognitive and Humor Development

Age	Piaget's Cognitive Stage	McGhee's Humor Stage
18-24 months	Sensorimotor Stage (Substage 6)	Stage 1 (18-20 months)
		Incongruous Actions towards Objects
	Child can use symbols, such as gestures, pictures, and words and can pretend	Child playfully manipulates an object in a way that demonstrates knowledge of its properties, but is incongruous to its usual uses. Visual surprises elicit laughter.
2-7 years	Preoperational Stage	Stage 3
		Conceptual Incongruity
	Symbolic use and pretending becomes more sophisticated. Understands identities, cause and effect, and numbers. Able to classify and categorize	Deliberately violates expectations of objects and words to create humor. Likes to hear and tell jokes, e.g. knock-knock. Likes to joke about areas of functioning that have mastered, e.g. coordination, toileting.

Types of Humor

Using graphic jokes as a means of analyzing how humor develops has been used to provide detail on a child's ability to analyze and compare, due to the proven fact that the ability to simultaneously consider two different representations… "is the decisive moment in the representational development of the child" (Mounoud, 1996, p. 94). Nevertheless, every joke is linked to a particular culture to which one must draw on for understanding (Puche-Navarro, 2004, p. 344). The culture of a joke should always be taken into consideration, due to the simple fact that a four-year-old may not have the same reaction to a picture of Rose, Blanch, Dorothy and Sophia (From the show entitled "The Golden Girls") as would a person who is forty; simply because that is not a part of their culture and/or experience. Ensuring that that child has been exposed to the culture of the joke before expecting them to find the joke humorous allows for the opportunity for the child to demonstrate semiological analysis. Semiological analysis is defined as a "task that makes explicit the required conditions (notions) in order to understand pictorial humor" (Puche-Navarro, 2009, p. 544). It would allow them to "understand the meaning of the relationship that made up the center of the graphic joke" (Puche-Navarro, 2004, p. 344).

Semiological analysis allows for the child to be able to identify the unexpected challenge or sabotage and the result of the incongruity. However, this ability is gained in stages and is seen throughout their understanding of three different types of jokes; mentalistic jokes, jokes based on substitution, and complex jokes (Puche-Novarro, 2004). Within a more recent study carried out by Puche-Navarro, definitions for these types of jokes were provided. Mentalistic jokes were define as "a space where the thoughts,

feelings or desires are projected" (Puche-Novarro, 2009, p. 544). An example of a

mentalistic joke is a photo of a little boy looking into the mirror and seeing himself as a

giant clown in a thought bubble). Substitution jokes were defined as "the substitution of a

principal element to produce incongruity" (Puche-Navarro, 2009, p. 544). An example of

this would be a picture of Dora and boots with their heads exchanged on each other's

bodies. On the other hand, "in hyperbolic jokes, the incongruity takes place as a function

of character exaggeration" (Puche-Navarro, 2009, p. 544). An example of this type of

joke is a sweating sun (due to the exaggerated heat).

Lack of Humor

Understanding that language development and abilities play a vital role in the

development of humor was found to be important, because it is a form of problem solving

and can provide information on a child's problem solving abilities (Brown, 1993, p. 36).

However, this area cannot be viewed as the only variable of humor. Studies have shown

that a child's language ability in processing, understanding, and showing appreciation for

a joke is a reflection of the child's own metalinguistic skills, social competences as well

as personality traits. (Bosacki, 2013; Samson, 2012). From this perspective, the idea of

"theory of mind" has been seen as a valid and essential component to developing humor.

Theory of mind has been defined as "the ability to represent other people's mental states,

such as beliefs, desires, emotions, and goals in order to predict their actions" (Baron-

Cohen, Leslie, & Frith, 1985 p. 814). It was believed by many that this variable was

essential for the processing of humor (Courage & Howe, 2002, p. 250). Because theory of

mind facilitates ones' anticipation of what should come next, it is understandable as to

how that must be a foundation of humor due to the incongruence that it would cause. As a

result of these findings, further research was done on individuals with Autism Spectrum Disorder (ASD). What was discovered was that those individuals demonstrated an impairment in their processing of humor which was because of the deficit as it pertains to theory of mind, thereby proving the hypothesis that some atypically developing children, such as those with ASD, would not be able to comprehend intentional humorous materials as hilarious (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997, p. 815). A study done in 2003 (Erickson & Feldstein, 2007) found that persons with ASD, when instructed to select a humorous depiction, often chose the least (intended) humorous (p. 257). Nevertheless, Lyons and Fitzgerald (2004) found that despite the fact that persons with ASD may have an impaired theory of mind, which would more than likely hinder their mind reading abilities, they may still be able to process humor from a different perspective, and that any hindrance may be as a result of a weak central coherence (p. 521). This was then followed by more supportive studies, such as one done by Farrant and Nusser (2005) who concluded from a more recent study done on persons with epilepsy, that theory of mind does not cause or hinder someone's processing and/or appreciation of humor (p. 215).

Due to the conflict in findings, some researchers decided to narrow in on exactly how the processing, understanding, and appreciation of humor occurs in children with learning disabilities due to the discovery that humor, a very important social skill, was not previously observed and assessed with this group, neither was it analyzed on how the lack of it could impact the child. Within a research done by Semrud-Clikeman & Glass (2008), learning disability was defined as "a collective term that indicates an individual who has difficulty processing information that may be written, oral, or nonverbal" (p.

164). Most mentionable from past studies, was the list of deficits that were mentioned to be affected by learning disabilities which included confusion with time or directionality, pragmatic/semantic language use and comprehension, as well as poor understanding of humor (Badian, 1992, p. 160). Understanding what learning disabilities include and the areas that it affects is essential to understanding how learning disabilities can influence humor. Because of a learning disability, a child may not be able to understand why something that is intended to be humorous, would be humorous.

Nevertheless, not everyone may be able to appreciate the joke, and find it humorous. This is due in part to the ideas that persons are only able to process and appreciate the humor of a joke if the type of humor is within their stage of development and language understanding (McGhee, 1979, p. 35). This ideology is appropriate in reference to the fact that jokes are understood through prior knowledge, experience, or exposure to something or someone. Therefore, if the person is unable to capture the disparity or "punch line" of a joke, or the incongruity, the joke would not be interpreted as humorous (Durant & Miller, 2011 p. 18). On the other hand, some jokes are not well received by persons due to some form of brain injury that the person may have encountered to the right hemisphere, which from previous studies, have shown a "low physical reaction and emotional response to humor" (Shammi & Stuss, 2003, p. 855). In a study reported in 1975, discovery was made that the brain is vital in the processing of humor when it comes to understanding and appreciating humor. Gardner found that the left hemisphere was responsible for processing jokes and the right hemisphere was responsible for appreciating and responding to the joke (Flowers, 1979, p. 339). However, another study that was reported in 2004 found more precise locations. Based

on the findings from this study, "the inferior frontal gyrus and posterior middle temporal gyrus were found to be activated during humor detection condition, while the insula and amygdala were activated during humor appreciation condition" (Moran, Wig, Adams, Janata, & Kelley, 2004, p. 1055). Additionally, a study that was reported in 2009 found that the temporal lobe also facilitated in the prediction versus surprise effect that results in what we perceive as humor (Samson, Hempelmann, Huber, & Zysset, 2009, p. 1023). Consequently, it was determined from a more recent study that "the neural processing and appreciation of humor requires integration of multisensory information as well as mental manipulation and organization of information in the anterior medial prefrontal cortex, bilateral superior frontal gyri, and temproparietal junctions" (Suits et al., 2011, p. 311), which can cause a deficit in the way that one understands humor. All of these areas play a vital role in the development of humor. Nevertheless, all insufficiencies in abilities based on assessment or observation should not always be related to deformities or inabilities to one's brain function, but can also be as a result of the person's lack of focus to particular details that may arise due to disinterest "difficulties at integration, tendencies toward concreteness, and egocentricity" (Suits et al., 2011, p. 311). Several atypically developing children were observed and assessed for their understanding and appreciation of humor, which resulted in the finding that children with epilepsy, autism, down syndrome, as well as learning disabilities showed reduced understanding and less appreciation of humor (Suits et al., 2011, p. 311)

Despite the fact that there were several experimental studies that examined humor by means of graphical representation within the last century, most of the studies done are outdated, dating back some fifty or more years, with very few current studies on this

topic (Puche-Navarro, 2004, p. 343). On the other hand, of the studies that were done, we can see only that humor has been found to completely develop some time after the fifth year of life (Bariaud, 1983; McGhee, 1989; Shultz & Pilon, 1973). Additionally, most of the research that has been done took data for analysis on a child's understanding of a joke and appreciation of it based solely on verbal explanations (Shultz & Horibe, 1974, p. 13). However, this should not be the main route of analysis of humor when observing children, which shows that other means of observation would prove to be beneficial in providing more in-depth knowledge into the development of humor in children (Puche-Navarro, 2004, p. 348). Additionally, analysis of understanding pictorial humor can provide varying and detailed information on mental processing.

Additionally, gender has played a major role in how many persons understand, appreciate, and live their lives. From toddlerhood, boys and girls are taught and trained to like certain things, engage in certain activities, and play with certain toys (Zachopoulou, Trevlas, & Tsikriki, 2004, p. 6). Roopnarine (1981) found that "By age three to five… girl's preferences include activities with refined, elegant manipulation in an artistic nature, while boys appear to spend more time in outdoor activities with active and aggressive play" (p. 161). But does their appreciation of certain activities also affect their appreciation of humor? A study conducted by Lieberman and Culpepper (1965) found that "no sex differences were detected for social spontaneity or sense of humor" (p. 984). However, because of the fifty years that have lapsed from that study to this study, in addition to the social and technological changes, a revisit to this aspect of gender differences would provide beneficial observations.

CHAPTER 3

METHOD

Participants

The participants in this study were recruited from Pre-school to first grade levels from two participating schools, The Crayon Box (Berrien, Springs, Michigan) and Bridgman Elementary (Bridgman, Michigan) in accordance with parental agreement. The participants in this study had to be between the ages of 2:0 and 5:0 at the time of the study. Persons were excluded from this study if they were visually impaired, hearing impaired, selectively or medically diagnosed as mute, mentally retarded, emotionally/behaviorally disturbed, or if a signed parental consent form was not returned. Participants included 23 children (i.e. 11 females and 12 males); aged five years old (10 participants), aged four years old (eight participants), aged three years old (four participants), aged two years old (two participants); with 20 participants having typical language skills, and three with atypical language skills (i.e. two 5-year-olds & one 3-year old) for their age and gender. Age and gender were predetermined. However, to determine language skills, all participants were assessed using the Peabody Picture Vocabulary Test 4th edition (PPVT-4). The PPVT-4 was used to determine receptive language abilities. A standard score of 85-115 was considered typical language development, and any score below 85 was considered to be atypical. This assessment was chosen as a predetermining protocol because it covered varying ethnicities and races,

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geographic regions, gender, socio-economic statuses, as well as special populations with high overall reliability and validity.

Procedure

Analyzing humor as a means of gaining information of the development of children's language ability is not a new concept or idea (Bergson, 1940). The observation of the understanding of humor at different levels was obtained through graphical representation. The pictures, although representative of the types of humor, differed from the model study by Puche-Novarro (2004), to provide visuals that are relatable to the observed generation. Every photo grid was previously tested with both children and adults to ensure functionality and reliability and construct validity.

A reference picture was presented to the participant on an iPad along with three similar pictures in a photo grid. Of the three "humorously presented" alternatives of the reference picture, each participant chose which option they found to be most humorous (whether neutral, congruent, or incongruent).

An example is adapted from the study conducted by Puche-Novarro (2004): In Figure 1, "The neutral alternative, consist[ed] of an element that, although does not belong to the system, does not create conflict and therefore is not humorous. The neutral element used in the Superman joke was a baseball bat" (p. 347).

Figure 1. Neutral graphic image of Superman. Image from Puche-Navarro (2004).

In Figure 2, "The congruent alternative consist[ed] of an element that belongs to the system in such a way that when inserted completes the image. For example, Superman's cape produces the typical image of Superman" (Puche-Novarro, 2004, p. 347).

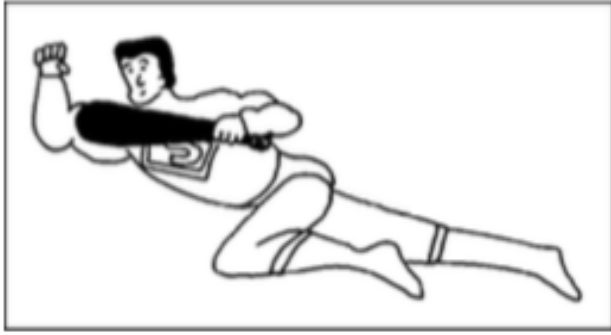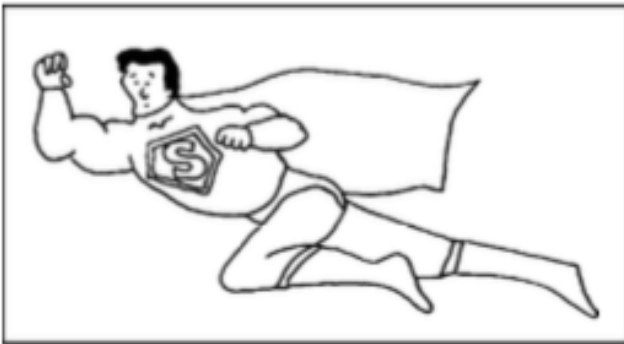*Figure 2*. Congruent alternative graphic image of Superman. Image from Puche-Navarro (2004).

In Figure 3, "The incongruent alternative consist[ed] of one element, which by inserting it in the system creates conflict. In other words, it puts the system in crisis and as a result is humorous. For example, the wings that are inserted on the body of Superman create a

joke about Superman with wings" (Puche-Novarro, 2004, p. 347) instead of a cape.

Figure 3. Incongruent alternative graphic image of Superman. Image from Puche-Navarro (2004).

To ensure that the word "funny" was understood the experimenter engaged in a brief conversation based on a previously read story during the language sample, on what they considered as funny. Additional examples from television shows were used when necessary. Once the experimenter was certain that the child understood what the word "funny" meant, the experiment began. This experiment was carried out by individually removing each child from the classroom to an environment that consisted of limited distractions to ensure attention maintenance on the presented stimuli. A total of 12 pictures were presented to each child (i.e. three groups of four pictures) via the iPad. When the first photo grid was presented, the experimenter directed the participant's attention to the reference picture, and created a story line to explain the reference picture. Then the experimenter directed the participant's picture to the other three pictures by saying, "…Point to the picture that makes you laugh the most." The participant then

selected from the three alternatives, with the expected selection to be the one of incongruency.

Each participant was given a range of zero to 90 seconds to observe each photo grid (i.e. one reference picture and three alternatives consisting of the neutral representation of the reference picture, the congruent representation of the reference picture, and the incongruent representation of the reference picture). If the child selected the neutral or the congruent version of the picture, it was recorded as incorrect (1), but the selection of the incongruent version of the picture was recorded as correct (2). The experimenter did not cue, prompt, or coach the child to select the incongruent graphic and recorded only the first response (even if the child alternates between the presented stimuli). Any direct verbal or non-verbal response (such as pointing) that was produced by the participant, was considered as a valid response. Nevertheless, instructions were repeated as often as needed to ensure that the individuals understood what was expected of them. Each participant's responses were recorded on a data collection sheet with Microsoft Excel (in relation to age, gender, and language skills) for analysis.

The order of appearance of the alternative jokes within each photo grid were randomized for each joke in order to avoid "footprint effects". Each session, with each participant, was visually recorded for subsequent analysis. As with the model study, "the criterion used to assess the children's performances was the choice of the incongruent alternative from among the other alternatives. This criterion is the main evidence of the comprehension of the joke. The neutral alternative was used as the control condition to avoid having a 50% probability of random selection" (Puche-Novarro, 2004, p. 348).

Figure 4 was presented to gain information on whether or not the participant was able to identify and appreciate visual mentalistic jokes. This photo grid was introduced with the following story line:

> *"Tommy loved his dad, and thought that his dad was the best fireman. He always dreamed of himself being just like his dad when he grew up… Point to the picture that makes you laugh the most."*

Figure 4. Mentalistic photo grid.

Figure 5 was presented to gain information on whether a not the participant was able to identify and appreciate visual substitution jokes. This photo grid was introduced with the following story line:

> *"Dan loved to carry his pet for a walk and his pet liked it too! But something happened… Point to the picture that makes you laugh the most."*
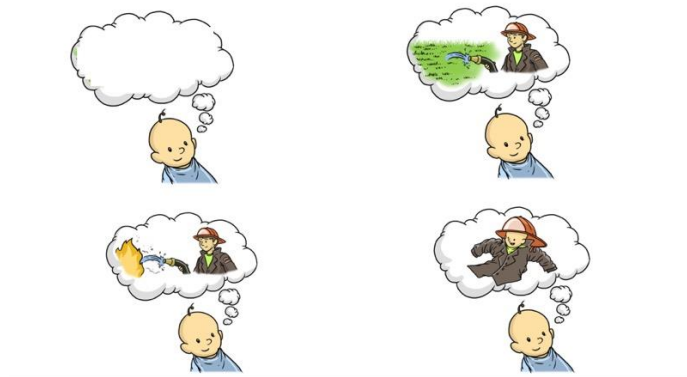
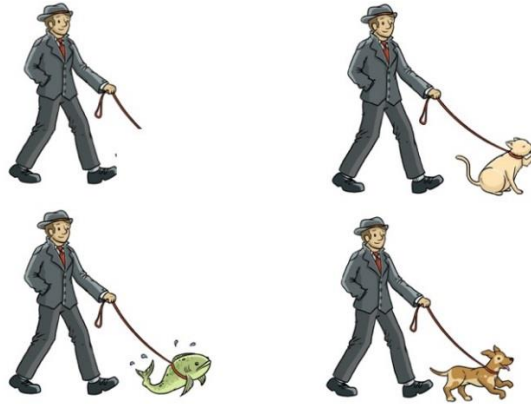*Figure 5*. Substitution photo grid.

Figure 6 was presented to gain information or whether not the participant was able to identify and appreciate visual hyperbolic jokes. This photo grid was introduced with the following story line:

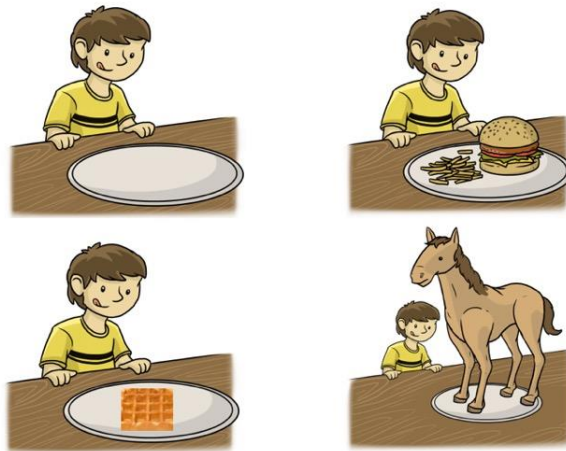*"Peter was very hungry, and wanted as much as he could get. Point to the picture that makes you laugh the most."*

Figure 6. Hyperbolic photo grid.

Data Analysis

If the participant selected the neutral or the congruent version of the picture, it was recorded as incorrect (1), but the selection of the incongruent version of the picture was recorded as correct (2). Data was recorded in a table created in Microsoft Excel. Additional information was also documented, which included gender, which was recorded as male (1) and female (2); language skills, recorded as atypical (1) and typical (2); and age, recorded as younger (1) and older (2). This data was then transferred to the Statistical Package for the Social Sciences program for analysis. Within this program, various tests were done which included the Pearson Product-Moment Correlation Coefficient which was done to assess the relationship between the experimental variables age group, gender, language, and types of humor (i.e. substitution, mentalistic, and hyperbolic); a repeated measures ANOVA was done to determine if there were differences among participants' in their ability to correctly identify incongruent elements with various types of humor (i.e. substitution, mentalistic, and hyperbolic); and a multiple regression analysis was done to predict ability of age grouping, gender and language skills on successfully identifying incongruence on types of humor (i.e. substitution, mentalistic, and hyperbolic).

CHAPTER 4

RESULTS

**Relationships Between Age, Gender,
Language and Humor**

A Pearson product-moment correlation coefficient was computed to assess the

relationship between the experimental variables age group, gender, language, and types

of humor. There was a positive correlation on all of the dependent variables (types of

humor) and some independent variables (language and gender). Language and

substitution humor type, $r = .586$, $N = 23$, $p = 0.002$, and between language and

mentalistic humor type, $r = .371$, $N = 23$, $p = .041$. There was also a positive correlation

between gender and hyperbolic humor type, $r = .444$, $N = 23$, $p = .017$. Table 2 shows the

correlations between the experimental variables.

**Differences Among Participants' on Identifying
Incongruent Elements with Various
Types of Humor**

Repeated measures ANOVA was done to determine if there were differences

among participants' in their ability to correctly identify incongruent elements with

various types of humor. Table 3 shows the descriptive statistics for the groups of

participants for the experimental variables. There was a statistically significant

Table 2

Correlations Between Experimental Variables

	Pearson Correlation		Sig(1-tailed)
	(GENDER)	(LANGUAGE)	
Age Group			
Gender			
Language			
Substitution		.586**	.002
Hyperbolic	.444*		.017
Mentalistic		.371*	.041

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).

difference in participants' ability to correctly identify incongruent elements in types of humor based on gender, $F(2, 15) = 4.309$, $p < .033$; Wilks Lambda = .635, partial Eta squared = .365. Figure 7 shows that females correctly identified more incongruent elements in hyperbolic humor than males; and males identified more incongruent elements in both substitution and mentalistic types of humor than females. It was also determined that language had a statistically significant effect on participants' identification of incongruent elements in types of humor, $F(1, 16) = 11.778$; $p < .003$; partial Eta squared = .424. Figure 8 confirms that participants with typical language, correctly identified more incongruent elements in all types of humor than those participants with atypical language. The mean score for the older age group compared to the younger age group was not found to be significantly different. However, the older group correctly identified more incongruent elements on hyperbolic and mentalistic types

Table 3

Descriptive Statistics for Experimental Variables.

Humor	Group	Gender	Language	Mean	Std. Dev	N
Substitution	Younger	F	Typical	.75	.500	4
	Older	F	Typical	.60	.548	5
	Younger	F	Atypical	.00	.00	1
	Older	F	Atypical	.00	.00	1
	Younger	M	Typical	.88	.354	8
	Older	M	Typical	1.00	.00	3
	Younger	M	Atypical	.00	.00	1
	Older	M	Atypical	.00	.00	1
Hyperbolic	Younger	M	Typical	.63	.518	8
	Younger	F	Typical	1.00	.00	4
	Younger	F	Atypical	.00	.00	1
	Older	M	Typical	.33	.577	3
	Older	M	Atypical	.00	.00	1
	Older	F	Typical	1.00	.00	5
	Older	F	Atypical	1.00	.00	1
Mentalistic	Younger	M	Typical	.50	.535	8
	Younger	F	Typical	.25	.500	4
	Younger	F	Atypical	.00	.00	1
	Older	F	Typical	.60	.548	5
	Older	F	Atypical	.00	.00	1
	Older	M	Typical	1.00	.00	3
	Older	M	Atypical	.00	.00	1

of humor; whereas, the younger group performed better on the substitution type of humor

as illustrated in Figure 9.

Predicting Success in Identifying Incongruent
Elements in Types of Humor

A multiple regression analysis was used to determine the significance of

independent variables age grouping, gender and language skills as successful predictors

of overall correct identification of incongruence in substitution, mentalistic, and

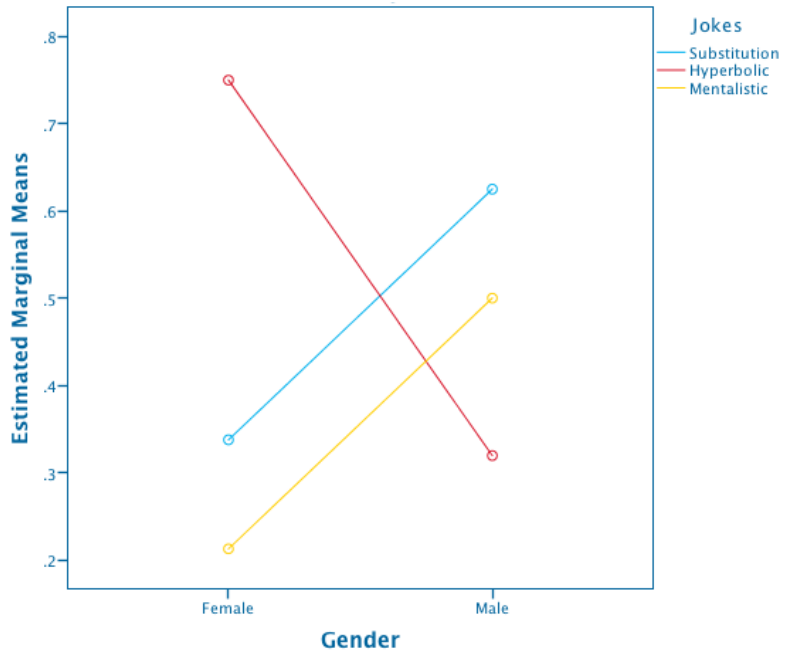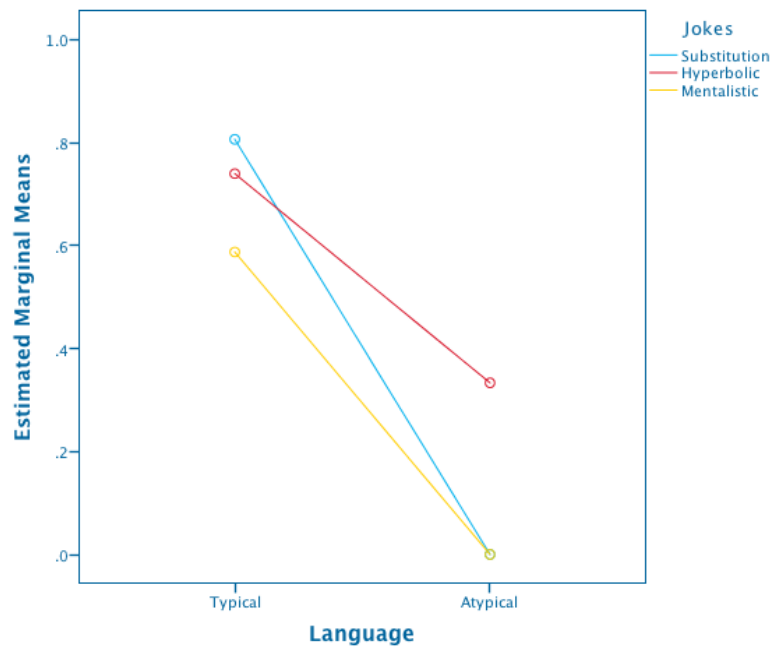*Figure 7.* ANOVA profile plot on jokes and gender

Figure 8. ANOVA profile plot on jokes and language
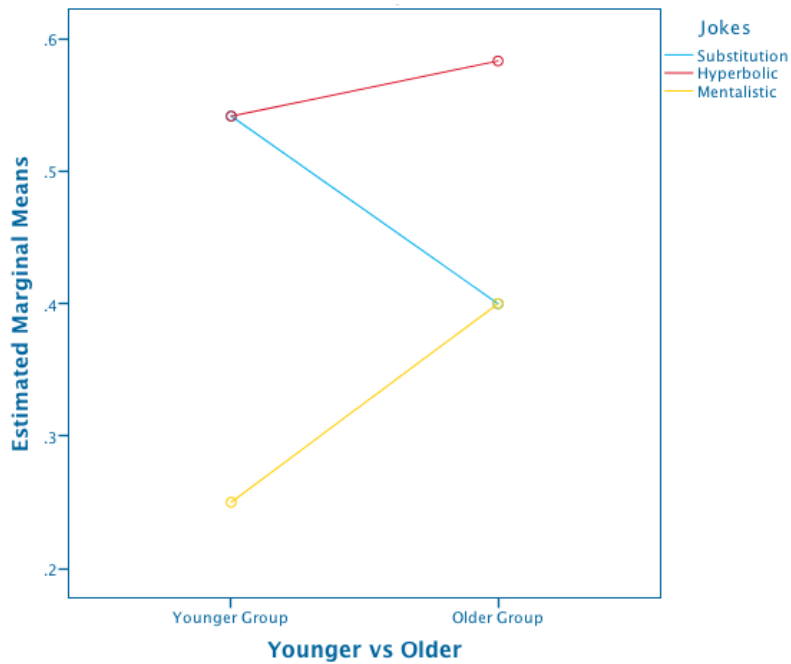
Figure 9. ANOVA profile plot on jokes and age (younger vs. older)

hyperbolic types of humor. Table 4 shows that approximately 42% of the variability in

the dependent variable. Overall correct identification of types of humor can be accounted

for by age grouping, gender and language in Model 3.

Table 4

Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.028[a]	.001	-.047	.990	.001	.017	1	21	.898
2	.066[b]	.004	-.095	1.013	.004	.071	1	20	.793
3	.645[c]	.416	.324	.796	.412	13.400	1	19	.002

a. Predictors: (Constant), Age Group

b. Predictors: (Constant), Age Group, Gender

c. Predictors: (Constant), Age Group, Gender, Language

d. Dependent Variable: Overall Correct Identification of Types of Humor

CHAPTER 5

DISCUSSION, LIMITATIONS, AND CONCLUSION

Discussion

The purpose of this study was to determine if age, gender, and language skills play a role in one's ability to understand and appreciate varying types of humor (i.e. mentalistic, substitution, and hyperbolic) through visual representations. The first question asked whether or not there is a correlation between age, gender and language skills, and mentalistic, substitution, and hyperbolic types of humor. It was found that there was a positive correlation between language skills and substitution jokes as well as language skills and mentalistic jokes. These results therefore show that language skills do play a role in one's ability to understand and appreciate both substitution and mentalistic jokes. This is due in part to the report by Puche-Navarro (2004), that jokes are understood through prior knowledge, experience, or exposure to something or someone, and according to Chomsky (1972), so are language skills. Therefore, in regards to language skills, it was reported by McGhee (1979) that only jokes that are within a child's stage of development and language understanding would be considered humorous by the child. As a result, children with varied exposure and experience, as well as those with typical to above average language skills should be able to identify and appreciate both mentalistic and substitution humor.

There was also a positive correlation between gender and hyperbolic jokes. This contradicts the findings by Lieberman and Culpepper (1965) which found that there were "no sex differences… for social spontaneity or sense of humor", because gender and hyperbolic jokes are correlated.

The second question focused on whether there is a difference in ability among participants to identify incongruent elements with various types of humor. It was found that gender and language skills play a role in understanding all types of humor, however a child's age does not determine their ability to identify incongruency in different types of jokes. When looking at gender, females correctly identified more incongruent elements in hyperbolic humor than males, and males identified more incongruent elements in both substitution and mentalistic types of humor than females. Therefore, the idea brought forth by Lieberman and Culpepper (1965) is no longer relevant when looking at a child's skill at identifying incongruences. However, the idea brought forth by Puche-Novarro (2004), where he found that semiological analysis is gained in stages and is seen throughout their understanding of three different types of jokes; mentalistic jokes, jokes based on substitution, and complex jokes (i.e. hyperbolic jokes), and in that order, can be supported if one was to look at gender alone. This is because females typically develop, both mentally and physically, at a faster rate than males. Therefore, if females have surpassed the first two stages (i.e. mentalistic and substitution), they may no longer find the substitution and mentalistic jokes to be humorous at all, whereas the males did. This mirrors the view of Suits et al. (2011) who found that lack of focus to particular details may arise due to disinterest, and can affect one's ability to identify incongruences. On the other hand, it was found that the findings of Durant and Miller (1988), on the idea that if

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the person is unable to identify the "punch line" of a joke, or the incongruity, the joke would not be interpreted as humorous. In this instance, the males in this study may not have been pre-exposed to the "punch line" of the visual representation in the hyperbolic joke, "I'm so hungry, I could eat a horse." This leads to the importance of also taking language skills into consideration, which is dependent on exposure,

It was found that participants with typical language, correctly identified more incongruent elements in all types of humor than those participants with atypical language. This would be expected based on the view of McGhee (1979), that only jokes within ones' stage of development and language skills can be processed, understood, and appreciated. However, the age of the participants did not present the same expected results. It was found that the older group correctly identified more incongruent elements on hyperbolic and mentalistic types of jokes; whereas, the younger group performed better on the substitution type of humor as illustrated in Figure 9. Because substitution jokes, according to Puche-Novarro (2009) are one of the first types of jokes understood by children, it was expected for the younger group to be able to identify the incongruency in this type of joke. This supports the findings by McGhee (1979), that younger children can easily identify and appreciate the incongruences of a substitution joke. However, it was not expected for the younger group to perform better than the older group on identifying the incongruency with this type of joke. The anticipation was that the ability to understand incongruences in all types of humor would increase with age. Nevertheless, this zig-zag result in age and ability to identify incongruences lends support to the findings of Bariaud (1983), McGhee (1989), and Shultz and Pilon (1973), that the ability

to identify incongruency in order to understand and appreciate humor does not completely develop until after the fifth year of life.

The third question asked whether age, gender, and language skills can predict a person's ability to identify incongruent elements in mentalistic, substitution and hyperbolic jokes. When age alone was analyzed as a predictor, there was no significance. This means that age alone cannot predict a child's ability to identify incongruences in order to understand and appreciate humor in various types of jokes. This brings a different perspective to the view of McGhee (1979), where he outlined his stages of humor development, like Piaget's stages of cognitive development, to be heavily dependent on age. Additionally, when age and gender were analyzed as predictors, there remained no significance. Despite the fact that Lieberman and Culpepper's (1965) findings were no longer relevant when looking at a child's skill at identifying incongruences to understand and appreciate the types of jokes in relation to gender, it is still valid when referring to whether or not gender can act as a predictor of ability.

On the other hand, when age, gender and language skills were analyzed, there was a significance. Which means that in order to predict a child's ability to identify incongruency in relation to humor, all three variables, age, gender, and language, must be taken into consideration. Many children struggle with language skills, and identifying, understanding, and appreciating humor is a part of those skills. However, despite their struggle, many of them love humor. Therefore, it is important to know when and how to include humor through visual representation within speech therapy sessions. We have seen that age and gender has no significance in relation to predicting a child's ability to identify incongruences in order to understand and appreciate humor. Therefore, when

planning therapy sessions, it is important to take into consideration the age, gender and type of humor as well as the language skill level of each client, because these aspects could have a major impact on the success or failure of a session and overall work with a client. For example, when incorporating humor into a session with a younger child, it is not wise to initiate it by utilizing mentalistic jokes, because this age group struggles with identifying incongruences associated with it, and would therefore have little to no understanding of and appreciation for it. Likewise, with males. The hyperbolic joke that may be easily identified, understood, and appreciated by a female client may not result in the same, or close to of a success, with a male client.

Based on the findings from this study, Table 5 outlines a recommended guide in selecting types of jokes that are age, gender, and language skill appropriate base on the overall expected performance from data gathered from this study. The arrow pointing North indicates an expected high level of performance, and the arrow pointing South indicates an expected low level of performance.

Limitations

Despite the results from this study, there were some limitations. This study did not provide participants the opportunity to explain why their selected response was considered as funny to them. This information would have allowed for a more refined analysis of each participant's selection, to ensure understanding of each joke. Additionally, providing 2 more items for each type of joke may have also been beneficial, to decrease the odds to a 3 to 1 chance of error. This was eliminate a participants only response being that of a "lucky guess" resulting in a lucky score. If this research were to

Table 5

Overall Expected Performance

	Substitution	Mentalistic	Hyperbolic
Age: Younger	↑	↑	↑
Age: Older	↓	↑	↑
Male	↑	↑	↓
Female	↓	↓	↑
ATypical	↓	↓	↓
Typical	↑	↑	↑

be duplicated or expanded on, those would be great starting points in order to provide

insight into whether or not the participants actually understood the incongruences that

were visually presented. Additionally, focus should be given towards typically

developing children, ages five to 18 as the control group, in comparison to atypically

developing children within the same age group. This would hopefully provide further

information on the effectiveness of humor within therapy with older atypically

developing children. Lastly, a larger sample size with a close to, if not, even distribution

across age, gender and language skills should be pursued.

Conclusion

The results have shown that different types of humor would be accurately

identified, understood, and appreciated by children differently based on age, gender, and

language levels. These findings are beneficial to the field of speech-language pathology

and the utilization of humor through visual stimulation during therapy. Although humor

is often welcomed by many, consideration must be done on the type of humor used and

the age, gender, and language skill of the audience that it is being used for.

APPENDIX A
PARENTAL CONSENT FORM

ANDREWS UNIVERSITY
DEPARTMENT OF SPEECH LANGAUGE PATHOLOGY & AUDIOLOGY
PARENTAL PERMISSION FORM FOR CHILD'S RESEARCH
PARTICIPATION

Your child is being asked to participate in a research study. This form has important information about the reason for doing this study, what we will ask your child to do, and the way we would like to use information about your child if you choose to allow your child to participate. Please read this form carefully and ask any questions you may have before agreeing to take part in the study.

Why are you doing this study?
Your child is being asked to participate in a research study about the understanding of humor in 2, 3, 4, and 5-Year-Olds with pictures.

The purpose of this study is to examine what types of humor children understand and how that understanding relates to age, gender, and cognitive development. The research is being done to see if age, cognitive abilities, and gender is related to the how a child understands humor. This information will provide benefits to the field of speech-language pathology with new procedures for the use of humor in pictures within therapy sessions.

Where will this study be done?
This study will be done at the school, in an empty classroom, under faculty/staff supervision.

What will my child be asked to do if my child is in this study?
Your child will be asked to identify the picture that they find to be funny. No personal and/or sensitive questions will be asked. Participation in this study should take approximately 30 minutes.

We would like to audio record your child as he/she responds to make sure that we accurately assess his/her responses to gain the necessary information. The researcher will keep these recordings private.

What are the possible risks or discomforts to my child?
Your child's participation in this study does not involve any physical or emotional risks beyond that of everyday life.

What are the possible benefits for my child or others?
Your child will not have any tangible or monetary benefit from being in this research study. However, you will be given the results of the screenings (which will determine the development of your child as above average, average or delayed), and a list of references of agencies that can provide help, if needed.

How will you protect the information you collect about my child, and how will that information be shared?
Results of this study may be used in publications and presentations. However, your name and/or your child's name will never be used. Your child will be referred to only by an assigned ID number, that will be given to him/her at the beginning of the study.

Financial Information
You do not have to pay and your child will not be paid for participating in this study.

What are my child's rights as a research participant?
Participation in this study is voluntary. Your child may withdraw from this study at any time and you and your child will not be penalized in any way for deciding to stop participating. If you and your child decide not to be in this study, this will not affect the relationship you and your child have with your child's school or Andrews University and its affiliations, in any way.

Who can I contact if I have questions or concerns about this research study?
If you or your child have any questions, you may contact the researcher, Sonovia McFall, via email (sonoviamcfall@gmail.com) or cell phone (1-269-213-0406), the Supervising Professor, Dr. D'Jaris Coles-White at the Department of Speech Language Pathology & Audiology or the Office of Research at Andrews University at:

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Consent form for Study on Humor Development in 2-5 year olds

Parental / Legal Guardian's Permission for Child's Participation in Research

I have read the consent form focused on examining what types of humor children understand and how that understanding relates to age, gender, and cognitive development. I have been told who to contact if I had any additional questions or concerns.

Having read the information provided, I, _____ give permission

(parent/guardian name)

for _____ to participate in this research study.

(child's name)

_____ _____

Parent/Legal Guardian's Name (printed)   Relationship

_____ _____

Parent/Legal Guardian's Signature   Date

ANDREWS UNIVERSITY
DEPARTMENT OF SPEECH LANGAUGE PATHOLOGY & AUDIOLOGY
ASSESNT FORM FOR CHILD'S RESEARCH PARTICIPATION

We are trying to find some information about what you would find funny. If you agree to help us, we are going to ask you to point to the picture that you think is funny, out of a group of pictures that we show you. For example, if we show you a picture of a woman holding a phone to her ear and another picture of the same woman holding an apple to her ear, we would like you to point to the one that you find funny.

You can ask questions about what we are doing or what we would like for you to do at any time. If you decide at any time that you don't want to do this anymore, you can ask us to stop, and we will. Your selection from the pictures we show you are based on what you think is funny. There are no right or wrong answers (because this is not a test).

Whether or not you help us is up to you, and no one will be upset if you don't or if you change your mind later. Would you like to help?

Your printed name: _____   Date _____

Printed name of person obtaining consent: _____   Date _____

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