ABSTRACT

The Impact of Observational Learning on Preschoolers’ Cooperation in an Ultrasound Swallowing Study

By Mary Jennifer Stenger

The purpose of the study was to determine the impact of observational learning on preschoolers’ cooperation when participating in an ultrasound swallowing study. More specifically, the study investigated whether a babydoll or “live” child model impacted preschooler cooperation. Nineteen preschoolers were recruited for this study and divided into groups based on modeling type. The results revealed that there was no difference between the groups of children participating in observational learning (babydoll and “live” child model) from those not participating in observational learning. However, despite the lack of statistical significance observed, the information obtained from this study will be beneficial for implementing a large scale study for this age group.
The Impact of Observational Learning on Preschoolers’ Cooperation in an Ultrasound Swallow Study

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# TABLE OF CONTENTS

Chapter I .................................................................................................................. 1

Introduction and Review of the Literature ............................................................... 1

*Introduction to the Social Cognitive Theory* .......................................................... 1

*Importance of self-efficacy* .................................................................................... 3

*Factors that influence observational learning* ....................................................... 4

*Importance of age-matched peers* ....................................................................... 4

*Four subprocesses of observational learning* ....................................................... 6

*Importance of the environment* ........................................................................... 6

*Importance of modeling in the medical setting* .................................................... 7

*Medical Play using dolls and toys* ....................................................................... 9

*Statement of Purpose* ......................................................................................... 10

Chapter II ............................................................................................................. 13

Methods and Procedures .......................................................................................... 13

*Training* ............................................................................................................... 13

*Recruitment* ......................................................................................................... 13

*Subject Eligibility* ............................................................................................... 13

*Methods* .............................................................................................................. 13

*Data Collection* .................................................................................................. 16

Chapter III ............................................................................................................ 17

Results ...................................................................................................................... 17
LIST OF TABLES

1. Group Data .................................................................24
2. Group Compliance .......................................................26
3. Frequency of Compliance .............................................27
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Chapter I

Introduction and Review of the Literature

Over 5 million children each year undergo some type of diagnostic medical procedure in the United States (Claar and Walker, 2002). For the majority of these children, medical procedures are unfamiliar and compliance may prove to be difficult. Medical procedures, whether familiar or unfamiliar, can be intimidating. Research is critical to assist children in working through their anxieties to help with medical procedure cooperation. This paper will investigate improving child compliance through observational learning or modeling. More specifically, this paper will examine the impact observational learning has on preschoolers’ cooperation in an ultrasound swallowing study. Further, the social cognitive theory will be discussed and explored as a potential tool to increase child cooperation when being introduced to an unfamiliar medical procedure.

Introduction to the Social Cognitive Theory

Albert Bandura (1986) is credited with the development of the social cognitive theory as an expansion of the social learning theory (Grusec, 1992). The social cognitive theory or Bandura’s theory states there is an interrelationship between an individual, the environment, and their behaviors (Grusec, 1992). Numerous studies which investigated how peers imitated behaviors after watching the behaviors of others were generated as a result of Bandura’s theory.

Human behavior is learned and regulated by stimuli within the environment (Bandura, 1999). Humans are able to recognize important information expressed through various mediums, including observational learning. The social cognitive theory states that much of human learning occurs either intentionally or inadvertently by observing the behaviors of others and the resulting consequences (Bandura, 1999). The person observing views the behaviors displayed as favorable or unfavorable. When observational
learning is used, the model can convey new ideas and ways of thinking and behaving to those watching (Bandura, 1999).

Modeling enables humans to expand their knowledge and skill base and develop new sets of behaviors (Bandura, 1999). Observational learning is particularly effective with children learning novel, complex tasks (Schunk, 2000). Novel, complex tasks require new procedural learning and development of outcome expectations. Therefore modeling provides a template for children to learn new skills and apply these skills to future, similar interactions.

The social cognitive theory proposes two ways in which humans learn: observational and enactive learning, although most behaviors are learned through observation (Colledge, 2002). Observational learning is learning through the observation of others, while enactive learning is learning through direct experiences (Colledge, 2002). A more common term used for observational learning is imitation. Observational learning is believed to provide behavioral cues which are positively reinforced by natural consequences (Schunk, 1987). Enactive learning, on the other hand, is primarily independent. The accompanying consequences of the behavior are the sole sources for learning. Enactive learning requires the person to be dependent on the consequences of the tried behaviors.

Observational learning has been used to assist in modifying child behaviors. In the use of observational learning, two participants are essential: the observer and the model. Observational learning consists of the observer watching the model engage in a specific behavior. Children are not born equipped with sets of behaviors, but instead learn through various experiences which often involve observing (Colledge, 2002). Thus viewing others’ behaviors is an important tool in acquiring new skills (Jahr and Eldevik, 2002). The type and complexity of skills acquired can vary, as long as the learner deems the skill important.

Findings show that observational learning is not as challenging for typically developing children versus cognitively delayed children (Charlop-Christy, Le, Freeman, 2000), and the ability to learn from a model highly depends on the child’s developmental factors (Bandura, 1997). Children who are delayed in cognitive development may have more difficulties learning from the cues of the model. Further, if a child lacks the developmental capabilities, demonstrating learned behaviors may be more difficult
(Schunk, 1987). Therefore, using observational learning strategies for typically developing preschoolers should be a natural and less demanding process than for developmental or cognitively delayed children.

Observational learning can be done through live, symbolic, or electronically portrayed modeling (Schunk, 2000). Live observational modeling involves the observer watching the behaviors being performed, such as an observer watching another child learning how to be gentle with a newborn baby. The observer views the live child producing a set of behaviors meant to be modeled. Symbolic or nonhuman modeling involves observing play with toys or cartoon characters. For example, an observer views the child learning how to gently treat a newborn baby while playing with a babydoll. Although only one live child is participating, the observer is still learning behaviors through the interactions with the toy. Finally, electronically portrayed modeling involves observing behavior via computers or videos, such as an observer watching a child in a video demonstrating gentle behaviors with a newborn baby.

Importance of self-efficacy

Self-efficacy is an additional part of Bandura’s social cognitive theory. Self-efficacy is defined by Bandura as the judgment of one’s ability to achieve a certain level of performance (Colledge, 2002). Self-efficacy helps influence how complicated the observer finds the task. For example, a child who is told to jump a far distance may perceive the task as less difficult if the child believes the task can be accomplished without getting hurt. Self-efficacy is important to the observer who must believe that the model can accomplish a specific goal.

Self-efficacy facilitates a child’s motivation. The theory suggests that after watching a model, the child will believe in the capability of achieving the same level of success and will be more motivated to confront it with less fear and anxiety. For example, the greater the degree of self-efficacy, the greater ability the child has to process tasks that are more difficult. Efficacy beliefs create a sense of confidence regardless of the degree of difficulty in the task (Bandura, 1999). Self-efficacy plays a part in the child performing tasks of various degrees of difficulty.
Factors that influence observational learning

Several factors which may influence observational learning include developmental status, model prestige and competence, various consequences, outcome expectations, goal setting, and self efficacy (Schunk, 2000). Developmental status refers to the developmental and cognitive capacity of the model. When the developmental and cognitive status of the model and observer are similar, observational learning will be the most effective. Model prestige and competence refers to an increase in attention by the observer when the models are seen as competent. Different consequences as models complete tasks have different motivating effects on observers as well. Outcome expectations refer to how observers are more likely to imitate behaviors the observer’s believe will lead to positive outcomes. Furthermore, goal setting refers to how observers are more likely to attend to models which demonstrate behaviors that achieve desired goals. And finally, self-efficacy refers to observers who attend to models when a belief exists that the observers are capable of performing the demonstrated behavior.

Children’s behaviors are shaped by other factors in addition to their individual thoughts. The social cognitive theory purports that child behaviors are driven within a structure of triadic reciprocality, which states that behaviors, cognition, personal factors and their environmental events all interact with each other (Schunk, 2000). Thus, the behavior of preschool children is shaped by cognitive development, personal factors such as personality, and environmental influences. Therefore, in an imitative situation, multiple factors determine how the observer will behave. Such behaviors may include a child’s disposition or the type of environment in which the child is placed.

Importance of age-matched peers

Success with observational learning is increased when peers are equivalently age-matched. The age-matched peer is a representative symbol for the observer. The model is then considered an entity that was created in order to be representative of the observer (DeLoache, 2000). Previous research shows that preschoolers adjust their behaviors to
match those behaviors of children age-matched and older (Brody and Stoneman, 2001). In modeling, the model’s age and competence is important when influencing imitation (Schunk, 1987), therefore, watching a video or live child who is age-matched to those children observing can serve as a beneficial way to modify behaviors of preschoolers. Responsiveness is increased in children when perception of similarity exists (Barnett, 2001). Interestingly, the findings show that the learning of new cognitive skills is not affected by gender (Schunk, 1987). Thus, the child sees acceptance from peers of either gender when the model engages in certain behaviors and the child wants that same acceptance.

Observational learning is a type of social comparison where the observer compares himself to a social standard and then self-evaluates his actions based on how closely the model represents him (Schunk, 1987). If the observer feels any sense of similarity to the model, the observer uses those representative behaviors as a social cue. The observer is more likely to imitate social behaviors of those who have a higher competency than those with a lower competency (Schunk, 1987). Therefore, a model and observer of similar age and development are important for the observer to produce the most imitation. Thus, if the observer does not relate to the model, the observer is less likely to accept those behaviors as suitable.

Preschoolers who feel an association with the model based on similarity are looking for positive consequences for their actions. Watching another’s success creates expectations which the child is likely to experience themselves (Schunk, 1987). Children attempt to learn advantageous behaviors while avoiding those behaviors which are unsuccessful (Schunk, 2000). Children regard behaviors to be acceptable based on watching the model producing successful behaviors (Grusec, 1992). Observed results are comparable to those results directly experienced and the results can change a child’s behavior (Colledge, 2002). The child will likely begin to accept those behaviors to be appropriate for that specific procedure and experience.

In addition to increasing a child’s ability to perform novel, complex tasks, modeling also increases the acceptance of certain behaviors. Modeling allows children to learn the types of actions that are acceptable in certain situations (Bandura, 1999). Furthermore, modeling may be an effective tool to develop the observer’s cognitive skills if the modeling involves affect and actions in combination rather than actions alone.
Preschoolers observing peers begin to learn social rules and to determine what types of behaviors are acceptable for imitation. These social rules apply in situations where the preschooler may have little or no previous experience.

*Four subprocesses of observational learning*

The social cognitive theory states four subprocesses are involved in observational learning: attention, retention, production, and motivation (Schunk, 1987). For the subprocess of attention, the preschooler must be aware of the events happening within their environment. Young children give a task only a limited amount of time and attention needed to master that task (Bandura, 1986). Further, the child must be attentive to the actions being exhibited in order to continue with the following subprocesses. Preschoolers must be able to take the observed information and store the information within their memory, thus creating retention. Retention of the information occurs without the child consciously being aware. The child must transfer the learned actions or information into symbolic forms and store it for easy retrieval later (Bandura, 1986). Within the production subprocess, the preschooler interprets exhibited behaviors as those that should be imitated. Children are looking for social acceptance, and by being more like their peers, children feel a sense of security and acceptance. Finally, motivation is demonstrated when the preschooler has enough incentive to imitate the actual behaviors (Schunk, 1987). The child has now connected the importance of the exhibited action to social acceptance and begins using those same behaviors.

*Importance of the environment*

A person’s environment plays a large part in the formation of an individual’s beliefs and actions. Environments may consist of various settings including school, home, medical, and work. The social cognitive theory states that cognitive processes evolve through environmental influences (Bandura, 1999). Thus human behavior is determined by the environment in which the person is exposed, and the expressed behavior is
modified by the environment (Grusec, 1992). Observing a peer engaging in an activity within a socially acceptable environment can help mold the observer’s idea of what is acceptable.

People can observe others in a variety of environments. One such environment is the imposed environment (Bandura, 1999). For example, an imposed environment is when the observer is placed in a situation whether prepared or unprepared and has little control over what happens. Another type of environment, the selected environment, occurs when an observer is selected and placed within an environment with specific activities (Bandura, 1999). A third type of environment is a constructed environment (Bandura, 1999). A constructed environment occurs when a person generates the environment to fit the needs of the observer. An example of a constructed environment for a child is an environment which is intended to produce a specific feeling or emotion. Depending on the type of environment in which the observer is placed, different reactions and feelings determine what is acceptable behavior.

(importance of modeling in the medical setting)

The social cognitive theory suggests that a single model can convey new thought processes and behaviors in widely dispersed settings (Bandura, 1999). Based on the social cognitive theory, observational learning within the medical setting may be beneficial for reducing the fear and anxieties in children when unfamiliar medical procedures are being introduced. Fearful behaviors frequently result from misconceptions regarding the medical procedure (Nelson and Allen, 1999). Depending on the procedure, a child may or may not understand the nuances that occur. In cases when children are unaware of exact procedures, increased fear or anxiety towards that procedure may be observed. The Agency for Health Care Policy has stated that a critical responsibility of health care providers working with children is to manage and alleviate the pain and stress of medical procedures (Stephens, Barkey, Hall, 1999). Incorporating a model to reduce anxiety towards medical procedures can be beneficial for introducing new responses when the preschooler is unaware of the consequence of that procedure.
Reducing child fears and anxieties is an important part of assisting in medical procedure completion. Fear-related behaviors may include treatment refusal, forceful crying, and hostility in children who are unfamiliar with the medical procedure (Nelson and Allen, 1999). As a result, using positive observational learning prior to the medical procedure would help treat those fears of the observer and possibly result in successful procedure completion.

Medical procedures can take place in several different environments, such as hospitals, clinics, or pediatric offices. Feelings toward a medical procedure may begin before the child walks into the medical environment. The child creates a mental image (accurate or inaccurate) of the procedure prior to being exposed (Claar, Walker, Smith, 2002). In addition, when the child is unwilling to cooperate, the length of the procedure is increased (Hertzog, Campbell, Dalton, Hauser, 1999). Reducing anxiety for children benefits the child by reducing stress, thereby benefiting all involved.

The distress resulting from the medical procedures, if left untreated, can lead to further negative experiences and produce increased anxiety and fear in subsequent procedures (MacLauren and Cohen, 2005). Younger children exhibit higher levels of stress than older children (Claar, Walker, Smith, 2002) and younger children, preschoolers in particular, tend to show less adaptive coping skills than older children (Salmon and Pereira, 2002). Interestingly, no gender difference is observed when dealing with distress with medical procedures (Carr, Lemanek, Armstrong, 1998).

When a child has no previous experience in an unfamiliar situation, a feeling of uncertainty is formed. Findings show that imitation increases in a situation where the child has little experience yet possesses a strong sense of self-efficacy (Miller and Thelen, 2001). Due to the uncertainty of the situation, observational learning encourages the observer to imitate behaviors to increase their feelings of certainty and competence (Miller and Thelen, 2001). Consequently, the model shows the observer the behavior which should be imitated.

Observational learning during a medical procedure can provide many positive influences for the child observing. Bandura states that observational learning can create acquisition of new behaviors, which in turn can strengthen or weaken behavioral inhibitions (Schunk, 1987). Observers are looking for consequences when participating in an unfamiliar procedure because consequences inform people of the correctness and
appropriateness of resulting behavior along with motivating factors to perform those behaviors (Schunk, 2000) Through observation of positive demonstration, the preschooler who rejected the idea out of fear or anxiety may gain assurance to participate (Grusec, 1992). Therefore, using a model can be a way to introduce a procedure in which the preschooler has no previous experience.

*Medical Play using dolls and toys*

As discussed previously, there are several types of modeling including live modeling, symbolic modeling, and electronically portrayed modeling. A form of observational learning in addition to peer modeling is symbolic play or symbolic modeling. Symbolic play involves role-playing with toys or dolls. Symbolic play with a baby doll can help the child feel comfortable in a situation of uncertainty. Again, for symbolization to occur, something must stand in to show representation (Casby, 2003). In this case, the baby doll represents the child. For symbolic play to be effective, three components must be involved (Casby, 2003): the agent, the instrument, and the scheme. Typically, the agent is the pretend object that is involved directly with the play actions. An example of an agent would be a baby doll. The instrument is the object that the agent uses for the play actions. The object of play in this example is the medical equipment. Finally, actions which are observed are called the scheme. An example of a scheme would be the preschooler observing the medical equipment being used on the baby doll.

Due to the distress of medical procedures, it is important to find a type of anxiety reducer of some form. Various types of distractors are used in helping child anxiety to medical procedures, including toys and videos (Salmon and Pereira, 2002). Although the toy or baby doll is not a “peer,” the toy or doll still represents a symbol experiencing the same medical procedure.

Dolls have been used in previous studies to help reduce child anxieties to medical procedures (DeRowe, Fishman, Leor, Kornecki, 2003). Dolls or stuffed animals are symbols children use in play, and children often use imaginative play as ways to express perceptions of the world (DeRowe, Fishman, Leor, Kornecki, 2003). Children use play as a mode of expression to displace anxiety (DeRowe, Fishman, Leor, Kornecki, 2003).
One documented case used a doll to reduce anxieties about a medical procedure involving tracheostomy care. When the parent first began attempting the procedure, the child would cry and physically resist. The observational learning approach was introduced, whereby the mother would perform mock tracheostomy care on the doll. A reduction of the child’s anxieties occurred and compliance was achieved (DeRowe, Fishman, Leor, Kornecki, 2003).

Children can also displace feelings of fear and anxiety through expressive play (DeRowe, Fishman, Leor, Kornecki, 2003). Thus, play itself can be the foundation of a valuable intervention strategy (Casby, 2003). For example, if the form of observational learning used is seen as play, a child may feel their fears are addressed. As a result of understanding the relation between play and decreased fear, a specific form of play has been used to reduce the fear of medical procedures. “Medical play” is a specific type of therapeutic play that is aimed at addressing the fears and misconceptions of medical procedures (DeRowe, Fishman, Leor, and Kornecki, 2003). Employing medical play always involves medical themes and the use of medical equipment (McCue, 1988). However, medical play is typically enjoyable for the child and is accompanied with laughter and relaxation (McCue, 1988). Using a combination of medical play with observational learning may help the preschooler feel more at ease with their unfamiliar experience and may increase imitation skills.

Another term for “modeling” the medical procedure is called a preparation program. Many hospitals have incorporated this type of program to assist children in the understanding of a medical procedure. Preparation programs can include things such as puppet shows, modeling procedures with dolls, or books (Nelson and Allen, 1999). Current programs have reported a reduction of anxiety in children and an increase in the knowledge of medical procedures (Nelson and Allen, 1999). With the preparation programs, an educational component has been added to the modeling technique to increase the awareness of the medical procedure along with reducing the child’s fear and anxiety.

Statement of Purpose
Incorporating preschoolers into research can be a challenging prospect. This is particularly true when the preschooler is facing an unfamiliar person and procedure. Enrollment and cooperation of the subjects in a research study is crucial to the outcome and success of the study (Lengacher, et al., 2001). Determining what types of strategies can be used to encourage preschool subjects not only to participate, but to cooperate throughout an entire research study is important.

The purpose of this study is to determine the impact of observational learning on preschoolers’ cooperation in an ultrasound swallowing study. Because the ultrasound procedure for swallowing requires a probe placed on the neck, some anxiety towards the procedure may be involved. Further, the ultrasound procedure also requires not one image, but a series. This study will assess both initial reactions as well as reactions while obtaining a series of ultrasound images.

Using a tool such as modeling can reduce those anxieties and help cooperation throughout the ultrasound research study. Success in overcoming issues related to subject recruitment, retention, and compliance can result in a more powerful study (Lengacher, Gonzalez, Guiliano, Bennett, Cox, Reintgen, 2001). When medical procedures are involved, the child’s anxiety and lack of understanding of that procedure can render the child uncooperative (Hertzog, Campbell, Dalton, Hauser, 1999). Reducing the anxieties of preschoolers who are participating in the ultrasound study will in turn make the research more reliable.

Various techniques in modeling can be used to relieve children’s anxieties toward those research procedures that are viewed as threatening. Based on the literature review, two different techniques are used in this study to determine the best method for participation: live modeling and medical play. Live modeling involves a preschooler directly observing a “model” preschooler undergoing the ultrasound procedure. Another type of modeling which is used is medical play or symbolic modeling. Medical play would entail the preschooler watching a baby doll undergoing the ultrasound procedure or the preschooler performing the procedure themselves. Both methods of modeling have been found to help in the reduction of child anxieties. Given the importance of completing research, finding the best way to help assist children in cooperating throughout the entire research study with minimal fears and anxiety is imperative.
Many studies have looked at modifying behaviors of preschoolers, however none of the studies focus on how to modify the behaviors for research cooperation in which an ultrasound procedure are involved. Other studies have focused on how rewarding the child may improve their interest and performance in research. Despite the fact that these studies are beneficial for researchers, a need for investigation in the area of cooperation in research where there is no reward for participating would be beneficial. The purpose of this present study is to determine how observational learning influences preschoolers to initially engage and remain engaged throughout ultrasound swallowing studies.
Chapter II
Methods and Procedures

Training

Training and standardization of probe placement was completed prior to the initiation of the study. Training included details such as ultrasound gel usage, placement of probe on the neck, and angle of probe for different ultrasound modes.

Recruitment

During the recruitment process, local southwest Ohio preschools were contacted for potential interest in the research study. Methods and procedures were approved by the Miami University Institutional Review Board prior to the enrollment of subjects. Information regarding the purpose, methods, and confidentiality were sent to the directors of interested preschools. Informed consent forms and recruitment flyers (See Appendix A) were given to the preschools to be distributed to parents after internal approval of research was obtained. Returned informed consent forms were collected by the directors for interested subjects. Preschool directors then informed the investigators of potential subject interest.

Subject Eligibility

The preschoolers were selected to participate in the study based on the following eligibility requirements: 1) enrolled in a preschool 2) between the ages of three and four 3) no overt neurological delays 4) no developmental delays 5) able to eat sitting in an upright position. All subject participation was voluntary.

Methods

Parents of the subjects were required to fill out a questionnaire. The purpose of the questionnaire was to screen normal controls to ensure the child was within normal
limits in relation to developmental milestones. The parents reported on topics such as feeding habits of the child, developmental milestones, and sensory skills (See Appendix B). The questionnaire also identified any medical history which would have excluded them from the study.

Following the collection of the questionnaire, each preschooler was randomly assigned to one of three stimulus groups.

- **Group one** was labeled the “no stimulus” sample. This method was tested by scoring the preschoolers’ motivation to participate in the ultrasound study without any type of external influence or modeling. For example, the child was only given the general procedural instructions and then asked to comply with the procedure. When this group was complete, the first group was separated from the remaining preschoolers until all testing was completed. This was done in order to control for bias from information given to remaining preschoolers about procedures of the study.

- **Group two** was labeled the “babydoll model” sample. This method was tested by scoring the preschoolers’ motivation to participate in the ultrasound study after watching the ultrasound probe being placed under a babydoll’s chin. For example, the child was given general procedural instructions and then shown a demonstration using a babydoll. After this group was tested, group two joined group one in order to maintain procedural privacy.

- **Group three** was labeled the “live child model” sample. This method was tested by scoring preschoolers’ motivation to participate in the ultrasound study after watching the ultrasound probe being placed under a “live” child model’s chin. The child in this group was given general procedural instructions and then shown a demonstration with an age-matched “live” peer.

On the day of the procedure, each child underwent a brief cursory oral motor screening which was utilized as a part of normal clinical evaluation. This screening focused on the anatomical relationships (i.e. symmetry, proportionality) of the face. This screening was accomplished by general observation of the anatomical relationship of the face of each individual child while walking to the area where the procedure was being performed. Complete intraoral examinations were not included due to the invasive nature of that type of procedure. The oral motor screening ensured the child was eligible to participate in the study.
Each child was given a brief explanation of the procedure. The child was shown the ultrasound machine (Aloka 900 SSD) and the pediatric probe (type UST 987-7.5MHz, 65 degree, 20 mm radius), and told that it would be used to take pictures of their neck. Each child was told the ultrasound transmission gel (Aquasonic 100) would feel like lotion, and was given the opportunity to feel the gel on their fingertip or top of their hand. This was done in order to help ease the anxiety of the child before the procedure began.

Prior to beginning the ultrasound procedure, the children selected to be in a model stimulus group were given a demonstration using either the babydoll or “live child” model. Following the demonstration, each child was asked, “May we take a picture of your neck?”

After the child’s consent was given to continue with the procedure, a measurement of the distance between the hyoid bone and posterior tongue was taken. The ultrasound probe was placed under the child’s chin at a depth of 5cm in order to obtain a more detailed view of the hyoid bone and posterior tongue (Frattali, et al., 1999). Following the measurement, the child was fed a pureed consistency of food (applesauce or pudding) by spoon while sitting upright in a chair. The feeding consisted of one of the three following measurements done in multiple trials:

- Taste (2 trials)
- 2.5ml (4 trials)
- 5.0ml (4 trials)

Time to complete all trials ranged from one minute to twenty-five minutes depending on the compliance of the child. Breaks were given as needed.

While performing the procedures, a Sony SVO 9500 MD video recorder was used. The purpose of videotaping the procedure was for researcher analysis after the procedures were complete. If at any point the preschooler stated the desire to no longer participate, gentle persuasion was used in order to finish the procedure, and the subject was noted as reluctant. If the preschooler showed resistance or fear of the procedure, the procedure was immediately discontinued, no further trials were attempted, and non-compliance was noted. Only if the preschooler agreed to the procedure and showed no signs of resistance was the preschooler considered compliant.
After the procedures were complete, in accordance with HIPAA regulations, all identifying information of the child was removed. Each child was assigned a code by which the child could be identified. The code assigned was the child’s last initial with the month and day of their birthdate. For example, Emily S. Smith, birthdate 7/12/2001 would be coded as S-0712.

Data Collection

The data collected indicates whether observational learning impacts preschooler’s cooperation in an ultrasound swallowing study. All forms used to collect the data were kept confidential and stored in a file cabinet in a locked office at Miami University. All forms will be shredded once the data is no longer needed.
Chapter III

Results

Subjects

Nineteen preschool children from the Southwestern Ohio region were included in this study. Eleven of the subjects were female and eight of the subjects were male. Each preschooler was between the ages of three and four years old. The age range of the children was 3.3 years to 4.11 years. The mean age of the children was 3.90 years with a standard deviation of 0.10. Table 1 indicates the subject number, age, sex, and type of modeling used.
### Table 1

**Group Data**

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<th>Subject Number</th>
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<th>Type of Modeling</th>
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<td>Live child</td>
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<tr>
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<td>F</td>
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</tr>
<tr>
<td>16</td>
<td>4.6</td>
<td>F</td>
<td>Live child</td>
</tr>
<tr>
<td>17</td>
<td>4.7</td>
<td>F</td>
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</tr>
<tr>
<td>18</td>
<td>3.3</td>
<td>F</td>
<td>Babydoll</td>
</tr>
<tr>
<td>19</td>
<td>4.0</td>
<td>F</td>
<td>Live child</td>
</tr>
</tbody>
</table>
Inferential Statistics

Research Question

**Does using observational learning impact preschooler’s cooperation in an ultrasound swallow study?**

Due to the small sample size, a Fisher’s Exact Test was used to determine if there was statistical significance between participation and model type. This procedure is often used when there is a two by two contingency table. The Fisher’s Exact Test is used as an alternative to the Chi-square test. The Fisher’s exact test analysis indicated a p-value=0.3550. With p<.05 indicating significance, the data is considered not to be statistically significant.

The age of compliance ranged from 3.3 to 4.8 years. Table 2 indicates the subject, age, sex, type of modeling, and compliance of the child. Non-compliance occurred with one subject after viewing the live child model and one subject with no model. Two subjects were considered to be reluctant after viewing the live child model and one subject after viewing the babydoll model. One female and one male were considered to be non-compliant throughout the study. Two males and one female were considered to be reluctant. Review of the subject videotapes revealed the same compliance. Table 3 indicates the frequency of compliance for each modeling type.
Table 2

Group Compliance

<table>
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<tr>
<th>Subject Number</th>
<th>Age</th>
<th>Sex</th>
<th>Type of Modeling</th>
<th>Participation</th>
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<td>2</td>
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<td>3.3</td>
<td>F</td>
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<td>Compliant</td>
</tr>
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<tr>
<td>9</td>
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<tr>
<td>16</td>
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<tr>
<td>19</td>
<td>4.0</td>
<td>F</td>
<td>Live child</td>
<td>Compliant</td>
</tr>
</tbody>
</table>
Table 3

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>Frequency</th>
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<tr>
<td>Baby Doll</td>
<td>Fisher’s Exact Test</td>
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<td>5</td>
</tr>
<tr>
<td>Live Model</td>
<td>Fisher’s Exact Test</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

****Total Children represents the total children involved in the research study for each group.
Chapter IV

Discussion

There is increasing interest in finding methods to help ease anxiety in children when preparing for ultrasound procedures. By providing children with positive experiences in current procedures, that experience may impact future procedures (Claar, Walker, Smith, 2002). Depending on the age of the child, intervention techniques to reduce stress and anxiety may vary. Therefore, finding intervention techniques to help young children cooperate throughout an unfamiliar procedure will lead to further cooperation in subsequent procedures.

The purpose of this research study was to investigate the impact of observational learning on preschoolers’ cooperation in an ultrasound swallowing study. Particularly, the study examined whether a babydoll or a “live child” model would assist in preschooler cooperation. Statistical analysis shows no difference between group one (no stimulus), group two (babydoll), and group three (live child). This information is not in support of what was hypothesized, therefore no statistical references can be made, and the data is considered not expected.

It is important to consider the information that was gained from this research study. After analyzing the results of this study, two perspectives can be applied. One perspective is that the study examined whether observational learning was effective in helping children comply with medical procedures such as an ultrasound in a medical setting. Finding the best way to ease the fears of children within all medical environments is important in generalizing this data. This perspective takes into account such medical settings as clinics, physician’s offices, and hospitals. A second perspective is that the study explored whether observational learning was effective in helping children to cooperate in a procedure to collect normative data. Collecting normative data may require methodology which is not used in a typical medical setting. These methods can contribute to limitations which are not ideal for generalizing within all medical environments. Both perspectives are important to this research, but lead to different limitations and future research suggestions.

More specific information regarding the results of this study was also achieved. Compliance was found in each stimulus group, with the “live” child model obtaining the
lowest frequency of compliance. The babydoll and no model stimulus groups were equal in their number of children demonstrating compliance. Due to the number of limitations in the research, it is difficult to determine the effectiveness of a “live child” model on three and four year old children.

When taking gender differences into consideration, approximately the same level of compliance was achieved for male and female subjects. This result supports previous research which states there is no gender difference between children who show fear and anxiety towards an unfamiliar medical procedure (Carr, Lemanek, Armstrong, 1998). According to these results, children of any gender are likely to comply with the procedure.

A high frequency of compliance was achieved for children at both three and four years of age. The age range of children in the study was 3.3 to 4.11 years of age. The youngest age of non-compliance was 3.3 years of age and the oldest age of non-compliance was 4.8 years of age. These results indicate that compliance will occur with children between the ages of three and four regardless of modeling type or procedural preparation.

A great deal of information was learned from the results of this study. However, the data was not expected and it is important to discuss potential reasons. The behavioral and emotional dispositions of the children were not considered in the data analysis. A child’s personality and emotional disposition may affect the way in which stressful situations are managed, especially unfamiliar medical procedures. If a child encounters an environment in which the child has little or no previous experience, the child’s behaviors can vary based on individual differences. Different children display a range of behaviors when placed within a stressful environment (Knoll, Riekmann, Schwarzer, 2005). One finding showed that the personality and coping abilities of the children were predictors of emotional responses to mildly stressful medical procedures. One theory suggests that people create coping mechanisms to reduce the stressful impact of a situation (Knoll, Riekmann, Schwarzer, 2005).

Taking a child’s emotional disposition, or “trait anxiety,” into consideration is important when reducing children’s anxieties to an unfamiliar medical procedure. Trait anxiety is defined as a motive or acquired behavioral disposition which can predispose an individual to perceive some unthreatening situations as threatening (Nelson and Allen,
Further a child’s trait anxiety is a factor that may potentially increase their fears and reactions to stressful situations (Nelson and Allen, 1999). Discovering a child’s trait anxiety can be accomplished by asking the parent questions which probe their child’s emotional disposition to unfamiliar things. Thus, the professional performing the medical procedure may be better equipped to prepare the child for the procedure by taking the child’s trait anxiety into consideration. Therefore, the outcome of the results may have been predetermined by the emotional disposition of some of the children.

Appropriate sample sizes for a research study are also essential to the results. The number of subjects (n=19) in this study was significantly low. Due to the low number of total subjects, each stimulus group contained an exceedingly small number of subjects. Although recruitment was open to several preschools within the Southwest Ohio region, the sample population was obtained at only two. Factors such as social status, education level of the parents, and familiarity with research may have been factors in the results as well. Without having a wide representational sample, statistical significance may be inconclusive.

Determining ways to score the participants’ compliance resulted in difficulty in data analysis. While one group fell within the category of compliance and another group fell within the category of non-compliance, a segment of participants could not be included within either of these categories. Participants who could not be included in either category were labeled “reluctant.” These participants initially complied with the procedure, however, due to unknown factors, expressed the desire to end participation. Completion of the procedure was accomplished only after gentle persuasion by the investigator. Potential factors in the desire to discontinue the procedure may have included the following: multiple swallow trials, length of the procedure, or the desire to return to the classroom. The challenge of scoring this segment of participants makes it difficult to draw conclusions regarding their compliance.

**Limitations of the Study**

This study presents limitations in its design and setup. First, the largest limitation was a small sample population and limited geographic location. By increasing the sample
size and geographic location, it would demonstrate a more accurate representation of preschoolers. Second, there was no blind observer or rater to judge compliance of the preschoolers. Adding inter-rater reliability would increase the consistency of the scoring of compliance among the preschoolers and decrease potential bias to the study. Third, there was no method to prevent parent communication with the child after signing the consent form and prior to the procedure being done. Parent communication may have prepared the subject for the procedure being performed, reducing the child’s fear and anxiety. Fourth, for the purpose of collecting normative data, participants were required to complete ten swallows without showing resistant behavior in order to be considered compliant. For a segment of the participants, completing ten swallows may have led to the label of “reluctant.” Reducing the amount of required swallows may increase compliance among the participants. Lastly, there was no screen to identify if the preschooler had previous ultrasound exposure. A child’s previous awareness of ultrasound procedures may contribute to less anxiety and fear when undergoing the procedure themselves.
Future Research

Further research is needed into the area of what impacts cooperation of children undergoing an ultrasound swallowing study. Recruiting subjects presented an unexpected difficulty and small sample size. One suggestion for future research is to provide an educational session for the parents regarding the usage of an ultrasound machine. Due to the lack of awareness regarding an ultrasound and the procedures, many parents may have feared allowing their children to participate. Providing an educational session may alleviate myths and fears regarding ultrasound procedures and allow for larger enrollment.

A second suggestion would be to provide a larger monetary incentive. For this study, either a speech and hearing screening or a ten dollar gift card to a local grocery store was provided. Parents of the subjects were required to fill-out paperwork that took approximately 30 minutes to complete. The parents may not have felt the monetary supplement was worth the time involved for the study.

A third suggestion for future research would be to perform the ultrasound procedure within the child’s home. Although having the procedure performed within the child’s home provides limitations in generalizing the procedure to all medical environments, for the purpose of collecting normative data, this would be the most effective environment. Previous research shows that parental reassurance during medical procedures decreases children’s anxiety (Salmon and Pereira, 2002). Therefore, having a parent present may reduce the child’s anxiety and fear. The home provides the most naturalistic setting, and therefore may impact the child’s desire to discontinue participation.

A fourth suggestion is to include a parental questionnaire which focuses on the personality and emotional disposition of the child. One recommendation would be The Behavioral Assessment System for Children-Second Edition (BASC-2). This form enables the parent to rate the child’s behavioral and emotional conduct. By using a form such as the BASC-2, data analysis may show a correlation between compliance and the child’s emotional disposition.

Lastly, the limited geographical location provided a smaller region for recruitment. Including more children from many regions of the United States would
provide the likelihood of a larger sample size. Additionally, it could provide a more accurate representation of preschoolers and preschoolers’ behaviors while undergoing an ultrasound procedure.
References


Appendix A

Recruitment Flyer

We Need Healthy Kids!!!!!
- Is your child healthy overall?
- Is your child between the ages of 3-4?
- You can help!!!!

Hello, our names are Jennifer Stenger and Stephanie Zeidler. We are graduate students in the study of Speech Language Pathology at Miami University. We are working on a project that looks at healthy kids while they swallow. The swallow will be recorded while using an ultrasound.

Important Details:
1. The study has three parts: a questionnaire, a brief oral motor screening, and use of an ultrasound (placed under the chin) during a small snack.
2. The parent will need to fill out a consent form for child to participate.
3. The family would be reimbursed with a $10.00 Kroger gift card.
4. The study will take place at your child’s preschool.
5. The study will begin in October 2006 and going until the middle of February 2007.
6. All information about your child will be confidential and HIPAA regulations will be used to protect your child’s information.

Thank you for your time!

Jennifer Stenger, Bachelor of Arts, Graduate Clinician
Stephanie Zeidler, Bachelor of Science, Graduate Clinician
Miami University-Speech Language Pathology Department

Other Contact Information:
Donna Scaborough, PhD. CCC-SLP (Faculty Advisor)
Phone: (513) 529-2506
Email: scarbod@muohio.edu
Appendix B

Parental Questionnaire

I. Identifying Information:

Name: _________________________________ Date: ____________________
Date of Birth: _______________ CA: _______________ AA: _______________

II. Medical Information:

1. Does your child have any food allergies? Yes No
   If yes, please explain

2. Is your child currently taking any medications? Yes No
   If yes, please explain

3. Does your child suffer from seizures? Yes No
   If yes, please explain

4. Do you ever notice your child coughing after mealtime? Yes No
   If yes, please explain

5. Do you notice a “gurgly” or “wet” voice quality after they eat a meal? Yes No
   If yes, please explain

6. Do you notice food or liquid coming out of the nose? Yes No
   If yes, please explain

7. Does your child have any type of intestinal, stomach or esophageal problems (such as reflux)? Yes No
   If yes, please explain
III. Developmental Milestones

1. What is the main method of communication?
   Speech  Gestures  Sign  None  Other

2. Please indicate the following gross motor skills your child is able to complete:
   Sit independently  Walk independently  Run  Jump

IV. Sensory Skills

1. Would you say that your child gags easily?  Yes  No

2. Is your child a picky eater?  Yes  No

3. Rate how sensitive you feel your child is to the environment?
   1  2  3  4  5  6  7  8  9  10
   Under Sensitive  Normal  Very Sensitive

V. General

1. Which food would your child prefer to eat?  Applesauce  Pudding
   If Pudding, what type would your child prefer?  Chocolate  Vanilla

If none, please suggest another pureed food option that can be used: