The Development and Utilization of a Scale to Measure Adolescents’ Attitudes Toward Peers Who Use Augmentative and Alternative Communication (AAC) Devices

Purpose: Study 1 developed the Assessment of Attitudes Toward Augmentative and Alternative Communication—2 (AATAAC–2) to assess adolescents’ attitudes toward peers who use AAC. Study 2 used the AATAAC–2 to examine influences of familiarity with people with disabilities; type of AAC device; and various combinations of gender of rater, AAC user, and communication partner on adolescents’ attitudes.

Method: In Study 1, 194 adolescents viewed videotapes depicting adolescents using AAC, then completed AATAAC–2. Study 2 utilized 8 videotapes depicting 4 different gender combinations of AAC user and communication partner as experimental stimuli. Each gender combination was filmed twice: once with a static touch screen device, and once with a dynamic touch screen device. One-hundred thirty-six adolescents were randomly assigned to view 1 of the 8 videos. Participants then completed AATAAC–2.

Results: Study 1 demonstrated that AATAAC–2 has adequate psychometric properties. Raters’ responses in Study 2 indicated no main effect of device type; girls were more positive than boys; and familiarity with peers with disabilities was associated with more positive attitudes. No 2-way interactions were significant; 3-way interaction of level of familiarity, gender, and type of device used was significant.

Conclusions: Familiarity and gender contribute to adolescents’ attitudes; type of AAC device combined with these factors to influence attitudes.

KEY WORDS: adolescents’ attitudes, AAC device type, familiarity with disabilities, gender

Attitudes have traditionally been considered by social psychologists to be composed of cognitive, affective, and behavioral components (Triandis, 1971). This view of attitudes posits that the cognitive, or evaluative, component interacts with the affective, or emotional, component to predispose actions, or behaviors, toward an attitude object.

Although this three-factor theory of attitude indicates that a relationship exists between behavioral responding and attitudes, other researchers have found that attitudes and behaviors are not necessarily synonymous with each other (Kraus, 1995). Factors related to people’s situations, dispositions, and motivations can result in discrepancies between their stated attitudes and their behaviors. The relationship between attitudes and behaviors, however, is reliably greater when the cognitive and affective
components of an individual’s attitude toward a specific attitude object are matched rather than mismatched (Seitz, Lord, & Taylor, 2007), and most people will try to maintain consistency between their attitudes and their behaviors (Hymel, 1986). Indeed, individuals typically attempt to interact with others who hold attitudes similar to their own. When this occurs, behaviors that are consistent with expressed attitudes are encouraged or, perhaps, actually enforced through strong social pressure (Kraus, 1995).

A person’s attitude toward another individual can therefore be a predisposing factor for the manner in which that person acts toward the other individual, especially when the person is a member of a group who holds the same attitude. School classrooms are “social communities in their own right” (Nowicki & Sandieson, 2002, p. 244), and within classrooms in which children with physical and intellectual disabilities are included, the attitudes of peers toward the children with disabilities tend to be negative and “are generally recognized as being a major barrier to full social inclusion at school for children and youth with disabilities” (McDougall, DeWit, King, Miller, & Killip, 2004, p. 288). Children with disabilities who are included are likely to face serious social difficulties that include social isolation, social neglect, rejection, teasing and bullying by their peers, and a lack of a sense of safety and belonging (McDougall et al., 2004; Nowicki & Sandieson, 2002).

**Attitudes Toward Individuals With Communication Impairments**

Another form of disability is communication impairments. Similar to the attitudes of peers toward those with physical and intellectual disabilities, the literature also indicates that the attitudes of peers toward individuals with various forms of communication impairments are not as positive as would be desired. Individuals who have voice or resonance disorders report negative social reactions to their verbal communication that affect their ability to socialize, to be employed, and to develop a psychological sense of well-being. Some people with voice disorders report being stared at, teased, and, indeed, feeling suicidal (Altenberg & Ferrand, 2006; Lallh & Rochet, 2000). People also tend to hold negative attitudes toward individuals who stutter (Patterson & Pring, 1991) and to perceive them as “generally quiet, reticent, guarded, avoiding, introverted, passive, self-derogatory, anxious, tense, nervous, and afraid” (Snyder, 2001, p. 150), even though there is no evidence to support the presence of these characteristics in people who stutter as a group. Children with specific language impairments are reported to be at risk for developing fewer friendships and being more likely to be victimized by their peers than are children with typical language skills (Conti-Ramsden & Botting, 2004).

A communication need can be so complex that it interferes with a person’s ability to communicate in a functional manner, making that person a potential candidate for augmentative and alternative communication (AAC). The most common causes of complex communication needs in children are autism, cerebral palsy, mental retardation, and developmental apraxia of speech (Beukelman & Mirenda, 2005). Therefore, many children who are candidates for AAC have not only a complex communication need but also physical and intellectual disabilities. As has been discussed previously, all of these characteristics have been documented as often being perceived negatively by peers. As McCarthy and Light (2005) indicated, “Negative attitudes about individuals who use AAC create barriers that limit opportunities for communication and full participation in society” (p. 41).

Even though an individual who holds a negative attitude toward another person does not necessarily engage in behaviors that are harmful to that person, the accumulated evidence indicates that individuals with physical, intellectual, and communication disabilities are at risk for lower acceptance by their peers and that this may result in being isolated, teased, or bullied (e.g., Altenberg & Ferrand, 2006; Conti-Ramsden & Botting, 2004; Cook & Semmel, 1999; Ferguson, 1998; Fisher, Pumipian, & Sax, 1998; Lallh & Rochet, 2000; McDougall et al., 2004; Nowicki & Sandieson, 2002). To ensure that individuals with disabilities, including those who use AAC to communicate, do not face such behaviors and limiting barriers, it is important to continue the study of attitudes to gain knowledge of variables that influence, or help to form, peers’ attitudes toward individuals with disabilities.

**Attitudes Toward Individuals Who Use AAC**

The development and determinants of attitudes toward people who use AAC have been attributed to various characteristics of AAC users and the AAC system itself (Bedrosian, Hoag, Calculator, & Molineux, 1992; Gorenflo & Gorenflo, 1991; Gorenflo, Gorenflo, & Santer, 1994; Hoag & Bedrosian, 1992; Hoag, Bedrosian, Johnson, & Molineux, 1994; Lilienfeld & Alant, 2002). Adults’ attitudes toward peers who use AAC have been reported to be influenced by variables such as gender, familiarity with disabilities, length of augmented message, information about the AAC user, and type of AAC device used (Bedrosian et al., 1992; Gorenflo & Gorenflo, 1991; Hoag & Bedrosian, 1992).

Gorenflo and Gorenflo (1991) compared adults’ attitudes to a person with complex communication needs
when that person communicated using an unaided communication technique (i.e., his own voice and naturally occurring facial and body gestures), an alphabet board, or a speech-generating device. Half of their participants also received positive, written information about the person who communicated using AAC, and half received no information. The results indicated that as the sophistication of the communication technique increased, so did the positive nature of the evaluative component of participants’ attitudes. The evaluative component of attitudes was also reported to be more positive for individuals who received the positive written information. However, only the use of the most sophisticated AAC technique resulted in an increase in the affective or behavioral component of attitude. Gorenflo and Gorenflo concluded that to increase interaction and, at best, communicative interaction between nonspeaking and able-bodied persons ... the use of a computer-based communication system might be necessary” (p. 24).

If this finding also held for children, then the type of AAC technique a child used could have a positive impact on his or her social experiences with other children. However, the accumulated research results have indicated that type of AAC technique used does not influence the attitudes of children in Grades 1–6 (Beck & Dennis, 1996; Beck, Fritz, Keller, & Dennis, 2000; Blockberger, Armstrong, O’Connor, & Freeman, 1993; Dudek, Beck, & Thompson, 2006). Instead, the variables that have shown an influence on children’s attitudes toward their peers who use AAC tended to be variables that were internal to the children (e.g., gender, familiarity with disabilities, grade; Beck, Bock, Thompson, & Kosuwan, 2002; Beck & Dennis, 1996; Beck, Fritz, et al., 2000; Beck, Kingsbury, Neff, & Dennis, 2000; Blockberger et al., 1993; Dudek et al., 2006).

While research has focused on the attitudes of children and adults toward their peers who use AAC, the attitudes of adolescents have not been studied extensively. Adolescence, with the onset of puberty and the shift from elementary to high school, is a major time of transition for all children. As McDougall et al. (2004) pointed out, for children with disabilities, peer acceptance is important for their successful integration into the high-school setting and also for their “eventual successful transition to the adult world” (p. 288). Therefore, research studies investigating variables that might increase the positive nature of adolescents’ attitudes toward their peers who use AAC are needed.

One study that reported findings regarding the attitudes of children in early adolescence was conducted by Lilienfeld and Alant (2002). These researchers investigated how the attitudes of children ages 11–13 toward an individual who used AAC were affected by voice output and gender of participants. These researchers developed a questionnaire, the Development of the Communication Aid/Device Attitudinal Questionnaire (CADAQ), to assess both the attitudes of 11- to 13-year-olds toward a child with disabilities who used AAC and their perceptions of that child’s communicative competence. Two stimulus videotapes of a 13-year-old boy with cerebral palsy and no functional speech were created. One video showed the boy communicating with single words, short phrases, and full sentences composed on a high-technology speech-generating device that utilized synthesized voice. His communication partner was a 15-year-old girl who spoke. The second videotape was a copy of the first, but with the voice edited out.

The participants in the study included 115 sixth- and seventh-grade students who spoke English and who attended a school where no students with significant disabilities were enrolled. Students were selected at random from one of two classrooms at each grade level to make up the two groups of participants. The participants viewed the videotapes and then completed the CADAQ.

Consistent with previous findings (e.g., Beck & Dennis, 1996; Blockberger et al., 1993; Gorenflo & Gorenflo, 1991), the results of the CADAQ indicated that girls had more positive responses than boys in both the voice and the no-voice conditions. Furthermore, Lilienfeld and Alant (2002) found that their participants’ attitudes were more positive for the voice conditions than for the no-voice conditions, regardless of gender. These results indicated that, unlike younger children, the attitudes of children in sixth and seventh grade were influenced by an aspect (i.e., voice or no voice) of the AAC technique used. There continues, however, to be a need to know about how other aspects of an AAC device might, or might not, influence adolescents’ attitudes.

One distinction between AAC devices is the type of screen used: a static (fixed selection set) touch screen or a dynamic (changing selection set) touch screen. Touch screens on computers are “monitors with some type of sensing device across its face that detects the location and duration of contact, usually by a finger or stylus. All touch screens then supply this contact information to the PC as though it were a click event from a mouse” (Meyers, 2007, p. 628).

Dedicated, computerized AAC devices typically have built-in touch screens. If a static touch screen device is being used, the AAC user accesses a button, or series of buttons, on the face of the screen in order to produce a spoken message. If a dynamic touch screen device is being used, the user can access specific locations on the screen that change the screen that is being presented to the user. If one of these types of device touch screens is viewed more positively by peers than the other, then that information could be considered, along with other critical diagnostic information, by interventionists when recommending AAC devices for use by adolescents.
The factor of a peer’s gender continues to influence attitudes throughout adolescence (Lilienfeld & Alant, 2002) and into adulthood (Gorenflo & Gorenflo, 1991). Research has been conducted on the specific differences between the attitudes of girls and boys in their teens toward their peers with mental retardation (Krajewski & Flaherty, 2000). These researchers administered an attitude inventory consisting of 29 items that fall into one of four categories (i.e., integration—segregation, private rights, social distance, and subtle derogatory beliefs) to 154 high school students in Grades 9, 10, 11, and 12. Females demonstrated more positive attitudes toward individuals with mental retardation than did males on the subscales of private rights, social distance, and subtle derogatory beliefs. The subscale that demonstrated the greatest effect for gender, however, was social distance; females held much more positive attitudes on this subscale than males.

Nowicki and Sandieson (2002) also found that girls were more positive toward peers with disabilities than were boys, but only if the target person was another girl. Girls tended to display a more negative bias toward a male target than did boys. Additionally, Gorenflo and Gorenflo (1997) found that perceived similarity and gender interacted to influence the attitudes of college-aged individuals toward people who use AAC. Specifically, when females perceived a similarity between themselves and either a male or a female who used AAC, their attitudes were enhanced favorably. For males, however, perceived similarity enhanced their attitudes toward a male who used AAC, but was less likely to enhance their attitudes toward a female who used AAC. It is unknown what the specific effect is, however, of the gender of the listener on adolescents’ attitudes toward peers who use AAC.

Another variable of concern is how level of familiarity with individuals with disabilities influences attitudes toward those who use AAC. Studies of children’s and adults’ attitudes toward peers who use AAC indicate that individuals who are more familiar with people with disabilities tend to hold more positive attitudes toward them than do those who are less familiar (Beck et al., 2002; Beck & Dennis, 1996; Beck, Fritz, et al., 2000; Beck, Kingsbury, et al., 2000; Bedrosian et al., 1992; Blockberger et al., 1993; Dudek et al., 2006; Gorenflo & Gorenflo, 1991; Hoag & Bedrosian, 1992). However, other recent research studies indicate that a major problem of inclusive education is the acceptance of children with disabilities (McDougall et al., 2004; Nowicki & Sandieson, 2002). Thus, it continues to be important to determine the full effects of familiarity on attitudes and acceptance of individuals with disabilities. Furthermore, all of the young adolescents in Lilienfeld and Alant’s (2002) study attended school where no children with disabilities were included, so the influence of level of familiarity on adolescents’ attitudes toward their peers who use AAC is not known.

The purpose of the current research was twofold. The first purpose, Study 1, was to develop and norm a scale, the Assessment of Attitudes Toward Augmentative and Alternative Communication—Secondary Form (AATAAC–2), to measure the attitudes of adolescents toward their peers who use AAC. Despite the fact that Lilienfeld and Alant (2002) developed the CADAQ to assess adolescents’ attitudes toward a peer who uses AAC, several factors limit the general usefulness of this scale. First, it was normed for children ages 11–13, so a scale was needed that would assess the attitudes of students through high school. Additionally, as Nowicki and Sandieson (2002) indicated, “Continued research is required to comprehensively address potential influencing factors with psychometrically sound measures administered throughout the childhood years” (p. 262). Developing a scale with several forms that could be used with children from grade school age through high school would allow the collection of such data. Second, the items in the CADAQ use the name of a specific student who used AAC. For example, one item reads, “Alan took an active part in the conversation” (Lilienfeld & Alant, p. 100). Therefore, this scale was normed in such a manner that participants were predisposed to respond as through the person who was using the AAC techniques was a male. A scale that uses more general terms such as “a student who uses AAC” could be used to address the attitudes of peers toward other students who use AAC regardless of their gender.

The second purpose, Study 2, was to utilize this scale to investigate elements of high school students’ attitudes toward peers who use AAC. The specific questions asked were as follows:

1. How does the use of an AAC device with a dynamic touch screen versus a static touch screen influence adolescents’ attitudes toward their peers who use AAC?
2. Is there a differential effect of gender on attitudes when gender of listener and AAC user are the same versus when they are the opposite?
3. How does level of familiarity with individuals with disabilities influence adolescents’ attitudes toward their peers who use AAC?

Study 1
Method
Participants

A cross-section of middle and high school–aged students served as participants. Because the AATAAC can
be used with children in 6th grade, the earliest grade level from which participants for the current study were drawn was 7th grade. The remaining participants were selected from Grades 9 and 11 for a total of 194 participants. These students attended either one of two suburban high schools or one of two suburban middle schools in central Illinois. Students with disabilities attended all four schools. Thirty-eight of the participants were in 7th grade (18 males, 20 females), 83 were in 9th grade (44 males, 39 females), and 73 were in 11th grade (33 males, 40 females). As described in the upcoming Procedure section, participants were asked to respond in writing to two questions regarding their familiarity with people with disabilities. Answers to these questions were not used as selection criteria, but rather as a means to describe students. Those who responded positively to one or both of the questions were considered “familiar” with people with disabilities; those who answered no to both questions were considered “less familiar.” Twenty-nine of the students in 7th grade (13 males, 16 females), 36 of the students in 9th grade (17 males, 19 females), and 34 of the students in 11th grade (16 males, 18 females) were considered to be “familiar.” Nine of the students in 7th grade (5 males, 4 females), 47 of the students in 9th grade (27 males, 20 females), and 39 of the students in 11th grade (17 males, 22 females) were considered to be “less familiar.”

Materials

Measurement scale. The AATAAC–2 was developed to measure the attitudes of students in Grades 7–12 toward peers who use AAC. The items for this scale were selected by the first and fourth authors based on a review of the literature and on modifications of the Assessment of Attitudes Toward Augmentative and Alternative Communication (AATAAC; Beck, Fritz, et al., 2000) and of the Professionals’ Attitudes Regarding Children who Communicate Augmentatively (PARCCA; Beck et al., 2001). This process resulted in one of the items being generated from scratch, and others being selected directly from the AATAAC and the PARCCA but modified to make them appropriate for adolescent students.

The AATAAC was normed on a sample of 174 children in Grades 1, 3, and 5 (Beck, Fritz, et al., 2000). Alpha coefficients were calculated to determine the internal consistency of the scale items overall and were found to be acceptable: first graders, $\alpha = .78$; third graders, $\alpha = .92$; and fifth graders, $\alpha = .95$. In no case would deletion of a particular item have significantly changed coefficient alpha. Test–retest reliability was established with a sample of 52 children (19 first graders, 21 third graders, and 12 fifth graders). One week separated two AATAAC administrations. Test–retest reliability for all 52 was good: Pearson correlation coefficient $= .79$. Spearman’s rho coefficients for each grade were also acceptable: .75, .75, and .87 for children in first, third, and fifth grades, respectively. Concurrent validity for the AATAAC was established by having 53 fifth grade students take, in counterbalanced order, the AATAAC and the Chedoke McMaster Attitudes Toward Children with Handicaps (CATCH) Scale, a scale that was previously validated as a measure of the attitudes of children in Grades 5–8 toward their peers with disabilities (Rosenbaum, Armstrong, & King, 1986). The Pearson correlation coefficient between the AATAAC and the CATCH was .88. Construct validity was established through theory prediction. Results of previous research indicate that girls have more positive attitudes toward children with disabilities than do boys (Beck & Dennis, 1996; Blockberger et al., 1993; Rosenbaum et al., 1986). Consistent with the prediction, mean AATAAC scores were significantly higher for girls.

The PARCCA (Beck et al., 2001) was normed on 289 college students: 85 were either senior level undergraduates or master’s level graduate students in speech pathology or audiology and were considered advanced level students, and 204 were undergraduate students enrolled in an introductory level speech pathology course and were considered introductory level students. Test–retest reliability was determined for the 204 introductory level students by calculating a Pearson correlation coefficient for their first and second PARCCA scores. The Pearson correlation coefficient was .71, significant at $p < .01$ (two-tailed). Internal consistency was determined by calculating an alpha coefficient for both the advanced level group and the first PARCCA scores for the introductory level group. Coefficient alpha was .89 and .90 for the advanced level students and the introductory level students, respectively. In neither group would omitting an item have significantly changed coefficient alpha. Construct validity was determined through theory prediction. An independent $t$ test was calculated between the mean PARCCA scores of the 81 speech pathology and audiology majors in the advanced level group who indicated that they had worked with or interacted with children with disabilities and of 80 students from the introductory group who had specified that they were special education or regular education majors but that they had never worked with a child who used AAC and who were either freshmen, sophomores, or juniors. Results of this analysis indicated that $t(159) = 3.237$ was significant at $p < .001$ (two-tailed). The mean PARCCA score for advanced students was higher than that of a subset one of the introductory level students indicating that, as would be expected, individuals with greater training in communication disorders and more experience with AAC expressed more positive attitudes toward children who used AAC than did those with less training and experience.

The original AATAAC–2 items were chosen to reflect the cognitive, behavioral, and affective components of
attitude as well as perceptions of the communicative competence of AAC users. To ensure that the wording of the items was appropriate for adolescent students, items were revised or omitted based on a review by one teacher at each grade: Grades 7–12. To establish content validity, the revised items were given to three speech-language pathologists (SLPs), each of whom had at least 10 years of experience working in the schools with students who use AAC. The SLPs independently reviewed the items and indicated if they believed the items accurately measured attitudes toward an individual who uses AAC and, if so, what aspect (i.e., cognitive, affective, and behavioral) of attitude each item measured or whether it measured communicative competency. Only items that all SLPs agreed upon were included in the AATAAC–2.

The final version of the AATAAC–2 includes 33 items. Twenty-one items are positively worded, and 12 are negatively worded. More items are positively worded than negatively worded to minimize the number of items that could potentially be perceived as derogatory toward individuals who use AAC and that could inadvertently instill in participants previously unrealized negative perceptions of individuals who use AAC.

Of the 21 positively worded items, 3 reflect cognitive aspects of attitude, 4 reflect affective components, 8 reflect behavioral components, and 6 reflect perceptions of communicative competence. Of the 12 negatively worded items, 3 reflect cognitive aspects of attitude, 4 reflect affective components, and 5 reflect perceptions of communicative competence. (See Appendix A for scale items.) Items are randomly ordered throughout the scale to decrease the likelihood of response bias.

Videotapes. Portions of four commercially produced videos were utilized because they were of professional quality and readily available. Additionally, the portions selected provided examples of adolescents using AAC appropriately and were specifically chosen in order to familiarize participants with a range of AAC systems, to demonstrate that individuals who use AAC have a variety of disabilities, and to show AAC being used in a range of conversational situations. A script describing what was shown on each video selection was read before the presentation of each video. The video selections showed examples of students using a communication board, mid-range AAC technology devices, and high-technology AAC devices. The first selection featured a student using a communication board (ABC Productions, 2002; 3:39–4:19). The next two video selections each showed a student using a mid-range technology device (Faux & Bayles, 2000; 40:58–41:50; Prentke Romich Company, n.d.; 9:31–10:06). The final video selection showed two students using high-technology devices (Dynavox, n.d.; 6:48–7:17). Of the five students shown on the videos, two appear to have cognitive impairments and three have physical disabilities. Four adolescents in the videos are males, and one is a female. Two students are shown in therapy with their SLPs, one is shown conversing with an adult with the help of his sister, and two are shown communicating with a group of students with no visibly apparent disabilities.

**Procedure**

Data were collected in rooms within the students’ schools (e.g., a classroom, school library). AATAAC–2s were distributed, and participants were instructed to turn to the first page that contained demographic information (i.e., first name, school, grade, gender, and date) and questions regarding familiarity with people with disabilities (i.e., Do you have a friend who has a disability? Have you spoken to or interacted with a person who has a disability in the past month?). Disabilities were defined on the first page of the AATAAC–2 as “something that does not allow an individual to do things like you do, such as walk or talk. Unlike a broken arm, which eventually gets better, a disability is long-term”. The first page also contained instructions for completing the remainder of the scale.

Participants were told to complete items on the first page and to not turn the page until after viewing the video selections. Before showing a video selection to participants, researchers read the scripted description of the video so that the participants knew what they would be viewing. This procedure was repeated for all of the participants so that each participant saw each video clip twice. After video selections were shown, scripted instructions were read that directed participants’ attention to the printed directions for completing the scale. After receiving instructions, participants were asked to turn to the second page of the scale and to complete it independently.

To establish concurrent validity, children in seventh grade completed the CATCH (Rosenbaum et al., 1986) as well as the AATAAC–2. Only participants in seventh grade completed the CATCH because it was validated on fifth through eighth grade students, and not on high school students. The order in which the AATAAC–2 and the CATCH were presented to the participants was counterbalanced.

To establish test–retest reliability, a similar procedure was repeated 1 week after the initial procedure with all of the students from one of the middle schools and from one of the high schools who had been in attendance on the first testing day (i.e., 10 students in 7th grade, 10 in 9th grade, and 12 in 11th grade). The only difference was that students in 7th grade completed only the AATAAC–2 during the repeat procedure.

**Data Analysis**

Participants were asked to rate each AATAAC–2 item using a 5-point scale. For positively worded items:
1 (strongly disagree), 2 (disagree), 3 (can’t decide), 4 (agree), 5 (strongly agree). Scoring was reversed for negatively worded items. Mean scores were computed for each participant; the closer this score came to 5, the more positive the participant’s overall self-reported attitude score. In accordance with Rosenbaum et al.’s (1986) directions, the CATCH was scored in the same manner as the AATAAC–2.

Internal consistency, an index of reliability that indicates homogeneity of test items relative to overall performance on the test (Schiavetti & Metz, 1997), was determined by calculating coefficient alpha for the mean AATAAC–2 scores of all students and for the mean scores of students in each grade: 7th, 9th, and 11th. A Pearson correlation coefficient was calculated to determine the concurrent validity between the AATAAC–2 and the CATCH. Additionally, for the entire group of students who took the AATAAC–2 twice, test–retest reliability was determined by calculating a Pearson correlation coefficient. Because the sample size for students in 7th, 9th, and 11th grades was less than 25, Spearman rank order correlation coefficients were calculated to determine test–retest reliability for students at each grade level (Schiavetti & Metz, 1997).

Finally, construct validity is the extent to which a scale measures the theoretical concept of interest (Schiavetti & Metz, 1997). For the AATAAC–2, previous research predicted that girls would have more positive attitudes toward their peers with disabilities than boys (Beck & Dennis, 1996; Beck, Fritz, et al., 2000; Blockberger et al., 1993; Rosenbaum et al., 1986), and that students who are familiar with peers with disabilities would have more positive attitudes toward individuals who use AAC than students who are less familiar (Beck & Dennis, 1996; Beck, Fritz, et al., 2000; Blockberger et al., 1993; Rosenbaum et al., 1986). Construct validity of the AATAAC–2 was tested by calculating a 2 (gender) × 2 (familiarity) × 3 (grade) analysis of variance (ANOVA) with \( \alpha = .05 \), using mean AATAAC–2 scores as the dependent variable.

**Results**

**Reliability**

Alpha coefficients were calculated to determine internal consistency. For the AATAAC–2 overall, coefficient alpha was .86. The alpha level for participants in the 7th grade was .86, in the 9th grade was .87, and in the 11th grade was .90. All of these exceed the acceptable level of .80 for coefficient alpha. Further analysis of the individual scale items revealed that deletion of any particular item would not have had a significant effect on coefficient alpha.

The Pearson correlation coefficient calculated for the results of all the participants who took the AATAAC–2 twice was .82, significant at \( \alpha = .01 \). The Spearman rank order correlation coefficient for participants in 7th grade was .80, for those in 9th grade was .80, and for those in 11th grade was .80. All coefficients were significant at \( \alpha = .01 \). These coefficients all met or exceeded the acceptable level of .80 and, therefore, indicate satisfactory test–retest reliability for the AATAAC–2.

**Validity**

An acceptable level of concurrent validity was established for the AATAAC–2 by calculating a Pearson correlation coefficient for the mean scores of the AATAAC–2 and the CATCH. The result was \( r = .73, p = .01 \).

Results of the 2 (gender) × 2 (familiarity) × 3 (grade level) ANOVA with mean AATAAC–2 scores as the dependent variable indicated that main effects of gender, \( F(1, 182) = 10.352, p = .002 \), and familiarity, \( F(1, 182) = 6.636, p = .011 \), were significant. Females (\( M = 3.47, SD = 0.39 \)) had higher scores than males (\( M = 3.23, SD = 0.41 \)), and students who were familiar with individuals with disabilities (\( M = 3.43, SD = 0.40 \)) had higher scores than those who were less so (\( M = 3.27, SD = 0.42 \)). No significant effect was found for the main effect of grade, and no significant interaction effects were found.

**Conclusions**

The results of Study 1 indicate that the AATAAC–2 has acceptable levels of internal consistency, test–retest reliability, concurrent validity, and construct validity. Additionally, for the participants of this study, no developmental trends were found for attitudinal reactions among students in 7th, 9th, and 11th grades.

**Study 2**

**Method**

**Participants**

Participants (\( n = 136 \)) were selected from two public high schools in central Illinois, both of which included students with disabilities. Seventy participants were male and 66 were female; 89 participants attended one school and 47 attended the other. Of the 136 students, 26 were 14 years old, 42 were 15 years old, 40 were 16 years old, 20 were 17 years old, and 8 were 18 years old. The mean ages of male (15.63) and female (15.52) participants were not significantly different, \( t(134) = 0.58, p = .56 \). Each participant’s level of self-reported familiarity with individuals with disabilities was obtained during the experimental procedure. Table 1 gives more specific information on participants’ ages and grades.
Table 1. Summary of students’ demographic information.

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Age mean | 15.63 | 15.52 | 15.57 |

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<td>12</td>
<td>11</td>
<td>3</td>
<td>14</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>66</td>
<td>136</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Materials

Videotapes. Eight different experimental videos were developed; each depicting one of eight experimental conditions. These conditions were created using four different gender combinations: a male adolescent AAC user interacting with a male communication partner, a male adolescent AAC user interacting with a female communication partner, a female adolescent AAC user interacting with a male communication partner, and a female AAC user interacting with a female communication partner. Each of these four combinations was then recorded twice: once with the AAC user accessing a static touch screen AAC device, and once with the AAC user accessing a dynamic touch screen AAC device—for a total of eight conditions.

In each video, the scene shown was the screen of the AAC device and the voice produced by the AAC device. This was done in order to control for potential confounding variables that might influence attitudes (e.g., age of AAC user, physical appearance of AAC user and communication partner) and to focus the participants’ attention on the device used. Gender of the AAC user was established by the appearance of his or her hand and by the voice produced by the AAC device. Gender of the communication partner was established by the sound of his or her voice. To ensure that the script described in Appendix B (see this appendix for the conversation script) was followed as written, and that response rates were controlled across all videos, each individual in the videos was a college student who was, in reality, able to speak functionally and had no other disabilities. The implication, however, was that the AAC user had a complex communication need.

Conversation script. The same conversational script (see Appendix B) was used across the eight videotapes to control for the effect of conversational factors. This script was created by the researchers and reviewed by two teenagers (a 16-year-old male and a 16-year-old female) to verify that the conversation was one that could actually occur between two teenage peers. The scripted conversation was created to be age appropriate and gender neutral. To obtain social validation, 60 freshman level college students were asked to rate the script and comment on whether it was appropriate for a teenage conversation. The script was amended based on feedback from these students. The edited script was used in all videos. Both communicators in each video had an equal number of conversational turns (i.e., nine turns each). Turns for each communicator consisted of greetings, responses, comments, questions, and initiations.

AAC devices. In this study, the static touch screen device used was the Prentke Romich Company Delta-Talker with the DEC Talk voice of Perfect Paul (male voice) or Beautiful Betty (female voice). The only overlay used was a 32-location colored picture overlay produced with Boardmaker for Windows to be appropriate for the entire conversational script created for this study. Six messages were accessed by activating 1 icon, eight by activating 2 icons, two by activating 3 icons, and one by activating 4 icons. No message feedback was provided, and the entire message was delivered after all icons had been activated. The AAC user accessed a total of 41 icons to produce nine turns in responding to and maintaining the conversation. The total length of the static touch screen conversation was 2 min and 5 s.

The dynamic touch screen device used was DynaVox Systems’ DynaVox 3100 with the DEC Talk voice of Perfect Paul (male voice) or Beautiful Betty (female voice). A total of four screens (three full pages and one pop-up) were page-linked together so that the participants observed four different screens that changed dynamically, given selections made by the AAC user. Each page was programmed categorically (i.e., home, computer, school, and TV). All four pages contained page links, icons, and command buttons (i.e., clear, backspace, delete word, close pop-up). For example, the Home page contained 40 icons (approximately 1 in. × 1½ in.), including 11 page links, four command buttons, and 25 icons used for greeting, general comments, and closing conversations. The Computer page contained 33 icons related to the computer discussed in the script, 5 page links, and three command buttons. In the script programmed on the DynaVox, six messages were accessed by activating 1 icon, six by activating 2 icons, three by activating 3 icons, and one by...
activating 5 icons. As with the static touch screen device, no message feedback was provided, and the entire message was delivered after all icons were activated. Forty-one icons were accessed by the AAC user to communicate the nine turns he or she took during the entire conversation. The total length of the dynamic touch screen conversation was 2 min and 15 s.

For both the static touch screen and the dynamic touch screen conditions, the icons associated with messages were chosen by an SLP with more than 15 years of experience working in the area of AAC in consultation with a special educator who also had more than 15 years of experience in the field of assistive technology. Icons were chosen to be representative of the main content of the message being communicated. Because both devices were set up to retrieve preprogrammed messages using single-meaning pictures as the representational method, this study was not designed to allow for comparisons of commercially available language application programs. Additionally, due to the fact that newer models have been introduced since the time the current study was conducted, neither of the specific devices used in this study are commercially available today.

**Measurement scale.** The AATAAC–2 was used to assess participants’ attitude toward the AAC users who were depicted in the videos. The purpose of Study 1 was to collect reliability and validity data for the AATAAC–2. So that these data would apply to the scale used in Study 2, the AATAAC–2 was not altered in any way from that described in Study 1.

**Procedure**

There were eight experimental conditions as described in the Videotapes section earlier. All experimental sessions were conducted in a section of the school that was away from other distractions (i.e., the library or school cafeteria at a time of limited use). Groups of 8 participants were dismissed from a class determined by teachers to be least disruptive of their daily schedule. Students who assented to participate were led to a room with eight computers specifically programmed for the current study. One AATAAC–2 form, a sharpened pencil, and headphones attached to the computer were also located at the workspace. Students chose one of the computers to sit at and were told to put on headphones, click on the computer start icon, and follow the instructions given by the computer and written on the AATAAC–2. Students had no idea what condition they were going to view before choosing a computer; therefore, assignment to conditions was random. The computer was programmed to provide information in the following sequence: (a) a written definition of AAC, (b) two presentations of the specific video loaded onto the computer, and (c) written instructions on how to complete the questionnaire. These instructions were the same as those printed on the AATAAC–2. Specifically, participants were instructed to read each item carefully, that there were no right or wrong answers, and that they should answer each question honestly according to how they felt about it. After watching the presentation on the computer, students completed the questionnaire and were told that they could ask questions once they were finished.

**Data Analysis**

The AATAAC–2 was scored as described in Study 1. Mean AATAAC–2 scores (maximum of 5) were used as the dependent variable for all analyses. Determining a participant’s level of familiarity with individuals with disabilities was obtained by asking each participant to complete seven items found on the first page of the AATAAC–2 form. These items consisted of four yes/no questions (yes = 1, no = 0), one multiple-choice question (score 1–4), and two 5-point Likert scale questions (ranging from s1 [strongly disagree] to 5 [strongly agree]). Specific items are found in Appendix A. Total scores regarding familiarity with individuals with disabilities, ranging from 3 (least familiar) to 18 (most familiar), were calculated for each participant. A participant was considered to be “familiar” if his or her score fell between 11 and 18 and “less familiar” if his or her score fell between 3 and 10.

Data were analyzed with two three-way ANOVAs. For both ANOVAs, the dependent variable was the mean AATAAC–2 score with α = .05. The first analysis was a 2 (gender of participant) × 2 (gender of AAC user) × 2 (gender of communicative partner) ANOVA. The second analysis was a 2 (familiarity level) × 2 (gender of participant) × 2 (device type) ANOVA. Pearson correlation coefficients were calculated between total familiarity scores, age, and total AATAAC–2 scores to determine if relationships existed between these factors. Additionally, Cronbach’s alpha was calculated as a measure of test reliability, and, because sample size was not sufficient to complete a factor analysis, correlation coefficients were calculated for the scale and subscales to examine the relationship among these variables.

**Results**

Cronbach’s alpha coefficient for the AATAAC–2 scale was .88, indicating an acceptable level of reliability for the AATAAC–2. Correlation coefficients were calculated for the scale and subscales to examine the relationships among variables; these are presented in Table 2. Correlations between the AATAAC–2 scale and its subscales were positive and significant at p < .01, indicating that the scale and all of the subscales were highly
related to one another. However, the correlations among the subscales, with the exception of the behavioral and affective subscales (intercorrelation = .706), exhibited more modest levels of intercorrelation ranging from .362 to .513.

The results of the 2 (gender of participant) × 2 (gender of AAC user) × 2 (gender of communicative partner) ANOVA indicated that the main effect of gender of participant was significant, \( F(1, 132) = 9.923, p = .002 \). The mean score of females (\( M = 3.82, SD = 0.34 \)) was higher than that for the males (\( M = 3.63, SD = 0.36 \)). No other main effects or interactions were significant. An estimate of the magnitude of the significant main effect was of interest and was determined by calculating eta squared (Young, 1993). Eta squared for gender of participant was \( .07 \) (i.e., 7% of the variation in AATAAC–2 scores was accounted for by knowledge of participants’ gender). According to Cohen (1988), a small effect size has a value of .20, a medium effect size a value of .50, and a large effect size a value of .80.

The results of the 2 (familiarity level) × 2 (gender of participant) × 2 (device type) ANOVA also indicated that the main effect of gender of participant was significant, \( F(1, 132) = 8.613, p = .004 \). Again, the mean score of females was higher than that for the males. The main effect of level of familiarity was also significant, \( F(1, 132) = 5.985, p = .016 \). The mean AATAAC–2 score of participants who were familiar with peers with disabilities (\( M = 3.77, SD = 0.36 \)) was higher than that for participants who were less familiar with peers with disabilities (\( M = 3.61, SD = 0.35 \)). Neither the main effect of device type nor any of the two-way interactions were statistically significant. The three-way interaction of Familiarity Level × Gender of Participant × Device Type, however, was significant, \( F(1, 132) = 4.174, p = .043 \). For participants who saw the videotape of the AAC user accessing a static touch screen device, little difference was found between the mean AATAAC–2 scores for males who were familiar and those for males who were less familiar with peers with disabilities. Mean AATAAC–2 scores for females who were familiar with peers with disabilities were slightly higher than those of females who were less familiar. For participants who watched the videotape of the AAC user accessing a dynamic touch screen device, little difference was seen between the mean AATAAC–2 scores for females who were familiar and females who were less familiar with peers with disabilities. For males, however, a notable difference was found between those who were less familiar (\( M = 3.40, SD = 0.36 \)) and those who were familiar (\( M = 3.77, SD = 0.29 \)).

To estimate the magnitude of the significant main effect of level of familiarity and of the three-way main interaction, eta squared was calculated for each (Young, 1993). Eta squared for level of familiarity was .05. Eta squared for the effect of familiarity level in the static condition for males was .0001 and .10 for females. Eta squared for the effect of familiarity level in the dynamic condition for males was .24 and .003 for females. Again, all of these effect sizes are relatively small based on Cohen’s (1988) guidelines. See Table 3 for complete data.

Results of the Pearson correlations between total AATAAC–2 scores, total familiarity scores, and age of

Table 2. Correlation between the AATAAC—2 scale and its subscales.

<table>
<thead>
<tr>
<th>Scale and subscale</th>
<th>AATAAC—2</th>
<th>Cognitive</th>
<th>Affective</th>
<th>Behavioral</th>
<th>Communicative competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>AATAAC—2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>.696**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective</td>
<td>.795**</td>
<td>.362**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral</td>
<td>.875**</td>
<td>.471**</td>
<td>.706**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Communicative competence</td>
<td>.773**</td>
<td>.508**</td>
<td>.388**</td>
<td>.513**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. AATAAC—2 = Assessment of Attitudes Toward Augmentative and Alternative Communication—2.

**p < .01.

Table 3. Means, standard deviations, and eta squared for conditions of Device Type × Gender of Rater × Familiarity Level.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static touch screen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>38</td>
<td>3.62</td>
<td>.41</td>
<td>.0001</td>
</tr>
<tr>
<td>Less familiar males</td>
<td>9</td>
<td>3.62</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>Familiar males</td>
<td>29</td>
<td>3.63</td>
<td>.36</td>
<td>.098</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less familiar females</td>
<td>10</td>
<td>3.68</td>
<td>.27</td>
<td>.33</td>
</tr>
<tr>
<td>Familiar females</td>
<td>21</td>
<td>3.90</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>Dynamic touch screen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>38</td>
<td>3.40</td>
<td>.36</td>
<td>.24</td>
</tr>
<tr>
<td>Less familiar males</td>
<td>12</td>
<td>3.40</td>
<td>.36</td>
<td></td>
</tr>
<tr>
<td>Familiar males</td>
<td>26</td>
<td>3.77</td>
<td>.29</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less familiar females</td>
<td>11</td>
<td>3.77</td>
<td>.29</td>
<td>.003</td>
</tr>
<tr>
<td>Familiar females</td>
<td>23</td>
<td>3.81</td>
<td>.39</td>
<td></td>
</tr>
</tbody>
</table>
participant indicated that a positive and significant correlation existed between total AATAAC scores and total familiarity scores ($r = .288$, $p = .001$). A slight negative trend existed between age and total AATAAC–2 scores ($r = -.17$, $p = .051$), and no relationship existed between age and total familiarity scores.

**Discussion**

**AATAAC–2**

The significant, positive correlations between the AATAAC–2 scale and its subscales indicate that the scale and all of the subscales were highly related to one another. Furthermore, Cronbach’s alpha of .88, in addition to being an indication of acceptable reliability for the scale, also indicates that the AATAAC–2 hangs together as a unified scale. The fact that the correlations among each subscale were modest suggests that each subscale measures dimensions of attitudes that are different from those measured by the other subscales, with the exception of the behavioral and affective subscales. The correlation between these two subscales (.706) indicates that a stronger relationship exists between the affective and behavioral subscales than between any of the other subscales on the AATAAC–2. This is consistent with findings reported by Gorenflo and Gorenflo (1991) and Rosenbaum et al. (1986), who also developed Likert-type scales to assess attitudes toward people who use AAC or with other types of disabilities.

**Gender**

The main effect of gender indicated that overall, females had more positive attitudes toward their peers who use AAC than did males. This has been a consistent finding in the research of attitudes toward individuals who use AAC (Beck & Dennis, 1996; Beck, Fritz, et al., 2000; Blockberger et al., 1993; Gorenflo & Gorenflo, 1991). It is also consistent with general literature on gender difference indicating that traits usually associated with masculinity include aggressiveness, dominance, and independence, whereas traits associated with females are compassion, understanding, and warmth (Eddleston, Veiga, & Powell, 2006), and with research indicating that male and female high school students expect girls to be more sensitive toward people who need help (Barnett, 1987).

The results concerning gender that were more interesting, however, were the lack of effects of gender combinations of participants, AAC users, and communication partners. Same gender combinations might have increased perceived similarity, which, according to Gorenflo and Gorenflo (1997), has differential effects on attitudes toward a peer who used AAC based on the gender of the listener and the AAC user. Additionally, according to Nowicki and Sandieson’s (2002) meta-analysis of 10 years of publications on children’s attitudes toward peers with disabilities, girls’ attitudes were more positive than boys’ only if the target peer was a girl; they tended to have a negative bias toward boys. In the current study, attitudes were not influenced if a female watched a female AAC user interacting with a female communication partner compared with any other combination of gender of AAC user and communication partner. The same held true for males. The practical implication of these findings is that in buddy-type programs promoting social opportunities (e.g., Hardman & Clark, 2006), the gender of a buddy should not have an effect on the acceptance of an adolescent who uses AAC.

**Familiarity and Age**

Findings from this study support past research showing that students who are familiar with peers with disabilities have more positive attitudes toward individuals who use AAC than students who are less familiar (e.g., Beck & Dennis, 1996; Beck, Fritz, et al., 2000; Blockberger et al., 1993). Not only were the mean AATAAC–2 scores of familiar students higher than the mean scores of students who were less familiar, but the significant positive correlation between AATAAC–2 scores and total familiarity scores demonstrated that as familiarity increased, so did the positive nature of attitudes.

A slight negative relationship was found between age and AATAAC–2 scores showing a tendency for high school students’ overall reported attitudes toward a peer who uses AAC to become slightly less positive as they age. This finding is consistent with Ryan’s (1981) research review that found young children’s attitudes toward people with physical disabilities tended to become more positive with age until the late teen years when attitudes began to decline.

No relationship, however, existed between self-reported level of familiarity and age. Given the relationships between level of familiarity and total AATAAC–2 scores and between total AATAAC–2 scores and age, the factor of familiarity appears to be more related to overall attitude scores toward peers who use AAC than age. This, and the fact that other current research indicates that children with disabilities who are included often face negative attitudes from their peers (McDougall et al., 2004; Nowicki & Sandieson, 2002), emphasize the importance of providing appropriately implemented opportunities for adolescent students who use AAC to be integrated with their peers throughout high school so that adolescents with and without disabilities continue to be familiar with, and positive toward, each other.

**Device Type**

The main effect of device type was not significant; whether an individual used a static touch screen device
Limitations and Directions for Future Research

Several limitations of the results of the current study exist that should be discussed. First, a possible confounding variable that could have influenced the results regarding the type of AAC device used is the fact that the dynamic touch screen device displayed more vocabulary than did the static touch screen device, so that participants may have made judgments based on the breadth of vocabulary presented rather than the manner in which it was presented. Given the fact that no significant main effect was found for device types, however, this factor does not appear to have influenced participants’ responses. Nonetheless, future research should investigate how factors such as the amount of available vocabulary, the communicative competence of the AAC user, and the use of more widely differing AAC techniques (e.g., communication boards vs. electronic devices) influence adolescents’ attitudes.

Conclusion

Smith (2005) characterized adolescence as a time of challenge: “Challenges in establishing personal identity,
maintaining emotional and mental health stability, and coping with exponentially increasing educational demands” (p. 68). She went on to point out that adolescents who use AAC also have the challenge of communicating in a manner that is markedly different than that of their peers, which increases the difficulty of their transition from childhood to adulthood. Providing individuals with complex communication needs the means with which to communicate in the most effective and efficient manner possible is a top priority. Ensuring that the environment in which communication is taking place is as supportive as possible is also important. Peer attitudes are critical aspects of a person's environment and can either facilitate or impede the production of appropriate communication.

The results of the current study suggest that maintaining familiarity between students who use AAC and their peers is important for enhancing the positive nature of peers' attitudes. One way of ensuring this might be to conduct programs from pre-K through high school that facilitate appropriate interactions between students who use AAC and their peers. The results of the current study furthermore suggest that neither the gender composition of such programs nor the type of AAC device used (i.e., static touch screen or dynamic touch screen) influences peers' attitudes. However, the unexpected finding that less familiar boys who viewed the dynamic touch screen video were, as a group, the ones who demonstrated the lowest scores on the AATAAC–2 emphasizes the fact that interventionists need to be vigilant about the affect of any aspect of intervention on peers' attitudes. Continued research into factors that increase peers' acceptance of adolescents who use AAC is critical in order to ameliorate some of the difficult challenges they face in these years of transition and to ensure that they are able to communicate effectively in supportive environments.

Acknowledgments

This article is based on a master's thesis completed by the fourth author and a doctoral dissertation completed by the third author. The first and second authors served as first and second reader, respectively, for the thesis and as co-directors of the dissertation. All researchers thank the students, parents, and educators who made the collection of the data possible.

References


Prentke Romich Company. (n.d.). Minspeak: For now... for later... for ever! [Videotape]. Wooster, OH: Author.


Appendix A. AATAAC—2 items and familiarity items.

Cognitive Items
1. Students who use AAC have many friends.
2. Students who use AAC would be able to keep up in my class.
3. Students who use AAC can be as smart as my friends.
4. Students who use AAC would not get good grades on assignments or tests.
5. Students who use AAC need a lot of help from the teacher.
6. Students who use AAC feel sorry for themselves.

Affective Items
1. I don’t feel embarrassed for students who have to communicate with AAC.
2. I feel sorry for students who use AAC.
3. I would feel embarrassed if I had to communicate using AAC.
4. I think other students would tease a student who uses AAC.
5. Talking to a student who uses AAC makes me uncomfortable.
6. I would feel good about being friends with a student who uses AAC.
7. I would feel comfortable talking to a student who uses AAC.
8. I would feel comfortable working with a student who uses AAC.

Behavioral Items
1. I would go to the mall and hang out with a student who uses AAC.
2. I would like students who use AAC to be included in my class.
3. I would date a student who uses AAC.
4. I would introduce a student who uses AAC to my friends.
5. I would go to the library with a student who uses AAC.
6. I would work on a project or assignment with a student who uses AAC.
7. I would sit with a student who uses AAC at a game, movie, or concert.
8. I would want my teacher to change classroom activities so that a student who uses AAC could be included.

Communicative Competence Items
1. Students who use AAC can say exactly what they want to say.
2. Students who use AAC can’t change their words if they are not understood the first time.
3. Students who use AAC take an active part in conversations.
4. Students who use AAC listen carefully to what others are saying to them.
5. Students who use AAC are unable to say what they want to say.
6. Students who use AAC understand what others are saying to them.
7. Students who use AAC communicate too slowly.
8. Students who use AAC understand what communication is all about.
9. Students who use AAC are difficult to understand.
10. It is easy to understand students who use AAC.
11. Students who use AAC don’t like to talk about the same things I do.

Familiarity Items
1. Do you have a friend with a disability?
2. If so, does he/she go to your school?
3. In the last week have you talked to or interacted with a student who has a disability?
4. Have you ever been involved in an activity where you worked or interacted with students with disabilities?
5. Please circle the answer that most closely matches how often you interact with another student with a disability.
   A. Every day  B. At least once a week
   C. At least once a month  D. Less than once a month
6. I am very familiar with students with disabilities. (rated on a 1-5 scale)
7. I am very comfortable interacting with students with disabilities. (rated on a 1-5 scale)

Note. AATAAC–2 = Assessment of Attitudes Toward Augmentative and Alternative Communication—2.
Appendix B. Script.

(P) Hey, what’s up?
(A) Not much, you?
(P) Not much either, but I’m glad that Mr. Johnson cancelled the test tomorrow!
(A) Me too. I’m not ready for it.
(P) That’s going to help me so much—his tests are impossible!
(A) That paper is due Monday.
(P) Yeah, I need to start writing.
(A) Is your research done?
(P) I looked some stuff up on the Internet last night, but then I got an IM from Erin, and I didn’t get much more done after that. How about you?
(A) My research is done. But, I haven’t written anything. I wish I had a new computer. Mine is slow.
(P) We got a new DELL last summer. It’d be really nice except that I have to share it with my sister, and it seems like she’s always on it when I need it.
(A) My computer is old. But, I don’t have to share.
(P) My sister is going out tonight, so I think I’ll try to get my research done. Are you going to start writing your paper tonight?
(A) Probably not. It’s Thursday. Friends is on TV.
(P) Yeah, I know what you mean—I don’t feel like doing homework after I start watching TV either.
(A) Well, good luck.
(P) Thanks, see ya around.
(A) Talk to you later.

Note.  (A) = AAC user; (P) = communication partner.