Evaluating the Effectiveness of Reading a First Person Narrative on the Attitudes of
School-Age Children Toward Individuals Who Use AAC

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This thesis titled
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School-Age Children Toward Individuals Who Use AAC

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ABSTRACT

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There is a lack of information on the attitudes of children toward individuals with severe communication impairments, as well as a lack of evidence as to how best to improve these attitudes. Two between-group studies investigated school-age children’s attitudes toward individuals who use AAC at baseline and after two separate intervention sessions. Interventions were conducted at two elementary schools. Baseline attitudes were slightly above neutral. An intervention utilizing a first person narrative written by a young girl who uses AAC did not significantly increase self-reported attitudes compared to a control group. The second intervention was delivered to all participants. The intervention took place two weeks after the first. Additional information and demonstrations of AAC systems were presented and self-reported attitudes significantly increased. Limitations of the current study and future research directions are discussed.

Approved: _____________________________________________________________

John W. McCarthy

Assistant Professor of Hearing, Speech and Language Sciences
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## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>3</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>4</td>
</tr>
<tr>
<td>List of Tables</td>
<td>10</td>
</tr>
<tr>
<td>List of Figures</td>
<td>11</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>12</td>
</tr>
<tr>
<td>Chapter 2: Literature Review</td>
<td>15</td>
</tr>
<tr>
<td>Attitudes</td>
<td>15</td>
</tr>
<tr>
<td>AAC Attitude Research with Children</td>
<td>16</td>
</tr>
<tr>
<td>Attitude Change</td>
<td>19</td>
</tr>
<tr>
<td>Attitudes and Persuasion</td>
<td>21</td>
</tr>
<tr>
<td>Personal Narratives</td>
<td>21</td>
</tr>
<tr>
<td>Summary and Conclusion</td>
<td>24</td>
</tr>
<tr>
<td>Research Objectives</td>
<td>24</td>
</tr>
<tr>
<td>Chapter 3: Study One</td>
<td>26</td>
</tr>
<tr>
<td>Method</td>
<td>26</td>
</tr>
<tr>
<td>Experimental Design</td>
<td>26</td>
</tr>
<tr>
<td>Recruitment</td>
<td>26</td>
</tr>
<tr>
<td>Participants</td>
<td>26</td>
</tr>
<tr>
<td>Materials</td>
<td>27</td>
</tr>
<tr>
<td>Measures</td>
<td>28</td>
</tr>
</tbody>
</table>
Appendix C: The Assessment of Attitudes Toward Augmentative/Alternative Communication (AATAAC) ................................................................. 92

Appendix D: AAC Introduction Script .................................................................................. 94

Appendix E: Demographic Questions ..................................................................................... 95

Appendix F: Instructions On Filling Out The AATAAC ........................................................ 96

Practice AATAAC Questions ................................................................................................. 98

Appendix G: Summary of Procedures for Each Session ..................................................... 99

Appendix H: Qualitative Questions ........................................................................................ 101

Appendix I: Additional Information About AAC ................................................................. 102

Footnotes .............................................................................................................................. 103
LIST OF TABLES

Table 1: Demographic Information for Participants in Study One ..................27
Table 2: Mean Attitude Scores for Participants Across Sessions One and Two .......33
Table 3: ANOVA Results for Study One .................................................................34
Table 4: Fifth-Grade Students’ Perceptions of the Benefits of Being Friends with Someone Like Kathrin .................................................................41
Table 5: Fifth-Grade Students’ Perceptions of the Challenges of Being Friends with Someone Like Kathrin .................................................................44
Table 6: Fifth-Grade Students’ Future Perceptions of Someone Like Kathrin .........47
Table 7: Fifth-Grade Students’ Explanations for the Future Perception of “Teacher”...49
Table 8: Fifth-Grade Students’ Explanations for the Future Perception of “Occupations other than Teacher” .................................................................50
Table 9: Fifth-Grade Students’ Explanations for the Future Perception relating to “Personal Characteristics of Kathrin” .........................................................53
Table 10: Demographic Information For Participants in Study Two ....................64
Table 11: ANOVA Results for Study Two ...............................................................68
Table 12: Mean Attitude Scores for Participants Across Sessions Two and Three ....69
LIST OF FIGURES

Figure 1: Illustration of the example of an individual who uses AAC .........................30

Figure 2: The effect of group across sessions one and two on the attitudes of fifth-grade students .........................................................................................................................35

Figure 3: The effect of sex across sessions one and two on the attitudes of fifth-grade students .............................................................................................................................36

Figure 4: The effect of experience across sessions one and two on the attitudes of fifth-grade students .................................................................................................................37

Figure 5: The effect of time across sessions one and two on the attitudes of fifth-grade students ...........................................................................................................................38

Figure 6: The effect of group across sessions two and three on the attitudes of fifth-grade students .............................................................................................................................70

Figure 7: The effect of sex across sessions two and three on the attitudes of fifth-grade students .............................................................................................................................71

Figure 8: The effect of experience across sessions two and three on the attitudes of fifth-grade students ..................................................................................................................72

Figure 9: The effect of time across sessions two and three on the attitudes of fifth-grade students .............................................................................................................................73
CHAPTER 1: INTRODUCTION

Approximately 3.5 million Americans cannot use their natural speech to communicate their daily needs due to severe communication disabilities (Beukelman & Mirenda, 2005). Individuals with severe communication disabilities may require and benefit from augmentative and alternative communication (AAC), forms of communication other than natural speech. AAC includes electronic computer devices that generate speech output, symbolic picture boards, alphabet boards, signs, or gestures. Causes of severe communication disorders include cerebral palsy, autism, multiple sclerosis, traumatic brain injury, stroke, and spinal cord injuries (Beukelman & Mirenda, 2005).

With the increase in advanced technology for severe communication disorders, there is an increase in potential for participation by individuals who use AAC. These individuals may be in integrated classrooms, the business industry, and in other jobs held by typically developing individuals (Bryen, Potts, & Carey, 2007). However, these individuals often face discrimination and stereotyping due to the lack of knowledge of AAC and disabilities in general (Kent-Walsh & Light, 2003; McNaughton, Light, & Arnold, 2002). In an attempt to decrease discrimination and stereotyping, children without disabilities have been targeted for attitude interventions and disability awareness programs (Beck & Fritz-Verticchio, 2003; Morrison & Ursprung, 1987).

Attitude research for children in the field of AAC has focused on the effects of the type of AAC system (Beck & Dennis, 1996; Beck, Fritz, Keller, & Dennis, 2000; Blockberger, Armstrong, O’Connor, & Freeman, 1993) or factors involving
communicative competence (Beck, Bock, Thompson, & Kosuwan, 2002; Beck, Kingsbury, Neff, & Dennis, 2000). There is a lack of information regarding effective interventions to influence the attitudes of children toward individuals who use AAC (McCarthy & Light, 2005). More research is needed in this area to change potentially negative attitudes of children toward individuals who use AAC. Baseline data are also necessary to determine whether pre-existing attitudes are neutral due to lack of information and insight about individuals who use AAC, whether attitudes are negative, and whether or not attitudes might change based on intervention.

Attitudes toward individuals with disabilities have been changed through information and contact provided through several different means (Yuker, 1994). Forms of accurate information and indirect contact may include personal stories written first hand. Personal narratives are accessible from the Internet, the library, newspapers, and schools, and are popular ways of conveying a message (Dal Cin, Zanna, & Fong, 2004). McCarthy, Donofrio, Dempsey, Birr, and Pratt (2006) found that reading personal narratives written by an individual using AAC had a positive impact on the attitudes of business majors toward that individual. To date, there is no information (to the author’s knowledge) about the role of personal narratives on the attitudes of children toward individuals who use AAC.

The aim of this study was to determine the effect of reading a first person narrative on school-aged children’s attitudes toward individuals who use AAC. Previous research findings indicated that accurate information leads to more positive attitudes (Lee & Rodda, 1994) and that perceived similarities between two people leads to more
positive attitudes (Gorenflo & Gorenflo, 1997). Therefore, it was predicted that reading a first person narrative by a similar-aged child who uses AAC would lead to an increase in positive attitudes, relative to (a) baseline attitude measures, (b) compared to attitudes reported prior to the intervention, and (c) compared to a control group not exposed to the intervention.
CHAPTER 2: LITERATURE REVIEW

Attitudes

Triandis (1971) provided the following definition of attitude: “an idea charged with emotion which predisposes a class of actions to a particular class of social situations” (p. 2). This definition includes the three components of an attitude: (a) cognitive (opinion and categories), (b) affective (emotions and feelings toward the object), and (c) behavioral (predisposition to a particular action).

Behavior and attitudes are closely related, but the relationship is not clearly defined or consistent. The components of an attitude include how a person thinks, feels, and would like to act toward an object or person, but behavior is based on more than an attitude. According to Triandis (1971), behavior is determined not only by feelings and a predisposition to an action, but also by social norms. Social norms include what the person thinks he should do based on what he has done in the past, as well as the consequences of the particular action. Therefore, behavior includes four factors: attitudes, norms, habits, and reinforcement. If all of these factors are consistent, behavior and attitude are closely related; when these factors are not consistent, behavior and attitude do not appear to be as related (Triandis, 1971).

Despite the lack of concrete evidence about the relationships between attitudes and behaviors, attitudes appear to be closely related to, and an influence on, behaviors (Yuker, 1965). When negative attitudes occur, a negative reaction to the object is present. Negative reactions result in avoidance and rejection. Conversely, when positive attitudes occur, a positive reaction to the object is present. The positive reaction results in
acceptance, rather than rejection, and thus has an effect on behavior (Yuker, 1965). Behavior is one component of an attitude, although the relationship is not clearly defined or concrete (Ajzen & Fishbein, 1980). By changing attitudes from negative to positive, researchers intend to have an effect on all components of an attitude: affective, behavioral, and cognitive.

AAC Attitude Research with Children

Negative attitudes of children toward individuals who use AAC can result in barriers that limit interaction, communication, and participation (Kent-Walsh & Light, 2003). Research on attitudes of children toward individuals who use AAC has generally focused on demographic features of participants or features of AAC devices and their impact on attitudes (McCarthy & Light, 2005).

One attitude study examined the effects of the type of AAC aids (nonelectronic alphabet board and a voice output device), gender, and experience in an integrated school on fifth-grade students’ self-reported attitudes (Beck & Dennis, 1996). The scores on the Chedoke-McMaster Attitudes Toward Children with Handicaps (CATCH; Rosenbaum, Armstrong, & King, 1986), a self-reported attitude scale, indicated that girls had more positive attitudes than boys. Findings were consistent with the literature in this area. First, girls have more positive attitudes towards individuals with disabilities. Second, all children who attended an integrated school versus those who did not attend an integrated school had more positive attitudes. That finding was also consistent with the findings that previous exposure and personal encounters with individuals with disabilities resulted in a
more favorable attitude. Third, the type of AAC aid did not have an effect on attitudes, regardless of the type of device (high tech computer or a low tech alphabet board).

Similarly, Blockberger et al. (1993) examined the attitudes of fourth-grade students towards a child using three different AAC techniques. The study examined three AAC conditions shown on a video: electronic technique, nonelectronic technique, and an unaided (gesture-based) technique. There were no differences between the groups viewing the different AAC techniques, as measured by the CATCH. However, consistent with previously discussed research, girls reported more positive attitudes and both boys and girls who had previous experience with individuals with disabilities reported more positive attitudes. This research supported the idea that the type of AAC systems does not necessarily impact the attitudes of school-aged children.

In addition to the type of AAC system being used, the physical status of the individual (sitting in a wheelchair or regular chair) has been examined to determine the impact on children’s self-reported attitudes toward individuals who use AAC (Beck, Fritz, et al., 2000). A self-reported attitude measurement, the *Assessment of Attitudes Toward Augmentative/Alternative Communication* (AATAAC) (Beck, Fritz, et al., 2000) was used to measure attitudes in this study. For children in third- and fifth-grades, there was no effect for the type of AAC system or physical status of the user on self-reported attitudes, but there was an effect on attitudes for children in first grade. Specifically, first-grade boys had more positive scores than girls, but for third- and fifth-graders, girls had more positive attitudes than boys. The results of this study indicated that younger children may react more strongly to the type of AAC system presented as well as whether
the individual is in a wheelchair or not, especially for boys. However, this was not true
for older children. This study supported previous literature that the type of AAC system
did not affect older children’s attitudes. Additional information from this study indicated
that physical status of the individual using AAC did not play a role in attitudes of older
school-aged children.

Rather than examining the effect of AAC systems, Beck, Kingsbury, et al. (2000)
examined the impact that the length of a communicated message from an AAC system
had on self-reported attitudes of third- and fifth-grade students. Children reported, using
the AATAAC, more positive attitudes when the messages consisted of two to four words
compared to only one word.

Similar to the length of a communicated message having an effect on attitudes,
communicative competence and AAC systems were investigated to determine if they had
an impact on the attitudes of fourth- and fifth-grade students, familiar with individuals
with disabilities (Beck et al., 2002). Comparable to previous research, the use of a
nonelectronic alphabet board and a voice output device were compared, as well as
communicative competence of the individual using AAC (manipulated by response time
and prompting). The results of this study reaffirmed that the type of AAC system did not
have an effect on the self-reported attitudes of school-aged children. Communicative
competence also did not have an effect on the self-reported attitudes of the children
participating in the study.

Overall, the results of these studies provide support that the type of AAC system
being used, whether high tech (voice output) or low tech (alphabet board) did not play a
role in the attitudes of school-aged children. Variables concerning the physical status of
the individual, communicative competence, and length of message also did not play a
role in influencing attitudes. The results supported known theories in the attitude
literature: Girls have more positive attitudes than boys and contact with individuals with
disabilities results in more positive attitudes. Although these studies were important in
building theory, they did not identify the means to change potentially negative attitudes
toward individuals who use AAC. Previous studies did not provide information on how
best to change the attitudes of children toward individuals who use AAC, and posed a
weakness by being post-test only designs, i.e., did not measure baseline attitudes prior to
exposure to AAC. In short, most of the previous studies have only compared factors that
correlated with positive attitudes, rather than identifying means to effectively change
attitudes.

Attitude Change

Beck and Fritz-Verticchio (2003) examined the effects of an intervention session
on the attitudes of school-aged children toward individuals who use AAC. The authors
examined the effects of a non-verbal role-playing situation in addition to an informational
session, compared to an informational session alone. The results indicated that engaging
children in a nonverbal role-playing situation, in addition to providing information about
peers who use AAC, increased positive attitudes for boys compared to information alone.
This finding was consistent for boys, but not for girls. The information presented
described AAC, why people use it, and different types of communication aids. The
authors concluded that the effect of role-playing was most likely stronger for boys
because girls were more likely to already have positive attitudes, which led to less of a 
potential for an increase in positive attitudes.

The study indicated that role-playing may have a positive influence on attitudes, 
but the use of role-playing is controversial in disability research because disability 
simulations tend to focus on the negative aspects of a disability (e.g. feeling lost while 
walking with a blindfold or maneuvering a wheelchair in tight spaces; Kiger, 1992). As a 
result of the experience, participants may feel pity and focus on the dependency, 
embarrassment, frustration, and inferiority they felt while simulating a disability. Kiger 
(1992) also stated that disability simulations may force participants to participate, induce stress, and break confidentiality and personal security, which are all negative factors associated with the simulation. Additionally, in a meta-analysis of factors affecting attitude change, Shaver, Curtis, Jesunathada, and Strong (1989) did not find a strong effect for simulations in changing attitudes.

There is much interest and research on examining methods to change the attitudes 
of adults toward individuals who use AAC (Gorenflo & Gorenflo, 1991; Gorenflo & 
Gorenflo, 1997; McCarthy et al., 2006), but little research exists on effectively changing attitudes of children in this area. In order to establish positive attitudes in children, they must be exposed to positive experiences about individuals who have disabilities. By capturing their attention at a young age, positive attitudes will be established, have a lasting impact, and remain throughout the child’s life (Morrison & Ursprung, 1987). Therefore, it is imperative that children are targeted in AAC interventions before they reach adulthood to ensure they develop and foster positive attitudes and behaviors.
Attitudes and Persuasion

Attitudes toward individuals with disabilities are not easily changed, and although there are numerous studies examining attitude change toward individuals with disabilities, these studies were neither well designed nor, in general, successful. Compared to other means of providing information, persuasive messages were effective at changing attitudes (Shaver et al., 1989). A persuasive message is one that presents information that advocates for a specific position, for example, a message that tells an individual what they should think and why, in an attempt to influence the counter-attitude of the audience (Dal Cin et al., 1994). Persuasive messages are intended to present a specific argument that is logical and clear to the audience (Dal Cin et al., 1994). In other words, a persuasive message is obvious to the intended audience and makes a very clear argument for a specific position. While it has been found that persuasive messages are effective at changing attitudes, they are not always successful (Shaver et al., 1989). Persuasive messages are not entirely successful at changing attitudes because individuals receiving these messages are aware that they are trying to be persuaded, and as a result become more defensive of their personal opinions. Therefore, the messages become more argumentative than persuasive (Dal Cin et al., 1994).

Personal Narratives

Lee and Rodda (1994) asserted that negative attitudes towards individuals with disabilities may be a result of inaccurate information about disabilities. In addition, lack of experience with individuals with disabilities nurtures negative attitudes and creates anxiety in others who encounter them. Assuming that lack of information and experience
are the basis for negative attitudes, the presentation of accurate information would increase positive attitudes by clarifying the belief system. Accurate information includes information in various fields, including cultural, medical, and psychological. Accurate information should include the truth about disabilities as well as the capabilities of individuals with disabilities.

Lee and Rodda (1994) added that contact is another method that beneficially modifies negative attitudes. Direct contact provides a medium for conveying accurate information, and reducing anxiety and discomfort when encountering individuals with disabilities. They further claimed that the combined effect of accurate information and contact results in the most positive attitude modification. This effect is created by learning new information that replaces old inaccurate beliefs. Then, exposure to someone with a disability reinforces and verifies the accuracy of the information presented.

Providing individuals with the opportunity to personally interact with an individual with a disability is not easy to arrange and is not always practical. The interaction may leave individuals with disabilities feeling like they are on display for learning purposes.

Rather than factual information as a means to change attitudes, personal narratives can be utilized. Narratives relate life experiences of other people and tell their story. Thus, they are not meant to be overtly persuasive and do not set forth a specific argument. Narratives provide an indirect way of meeting another individual and provides accurate information and insight into the experiences of others. Therefore, narratives are less threatening than persuasive and informational arguments (Dal Cin et al., 2004).
Narratives are becoming increasingly popular, including narratives written by individuals who use AAC. Two examples of commercially available personal narrative collections written by individuals who use AAC are *Beneath the Surface* (Williams & Krezman, 2000) and *Speaking Up and Spelling It Out* (Fried-Oken & Bersani, 2000).

Reading a short narrative written by an individual using AAC was found to positively impact attitudes of undergraduate business students toward that person (McCarthy et al., 2006). However, to the author’s knowledge, there is no evidence on the use of narratives to change children’s attitudes toward individuals who use AAC.

Morrison and Ursprung (1987) concluded from their literature review that studies intended to influence children’s attitudes must be based on the assumption that accurate information about disabilities will lead to an increase in positive attitudes and, conversely, reduce social rejection and prejudice toward individuals with disabilities. The authors stated that information presented for the program must be age appropriate, geared toward increasing understanding the meaning of disability, and making children aware of their feelings about people with disabilities. The individuals with disabilities should be of equal or higher status than the targeted population and convey information on what it is like to have a disability and how they want typical individuals to relate to them (Morrison & Ursprung, 1987).

Using a personal narrative written by a child who uses AAC meets the criteria for attitude change with information, as outlined above by Morrison and Ursprung (1987). Using a narrative also meets the criterion of activating perceived similarity among two people (Gorenflo & Gorenflo, 1997). Therefore, it can be hypothesized that a personal
narrative will have a positive effect on children’s attitudes toward individuals who use AAC and is a practical method of conveying accurate and influential information.

Summary and Conclusion

Individuals who use AAC may face discrimination, negative behaviors, and reduced educational and career opportunities. Negative attitudes that develop in childhood are a result of inaccurate information, a lack of experience with individuals with disabilities, and a lack of education concerning disabilities. Reading personal narratives may be a way to raise awareness in positive ways for children about individuals who use AAC. Previous research has focused on the characteristics of AAC systems, but more studies are needed on teaching children about AAC and individuals who use it in a positive and engaging manner. Documenting the experiences children have while reading a narrative and learning about AAC can provide insight into their thoughts and attitudes, in addition to a measurement of their attitudes.

Research Objectives

The purpose of the current study was to determine whether reading a first person narrative would positively influence the attitudes of school-aged children. This objective was addressed through two studies. The purpose of study one was to examine the effect of only reading a first person narrative. Study one addressed the following questions: (a) What are the baseline attitudes of school-aged children toward individuals who use AAC? (b) What is the effect of reading a first person narrative on children’s attitudes toward individuals who use AAC? (c) What are the perspectives of school-aged children toward individuals who use AAC? It was predicted that the baseline measurement of
attitudes would be neutral, not negative. It was hypothesized that reading a first person narrative would have a positive impact on children’s attitudes.

The purpose of study two was to determine the effect of additional information on attitudes in the experimental group and initially on the control group. The study addressed the following question: What is the effect of additional information and AAC system demonstrations on the attitudes of school-aged children? It was hypothesized that additional information as well as the opportunity to experience AAC systems would improve the self-reported attitudes of participants in both groups.
CHAPTER 3: STUDY ONE

Method

Experimental Design

A mixed factorial design was used: 2 (group: experimental vs. control) × 2 (sex: female vs. male) × 2 (time: sessions) (2 between, 1 within). The independent variable was the condition of the experimental narrative or the control reading, and the dependent variable was the Assessment of Attitudes Toward Augmentative/Alternative Communication (AATAAC), a self-report measurement of attitudes. Additionally, during session two both groups answered three open-ended qualitative questions after completing the attitude assessment. The qualitative responses of the experimental group were coded and analyzed for themes.

Recruitment

The researcher contacted schools in southern Ohio via e-mail and invited fifth-grade classrooms to participate in the study. The e-mail included a summary of the study, procedures, and potential benefits for the participating classes.

Participants

Participants in the study consisted of six, fifth-grade classrooms from two elementary schools in southern Ohio. There were a total of three classrooms in the control group and three classrooms in the experimental group. Teachers reported whether or not each child participating in the study was reading at or above grade level, to ensure each child was able to read the attitude assessment accurately and comprehend the oral reading of the story. Students who reported that they either had a friend who had a
disability or that they had talked or played with someone with a disability during the past
week, at anytime during the three sessions, were considered as having previous
experience with individuals with disabilities. Table 1 summarizes the demographic
information for students participating in study one.

Table 1

Demographic Information for Participants in Study One

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Sex</th>
<th>Experience with disabilities</th>
<th>Reading at grade level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>37</td>
<td>14</td>
<td>23 43% (16/37)</td>
<td>89% (33/37)</td>
</tr>
<tr>
<td>Control</td>
<td>29</td>
<td>13</td>
<td>16 45% (13/29)</td>
<td>93% (27/29)</td>
</tr>
</tbody>
</table>

Materials

The narrative read to students in the experimental condition was *Kathrin Talks with Her Eyes* (Lehler & Gemmel, 1997; see Appendix A). The narrative is an illustrated children’s book portraying, in first person voice, the life of a young girl who uses AAC and her experiences in childhood. The story read to the students in the control condition was *If You Decide to Go to the Moon* (McNulty, 2002; see Appendix B), an illustrated nonfiction children’s book. The experimental story had a reading level of 4.4 as measured by the Flesch-Kindcaid Grade Level Measurement on Microsoft Word, and consisted of 1,532 words, and 18 illustrations. The control story was matched to reading level, number
of words, and number of illustrations. The stories were read from a script and corresponding pictures were shown directly from the books.

**Measures**

The *Assessment of Attitudes Toward Augmentative/Alternative Communication* (AATAAC) was used to measure attitudes (Beck, Fritz, et al., 2000; see Appendix C). The AATAAC is used for measuring attitudes of school-aged children in first- through fifth- grades. The instrument contains a total of 26 statements rated with a 5-point Likert scale with the anchors “strongly agree” and “strongly disagree.” The items are designed to measure the cognitive, affective, and behavioral aspects of attitude. As reported by the authors (Beck, Fritz, et al.), for children in the fifth-grade the AATAAC has acceptable internal consistency (.95) and test-retest reliability after one week (α = .01 and r = .87). Construct validity was demonstrated by confirming a known hypothesis of attitude measurements: girls demonstrate more positive attitudes than boys toward individuals with disabilities.

**Procedures**

Once a school agreed to participate, classroom teachers were sent recruitment letters and consent forms to send home with students. During the week of the first session, a second letter and consent form were sent home with students who had not already returned their consent forms. Both sessions took place in the participating classrooms. Students that did not have parental consent to participate in the study remained in the room and sat at their desks. Three classrooms were randomly assigned to
be part of the experimental group and three classrooms were randomly assigned to be part of the control group.

Procedures for the first session were identical for both the experimental group and the control group. During the first session the researcher provided a brief, standardized introduction to AAC (see Appendix D). After the description of AAC, the researcher passed out a demographic questionnaire that was filled out by the students (see Appendix E). The questionnaire asked identifying information as well as questions about the child’s experiences with individuals with disabilities. Next, students were given verbal instructions on how to fill out the AATAAC (see Appendix F). The researcher and students answered two sample questions together to ensure understanding of the Likert scale. Each child was given a 5” × 7” color copy of an illustration of Kathrin from the experimental reading to refer to as an example of a child who uses AAC. Figure 1 displays a smaller version of the picture given to students. The students were told Kathrin is a child who uses AAC and to think of people “like Kathrin” while filling out the AATAAC. Students then completed the assessment. A summary of procedures for each session is included in Appendix G.

The second session took place exactly one week after the first. The session began with the researcher reading the story to each group. The experimental group heard Kathrin Talks with Her Eyes (Lemler & Gemmel, 1997) and the control group heard If You Decide to Go to the Moon (McNulty, 2002). To control for children not reading at grade level, the stories were read aloud by the researcher. After reading the story, the procedures for both groups were identical. The standardized introduction to AAC was
read by the researcher, as well as the instructions and sample questions for the AATAAC. The illustration of Kathrin was also provided and the students completed the AATAAC for the second time. After completing the AATAAC, students in the experimental condition also answered three questions about the story that was read (see Appendix H), to gain insight into their perspectives about AAC and individuals who use AAC. Students in the control condition also answered the same three questions, but referred to the picture (rather than the story) when they answered the questions. A summary of procedures for each session is included in Appendix G.

Figure 1. Illustration of the example of an individual who uses AAC.

Data Analysis

Scores for the AATAAC were calculated and a mean score was determined for each participant as described by Beck, Fritz, et al. (2000). To determine a mean score for each participant, individual scores were added together and divided by the total number of questions (26). Because the instrument uses a 5-point Likert scale with the anchors “strongly agree” and “strongly disagree,” mean scores closer to 5 were considered to reflect more positive attitudes; scores closer to 1 were considered to reflect more negative attitudes. A mixed factorial ANOVA was used to analyze interactions and main effects among variables.

The qualitative responses of the experimental group were transcribed and coded for themes using procedures outlined by Vaughn, Schumm, and Sinagub (1996). Individual responses were transcribed and broken down into thought units. A thought unit is the smallest unit that can stand alone and maintain its original meaning. Thought units were then coded and analyzed for themes. A quantitative count of each number of thought units per theme was noted to obtain quantitative data on the number of thought units per theme.

Reliability

Procedural reliability was calculated for sessions to ensure correct administration of the tasks. An independent judge listened to audio-taped recordings of sessions to determine if the test administrator followed the procedures outlined in the script correctly. Four sessions were randomly selected, and procedural reliability was 100%.
For the qualitative portion of the study, an independent coder established the reliability of themes by recoding 25% of the data. Forty thought units were re-coded for themes with 93% (37/40) agreement.

Results

The mixed factorial ANOVA revealed main effects for the within-subject factor of time ($F[1, 58] = 4.94, p = .03$). The between-subjects factors of experience ($F[1, 58] = 13.835, p < .001$), and sex ($F[1, 58] = 4.90, p = .03$) were also significant. Group was not significant ($F[1, 58] = .81, p = .37$). There were no significant interactions between any other factors. Table 3 summarizes the ANOVA results.

Baseline Attitude Scores

Baseline AATAAC scores for girls was a mean of 3.81 (SD = .48) and baseline AATAAC scores for boys was a mean of 3.45 (SD = .53). Mean baseline AATAAC scores for individuals with experience was 3.93 (SD = .39) and mean AATAAC scores for individuals without experience was 3.45 (SD = .53). Table 2 summarizes the mean attitude scores for participants across sessions one and two.
Table 2

*Mean Attitude Scores for Participants Across Sessions One and Two*

<table>
<thead>
<tr>
<th></th>
<th>Session One</th>
<th>Session Two</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>3.78</td>
<td>.47</td>
</tr>
<tr>
<td>Control Group</td>
<td>3.52</td>
<td>.57</td>
</tr>
<tr>
<td>Male</td>
<td>3.45</td>
<td>.53</td>
</tr>
<tr>
<td>Female</td>
<td>3.81</td>
<td>.48</td>
</tr>
<tr>
<td>Experience</td>
<td>3.93</td>
<td>.39</td>
</tr>
<tr>
<td>No Experience</td>
<td>3.45</td>
<td>.53</td>
</tr>
<tr>
<td>Time</td>
<td>3.66</td>
<td>.48</td>
</tr>
</tbody>
</table>
Table 3

*ANOVA Results for Study One*

<table>
<thead>
<tr>
<th>Source</th>
<th>$df$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>1</td>
<td>.811</td>
<td>.372</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>4.903*</td>
<td>.031</td>
</tr>
<tr>
<td>Experience</td>
<td>1</td>
<td>13.835*</td>
<td>.000</td>
</tr>
<tr>
<td>Group * Sex</td>
<td>1</td>
<td>1.725</td>
<td>.194</td>
</tr>
<tr>
<td>Group * Experience</td>
<td>1</td>
<td>1.852</td>
<td>.179</td>
</tr>
<tr>
<td>Sex * Experience</td>
<td>1</td>
<td>.619</td>
<td>.435</td>
</tr>
<tr>
<td>Group * Sex * Experience</td>
<td>1</td>
<td>.159</td>
<td>.692</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>4.942*</td>
<td>.030</td>
</tr>
<tr>
<td>Time * Group</td>
<td>1</td>
<td>3.670</td>
<td>.060</td>
</tr>
<tr>
<td>Time * Sex</td>
<td>1</td>
<td>.643</td>
<td>.426</td>
</tr>
<tr>
<td>Time * Experience</td>
<td>1</td>
<td>.015</td>
<td>.902</td>
</tr>
<tr>
<td>Time * Group * Sex</td>
<td>1</td>
<td>1.134</td>
<td>.291</td>
</tr>
<tr>
<td>Time * Group * Experience</td>
<td>1</td>
<td>.020</td>
<td>.889</td>
</tr>
<tr>
<td>Time * Sex * Experience</td>
<td>1</td>
<td>.196</td>
<td>.659</td>
</tr>
<tr>
<td>Time * Group * Sex * Experience</td>
<td>1</td>
<td>.439</td>
<td>.510</td>
</tr>
<tr>
<td>Error (Time)</td>
<td>58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = <.05*
Group

Mean AATAAC scores were not significantly different across sessions one and two between the experimental group (M = 3.78, 3.57; SD = .47, .66) and the control group (M = 3.52, 3.49; SD = .57, .68). Figure 2 displays these results by session.

Figure 2. The effect of group across sessions one and two on the attitudes of fifth-grade students.
Sex

Across sessions one and two, mean AATAAC scores for girls (M = 3.81, 3.72; SD = .48, .59) were significantly higher than boys (M = 3.45, 3.27; SD = .53, .71). Figure 3 displays these results by session.

Figure 3. The effect of sex across sessions one and two on the attitudes of fifth-grade students.
Experience

Mean AATAAC scores for individuals with experience (M = 3.93, 3.82; SD = .39, .52) were significantly higher across sessions one and two than those without experience (M = 3.45, 3.32; SD = .53, .71). Figure 4 displays these results by session.

Figure 4. The effect of experience across sessions one and two on the attitudes of fifth-grade students.
Time

Regardless of group, mean AATAAC scores for session one (M = 3.66, SD = .48) were significantly greater than mean scores for session two (M = 3.54, SD = .68). Figure 5 displays these results by session.

Figure 5. The effect of time across sessions one and two on the attitudes of fifth-grade students.

Qualitative Results

Qualitative data collected from participants in the experimental condition were analyzed and coded for themes. Data are summarized according to each question.

Benefits

Four themes emerged from the question: What do you think would be good about being friends with someone like Kathrin? The themes were: benefits for typically developing peers, benefits for Kathrin, personal characteristics of Kathrin, and other. A
summary of themes, topics, and number of thought units per theme for this question is displayed in Table 4.

Benefits for typically developing peers. The majority of thought units (43%) were comments about the benefits participants would receive from being friends with Kathrin. The benefits included learning about Kathrin, learning from Kathrin, and learning about AAC. Participants also commented that differences do not matter, it would be good because she is different, and that they are open-minded. As one participant stated, “I think it would be good because they would be someone who is different than me so she would be fun.” Lastly, general comments were made about the benefits of playing, having a good experience, and having the opportunity to ride in a wheelchair.

Benefits for Kathrin. The second largest majority of thought units (32%) reported on the benefits Kathrin would receive from being friends with a typically developing peer. The benefits included it would make her happy and they would be able to teach and help her. Comments were also made that “it would be good because they [people like Kathrin] probably don't have many friends.”

Personal characteristics of Kathrin. Participants perceived qualities of Kathrin that would make her a good friend, which made up 11% of the thought units. These qualities include she is nice, fun, and would listen. For example, one participant stated, “She is nice and friendly to others.”

Other. Other comments made by the participants did not fit into any specific theme and made up 14% of the thought units. These comments included not knowing,
parents telling you what to do, and “I think a good friend for Kathrin would be another kid that uses AAC.”
### Table 4

*Fifth-Grade Students’ Perceptions of the Benefits of Being Friends with Someone Like Kathrin*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits for typically developing peers</td>
<td>A positive/good experience</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Playing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning about AAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning from Kathrin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning about Kathrin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Riding in a wheelchair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Differences do not matter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good because she is different</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open-minded</td>
<td></td>
</tr>
<tr>
<td>Benefits for Kathrin</td>
<td>Lack of other friends</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Making her happy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching her</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Helping her</td>
<td></td>
</tr>
<tr>
<td>Personal characteristics of Kathrin</td>
<td>She is nice</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>She is fun</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She would listen</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 (continued)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>I don’t know</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>I do not</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parents tell you what to do</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She should play with someone like herself</td>
<td></td>
</tr>
</tbody>
</table>

**Challenges**

Three themes emerged from the question: What do you think would be challenging about being friends with someone like Kathrin? The themes were communication, physical challenges, and other. A summary of themes, topics, and number of thought units per theme for this question is displayed in Table 5.

*Communication.* The majority of thought units (76%) addressed by the participants involved communication. Some participants indicated that communication would not be a problem, they would be able to understand her, and talking would be easy. However, most students thought she would be difficult to understand, difficult to talk to, and commented that she cannot talk. The majority of students made comments similar to this one: “It would be hard to understand what they [individuals who use AAC] are trying to say.” As a result of the challenges, participants reported it would be a challenge learning how to communicate with Kathrin. Some students reported that someone like Kathrin cannot hear and she does not understand what is being said, although no such
information was contained in the narrative. Lastly, a reported challenge was trying not to make her frustrated with communication.

*Physical challenges.* Seventeen percent of the thought units concerned the physical challenges of being friends with someone like Kathrin. These challenges included physical limitations, difficulties playing, and typically developing peers not being able to do what they wanted. For example, one participant stated a challenge would be “you don't get to play as many things like other kids.”

*Other.* Other comments made that did not fit into a theme included general comments and group of friends would be challenging, which indicates the typically developing peers’ fear that their friends would not be accepting of a person like Kathrin.
Table 5

*Fifth-Grade Students’ Perceptions of the Challenges of Being Friends with Someone Like Kathrin*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Difficult to understand</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Cannot talk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Talking would be easy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She cannot hear</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Making her frustrated communicating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difficult to talk to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Will be able to understand her</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She does not understand what is being said</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning how to communicate with her</td>
<td></td>
</tr>
<tr>
<td>Physical challenges</td>
<td>Physical limitations</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Playing would be difficult</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Could not do what you wanted</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Group of friends would be challenging</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>General comment</td>
<td></td>
</tr>
</tbody>
</table>
Future Perceptions

When asked “What do you think someone like Kathrin will be when she grows up?” six themes emerged. The themes were a teacher, occupations other than teacher, comments on personal characteristics of Kathrin, comments on her physical status, unemployed, and other. A summary of themes, topics, and number of thought units per theme for this question is displayed in Table 6.

Teacher. Thirty-six percent of thought units involved education. Participants reported that Kathrin would be a teacher. More specifically, they noted she would be an AAC teacher, a sign language teacher, and a teacher in a school for “handicapped” children. More generally, it was commented that she would teach others about people like herself. An example of a general statement alluding to education made by a participant was, “I think they will grow up to be someone who helps other disabled kids.”

Occupations other than teacher. The next largest response (23%) were occupations other than teaching. These included doctor, writer, artist, and other various jobs. Participants also thought she would be a parent and “they will probably help people when they grow up.” One comment was made that she would be employed doing something easy. In contrast, other comments were made that she would be “something unexpected” and a “genius.”

Personal characteristics of Kathrin. Comments were made on personal characteristics and qualities of Kathrin (16%). These comments included that she would be a good person, a good worker, and happy. Put simply, one participant stated, “She will be a nice person.”
Physical status. Topics were initiated about Kathrin’s future physical status (11%). Participants reported that she would be speaking the same, difficult to talk to, and someone who uses AAC. Conversely, some comments were made about her physical abilities improving. These comments included she would be better at talking and able to walk. “I think she will probably be the same but better at talking,” stated one participant.

Other. Fourteen percent of participants initiated topics that did not fall into a specific category. The majority of participants replied “I don’t know” what someone like Kathrin will be when she grows up. One participant indicated that she would be unemployed because “because the owner would not want them.”

Future Perception Explanations

After responding to the question about someone like Kathrin’s future, participants were asked a follow-up question about why they thought that. The responses are categorized according to the thought unit of the previous question.

Teacher. Three themes emerged from participants who reported that someone like Kathrin would be a teacher when she grows up: based on her experiences, her personal characteristics, and her abilities. A summary of themes, topics, and number of thought units per theme for this perception is displayed in Table 7.
Table 6

_Fifth-Grade Students’ Future Perceptions of Someone Like Kathrin_

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>Teacher</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>AAC teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sign language teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teacher in a handicap school</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teach others about people like herself</td>
<td></td>
</tr>
<tr>
<td>Occupations other than teacher</td>
<td>Doctor</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Writer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Artist</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Various jobs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Helping people</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Something easy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Something unexpected</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genius</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6 (continued)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal characteristics of Kathrin</td>
<td>A good person</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>A good worker</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Happy</td>
<td></td>
</tr>
<tr>
<td>Physical status</td>
<td>Better at talking</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Speaking the same</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difficult to talk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Someone who uses AAC</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Unemployed</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>I don’t know</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personal comment</td>
<td></td>
</tr>
</tbody>
</table>

Topics that made up the theme “based on her experiences” included she would want to make lives of people like her better, teach what she knows, teach and help others like herself, and she uses AAC. An example topic from this theme is “she would probably want to help kids that are going through the things she is.” A comment was also made that she has sign language experience “because she would have done sign language with her eyes.” Topics that involved her personal characteristics included she is nice, she
is smart, and her personal appearance. Lastly, participants reported she is able to do everything others can do, and therefore have the same abilities as anyone else.

Table 7

Fifth-Grade Students’ Explanations for the Future Perception of “Teacher”

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on her experiences</td>
<td>Make lives of people liker her better</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>She has sign language experience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She uses AAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teach what she knows</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teach/help others like herself</td>
<td></td>
</tr>
<tr>
<td>Personal characteristics of Kathrin</td>
<td>She seems nice</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>She is smart</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personal appearance</td>
<td></td>
</tr>
<tr>
<td>Same abilities as other</td>
<td>Able to do everything others can do</td>
<td>1</td>
</tr>
</tbody>
</table>

Occupations other than teacher. Six themes emerged from students who reported she would be an occupation other than a teacher: based on her experiences, same abilities
as others, overcome low expectations, and other. A summary of themes, topics, and number of thought units per theme for this perception is displayed in Table 8.

Topics that made up the theme “based on her experiences” include making lives of people like her better and helping others like herself, e.g., “I think that because she probably feels sorry for them [individuals with disabilities].” Participants also reported on two experiences she shared in the book: drawing and writing. Similar to previous

Table 8

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th># Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on her experiences</td>
<td>Make lives of people like her better</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Help others like herself</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She wrote a book</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She has drawn in the past</td>
<td></td>
</tr>
<tr>
<td>Same abilities as others</td>
<td>Abe to do everything others can do</td>
<td>2</td>
</tr>
<tr>
<td>Overcome low expectations</td>
<td>Not expected to be successful</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>Have a family with someone like her</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Physical limitations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>She seems nice</td>
<td></td>
</tr>
</tbody>
</table>
questions, other topics discussed included she is able to do everything others can do, physical limitations she has, and she seems nice. The participant, who thought she would be a parent, commented “I think she will meet someone like her and they will have kids.” Lastly, topics under the theme “overcome low expectations” were that she was not expected to be successful and she could study to be smart. One participant believed she would overcome low expectations because “people might not expect people who use AAC will be successful.”

Personal characteristics of Kathrin. Comments on her personal characteristics when she grows up were divided into two themes: personal characteristics (she is nice) and physical abilities (she will be better at doing things). Describing the personal qualities of Kathrin, one participant reported “cause if they're nice when they're young she might be nice later.” A summary of themes, topics, and number of thought units per theme for this perception is displayed in Table 9.

Physical status. For those participants who made comments on her future physical abilities, the topics of discussion included she would have limited abilities, she is difficult to talk to, and some people [who use wheelchairs] are able to walk. A summary of themes, topics, and number of thought units per theme for this perception is displayed in Table 9.

Other. Lastly, some participants were unable to come up with reasoning for their belief and reported not knowing. One participant reported “It’s hard telling what he/she could do.” The participant who reported that she would be unemployed felt that way
because “people don’t want them to mess up their work.” A summary of the theme, topics, and number of thought units for this perception is displayed in Table 9.

Discussion

The Lack of Effect for Group

Contrary to predictions, the placement in the experimental group did not result in significantly higher AATAAC scores compared to the control group. Regardless of group, mean AATAAC scores were more negative during session two.

There are three potential explanations for this lack of effect: the content of the narrative, the length of the intervention, and the attitude measure. First, the content of the narrative was not designed to change attitudes. The narrative was informative and talked about a particular child’s life. For the narrative to be influential at changing attitudes, it would need to include more portions of persuasion, such as a direct challenge to held attitudes and a story that allows the reader to truly feel “in-the-shoes” of the narrator (Dal Cin et al., 2004). According to Dal Cin and colleagues, another possibility is that narratives can be particularly effective at changing only those attitudes that are very strong and resistant to change. At baseline measurement, participants in this study did not report having strongly negative attitudes. Therefore, based on the fact that the participants’ attitudes were not very negative at the outset, they were not easily changeable, regardless of the narrative content.

The second explanation is that the intervention was not long enough to change attitudes. First, students were exposed briefly to AAC through a standardized introduction and the initial exposure to the AATAAC. The intervention that took place
Table 9

*Fifth-Grade Students’ Explanation for the Future Perceptions Relating to “Personal Characteristics of Kathrin,” “Physical Status,” and “Other”*

<table>
<thead>
<tr>
<th>Future Perception</th>
<th>Theme</th>
<th>Topics</th>
<th>#Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal</td>
<td>Personal characteristics of Kathrin</td>
<td>She is nice</td>
<td>6</td>
</tr>
<tr>
<td>Physical status</td>
<td>Physical abilities</td>
<td>Some people are able to walk</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited abilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to talk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>I don’t know</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Based on her experiences</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
<td>I don’t know</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General comment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>She would mess up the work</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to know</td>
<td></td>
</tr>
</tbody>
</table>
during the second session provided a brief, ten-minute, informational story about a girl who uses AAC. However, ten minutes of information is apparently not enough to change attitudes. Potentially, a longer informational session, lasting across several sessions or weeks might have had more of an impact on attitudes and beliefs.

Third, the attitude assessment might have had an impact on the results. The AATAAC measures global attitude change toward “children who use AAC.” Participants in the study were only exposed to one child who uses AAC and therefore were only exposed to one AAC system. McCarthy et al. (2006) found that reading a first person narrative had a positive effect on the attitudes of college students toward an individual using AAC. The study with adults used an attitude measurement with the wording “this person,” meaning that their attitudes were measured according to their knowledge of only one person (the person they were exposed to). Therefore, it is more likely that the attitudes of children in this study might have changed significantly if their attitudes had been assessed relative to a single person. However, to the researcher’s knowledge, there is no measurement for children that measures their attitudes toward only one person using AAC.

These findings (the discrepancy between the narrative study with adults and the current study) are analogous to extant attitude studies in AAC with adults versus children. Beck and Dennis (1996) and Blockberger et al. (1993) failed to replicate findings of attitude differences in children according to the level of technology used by a child using AAC, even though such differences were found with adults (Gorenflo & Gorenflo, 1991).
The Effect of Sex

Results of the current study are consistent with previous studies using the AATAAC (Beck, Fritz, et al., 2000; Beck et al., 2002; Beck & Fritz-Verticchio, 2003; Beck, Kingsbury, et al., 2000), that girls have more positive attitudes than boys. For example, using the AATAAC, Beck, Fritz, et al. (2000) found an effect for 5th grade girls (M = 3.97) compared to 5th grade boys (M = 3.76). These results are similar to those of the current study (M = 3.81, 3.72 [girls]; M = 3.45, 3.27 [boys]). The effect of sex on attitudes is well documented (McCarthy & Light, 2005). This result is also not surprising as the construct validity of the AATAAC is based on its ability to detect differences between boys and girls.

The Effect of Experience

A well-documented effect is that individuals with experience with disabilities have more positive attitudes than individuals without experience. For example, Beck, Kingsbury, et al. (2000) found that mean AATAAC scores for students with experience with disabilities (M = 3.92) were significantly higher than those students without experience with disabilities (M = 3.63). These results are similar to those of the current study (M = 3.93, 3.82 [experience]; M = 3.45, 3.32 [no experience]). Although the effect of experience was not used to test the construct validity of the AATAAC, it has been used with other attitude measures including the Chedoke-McMaster Attitudes Toward Children with Handicaps (CATCH; Rosenbaum et al., 1986) and the Attitudes Toward Nonspeaking Persons (ATNP; Gorenflo & Gorenflo, 1991).
The Effect of Time

The effect of time, regardless of group, was unexpected given the reported test-retest reliability of the AATAAC ($\alpha = .01$ and $r = .87$). This result suggests a possible influence of pre-testing on attitudes. The act of taking the same measurement multiple times may have had an impact on the outcome. In other words, after taking the assessment the first time, students may have had time to reflect on their responses and change their opinion and feelings the second time. Also, the presence of the researcher might have resulted in students misrepresenting their attitudes to be higher than they were during the first visit; students might have altered their responses to be more socially appealing. The second visit might have resulted in a more accurate attitude reports once students were accustomed to the presence of the researcher.

Attitude scores drifted lower from the first session ($M = 3.66$) to the second session ($M = 3.54$). Although no group effect was noted in the ANOVA, analysis of the means suggests the experimental groups were more prone to drifting downward over time. The first and second session means for the experimental groups were 3.78 (SD = .47) and 3.57 (SD = .66) and the means for the control groups were 3.52 (SD = .57) and 3.49 (SD = .68). Very few studies involving attitudes in the AAC literature measure baseline attitudes prior to the intervention. For this reason, there is little information on how attitudes change from baseline to intervention, and how they change as a result of taking the same measurement repeatedly. To the researcher’s knowledge, all studies utilizing the AATAAC were studies with post-test measurements only. Pre-test measures are crucial when investigating the effect of an intervention, making decisions about the
clinical significance of change, and informing the literature about social desirability biases in attitude research.

Qualitative Results

While the qualitative analysis revealed some misunderstandings about the nature of AAC and individuals who use AAC, there were also several positive findings that emerged from the analysis.

Benefits

The majority of participants discussed positive benefits of being friends with someone like Kathrin, benefits such as having a friend, having fun, and qualities of Kathrin they would look for in a friend. A large portion of participants also appeared to frame the relationship as a learning experience: to learn about disabilities. These participants saw a benefit of having the opportunity to learn about someone who is different from themselves, and as a result they would have the opportunity to learn from Kathrin about her disability and AAC. However, rather than a true peer relationship, several participants described an unequal friendship where they took on the role of helper rather than friend.

Challenges

The majority of participants discussed communication as a challenge with being friends with someone like Kathrin. In the narrative, Kathrin stated that her friends and family (people who know her well) were able to communicate with her easily. Based on their comments, participants in the study appeared to focus more on the challenge of communicating with Kathrin initially.
In addition to the challenges with AAC, several misunderstandings regarding the nature of Kathrin’s communication emerged; some respondents added potentially conflicting information. For example, at no point in Kathrin’s narrative is there any mention of a hearing impairment or the use of sign language. However, two participants mentioned sign language and deafness. An explanation for this finding could be that participants did not get sufficient information to consider that there could be some individuals who can hear, but cannot speak. Some participants in the current study may have, in effect, resorted to a preconceived notion about people who are unable to talk or hear, rather than considering a new category. Comments about deafness and sign language suggest that more information over a longer period of time is necessary to allow participants to add a new category of “people who can hear but cannot talk” to their cognitive classification system.

For example, comments were made that someone like Kathrin “can’t hear” and “is not able to understand what is being said.” The first comment implies that participants misunderstood that the abilities of speaking and hearing are unrelated. As indicated in a later comment, a participant reported that she “has sign language experience” which implies that because she cannot speak she cannot hear. This particular person thought she was deaf and communicating with a letter board was her form of sign language.

Additional comments that Kathrin could not understand speech demonstrated that the link between speaking and receptive language abilities was not clear to the students. Based on participants’ responses, it was apparent that they thought because Kathrin could not speak, she could not hear or understand what was being said. If the protocol had
explained Kathrin’s abilities, rather than highlighting her AAC system, participants might have had a better understanding of the nature of AAC.

Future Perceptions

The majority of participants saw someone like Kathrin having a future career as a teacher, or someone who helps others. Participants reported this was “based on her experiences.” Other occupations were also mentioned, which suggested that the second largest percentage of participants were able to think beyond her disability. However, participants also commented on her physical limitations, which they saw as a hindrance to her future abilities. Based on comments about her physical status, it is difficult to determine if they thought she had fewer opportunities in the future because of her physical limitations or because of her speech limitations. It is also possible that participants saw her as a teacher or helping others because school-aged participants are exposed to education and possibly see females as teacher or motherly figures; therefore, Kathrin would fit into one of those roles, regardless of her disability.

Limitations of Study One

The first limitation of the study is that the participants were only exposed to one type of AAC system: eye gaze with a letter board. Previous research has concluded that the type of AAC system (high-tech versus an alphabet board) made no difference on attitudes of children (Blockberger et al., 1993). Based on this finding, Blockberger and colleagues determined that the type of AAC system being used in the narrative would not have an effect on attitudes. However, due to the misunderstandings about the AAC system being used, the possibility of improved attitudes and better understanding might
be plausible if the current study had included more than one type of AAC system. Reading a narrative that included more than one person who used AAC would have allowed participants to learn about a variety of AAC systems and a variety of people with disabilities, which might result in giving them a broader definition of AAC and communication disorders.

The second limitation occurred after the experimental reading; participants were not given the opportunity to ask questions about the story. Common practice in classrooms is that students and teachers discuss material that has been read, and questions are asked and answered to clarify any misunderstandings or to identify the need for additional information. In the experimental protocol, by not allowing students to ask questions, the researcher was unable to identify discrepancies between the information presented and the understanding of that information by the students. If questions were asked it might have allowed for discussion, for students to think and reflect on the material, and to clarify details. However, allowing questions to be asked after the reading would have resulted in a problem with control. There were multiple classrooms that participated in the study and it would not have been logistically possible to have all the participants together at once. There would have been no guarantee that questions asked from session to session would be the same, therefore the study would lack control in that aspect. As a result, one classroom might have received more additional information about AAC and more clarifying information than another classroom. On a related point, the researcher did not ask the children any questions to check comprehension of the story. As
such, there was no guarantee that students actually listened to the story (although the researcher did not note any students talking or otherwise unengaged during the readings).

A third limitation of the study was the tone of the narrative. Kathrin discussed her life and made both positive and negative remarks. For example, she discussed how she had no friends in the neighborhood because nobody wanted to learn how to talk with her. She also mentioned that others had a hard time communicating with her. The young age of the participants might not have allowed for them to realize that even though there were negative aspects of Kathrin’s life, there were positive attributes. For example, although she had no friends, the children might have failed to see that they could be her friend and they could learn to successfully communicate and play with her.

A fourth limitation to the study was the broad definition of experience with disabilities that was used to classify whether or not participants had previous experience with individuals with disabilities. For example, the demographic questionnaire asked participants if they had a disability, if they had friends who had disabilities, and whether or not they played or talked to a child with a disability in the past week. If participants answered “yes” to any of these questions at any point during the study, they were classified as having experience with an individual with a disability. Due to the broad definition, it is difficult to determine what previous experience was a factor in overall attitudinal differences between groups.

The final limitation to study one was the absence of behavioral measures. The relationship between attitudes and behavior is complex (Kraus, 1995). It is not possible to assume self-reported attitudes will match future behavior. Although the AATAAC
contains “behaviorally” oriented items, factor analysis has revealed the behavioral responses on the AATAAC are heavily influenced by affective responses (Beck, Fritz, et al., 2000).
CHAPTER 4: STUDY TWO

Methods

Experimental Design

Data for study two consisted of the second session of study one and a third, follow-up session, i.e., study two spanned sessions two and three with the original participants. The original intent of the study was for the first two sessions to be conducted as described previously and a maintenance session to occur two weeks after the post-test. The maintenance session was intended to consist of administration of the AATAAC to determine if attitude change as a result of the intervention session had been maintained over time (following the intervention session). After administration of the AATAAC, information was to be given to all participants, regardless of group, about AAC in general, as well as demonstrations of AAC systems. However, after preliminary analysis of the experimental group data from study one, the researcher became aware that some participants had were misunderstandings related to the nature of AAC. For example, qualitative comments were made that Kathrin was deaf, communication partners would have to learn sign language, and that she could not understand what was being said to her. These comments revealed that students were not able to fully understand AAC and that the story read to those in the experimental group was not clear enough or informative enough for fifth-grade students. Rather than continuing the original design, it was decided that a second intervention would be administered to both groups to provide additional information to them, and to provide participants the opportunity to ask any questions to clarify misunderstandings. Consequently, additional information was created to address
participants’ misunderstandings and analyze the effect of this information after the third session. The information was presented before the AATAAC was administered a third time to test the relative effect on responses by both groups of participants.

A mixed factorial design was used: 2 (group: experimental vs. control) × 2 (sex: female vs. male) × 2 (time: session two, session three) (2 between, 1 within). The independent variable was the additional information about AAC and the opportunity to use AAC systems, and the dependent variable was the self-report measurement of attitudes (AATAAC).

Participants

Participants for the second study (sessions two and three) were the same as study one. However, due to absence from school during the follow-up session, four participants from the control group were eliminated from study two. Table 10 summarizes the demographic information for students participating in study two.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Sex</th>
<th>Experience with disabilities</th>
<th>Reading at grade level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>37</td>
<td>14</td>
<td>23 43% (16/37)</td>
<td>89% (33/37)</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>10</td>
<td>15 44% (11/25)</td>
<td>92% (23/25)</td>
</tr>
</tbody>
</table>
Materials

During session three, both groups of students were presented with additional information about AAC (see Appendix I) as well as the opportunity to use aided AAC systems. AAC systems that were used during the demonstration were the Dynavox DV4®¹, Cheap Talk 8®², and Big Mack®³. Each participant was able to send at least one message with each of the devices.

Measures

The same measurement tool used in study one, the AATAAC, was used during study two.

Procedures

Session two of study one was used to obtain a baseline measure of attitudes. Two weeks later session three took place in participating classrooms. The researcher provided the brief, standardized introduction to AAC. After the description of AAC, the researcher provided the additional information about Kathrin and AAC informally. This information addressed the misunderstandings that participants expressed during study one. The researcher asked participants to imagine that they were themselves, with the same abilities they have now, but they were unable to use their mouths to speak. This was intended to emphasize the similarities between individuals who use AAC and typically developing peers, with the only difference being the ability to speak. The researcher also provided information that technology was now available for Kathrin to allow her to communicate in other ways than pointing to a letter board with her eyes. After the information about AAC, the researcher demonstrated the use of the three AAC systems.
Students were then able to take turns sending messages with the systems. Students were also allowed the opportunity to ask any questions that they had about AAC and people who use AAC. Students were invited to ask questions in order to resolve any misunderstandings they still had from the previous session and to ensure that all students were able to fully understand the material presented.

Questions that were asked revolved around the Dynavox® system and how it worked. For example, students asked about what type of words you could make it say and whether or not you could say nonsense words with it. Students had the opportunity to test out the system and discover for themselves what it was capable of doing. Students were also interested in the cost of a system, who was responsible for paying for the device, and other features it was capable of (for example, colors it came in and the ability to play or record videos).

After the presentation of the devices, students were orally given the instructions and sample questions for the AATAAC, the illustration of Kathrin, and then asked to complete the AATAAC for a final time. A summary of procedures for each session is included in Appendix G.

Data Analysis

Identical to the first study, scores for the AATAAC were calculated and a mean score was determined for each participant. A mixed factorial ANOVA was used to analyze main effects and interactions among variables.
Results

A mixed factorial ANOVA revealed main effects for the within-subject factor of time \( (F[1, 58] = 5.816; p = .019) \), and the between-subjects factor of experience \( (F[1, 58] = 5.402; p = .024) \). Group \( (F[1, 58] = .295; p = .589) \), and sex \( (F[1, 58] = 2.893; p = .095) \) were not significant. There were no significant interactions among the other factors. Table 11 summarizes the ANOVA results. Table 12 summarizes the mean scores for participants across sessions two and three.
Table 11

*ANOVA Results for Study Two*

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>1</td>
<td>.295</td>
<td>.589</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>2.893</td>
<td>.095</td>
</tr>
<tr>
<td>Experience</td>
<td>1</td>
<td>5.402*</td>
<td>.024</td>
</tr>
<tr>
<td>Group * Sex</td>
<td>1</td>
<td>1.306</td>
<td>.258</td>
</tr>
<tr>
<td>Group * Experience</td>
<td>1</td>
<td>.614</td>
<td>.437</td>
</tr>
<tr>
<td>Sex * Experience</td>
<td>1</td>
<td>.737</td>
<td>.394</td>
</tr>
<tr>
<td>Group * Sex * Experience</td>
<td>1</td>
<td>.594</td>
<td>.444</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>5.816*</td>
<td>.019</td>
</tr>
<tr>
<td>Time * Group</td>
<td>1</td>
<td>.598</td>
<td>.443</td>
</tr>
<tr>
<td>Time * Sex</td>
<td>1</td>
<td>.900</td>
<td>.347</td>
</tr>
<tr>
<td>Time * Experience</td>
<td>1</td>
<td>2.649</td>
<td>.109</td>
</tr>
<tr>
<td>Time * Group * Sex</td>
<td>1</td>
<td>.398</td>
<td>.531</td>
</tr>
<tr>
<td>Time * Group * Experience</td>
<td>1</td>
<td>.561</td>
<td>.457</td>
</tr>
<tr>
<td>Time * Sex * Experience</td>
<td>1</td>
<td>.005</td>
<td>.945</td>
</tr>
<tr>
<td>Time * Group * Sex * Experience</td>
<td>1</td>
<td>1.183</td>
<td>.282</td>
</tr>
<tr>
<td>Error(time)</td>
<td>58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = <.05*
Table 12

*Mean Attitude Scores for Participants Across Sessions Two and Three*

<table>
<thead>
<tr>
<th></th>
<th>Session Two*</th>
<th></th>
<th>Session Three</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>3.57</td>
<td>.68</td>
<td>3.72</td>
<td>.69</td>
</tr>
<tr>
<td>Control Group</td>
<td>3.46</td>
<td>.59</td>
<td>3.57</td>
<td>.71</td>
</tr>
<tr>
<td>Male</td>
<td>3.24</td>
<td>.62</td>
<td>3.45</td>
<td>.72</td>
</tr>
<tr>
<td>Female</td>
<td>3.70</td>
<td>.59</td>
<td>3.79</td>
<td>.67</td>
</tr>
<tr>
<td>Experience</td>
<td>3.79</td>
<td>.53</td>
<td>3.81</td>
<td>.59</td>
</tr>
<tr>
<td>No Experience</td>
<td>3.32</td>
<td>.65</td>
<td>3.53</td>
<td>.76</td>
</tr>
<tr>
<td>Time</td>
<td>3.52</td>
<td>.64</td>
<td>3.66</td>
<td>.70</td>
</tr>
</tbody>
</table>
Group

Mean AATAAC scores were not significantly different across sessions two and three between the experimental group (M = 3.57, 3.72, SD = .68, .69) and the control group (M = 3.46, 3.57, SD = .59, .71). Figure 6 displays these results by session.

Figure 6. The effect of group across sessions two and three on the attitudes of fifth-grade students.
Sex

Mean AATAAC scores for girls (M = 3.70, 3.79, SD = .59, .67) were not significantly higher than mean scores for boys (M = 3.24, 3.45, SD = .62, .72) across sessions two and three. Figure 7 displays these results by session.

![Figure 7](image)

*Figure 7. The effect of sex across sessions two and three on the attitudes of fifth-grade students.*
Experience

Across sessions two and three, mean AATAAC scores for individuals with experience (M = 3.79, 3.81, SD = .53, .59) were significantly higher than those without experience (M = 3.32, 3.53, SD = .65, .76). Figure 8 displays these results by session.

![Bar chart showing the effect of experience across sessions two and three on the attitudes of fifth-grade students.](image)

*Figure 8.* The effect of experience across sessions two and three on the attitudes of fifth-grade students.
Regardless of group, mean AATAAC scores for session three ($M = 3.66$, $SD = .70$) were significantly greater than mean scores for session two ($M = 3.52$, $SD = .64$). Figure 9 displays these results by session.

*Figure 9.* The effect of time across sessions two and three on the attitudes of fifth-grade students.
Discussion

The Lack of Effect for Group

The lack of effect for group was not surprising. For this part of the study, all students received the intervention (AAC device demonstrations, the opportunity to use the devices and the opportunity to ask questions). As a result, participants in both the original experimental group and participants in the original control group reported significantly more positive attitudes as compared to the study one post-test (session two). Comparing study one to study two, mean AATAAC scores from session three were comparable to the mean scores from session one, after having declined during session two. These results suggest the use of AAC demonstrations, as well as providing accurate information, had a positive influence on attitudes.

The Lack of Effect for Sex

There are two possibilities for the lack of effect for sex. First, as mentioned earlier, it is known that girls have more positive attitudes than boys. It is possible that because girls start out with more positive attitudes than boys, they have less room for change. If attitudes are already fairly positive, then a change due to an intervention is less likely. Analysis of the means reveals that female mean AATAAC scores were higher than males during both sessions two and three. Second, the hands-on component of demonstrations may have had more of an effect on attitudes for boys than compared to girls. Thus, the reported attitudes of boys changed more for the positive, whereas the reported attitudes of girls started out high and remained high throughout the study.
This finding, that a hands-on component more strongly influenced the attitudes of boys than girls, is similar to a study by Beck and Fritz-Verticchio (2003), where school-aged participants who were boys had higher attitudes compared to girls after the presentation of information and a hands-on role play experience of being nonspeaking. In this study, for the group that participated in the role-play experience, the mean AATAAC scores of boys were as high as those of the girls. Therefore, it is likely the hands-on component of AAC device demonstrations had more of an effect on the boys in the current study, resulted in more positive self-reported attitude scores, and the demonstrations had less of an effect on girls’ attitude scores.

The Effect of Experience

Similar to study one, it is well documented that individuals with experience with individuals with disabilities have more positive attitudes than individuals without experience. Not unexpectedly, participants with experience with individuals with disabilities continued to have significantly higher mean AATAAC scores than individuals without this experience.

The Effect of Time

Due to the nature of session three, it was not unexpected that there was an effect for time. Both groups received the intervention during session three and there was a significant impact of that intervention compared to participants’ self-reported attitudes after session two.
Limitations

There are three limitations to this study. First, the AATAAC has only test-retest reliability. The effect of taking the assessment three times is unknown. Potentially, taking the AATAAC multiple times could have an impact, because extreme responses regress to the mean and other responses are affected by social desirability.

Second, the lack of a true control group was a limitation. Only one group had been previously exposed to the experimental condition of the narrative reading during study one, but both groups were a part of the intervention of study two that involved AAC system demonstrations. Therefore, in study two, there was no control (non-intervention) group. Both groups in the current study improved their attitudes from session two to three; without a control group it is not possible to determine whether the improvement in reported attitudes is from the intervention, from completing the attitude assessment multiple times, or because of some other intervening event.

The third limitation of the current study is the interactive component of session three. There were some differences in the exact questions asked and answered between the classrooms. Also, all participants in the study had the opportunity to send messages with the different devices, but each child may not have had the same amount of time with each device.
CHAPTER 5: PLENARY DISCUSSION

Comparing the data from both study one and study two, analysis of the means revealed that scores fell below baseline during session two, but after session three returned back to approximately baseline levels (session one). The first finding of this study was that girls had significantly higher self-reported attitude scores than boys. This finding has been replicated repeatedly in the AAC literature and the disability literature (Beck et al., 2002; Beck, Fritz, et al., 2000; Beck & Fritz-Verticchio, 2003; Beck, Kingsbury, et al., 2000). The second finding was that the attitudes of fifth-grade students were not negative at the baseline measurement. Self-reported attitude measurements were slightly above neutral. It is known that as children progress through adolescence and become adults, attitudes toward individuals with disabilities tend to shift in a negative direction. As a result of this negative shift individuals with disabilities tend to face discrimination, stereotyping, and a lack of opportunities (McCarthy & Light, 2005). For these reasons, it is important to continue targeting children in intervention programs.

The second finding of the study was that a hands-on component resulted in higher (more positive) attitude scores for all participants in both groups. A hands-on component allowed for children to experience AAC, have a concrete representation of systems, and practice sending messages with it. Although the narrative had pictures, a real system allowed children to both see and experience, which resulted in better understanding and possibly more acceptance for an individual using AAC.
Directions for Future Research

Future research in this area should examine the effect of providing accurate information about AAC and individuals who use AAC, in addition to demonstrations and interactions with several different types of AAC devices. The information should clearly describe the abilities of someone who uses AAC. Specifically, clear explanations of AAC and the speech and language abilities of the individual in the narrative should be described thoroughly, to prevent misunderstandings about expressive and receptive language and hearing abilities.

The use of a first person narrative can be utilized in future research, but the content of the narrative should be altered, incorporating more persuasive text. In addition to being informative, the narrative should contain passages of persuasion to challenge negative beliefs, which will influence the targeted individual to think critically about the information and integrate it into their own personal belief system. Use of multiple stories should also be used to broaden the idea of AAC and individuals who use AAC to children. Children should also be given the opportunity to ask questions after reading the story, to ensure no misperceptions continue. It may even be beneficial for the researcher to encourage a discussion with the students after reading the story, by supplying questions about topics that may potentially be confusing. At the time of pre-test and post-test a comprehension check can be administered to ensure that each child understands the concept of AAC and individuals who use AAC.

Intervention sessions that last several sessions, rather than one brief intervention period, should also be examined for an effect on attitudes. One informative session is not
enough time for a person to contemplate, analyze, and evaluate the information presented. For this reason, it is essential for intervention session to last multiple sessions over an extended period of time, perhaps a few months. Introducing the topic and revisiting the material over a period of time will allow children to be exposed continually to a variety of individuals with communication disorders and different types of AAC systems, thereby allowing them to continually reflect and evaluate the material. Attitudes are not changed easily and influencing attitudes gradually may result in better long-term benefits for the participants. The multiple sessions should include the narratives, multimedia components such as videos, simulations, hands-on components, and other activities available through the internet, and opportunities for reflection (journal writing, answering questions, and other activities). By incorporating academic tasks, such as writing, teachers will be more willing to participate in an extensive study. An intervention session targeting individuals who use AAC can include the academic standards of reading decoding and comprehension, vocabulary learning, and writing. Future interventions should include more hands-on activities and interactions by the students.

Future research should continue to examine the descriptive component of attitude research and develop a qualitative study to describe children’s experiences with AAC and individuals who use AAC. Understanding attitudes through qualitative means will allow researchers to understand what misunderstandings children have, what type of information may be beneficial, while allowing for improved intervention programs targeted at typically developing students.
Conclusion

The current studies examined the effects of reading a first person narrative and learning information about AAC, the opportunity to interact with AAC devices, and the opportunity to ask questions about AAC and individuals who use AAC on the attitudes of school-aged children. The results of these studies indicate that reading a first person narrative was not effective at changing children’s attitudes, but there is potential that experiencing interactions with AAC and being given information in addition to the narrative, may change children’s attitudes. The qualitative component of the study revealed that students had several misconceptions about AAC and people who require it, indicating that more detailed information, perhaps over more than one session, would help change attitudes. Misunderstandings and lack of clear, concise information may be a reason why there are negative attitudes in the first place. It is also important to note that the average mean self-reported baseline attitude score for both boys and girls was neutral, indicating that children’s self-reported attitudes are not necessarily negative to begin with. It is assuring that young children possess these better than neutral attitudes which can hopefully be shifted into more positive attitudes as they develop and gain more experience and exposure to individuals different from themselves. However, the relationship between attitudes and behaviors is a complex one. Inclusion of a disenfranchised group of individuals requires more than a neutral regard. Having “nothing against” some members of society is still far from valuing all members. More research is needed about how to improve perceptions about individuals using AAC.
REFERENCES


Hello, my name is Kathrin! I am ten years old and I live with my mom and my brother Niklas in a large house in the city. I love music and stories. I read a lot in the afternoon or play with Niklas. We lie on the floor and fool around and romp together.

Playing with Niklas is not always easy. I cannot move my arms and legs as I would like. I am not able to walk or sit on my own. That is why I have an electric wheelchair. By using it, I am able to move about. But unfortunately I just sit for many hours a day in my wheelchair. Often I see other children running and playing together, and I cannot join them. Such moments make me sad.

It is also hard for me to talk. It is easy for me to say short words like “yes” or “no,” “mom” or “dad,” but I am not able to say whole sentences. Actually I talk with my eyes. If I want to have something, I look at it and someone gives it to me. If I want to go for a walk, I look at the door. If I am hungry, I look at the table.

All people who know me understand me. For others, however, it is not easy. It takes a long time for them to find out what I would like to say. This strains every nerve in my body, because I have to try many different ways to make them understand what I mean. I have had a letter board for a few years now. It is a small board with the alphabet on it. It helps me to talk. I look at the letters to spell the words I would like to say. It is true that it takes a long time, but the board helps me very much.

Until I had my letter board, most people could not understand me. Talking only with my eyes was very difficult and I could not say everything I wanted. For a long time, I wondered what clouds would feel like, and I wanted to ask somebody why there are handicapped children in the world. Now, with the letter board, I can spell words to make sentences. I had to wait a long time before I could ask the questions I wanted to ask, and before people could talk to me about the things I chose. It is difficult to be nonspeaking. Often I am very sad. But there is one sentence that I thought up and that my mom wrote in big letters for me: “Not being able to laugh would be worse than not being able to speak.” And I can laugh very well!

Though I need help from other people for many things, there are several things that I can do on my own. For example, I can read, paint, invent stories and much more.

Last year at Christmas, I thought up a story about a snowman who felt lonely and went searching for a friend. It was a long story. Mom read it, while we both sat close to the Christmas tree.
Every morning at half past six, my Mom wakes me up. We choose my clothing together and after that she dresses me. I help as much as I can, of course. I stretch my arms and legs when it is necessary and I draw in my head. Then it is not so difficult for Mom. She helps me also for breakfast. She cuts the bread and puts it in my mouth. I love to have breakfast with Niklas and Mom. Most times we have fun planning what we will do in the afternoon.

A few minutes to eight, I get picked up for school. Mr. Dietl, the driver, takes me out of my wheelchair and puts me into the school taxi. There are already other handicapped children in the taxi. They go to my school as well. The school I go to is a special school, one with special education. There are more teachers than in other schools. This is necessary because of the many students who are in wheelchairs and who cannot speak. It is a simple fact that the teachers need more time for us. But there are only a few of these schools and my school is several miles away from my home. The ride takes nearly a half an hour.

When we arrive at school, the teachers are already there. They help the driver take us out of the taxi and put us into our wheelchairs. I like to go to school and I enjoy most subjects. I love mathematics the most. In math, I am the best student. Recently, my schoolmates elected me to be the class representative. I was really glad about it. We have many subjects that are not taught at other schools. For example, we have physiotherapy, communication, training in the best way to eat our food, and wheelchair sports. I like wheelchair sports very much. We play games and do exercises with the wheelchairs. We chase each other and run races. At recess, I drive my wheelchair in the schoolyard most of the time. The other children are often playing soccer. They don’t need a soccer player who is in a wheelchair, but I am able to be the referee.

When I come home in the afternoon, I want to tell my Mom everything that happened at school. Once, I left my letterboard in the classroom and when I got home, I could only talk to my Mom with my eyes. I wanted to tell her about something funny that happened at school. I looked in the air. Mom had to guess what I wanted to tell her.

“What do you want to tell me?” she asked.
“Is it about a teacher or another student?”
I shook my head and looked at the table.
“Table? Meal?”
I said “Yes” and laughed. Each day we have lunch in school, and I wanted her to guess what we had eaten on this particular day.
“Was there something special to eat today?”
I nodded again.
“So, what?”
I looked in the air again.
“Something from the air? Perhaps a bird?”
“No.”
I shook my head and Mom went on guessing.
“Hmm, air, was it anything cold?”
I shook my head.
“Warm?”
Again, I shook my head and now Mom began to despair.
“When it’s not cold and not warm, what is it then?”

On this day, we sat together for more than one hour and Mom was unable to guess what I wanted to tell her. Just when she was about to give up, however, she guessed it!
“Air?” she asked me. “Did you eat air?”
I nodded and laughed again. Finally she had understood!
That morning at school, they had brought us an empty pot from the kitchen by mistake. Our teacher, for fun, took the large serving spoon and gave each of us some air on our plate. Mom and I could not stop laughing about this!

In the afternoon, I love to be outside. Not far away from our home, there is a beautiful forest, and we go there often. I hear the wind in the trees, watch the bees visiting the flowers, and see the brook rippling over rocks and crevices. At the end of the path, there is a huge playground. Niklas loves to climb. I sit with Mom on a swing. She holds me tightly and we swing together.

In the summer, when it is really hot, we take off our shoes and socks and put our feet in the brook. It feels wonderful when the cold water tickles our toes. We splash each other and come home totally soaked. The first thing we do when we get there is have a cup of tea. I love these days!

Even though the time with Mom and Niklas is always wonderful, I still feel lonely. I cannot be with the children from my class in the afternoon for they all live far away from my home. And the children in our neighborhood do not play with me. Since I cannot speak, they do not know how to play with me. They stay far away.

Yet it is so easy to play with me. I am happy to watch other people playing a game. I listen to others and watch them as they show me things. I love playing with blocks, and help to build things by showing with my eyes where to put each block. But no child from our neighborhood has ever played with me in this way. Therefore I feel lonely. This is actually the worst thing. Not that I am unable to walk. Not that I am unable to speak. But that I do not have a good friend! I would if it would be different if I could talk? I think so! Nonetheless, I have to learn to communicate better in my special way. Then who knows? Perhaps I will meet someone who will understand me and who will like me. That is my biggest wish!
APPENDIX B: CONTROL READING


If you decide to go to the moon in your own rocket ship, read this book before you start. It will tell you how to get there and what to do after you land. The most important part tells you how to get home. To get to the moon, you will travel about 240,000 miles—a long trip, but rocket ships go fast. If you average 3,750 miles per hour, you will get there in two-and-a-half-days.

Get aboard. Close the hatch. Light the burners. Countdown to one and then blast off! You shoot up into the sky and as your ship rises through the clouds, your body is pressed against the seat. At first you feel heavy, but don’t worry, this feeling will go away soon. For a few seconds you fly through clouds, air, and dust that hangs over the earth. It is only about fifteen miles thick and you will shoot right through it into space.

Space is dark and empty. There is no air, clouds, or rain in space; there is only a few specks of dust. There is also some rocks called meteors, and some chunks of ice called comets. Both meteors and comets are pieces of stars that exploded long ago and have been flying around in space ever since. If one hit you, it would be very bad, but space is so big and you are so small that a collision is unlikely. In the blackness of space the stars shine like a million fireflies.

The sun blazes like fire and the moon glows like a pearl in the black sky. The moon has no light of its own; it glows in the light of the sun. Up here in space you may feel very alone. Don’t look back at the Earth. It would make you even lonelier. This is the time to play some cheerful music, eat a peanut butter sandwich, keep your eyes fixed on the shining moon, and settle down for a long ride.

Relax, take off your seat belt, and be prepared for a surprise. Because you are weightless in space, you’ll feel amazingly light and you will float like a feather inside the cabin and bounce off the cabin walls. But you’ll bounce very lightly and find it a lot of fun. When you are thirsty, don’t try to pour orange juice into a glass. With everything weightless, it would collect into floating liquid balls and become an orange juice blob. You can drink out of a squeeze bottle instead.

Tie yourself to your bunk so you won’t float away, and settle down for a good night’s sleep. Because there is no night in space you will have to pretend. Try to have sweet dreams.
When you wake you will be much closer to the moon. It will be big and round and very bright with dark patches that look like lakes or seas. They were made billions of years ago when the moon was very hot, hot enough to melt stone. Now and then, melted stone spurted up through the crust and spread out on the surface like spilled soup. When it cooled, it hardened into stone, called lava. From Earth, these smooth, dark places look like oceans.

Playing cards will help to pass the time, but if you drop them they will drift around the cabin and floating around to catch them feels like swimming in a dream. The first humans to go to the moon landed on the Sea of Tranquility. It is marked on your moon map and would be a good place to land. You still have a long way to go. When you are tired, lie down and look at all the stars.

At last, you wake from a nap and see the moon right there below you. You look down on an endless desert. Everything is all one color- silvery gray. The ground is covered with rocks and round craters. Craters are holes made by meteors that have rained down on the moon through the ages. Some were huge and made deep holes hundreds of miles across. Of course, you steer clear of the rocky places.

At last you see a lava lake below- the Sea of Tranquility. Get ready to land! As you descend, your craft shivers, shakes, and it settles softly. You feel a bump. YOU ARE ON THE MOON!

Your first look will be disappointing. All you see through your porthole is a cloud of dust stirred up by your landing. Put on your space suit and air take while you wait for it to settle. Then open the hatch and jump out.

You will land lightly. The moon is smaller than the Earth and has less gravity to pull you down. If you weigh sixty pounds on Earth, you will weigh only ten on the moon. Your first step will be difficult. You will rise in the air and leap forward like a kangaroo, but once you learn how, walking will be fun. Each step takes you five times as far as a step on Earth. Leaping over boulders and craters, you cover the ground with magical swiftness. The moonscape is strange, but it doesn’t look dangerous. The dust reminds you of cake flour and you wish you could take off your suit and play in it.

DON’T DO IT! The heat of the sun would burn you up! Because there is no air or water on the moon, there are no clouds to shield it from the heat of the sun, or the cold of space. Anything touched by the sun is blistering hot. Anything in shadow is instantly cold. Without a space suit, you would sizzle or freeze.

As you walk, you will notice that your boots don’t crunch on the pebbles. If you take a hammer and hit a rock, there is no bang. It is impossible to make a noise on the moon. Without air to carry sound waves, you can’t hear a bell ring, you can’t hear a horn blow.
You can’t hear a whistle or a song on the moon. If you kick a pebble, it will bounce without a sound.

As you keep walking, the silence and stillness are eerie. Nothing moves. The boulders and hills have strange shapes. Some hills look like dinosaurs; some boulders look like giant turtles, or weird birds, or a herd of cows. A heap of jagged rocks looks like a ruined castle. You feel as if you might be in a fairy tale. Or is it a dream?

Your map tells you that the astronauts’ camp is just over the next hill. As you climb you wonder if things will look different on the other side. Will you find something green? Something alive? A meadow of moongrass? A heard of mooncows?

The answer is “no.” The hills stretch on and on to the horizon, where the rim of the moon meets the blackness of space. Everything on the moon is lifeless and still.

To find the astronauts’ camp climb to the top of a boulder and use your binoculars to scan the distance. Look for a patch of color- the red, white, and blue of the flag that the astronauts left behind. It will stand out against the gray dust. As you get close to the camp, you will see everything the astronauts left behind. Strewn amidst the lunar dust, tools and equipment are scattered about. Their boot prints look fresh, as though they were made a moment ago. There is no wind or rain to wear them away. The astronauts left a message for everyone who visits the moon. You find it written on a plaque: Here men from the planet Earth first set foot on the moon. July 1969.

The flag they planted isn’t flying. The flagpole was blown over from the blast when the astronauts took off and the flag is lying in the dust. You pick it up and push it deep into the sand. The flag is stiffened with wires so that it looks as though it is flying even though there is no wind. It is a brave and wonderful sight and reminds you of the courage of the astronauts who brought it here. If astronauts ever return they will find the flag flying once again, and your footprints in the dust.

By now your tank of air must be half empty and it’s time to return to your ship. Your trail of footprints will lead you back. You retrace your steps in leaps and bounds. When you see your spaceship waiting, you are suddenly homesick and can’t wait to get back to Earth. Take a last look at the moonscape, get aboard, close the hatch, and pray the computers will start.

You push buttons. Lights flickers. Machinery whirs. Rockets fire. Your ship lifts off. Your heart lifts, too, but you have thousands of miles to travel. You’ll just have to be patient.

Your trip is almost over. Your ship has reached the atmosphere. You drop down through clouds and land on green grass. You open the door and you jump out, thankful for a miraculous journey and a safe return.
APPENDIX C: THE ASSESSMENT OF ATTITUDES TOWARD AUGMENTATIVE/ALTERNATIVE COMMUNICATION (AATAAC)

(Beck, Fritz, Keller, & Dennis, 2000)

1. I would feel good about myself if I was with a child who uses AAC.
2. Children who use AAC don’t take many turns when they try to talk.
3. I like children who use AAC.
4. Children who use AAC scare me.
5. I would feel comfortable around a child who uses AAC.
6. Children who use AAC really don’t want to talk with other children.
7. Children who use AAC try to talk about what other children want to talk about.
8. Children who use AAC can’t change their words if they’re not understood.
9. I think children who use AAC are fun to be with.
10. People have trouble knowing what children who use AAC are trying to say to them.
11. Children who use AAC take as many turns as other children do when they are talking.
12. Children who use AAC try to understand what others are saying to them.
13. I would work at school with a child who uses AAC.
14. I would eat lunch with a child who uses AAC.
15. I would go to the park with a child who uses AAC.
16. I would introduce a child who uses AAC to my friends.
17. I would invite a child who uses AAC to my house.
18. I would play with a child who uses AAC.
19. I would sit next to a child who uses AAC.
20. I would talk to a child who uses AAC.

21. I would invite a child who uses AAC to a party I had.

22. I would walk in the school halls with a child who uses AAC.

23. I would choose a child who uses AAC to be on my team in physical education.

24. I would go to the library with a child who uses AAC.

25. I would ask a child who uses AAC to sleep over at my house.

26. I would go to a movie with a child who uses AAC.
APPENDIX D: AAC INTRODUCTION SCRIPT

(Beck, Fritz, Keller, & Dennis, 2000)

Some people can’t use their own voice to speak and communicate with something called augmentative/alternative communication or AAC (write AAC on blackboard). AAC is used by students who cannot speak like you and I can. There are many reasons some children can’t speak. Some may have physical disabilities that do not allow them to talk like most of us can. Some may have difficulty thinking as easily as others so that speaking is hard for them. Many students who cannot speak were born that way; others have had accidents that have caused them to have difficulties speaking. One way of helping students who can’t talk is to provide them with what is called augmentative/alternative communication systems or AAC. Students who use AAC may use a number of different ways of communicating: some may sign or gesture; some may point to pictures, letters, or words; some may use machines or computers that talk for them. These are all forms of AAC.
APPENDIX E: DEMOGRAPHIC QUESTIONS

1. Name ________________________________________________

2. Date ______________

3. School ________________________________

4. Teacher’s Name ________________________________

5. Please circle one: Are you a boy or girl?

6. Do you have a disability? Yes_____     No______
If yes, please describe your disability

_________________________________________

7. Do you have a friend who has a disability?

Yes_____     No______

8. In the past week have you played with or talked to a child who has a disability?

Yes_____     No_____
APPENDIX F: INSTRUCTIONS ON FILLING OUT THE AATAAC

(Beck, Kingsbury, Neff, & Dennis, 2000)

Turn over your papers. Here you see spaces for your name, date, school, and teacher’s name. Please fill these in. Also circle whether you are a boy or a girl. Then answer the next two questions about disabilities. Once you answer these questions put your pencil down and we will do the next part together.

Turn to the next page. You see two more questions. These are examples of how you will answer the rest of the questions. I will explain how to answer these items. First of all, there are not right or wrong answers. I want you to answer each item just the way you really feel. Please answer as honestly as you can, and, remember, there are no right or wrong answers. Now, look at the first item (point to each item as it is referred to and the response boxes as they are referred to). It says “Little babies are lots of fun for their parents.” Underneath that item, there are five boxes. You will put an X through one of these boxes. In the first box, you will see the words “strong disagree” and under it a frowning face. If you really don’t think babies are fun for their parents, put an X through this box. In the next box, you see the word “disagree.” If you just sort of think babies aren’t fun for their parents, put an X in this box. The next box says “can’t decide.” This is the box you would put an X through if you don’t know if babies are fun for their parents or not. The next box says “agree.” Put an X through this box if you kind of think babies are fun for their parents. The last box has the words “strongly agree” and has the happy face under it. If you really think babies are fun for their parents, put an X through this box. Let’s try another one. This item says “Little babies are messy and they cry too
much.” If you think this is really true, put an X through the box that says “strongly agree” and has the happy face under it. If you think it’s just kind of true, put an X through the box in the middle that says “agree.” If you aren’t sure if babies are messy and cry too much, put an X through the box in the middle that says “can’t decide.” If you kind of think that babies aren’t that messy and don’t cry too much, put an X through the box that says “disagree.” If you really don’t think that babies are messy and cry too much, put an X through the box that says “strongly disagree” and has the frowning face under it. Do you have any questions? Remember to mark only one box per answer and to answer the items as honestly as you can; there are no right or wrong answers.
Practice AATAAC Questions

Little babies are fun for their parents.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Can’t Decide</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
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<td>☹</td>
<td>☹</td>
<td>☺</td>
<td>☺</td>
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</table>

Little babies are messy and they cry too much.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Can’t Decide</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>☹</td>
<td>☹</td>
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<td>☺</td>
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</tbody>
</table>
APPENDIX G: SUMMARY OF PROCEDURES FOR EACH SESSION

<table>
<thead>
<tr>
<th></th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session One</strong></td>
<td>AAA Introduction</td>
<td>AAA Introduction</td>
</tr>
<tr>
<td></td>
<td>Demographic</td>
<td>Demographic</td>
</tr>
<tr>
<td></td>
<td>Questionnaire</td>
<td>Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Verbal Instructions</td>
<td>Verbal Instructions</td>
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<tr>
<td></td>
<td>Sample AAAAC</td>
<td>Sample AAAAC</td>
</tr>
<tr>
<td></td>
<td>Questions</td>
<td>Questions</td>
</tr>
<tr>
<td></td>
<td>AAAAC Completed</td>
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<tr>
<td><strong>Session Two</strong></td>
<td>Story: <em>Kathrin Talks</em></td>
<td>Story: <em>If You Decide</em></td>
</tr>
<tr>
<td></td>
<td><em>with her Eyes</em></td>
<td><em>to go to the Moon</em></td>
</tr>
<tr>
<td></td>
<td>AAA Introduction</td>
<td>AAA Introduction</td>
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<td>Demographic</td>
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<td></td>
<td>Questionnaire</td>
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<td></td>
<td>Verbal Instructions</td>
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<tr>
<td></td>
<td>Sample AAAAC</td>
<td>Sample AAAAC</td>
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<tr>
<td></td>
<td>Questions</td>
<td>Questions</td>
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<td>about the picture</td>
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<td>Session Three</td>
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<td>Control</td>
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<td>-------------------</td>
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<td>AAC Introduction</td>
<td>AAC Introduction</td>
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<td>Additional Information</td>
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<td>AAC system demonstrations</td>
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<td>AAC hands-on experience</td>
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<td>Demographic Questionnaire</td>
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<tr>
<td>Verbal Instructions</td>
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<td>Sample AATAAC Questions</td>
<td>Sample AATAAC Questions</td>
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</tr>
<tr>
<td>AATAAC Completed</td>
<td>AATAAC Completed</td>
<td>AATAAC Completed</td>
</tr>
</tbody>
</table>
APPENDIX H: QUALITATIVE QUESTIONS

INSTRUCTIONS FOR EXPERIMENTAL GROUP: Please answer the following questions the best you can about the story that was read to you. Remember, there are no right or wrong answers; just answer the questions honestly.

INSTRUCTIONS FOR CONTROL GROUP: Please answer the following questions the best you can about the girl in the picture, Kathrin. Remember, there are no right or wrong answers; just answer the questions honestly.

1. What do you think would be good about being friends with someone like Kathrin?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. What do you think would be challenging about being friends with someone like Kathrin?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3. What do you think someone like Kathrin will be when she grows up?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Why do you think that?

________________________________________________________________________

________________________________________________________________________
APPENDIX I: ADDITIONAL INFORMATION ABOUT AAC

Now, imagine that you cannot speak. You are still you but you can’t talk. You can hear. You can think. You are just as smart as you are now. You can read and do your homework. You can take tests. You can see. You can go to school and you are in this classroom. You want to have the same friends and do things you usually do. You can do everything you do now but you cannot talk. You want to talk. You have things you want to say, but you are not able to use your mouth to say them. What would that be like?

That’s why there is AAC. AAC helps people who want to talk but can’t. This is Kathrin. Kathrin is 10 years old and she uses AAC. She uses AAC because her speech is not clear enough for others to understand her. People like Kathrin use AAC to help them speak. Kathrin wants to talk. She is smart and goes to school. She wants to play. She can hear and understand what people say to her. She can listen and wants to talk back, but she can’t. She was born with a disability. She uses a wheelchair and can’t talk but she wants to be just like you. She uses a letter board. She looks with her eyes to spell things. Now, Kathrin has a computer. She uses her eyes with the computer and the computer talks for her. So you don’t have to figure out what she is spelling, you can hear what she says with the computer. This is another form of AAC. Do you have any questions about AAC, Kathrin, or people like Kathrin?

I brought some examples of AAC with me. These are all things that people can use to talk with. This way, they can talk with other ways besides using their mouth.

Show the devices. Do you have any questions about the devices? Answer questions.
Footnotes

