THE EFFECT OF A CHECKLIST ON SCHOOL TEAMS’ PLANS FOR AUGMENTATIVE AND ALTERNATIVE COMMUNICATION ASSESSMENTS

A Dissertation in
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by
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ABSTRACT

Children with complex communication needs (CCN) require augmentative and alternative communication (AAC) to participate in home, school, and community environments, but many school teams are unprepared to provide effective AAC assessments. A pretest-posttest control group design was used to evaluate the effect of the AAC Assessment Checklist on school teams’ plans for AAC assessments. Twelve teams read case studies about children with CCN, and planned AAC assessments in pretests using the SETT Framework (Zabala, 2005). Then teams in the experimental group received the AAC Assessment Checklist (Birmingham & Light, 2016). There were no statistically significant differences between the control and experimental groups in the pretest. Teams in the control group showed no difference in the number of assessment components in their plans for AAC assessment in the posttest compared to the pretest. Teams in the experimental group described more assessment components in their plans for AAC assessment in the posttest (M = 16, SD = 2.53). A mixed analysis of variance (ANOVA) was used to determine main effects and interactions. There was a statistically significant interaction between Group and Time, $F(1, 8) = 25.6, p < .001$. Planned paired-samples t-tests were used to determine whether there were statistically significant differences between pre- and posttests in the control and experimental groups. There was no statistically significant difference between pre- and posttest in the control group ($t(5) = -.791, p = .465$). There was a statistically significant difference between pre- and posttest in the experimental group ($t(5) = 5.362, p = .003$). The results generalized to plans for actual assessments for children with CCN and their families. The results are encouraging because the addition of the AAC Assessment Checklist to the SETT Framework may have reduced errors and improved teams’ adherence to best practice for AAC assessments as described in the Participation Model (Beukelman & Mirenda, 1988; Light et al., 1998; Schlosser et al., 2000).
Keywords: Augmentative and alternative communication (AAC), assessment, school, checklist
TABLE OF CONTENTS

LIST OF FIGURES ........................................................................................................vii
LIST OF TABLES ...........................................................................................................viii
ACKNOWLEDGEMENTS ..............................................................................................ix

Chapter 1 Introduction and Review of the Literature ..............................................1
AAC assessment .............................................................................................................2
Challenges in AAC assessment ..................................................................................3
  Comprehensive AAC assessment of children with CCN .......................................4
  Complex AAC assessment of children with CCN ...............................................5
  Collaborative AAC assessment of children with CCN ......................................6
  Professional preparation in AAC assessment and intervention .........................8
  Tools for AAC assessment .................................................................................8
Checklists ..................................................................................................................10
  The AAC Assessment Checklist ......................................................................13
    Content of the checklist .............................................................................14
    Format of the checklist .............................................................................16
Research objectives ..............................................................................................19

Chapter 2 Methods .................................................................................................20
  Research Design ..............................................................................................20
  Participants ........................................................................................................21
    Selection criteria .......................................................................................21
    Recruitment ...............................................................................................21
    Participant description .........................................................................22
  Materials ........................................................................................................30
    Demographic surveys ...........................................................................30
    Case studies ..............................................................................................30
    Student Environment Task Tools (SETT) Framework ..................................31
    Augmentative and Alternative Communication (AAC) Assessment Checklist ...31
  Procedures ........................................................................................................32
    Pretest .........................................................................................................32
    Intervention ..................................................................................................33
    Posttest .........................................................................................................33
    Generalization to actual AAC assessment .................................................34
    Social validity ............................................................................................34
  Data collection and analysis .........................................................................35
    Data coding ..................................................................................................35
    Reliability of the coding ...........................................................................37
    Procedural reliability ................................................................................38
    Data analysis ...............................................................................................38
Chapter 3 Results

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest performance</td>
<td>39</td>
</tr>
<tr>
<td>Posttest performance</td>
<td>39</td>
</tr>
<tr>
<td>Assessment components in pre- and posttests</td>
<td>40</td>
</tr>
<tr>
<td>Generalization to actual AAC assessments</td>
<td>43</td>
</tr>
<tr>
<td>Social validity</td>
<td>45</td>
</tr>
<tr>
<td>Teams</td>
<td>48</td>
</tr>
<tr>
<td>Families</td>
<td>50</td>
</tr>
</tbody>
</table>

Chapter 4 Discussion

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teams’ plans using only the SETT Framework</td>
<td>52</td>
</tr>
<tr>
<td>Effect of the addition of the AAC Assessment Checklist</td>
<td>55</td>
</tr>
<tr>
<td>Generalization</td>
<td>60</td>
</tr>
<tr>
<td>Implications for practice</td>
<td>63</td>
</tr>
<tr>
<td>Limitations</td>
<td>65</td>
</tr>
<tr>
<td>Future research</td>
<td>67</td>
</tr>
<tr>
<td>Conclusions</td>
<td>68</td>
</tr>
</tbody>
</table>

REFERENCES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A IRB Approval Letter</td>
<td>78</td>
</tr>
<tr>
<td>Appendix B Consent to Participate</td>
<td>80</td>
</tr>
<tr>
<td>Appendix C Demographic Surveys</td>
<td>92</td>
</tr>
<tr>
<td>Appendix D Case Studies</td>
<td>96</td>
</tr>
<tr>
<td>Appendix E Student Environment Tasks Tools (SETT) Framework</td>
<td>97</td>
</tr>
<tr>
<td>Appendix F Augmentative and Alternative Communication (AAC) Assessment</td>
<td>99</td>
</tr>
<tr>
<td>CheckList</td>
<td></td>
</tr>
<tr>
<td>Appendix G Social Validity Questionnaire</td>
<td>100</td>
</tr>
<tr>
<td>Appendix H Operational Definitions of Assessment Components</td>
<td>101</td>
</tr>
<tr>
<td>Appendix I Transcription Coding Sheet</td>
<td>104</td>
</tr>
<tr>
<td>Appendix J Procedural Reliability Checklist</td>
<td>105</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 3-1: Mean number of assessment components for control and experimental groups’ plans in pre- and posttests out of 18 possible assessment components. ............ 39

Figure 3-2: Mean number of assessment components in the control and experimental groups’ plans for actual AAC assessments during the generalization condition out of 18 possible assessment components. ................................................................. 45
LIST OF TABLES

Table 1-1. AAC assessment components identified in the literature review of key references on AAC assessment. .................................................................................................................. 15

Table 2-1: Professional demographics. ................................................................................................................................. 26

Table 2-2: Family demographics. .............................................................................................................................................. 29

Table 2-3: Reliability of coding across graduate students and transcripts. ................................................................. 37

Table 3-1: The number of assessment components in the control and experimental groups’ plans in pre- and posttests out of 18 possible assessment components. ............... 41

Table 3-2: Analysis of variance (ANOVA) for time, group, and case study order. ......................... 42

Table 3-3: The percentage of teams in each group that included each assessment component in their plans in the pre- and posttests......................................................... 43

Table 3-4: The number of components in plans for actual AAC assessments out of 18 possible assessment components. ......................................................................................... 46

Table 3-5: The percentage of teams in each group that included each component in their plans for actual AAC assessments during generalization......................................................... 47

Table 3-6: A summary of the professionals’ responses to open-ended social validity questionnaire about the AAC Assessment Checklist .......................................................... 49

Table 3-7: A summary of the parents’ responses to the open-ended questionnaire about the AAC Assessment Checklist ........................................................................................................ 50
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Chapter 1
Introduction and Review of the Literature

Augmentative and alternative communication (AAC) offers children with complex communication needs (CCN) ways to participate in home, school, and community environments through aided and unaided communication systems (e.g., signs, gestures, communication boards, speech generating devices). The Individuals with Disabilities Education Act (IDEA) and Section 504 of the Rehabilitation Act require schools to develop individualized education programs (IEPs) that include assistive technology and AAC for children with CCN (Robinson & Solomon-Rice, 2009; Wendt & Lloyd, 2011), but many special education teachers (SETs), speech-language pathologists (SLPs), and occupational therapists (OTs) are unprepared to provide effective AAC assessment and intervention (Beukelman & Mirenda, 2013; Costigan & Light, 2010; Ratcliff, Koul, & Lloyd, 2008).

Children with CCN are unable to meet their communication needs with speech because of developmental, acquired, and/or degenerative disabilities (Beukelman & Mirenda, 2013); many receive services in schools (Binger & Light, 2006). Effective AAC interventions may improve communication, language, and literacy skills in children with CCN, without risking their speech development (Light & McNaughton, 2012; Light & McNaughton, 2009a; Millar, Light, & Schlosser, 2006). AAC interventions may also decrease challenging behavior, and increase compliance and on-task behavior (Bopp, Brown, & Mirenda, 2004; Walker & Snell, 2013). Effective AAC interventions depend on effective assessments (Binger et al., 2012; Dietz et al., 2012; Light et al., 1998). Because many school-based professionals are unprepared to provide effective assessments, many students with CCN do not receive effective AAC interventions. There is a significant need for clinical tools that guide effective AAC assessments.
**AAC assessment**

An AAC assessment provides information about current communication skills, current and future communication needs, and environmental supports and barriers (Beukelman & Mirenda, 2013). There are several models for AAC assessment, including candidacy models, the Communication Needs Model, and the Participation Model. Candidacy models determine candidacy or eligibility for intervention based on prerequisite skills for communication. For example, Shane and Bashir (1980) described a decision matrix for determining candidacy for augmentative communication. It included questions about cognition and speech, and recommended delayed intervention if children were unable to demonstrate sensorimotor intelligence (means-end, object permanence). The decision matrix also delayed intervention if children were likely to improve their speech. Chapman and Miller (1980) described similar decision rules for determining candidacy, and recommended intervention only if children failed to develop speech. Researchers challenged candidacy models because there was limited evidence to support cognitive and sensorimotor prerequisites to communication (Reichle & Karlan, 1985; Kangas & Lloyd, 1988; Romski & Sevcik, 1988). Candidacy models negatively affected service delivery guidelines in education because they required children to demonstrate “readiness” for intervention (Beukelman & Mirenda, 2013).

The Communication Needs Model replaced candidacy models (Beukelman, Yorkston, & Dowden, 1985). It described current and future communication needs across environments and determined intervention based on unmet communication needs. The Communication Needs Model described communication needs and access for the individual, but it did not consider communication opportunities and barriers in the environment.

The Participation Model focused on communication needs and access and communication opportunities (e.g., discrimination and knowledge factors) (Beukelman &
Mirenda, 1988). It provided a framework for assessment and intervention and included: (a) identifying student communication needs; (b) assessing student skills (i.e., receptive language, expressive communication, natural speech, symbol representation, literacy, cognitive organization, motor skills, and sensory perceptual skills); and (c) identifying partner interaction strategies that support communication and environmental barriers that impede communication (Beukelman & Mirenda, 1988; Light et al., 1998; Schlosser et al., 2000).

The Participation Model allows teams to gather the necessary assessment data to plan AAC interventions for children with CCN and their communication partners. Interventions for children with CCN target: (a) selecting and customizing appropriate AAC systems; and (b) teaching skills to improve communicative competence. Interventions for partners target: (a) knowledge and skills in the operation, maintenance, and development of augmentative and alternative communication systems; and (b) interaction strategies to support communication (Light et al., 1998). The Participation Model is considered best practice by the American Speech-Language-Hearing Association (ASHA, 2004).

**Challenges in AAC assessment**

AAC assessments are challenging because: (a) they require comprehensive assessment of a range of intrinsic factors related to children with CCN and extrinsic factors related to their environments; (b) they focus on children with the most complex needs, who present with a range of impairments and functional limitations; (c) they require effective communication and collaboration with children with CCN, their families, and other professionals; (d) teams often have limited pre- and inservice preparation in AAC assessment and intervention; and (e) there are few evidence-based tools to support assessment.
Comprehensive AAC assessment of children with CCN

Comprehensive AAC assessments include assessments of both intrinsic factors related to children with CCN and extrinsic factors related to their environments. For example, intrinsic factors include age, disability, and skills across a wide range of domains and extrinsic factors include communication partners’ knowledge and skills in AAC, and environmental barriers to communication (Beukelman & Mirenda, 2013). Comprehensive AAC assessments are important because they guide clinical decisions about effective AAC intervention for children with CCN, including the development of appropriate AAC systems and instruction in strategies and skills to improve communicative competence and effective intervention for communication partners, including instruction in interaction strategies and environmental adaptations to support communication and instruction in the operation and development of AAC systems (Light, 1989; Light et al., 1998).

Despite the importance of comprehensive AAC assessment, the research indicates SLPs’ approaches to AAC assessment are not comprehensive (Binger et al., 2012; Dietz et al., 2012; Lund et al., 2017). Dietz et al. (2012) interviewed SLPs to describe their approaches to AAC assessment. General practice SLPs described assessment as a two-step process that included only language and symbol assessments. They neglected assessment of important intrinsic factors (e.g., sensory perceptual and motor skills) and extrinsic factors (e.g., partner and environmental barriers to communication). General practice SLPs focused “…on the premise that speech-language pathologists must make a decision” about device recommendation (Dietz et al., 2012, p. 155). They neglected intervention to teach skills to children with CCN, or instruct partners in interaction strategies and/or environmental adaptation.

In the same study, specialist SLPs (i.e., AAC clinical specialists and AAC research/policy specialists) described AAC assessment as a six-step process, including: (a) communication
assessment; (b) alternative access assessment; (c) multiple modes of communication; (d) AAC instruction; (e) symbol assessment; and (f) device trials (Dietz et al., 2012). The descriptions provided by specialist SLPs were more detailed than descriptions provided by general practice SLPs, but many specialist SLPs neglected assessment of intrinsic and extrinsic factors (e.g., partner and environmental barriers to communication). Overall, SLPs are unprepared to provide effective AAC assessment (Costigan & Light, 2010; Ratcliff et al., 2008). Without comprehensive AAC assessments, including assessment of intrinsic and extrinsic factors, SLPs cannot develop effective AAC intervention for children with CCN and their communication partners.

**Complex AAC assessment of children with CCN**

Conducting AAC assessments is especially challenging because the assessments focus on children with complex needs. Children with CCN may have significant speech and/or language impairments because of autism spectrum disorder (ASD), cerebral palsy, Down syndrome, and/or other disabilities. The range of concomitant cognitive, sensory perceptual, and motor impairments requires input from professionals with knowledge and skills across disciplines (Beukelman & Mirenda, 2013; Light et al., 1998). The heterogeneity of children with CCN and their communication partners and environments contributes to the complexity of AAC assessments (Dietz et al., 2012).

AAC assessments are also complex because they must address both children with CCN and their communication partners (Beukelman & Mirenda, 2013). Communication is transactional; both children with CCN and their communication partners affect the success of interactions (Kent-Walsh & McNaughton, 2005). AAC assessments must also address a range of
communication environments (Beukelman & Mirenda, 2013). Children with CCN are expected to participate in home, school, and community environments, each with different communication demands. For example, children with CCN may have complex environmental needs depending on their cultural, linguistic, and/or socioeconomic backgrounds (Robinson & Solomon-Rice, 2009).

**Collaborative AAC assessment of children with CCN**

Given the needs of children with CCN, AAC assessment depends on collaborative teams of professionals with knowledge and skills across disciplines (Beukelman & Mirenda, 2013). Researchers recognize the importance of collaborative teams in school-based assessment and intervention (Giangreco, 2000). For example, Soto, Müller, Hunt, and Goetz (2001a; 2001b) described the skills required of teams to support students with CCN, including collaborative teaming (understanding the roles and responsibilities of all members, respecting all members, and communicating effectively).

Collaborative teaming requires understanding the roles and responsibilities of all team members (Soto et al., 2001a; 2001b). Beukelman, Ball, and Fager (2008) developed the AAC Personnel Framework to support adults with CCN. They defined the roles of individuals in AAC intervention, including: (a) people with CCN; (b) AAC facilitators; (c) AAC finders; (d) general practice clinicians and educators; (e) AAC specialists; and (f) AAC experts. Binger et al. (2012) adapted the AAC Personnel Framework for assessment and described nine personnel roles. For example, AAC finders identify people with CCN and refer them to professionals with experience/expertise in AAC. General practice SLPs provide direct clinical and educational services, but they do not specialize in AAC. Clinical specialists have experience/expertise in AAC and provide assessments and follow-up supports to intervention. Collaborating
professionals provide important information for the assessment, including seating and positioning, and sensory/perceptual skills. Communication partners have social, educational, or caring relationships with children with CCN. All of these people have important roles. Effective AAC assessments require the coordination and collaboration of all of these personnel.

Soto et al. (2001a) described “the importance of regular team meetings where all team members contributed to the development of strategies and ideas for mutually defined goals.” (p. 54). Unfortunately, professionals often have large caseloads that limit their time for meetings. Dowden et al. (2006) surveyed school-based SLPs to document caseloads in Washington. SLPs reported that average caseloads of 59 students affected the ability of SLPs to provide effective assessment and intervention to children with CCN. Binger et al. (2012) described challenges to assessment: “…poor coordination across AAC personnel…can lead to delays in the assessment.” (p. 287). Birmingham and Light (2015) conducted focus groups with teams and reported school-based AAC assessments sometimes last between six and twelve months. Part-time schedules, travel between buildings, and unanswered emails contributed to limited communication between school teams and parents (Birmingham & Light, 2015).

The challenges of collaboration extend beyond school teams. McNaughton et al. (2008) described the perspectives of parents of children with cerebral palsy who used AAC. The parents highlighted limited communication with their children’s school and said, “…they had little to no input in selecting a device for their child” (p. 47). Families must be included in assessment (Beukelman & Mirenda, 2013; Glennen & DeCoste, 1997). Failure to consider families’ perspectives will likely result in abandonment of the AAC system and/or strategy (Johnson, Inglebret, Jones, & Ray, 2006; Bailey, Parette, Stoner, Angell & Carroll, 2006; Parette, Brotherson, & Huer; 2000).
Professional preparation in AAC assessment and intervention

The challenges of AAC assessments are compounded as many professionals are unprepared to provide AAC assessment and intervention to children with CCN because of limited pre- and inservice preparation (Costigan & Light, 2010). Ratcliff et al. (2008) reported that 73% of speech-language pathology programs offered courses in AAC, but only 52% required them for graduation. There is limited information about instructional content and approaches in classes, and about the effectiveness of the approaches in preparing professionals for practice (Costigan & Light, 2010; Ratcliff et al., 2008). The lack of preservice preparation is concerning because 54% of school-based SLPs provide AAC assessment and intervention to children with CCN (ASHA, 2014).

Special education teachers (SETs) and occupational therapists (OTs) are also unprepared to provide assessment and intervention (Costigan & Light, 2010). Because they might only assess children with CCN once or twice a year, many professionals also have limited inservice experience with AAC assessment (Birmingham & Light, 2015). Given the lack of effective pre- and inservice preparation, most clinical decisions are not evidence-based. Schlosser and Raghavendra (2004) reported: “most clinical decisions are based on therapists’ familiarity, reasoning from experience, practices promoted in continuing education/professional development activities, discussions with colleagues, and some use of research evidence” (p. 2).

Tools for AAC assessment

Given the complexity and the lack of pre- and inservice preparation in AAC, there is a significant need for clinical tools to guide AAC assessment. There are a number of assessment
tools available, but each only focuses on a specific domain(s). None focus on comprehensive AAC assessment. For example, the Communication Matrix (Rowland, 2011) and the Inventory of Potential Communication Acts (Sigafoos et al., 2000) gather information from communication partners about early communicative behaviors, including pre-intentional behavior, intentional behavior, pre-symbolic communication, symbolic communication, and language. Social Networks (Blackstone & Hunt-Berg, 2003) is an inventory for describing communication partners and environments; and the Communication Supports Checklist for Programs Serving Individuals with Severe Disabilities is a clinical tool for determining quality indicators of assessments and interventions for children with CCN (National Joint Committee for the Communication Needs of Individuals with Severe Disabilities [NJC], 1998). These tools are helpful, but none are comprehensive.

The Student Environment Tasks and Tools (SETT) Framework is used to organize information about assistive technology (AT) for individuals with disabilities (Zabala, 2005). The SETT Framework is a simple organizational tool that can be used to assess students’ needs to identify tools and strategies professionals can use to meet those needs. It is intended to help IEP teams gather information about students, environments in which the students spend their time, tasks required for students to be active participants in teaching/learning processes, and tools needed to complete those tasks (Zabala, 2005).

The SETT Framework provides an outline of questions, including questions about students: (a) What are the functional areas of concern; (b) What are special needs that contribute to these concerns; (c) What are current abilities related to these concerns; and (d) What are the student’s interests? Questions about environments include: (a) Where does the student need the technology; (b) What is in the environment; and (c) Who is in the environment? Questions about tasks include: What do students need to do in specific environments? (Zabala, 1995). The SETT Framework organizes information about AT, but its questions are only guidelines (Zabala, 1995).
There is no evidence of the reliability and validity of the SETT Framework, or its effectiveness for AAC assessment and intervention planning.

Although there are a number of tools available to guide AAC assessment, none address the comprehensive range of assessment domains outlined by the Participation Model. The Participation Model is considered best practice in AAC assessment and intervention (ASHA, 2004), but there are only two studies that describe its use in schools (e.g., Dodd, Schaefer, & Rothbart, 2015; Light et al., 1998). These studies described the implementation of the Participation Model to guide assessment and intervention for children with CCN, but only Light et al. (1998) described its implementation to guide assessment and intervention for communication partners. Light et al. (1998) highlighted a range of AAC assessment domains across: (a) student communication needs; (b) student skills; and (c) partner and environmental supports and barriers. The Participation Model, as it is implemented by Light et al. (1998), provides a possible framework to support comprehensive AAC assessment, but there are currently no clinical tools to support its use to guide AAC assessment in schools.

Checklists

Checklists may provide a means to support more comprehensive AAC assessments in schools. Checklists are often used as cognitive aids to support users through task completion, or through team briefings and debriefings (Hales & Pronovost, 2006). They were originally introduced in aviation to reduce errors in B-17 flight, and in medicine to reduce errors and improve adherence to practice guidelines in intensive care units (ICUs) and surgery (Gawande, 2009). Peer-reviewed research about checklists is limited to aviation and medicine. A review of
research in both settings demonstrates the positive effects of checklists in reducing errors and improving adherence to practice guidelines (Hales & Pronovost, 2006).

Checklists reduce errors of commission and omission (Hales & Pronovost, 2006; Weiser, Haynes, Lashoher, Dziekan, Boorman, Berry, & Gawande, 2010). For example, surgical checklists reduce errors of commission (e.g., wrong patient, surgical site, and/or procedure) and errors of omission (e.g., forgetting antibiotic administration) (Treadwell, Lucas, & Tsou, 2014). Researchers determined the effectiveness of checklists through overall outcome measures (e.g., complications, mortality, and/or morbidity). Systematic reviews of the effects of surgical safety checklists report checklists reduce patient mortality and morbidity (Borchard, Schwappach, Barbier, & Bezolla, 2012; Treadwell et al., 2014).

Checklists also improve adherence to practice guidelines (Hales & Pronovost, 2006). Because checklists summarize practice guidelines, compliance with checklists improves adherence (Weiser et al., 2010). Systematic reviews of the effects of surgical safety checklists demonstrate improved compliance and adherence to practice guidelines (Treadwell et al., 2014; Borchard et al., 2012).

The exact mechanisms for reducing errors and improving adherence to practice guidelines are unclear, but there are at least three hypotheses, including establishing standards (Hales & Pronovost, 2006), supporting memory (Hales, Terblanche, Fowler, & Sibbald, 2008), and improving teamwork and communication (Russ, Rout, Sevdalis, Moorthy, Darzi, & Vincent, 2013).

The first potential mechanism for reducing errors and improving adherence to practice guidelines is establishing standards (Gawande, 2009). For example, when researchers surveyed nurses about evidence-based practices for patients receiving mechanical ventilation in ICUs (positioning, antacid medications, anticoagulant medications, and sedation), 80% were unaware of at least one of the practices. The researchers provided nurses with a summary of evidence to
support the practices, and a checklist for mechanical ventilation. The checklist standardized performance, and improved the nurses’ adherence to practice guidelines from 30% to 96% (Berenholtz et al., 2004).

The second potential mechanism for reducing errors and improving adherence to practice guidelines is supporting memory. There are a number of models of memory (Baddeley & Hitch, 1974; Baddeley, 2012; Cowan, 2005). Baddeley (2012) described separate but interacting short- and long-term memory systems. The model describes four components of working memory, including the ‘central executive’, the ‘phonological loop’, the ‘visuospatial sketchpad’, and the episodic buffer’. The capacity of each component is limited to approximately four ‘chunks’ of information, each with more than one item. Cowan (2005) did not describe separate memory systems, but the temporary activation of long-term memory. The embedded processes model describes working memory as the application of focused attention to long-term memory. The capacity of working memory is limited by attention, and attention is limited to four discrete ‘chunks’. Both Baddeley (2012) and Cowan (2005) recognize the limited capacity of working memory.

Checklists support working memory because they provide important information on paper (an external memory aid) (Hales & Pronovost, 2006). Users are not required to recall items from long-term memory, or hold items in working memory. They are only required to read and recognize important information (Wilkinson & McIlvane, 2002; Light & Lindsay, 1991).

Checklists also support memory by ‘chunking’ information (Hales & Pronovost, 2006). Checklists chunk information around ‘pause points’ or workflow patterns. For example, pilots’ checklists chunk information around takeoff and landing, and surgical teams’ checklists chunk information around workflow patterns for surgery (before induction of anesthesia, before skin incision, and before the patient leaves the operating room) (Weiser et al., 2010).
The third potential mechanism for reducing errors and improving adherence to practice guidelines is improving teamwork and communication. Checklists structure team briefings and debriefings. For example, the Surgical Safety Checklist (WHO, 2008) requires surgical teams (nurses, surgeons, anesthesiologists, and others) to complete pre- and postoperative briefings. The checklist prompts surgical teams to confirm everyone is introduced by name and role; confirms the patient, surgical site, and procedure; reviews anticipated events; confirm antibiotic administration; and confirms images (including X-rays, MRIs, and CT scans) are displayed in the operating room (Haynes et al., 2009). A systematic review of checklists for pre- and postoperative briefings demonstrated reduced communication failures and errors, and improved teamwork and communication (Russ et al., 2013). The results are likely related to an activation phenomenon – when nurses shared concerns during preoperative briefings, “they were more likely to note problems and offer solutions” (Gawande, 2009, p. 108).

The effect of checklists in improving outcomes is demonstrated in two different fields that involve comprehensive, complex, and collaborative work: aviation and medicine. Checklists are recognized for establishing standards, supporting memory, and improving teamwork and communication (Hales & Pronovost, 2006; Hales et al., 2008; Russ et al., 2013). A checklist might also improve AAC assessment and outcomes for children with CCN.

**The AAC Assessment Checklist**

Birmingham and Light (2016) developed and evaluated the AAC Assessment Checklist to improve school-based SLPs’ plans for AAC assessments. The content and format of the AAC Assessment Checklist were developed following literature reviews, feedback from experts and users (researchers and school-based SLPs), and pilot-testing.
Content of the checklist

The content of the AAC Assessment Checklist was developed following a literature review of the key references on AAC assessment. The literature review included textbooks and published papers with descriptions of comprehensive AAC assessment (Beukelman & Mirenda, 2013; Glennen & DeCoste, 1997; Light et al., 1998). The AAC assessment components included in textbooks and papers were identified (Table 1-1).
Table 1-1. AAC assessment components identified in the literature review of key references on AAC assessment.

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<tr>
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Electronic databases (ProQuest, PsychInfo) were searched with the following keywords: “augmentative and alternative communication” or “AAC” and “assessment”. The search returned 150 studies. The titles and abstracts were reviewed for additional AAC assessment components, but none were identified. Therefore, the following AAC assessment components were included in the checklist: (a) What are the student’s communication needs; (b) Which of the student’s needs are unmet communication needs; (c) Which of the student’s communication needs are priorities for the student, family, and professional; (d) What are the student’s vision skills; (e) What are the
student’s hearing skills; (f) What are the student’s motor skills (including seating and positioning); (g) What are the student’s receptive language skills; (h) What are the student’s expressive communication skills; (i) What are the student’s literacy skills; (j) What are the student’s symbol representation skills; (k) What are the student’s cognitive organization skills; (l) What are the partner and environmental supports and limitations to communication (e.g. What are partner supports to communication? What are partner limitations to communication? What are environmental supports to communication? What are environmental limitations to communication); and (m) Is the student involved in the assessment; (q) Is the family involved in the assessment; and (r) Are professionals involved in the assessment (Birmingham & Light, 2016). Access barriers, including the potential to increase natural speech, the potential for environmental adaptations, and the potential to use AAC systems/devices, were not included in the checklist following school-based SLPs’ reviews of its content and format. The SLPs reported the assessment components were covered (What are the student’s expressive communication skills? What are environmental supports to communication? What are environmental limitations to communication?).

**Format of the checklist**

The format of the AAC Assessment Checklist (Birmingham & Light, 2016) was developed following a literature review of checklist development in aviation and medicine (Federal Aviation Administration [FAA], 2016; Weiser, Haynes, Lashoher, Dziekan, Boorman, Berry, & Gawande, 2010). According to these sources, checklists have clear objectives and simple sentence structure. They are limited to one page; with minimal color; sans serif font; upper- and lowercase text; and fewer than 10 items per pause point. The AAC Assessment
Checklist was designed to adhere to these guidelines. It has clear objectives – to improve AAC assessment for children with CCN - and simple sentence structure. It is limited to one page; with minimal color; Helvetica font; upper- and lowercase text; and between 3 and 8 items per pause point (FAA, 2016). Its pause points are organized around workflow patterns for student communication needs, student skills, and partner and environmental supports and limitations to communication (Appendix F).

Birmingham and Light (2016) asked five AAC researchers and five school-based SLPs to review the AAC Assessment Checklist and provide feedback about its content and format. AAC researchers recommended reorganizing pause points around workflow patterns for AAC assessment (e.g., organizing student communication needs before student skills). School-based SLPs recommended rewording items (e.g., rewording “partner barriers to communication” to “partner limitations to communication”). The checklist was redrafted with each review.

The AAC Assessment Checklist was evaluated in a pilot study with school-based SLPs. The pilot study used a pretest-posttest control group design to evaluate the effect of the AAC Assessment Checklist on school-based SLPs’ plans for AAC assessments. Twenty SLPs read case studies about children with CCN, and planned AAC assessments in pretests. There was no statistically significant difference between the control and experimental groups in the pretest. SLPs in the control group described a mean of 5.8 (SD = 1.75) out of 18 required assessment components in the pretest, and SLPs in the experimental group described a mean of 6.6 (SD = 2.9) (Birmingham & Light, 2016). The SLPs in these two groups only included 32 - 36% of the required components in their planned assessments.

After the pretest, SLPs in the experimental group received the AAC Assessment Checklist, and SLPs in the control group did not. Both groups then read another case study, and planned AAC assessments in posttests. SLPs in the control group described only 6.2 (SD = 1.14) assessment components in their plans for AAC assessment in the posttest. In contrast, SLPs in the
The experimental group described more assessment components in their plans for AAC assessment in the posttest ($M = 16.1, SD = 1.17$) than in the pretest. The mean difference between pre- and posttests in the control group was $+0.4$ ($SD = 2.0$), and the mean difference in the experimental group was $+9.5$ ($SD = 2.5$). A mixed analysis of variance (ANOVA) was used to determine main effects and interactions. There was a statistically significant interaction between Group and Time, $F(1, 16) = 71.697, p < .001$. Planned paired-samples t-tests were used to determine whether there were statistically significant differences between pre- and posttests in experimental and control groups. There was no statistically significant difference between pre- and posttests in the control group ($t(9) = .647, p = .534$). There was a statistically significant difference between pre- and posttests in the experimental group ($t(9) = 11.783, p < .001$). (Birmingham & Light, 2016).

The pilot study indicated school-based SLPs’ failure to include important components in their plans for AAC assessment in their pretests – with potentially negative outcomes for children with CCN. The AAC Assessment Checklist significantly increased the number of components included in SLPs’ plans for AAC assessments. When SLPs consider all of the important components in an AAC assessment, they are more likely to have the information they need to make clinical decisions about effective intervention to improve language, literacy, and communication outcomes in children with CCN. The results of the pilot study were encouraging, but there were some limitations: (a) the SLPs planned AAC assessments for case studies, and the results might not generalize to actual assessments with children with CCN; (b) the study only included school-based SLPs, and the results might not generalize to multidisciplinary school teams that provide school-based AAC assessments (Birmingham & Light, 2016); and (c) the study evaluated the effect of the AAC Assessment Checklist compared to no tool, but school teams often use the SETT Framework to guide assessments. Research is required to investigate the effects of the AAC Assessment Checklist compared to the SETT Framework on the
assessment plans of multidisciplinary school teams’ plans and to investigate generalization to actual assessment plans for children with CCN.

**Research objectives**

Given the potential to use checklists as clinical tools to support comprehensive AAC assessment, and the limited research to date, the current study was designed to determine the effects of the AAC Assessment Checklist (Birmingham & Light, 2016) on school teams’ plans for AAC assessments. The study addressed the following questions: (a) What is the effect of the AAC Assessment Checklist in addition to the SETT Framework on the number of components included in school teams’ plans compared to plans with the SETT Framework alone; and (b) Do the results generalize to school teams’ plans for actual AAC assessments of children with CCN on their caseloads?
Chapter 2

Methods

Research Design

A pretest-posttest control group design (Campbell & Stanley, 1963) was used to determine the effect of a checklist on school teams’ plans for AAC assessment. Teams were randomly assigned to control and experimental groups. The independent variable was the checklist and the dependent variable was the number of assessment components included in teams’ plans for AAC assessments. The pretest-posttest control group design allows investigation of a causal relationship between the independent and dependent variables (Trochim & Donnelly, 2006). The pretest-posttest control group design is appropriate for this study because of its strength in ensuring internal validity. Each team only participated for about 2 hours (across 2 meetings). Teams completed pre- and posttests in one meeting, planning AAC assessments for 2 different case studies; and generalization in another meeting with parents, planning actual AAC assessments for children with CCN.
Participants

Selection criteria

Participants were teams of professionals, including, for example, SETs, SLPs, OTs, physical therapists (PTs), instructional aides, and/or nurses. Teams were included in the study if they: (a) included at least 2 professionals with required certifications (e.g., American Occupational Therapy Association [AOTA], American Physical Therapy Association [APTA], ASHA, and/or the Pennsylvania Department of Education); (b) provided assessment and/or intervention to children with CCN in preschools and/or schools; and (c) were scheduled to provide an AAC assessment for a child with CCN between the ages of 3- and 18-years old. Parents of the children with CCN scheduled for AAC assessments were invited to participate in the generalization phase of the study.

Recruitment

Teams were recruited through personal and professional contacts in suburban and rural Pennsylvania. These contacts provided contact information for professionals with children with CCN on their caseloads. The researcher sent recruitment emails and flyers to the professionals, and interested professionals forwarded them to parents of children with CCN scheduled for AAC assessments. When parents contacted the researcher by phone or email and provided consent to participate, the researcher invited the school teams to participate in the study by email.
**Participant description**

Twelve teams from suburban and rural Pennsylvania participated in the study. Six were randomly assigned to the control group, and 6 were randomly assigned to the experimental group. The sample size was targeted based on a power analysis for mixed ANOVA ($\alpha = 0.05$, and $\beta = 0.80$). The effect size ($d = 0.60$) was estimated based on the results of the earlier pilot study (Birmingham & Light, 2016).

The teams ranged in size from two to seven members. All of the teams included an SLP and a SET, and some included professionals with certifications from AOTA, APTA, ASHA and/or the Pennsylvania Department of Education (Elementary Education K-6, Special Education PK-12, Special Education PK-8, Special Education 7-12, Special Education Visually Impaired PK-12, Specialist Speech and Language Pathologist PK-12, and Supervisor Special Education PK-12). Two SETs and one SLP worked as assistive technology specialists (ATs). Professionals ranged in age from 24 to 63 years old ($M = 41.2$ years) and reported between 1 and 37 years of experience in special education ($M = 13.9$ years). Nine teams worked with children with CCN in elementary and high schools (i.e., autism, life skills, and multiple disabilities support classrooms). Two teams worked with children with CCN in preschools, and one preschool team worked with a child with CCN at home. The teams reported some knowledge of the SETT Framework for AT and AAC because it is regularly used in Pennsylvania, but the extent of their knowledge differed across professionals. None of the teams were familiar with the AAC Assessment Checklist before the study.

Teams were randomly assigned to groups (control and experimental) and case study order (AB or BA) with random numbers (i.e., Microsoft Excel). Professional demographics are included in Table 2-1.
Control group

The control group included 6 teams from suburban and rural Pennsylvania. Teams included between 3 and 7 professionals. All of the teams included SLPs and SETs. Fifty percent of the teams included OTs and 67% included PTs. Thirty-three percent of the teams included regular education teachers and 16% included an instructional aide. The professionals ranged in age from 25 to 60 years old and reported between 1 and 32 years of experience in special education with children with CCN because of ASD, CP, Down syndrome, and other disabilities. Four percent of the professionals reported having a doctorate degree. Eighty-three percent of the professionals reported having Masters’ degrees and 13% reported having bachelor degrees. The professionals’ experience working with children with CCN ranged from experience with 1 child to more than 100 children. Fifty percent of the professionals reported having completed an undergraduate and/or graduate course in AAC, and 83% reported having attended an inservice in AAC.

Families that participated in the generalization phase with the control group included eight parents and six children with CCN. Parents ranged in age from 31 to 47 years old. Twenty-five percent of parents reported having Masters’ degrees; 50% reported having bachelor degrees; and 25% reported having some college. Children with CCN ranged in age from four to ten years old. The children were diagnosed with a range of disabilities, including ASD, CP, Down syndrome, and genetic disorders. Family demographics are included in Table 2-2.

Experimental group

The experimental group also included 6 teams from suburban and rural Pennsylvania. Teams included between 2 and 7 professionals. All of the teams included SLPs and SETs and
83% of the teams included OTs. Sixteen percent of the teams included regular education teachers, nurses, and/or PTs. The professionals ranged in age from 24 to 63 years old and reported between 1 and 37 years of experience in special education with children with CCN because of autism spectrum disorders (ASD), cerebral palsy (CP), Down syndrome, and other disabilities. Seventy-nine percent of the professionals reported having Masters’ degrees and 21% reported having bachelor degrees. The teams’ experience working with children with CCN ranged from experience with 1 child to more than 100 children. Thirty-three percent of the professionals reported having completed an undergraduate and/or graduate course in AAC, and 66% reported having attended an inservice in AAC.

Families that participated in the generalization phase with the experimental group included eight parents and grandparents and six children with CCN. Parents and grandparents ranged in age from 34 to 67 years old. Sixty-three percent of parents reported having Masters’ degrees; 25% reported having bachelor degrees; and 13% parents reported having some college. Children with CCN ranged in age from 4 to 15 years old. The children were diagnosed with a range of disabilities, including ASD, CP, Down syndrome, and a genetic disorder.

**Group comparison**

Teams were randomly assigned to the control and experimental groups. The groups were similar in age, education, and years of experience in special education. There were differences in teams’ specific compositions but all of the teams in the control and experimental groups included SLPs, SETs, and more than 60% included OTs. The teams worked with children with CCN because of a range of disabilities.

The control group included one professional with a doctorate of physical therapy (DPT) but had similar numbers of professionals with MS and BS degrees. The control group completed
more undergraduate/graduate courses and inservices in AAC compared to the experimental group.

With regard to the parents in the study, the two groups were similar in age, but those in the experimental group had a higher proportion of post graduate education (masters’ degrees) than parents in the control group. Mothers were represented more than fathers in the study but each group included at least one paternal participant.

Children in the two groups were similar in age although the experimental group included a teenager whereas the oldest in the control group was only 10 years old. The children’s diagnoses were well matched between groups. Overall, the two groups were similar with no identified differences which would likely influence the outcome of the study.
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<td>32</td>
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<td>41-50</td>
<td>No</td>
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<tr>
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<td>OT</td>
<td>38</td>
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<td>OT</td>
<td>8</td>
<td>11-20</td>
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<td>28</td>
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<td>Group</td>
<td>Participant</td>
<td>Age</td>
<td>Education</td>
<td>Certificate</td>
<td>Years of experience in education</td>
<td>Number of students with CCN</td>
<td>Undergraduate and/or graduate course in AAC</td>
<td>Inservice in AAC</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>-----</td>
<td>-----------</td>
<td>------------------------------</td>
<td>---------------------------------</td>
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</tr>
<tr>
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<td>Masters</td>
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<td>Less than 10</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>SET</td>
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<td>Masters</td>
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<tr>
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<td>34</td>
<td>Bachelors</td>
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<td>11-20</td>
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<td>No</td>
</tr>
</tbody>
</table>
Table 2-2: Family demographics.

<table>
<thead>
<tr>
<th>Group</th>
<th>Parent/grandparent</th>
<th>Age</th>
<th>Education</th>
<th>Child with CCN</th>
<th>Age</th>
<th>Disability</th>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Team A</td>
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<td>36</td>
<td>Bachelor</td>
<td>Male</td>
<td>7</td>
<td>Partial Trisomy 10q</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team B</td>
<td>Mother</td>
<td>35</td>
<td>Bachelor</td>
<td>Female</td>
<td>4</td>
<td>CP</td>
</tr>
<tr>
<td></td>
<td>Father</td>
<td>35</td>
<td>Bachelor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team C</td>
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<td>47</td>
<td>Masters</td>
<td>Female</td>
<td>8</td>
<td>CP</td>
</tr>
<tr>
<td>Team D</td>
<td>Mother</td>
<td>31</td>
<td>Some college</td>
<td>Female</td>
<td>4</td>
<td>ASD</td>
</tr>
<tr>
<td></td>
<td>Father</td>
<td>36</td>
<td>Bachelor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team E</td>
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<td>31</td>
<td>Some college</td>
<td>Male</td>
<td>6</td>
<td>Down syndrome</td>
</tr>
<tr>
<td>Team F</td>
<td>Mother</td>
<td>38</td>
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<td>Female</td>
<td>10</td>
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<td>Experimental</td>
<td>Team G</td>
<td>--</td>
<td>Bachelor</td>
<td>Male</td>
<td>15</td>
<td>ASD</td>
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<td></td>
<td>Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team H</td>
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<td>34</td>
<td>Some college</td>
<td>Female</td>
<td>8</td>
<td>ASD</td>
</tr>
<tr>
<td>Team I</td>
<td>Mother</td>
<td>43</td>
<td>Masters</td>
<td>Female</td>
<td>7</td>
<td>CP</td>
</tr>
<tr>
<td>Team J</td>
<td>Mother</td>
<td>34</td>
<td>Masters</td>
<td>Male</td>
<td>4</td>
<td>Lissencephaly Miller-Dieker’s Syndrome</td>
</tr>
<tr>
<td></td>
<td>Grandmother</td>
<td>67</td>
<td>Bachelor</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Team K</td>
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<td>46</td>
<td>Masters</td>
<td>Male</td>
<td>9</td>
<td>Down syndrome/ASD</td>
</tr>
<tr>
<td></td>
<td>Father</td>
<td>43</td>
<td>Masters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team L</td>
<td>Mother</td>
<td>43</td>
<td>Masters</td>
<td>Female</td>
<td>8</td>
<td>CP</td>
</tr>
</tbody>
</table>
Materials

The study included four types of materials: (a) demographic surveys; (b) case studies of children with CCN for pre- and posttest plans for assessment; (c) the SETT Framework (Zabala, 2005); and (d) the AAC Assessment Checklist (Birmingham & Light, 2016) for the experimental group.

Demographic surveys

Professionals completed demographic surveys about their education and experience at the start of the study before the pretests, and parents completed a demographic survey about themselves and their children with CCN before the generalization phase. Demographic surveys for professionals and parents are included in Appendix C.

Case studies

The teams planned AAC assessments for two different case studies, one in the pretest and one in the posttest. Case studies have been used effectively in prior research to investigate clinical practices (McFadd & Wilkinson, 2010). The case studies for pre- and posttests were based on the clinical literature (e.g., Beukelman & Mirenda, 2013) and included descriptions of two boys with CP and CCN. The case studies included information about the boys’ ages and diagnoses, and their interests, educational placement, and current communication. For example, Sam and Daniel used gestures and speech approximations that were difficult to understand, and both received regular and special education at their elementary schools. They liked to read with their families.
about superheroes and sports. Sam attended Wednesday and Sunday services at the First Baptist Church with his parents and brother, and Daniel spoke Spanish and English with his mother and sisters. The case studies used in this study were originally developed for the pilot study with SLPs conducted by Birmingham and Light (2016). Results of the pilot study suggested that the cases were similar, and there were no case study effects. Because the SLPs’ assessment plans were similar in pretests across the case studies, regardless of the SLPs’ diverse caseloads, the case studies were also used for the current study. The case studies were counterbalanced (AB and BA) across the teams in the experimental and control groups to reduce bias from the order in which they were provided (Gravetter & Forzano, 2015). Both case studies are included in Appendix D.

**Student Environment Task Tools (SETT) Framework**

The Student Environment Tasks and Tools (SETT) Framework was provided for both the control and experimental groups in pre- and posttests and generalization. Because the SETT Framework is used across Pennsylvania schools for AT and AAC assessment and intervention, it represents “typical” practice. As described earlier, the SETT Framework includes questions about the student, his or her environment, tasks, and tools. There is currently no evidence to support the effectiveness of the SETT Framework or its reliability and validity. The SETT Framework (Zabala, 2005) is included in Appendix E.

**Augmentative and Alternative Communication (AAC) Assessment Checklist**

In addition to the SETT Framework, before the posttest, the teams in the experimental group received the AAC Assessment Checklist that was developed for the pilot study.
(Birmingham & Light, 2016). It is included in Appendix F. As described earlier, the content and format of the AAC Assessment Checklist were developed based on a review of the research on best practices in AAC assessment and checklists. The checklist was field tested in a pilot study by Birmingham and Light (2016).

**Procedures**

Data were collected with each team separately in two meetings in offices and/or classrooms. Teams completed the demographic surveys, and then completed pre- and posttests using case studies in the first meeting. In a second meeting, they planned an actual AAC assessment for a child with CCN on their caseload. The second meeting included parents (or grandparents) of the child with CCN. Teams completed both meetings within one to four weeks; meetings were scheduled at the convenience of the teams and families. The meetings were audio recorded with a Sony ICDPX333 Digital Voice Recorder™.

**Pretest**

When each team had completed the demographic forms, the researcher described the study to the team: “This study is designed to improve our understanding of augmentative and alternative communication (AAC) assessment.” Then, the researcher provided copies of one of the case studies (either case study A or B) and the SETT Framework (Zabala, 2005) to each professional on each team. The researcher said, “Use the SETT Framework to plan an AAC assessment for Sam/Daniel.” The teams read the case study and planned an AAC assessment, talking and taking notes. They received as much time as they needed. When the teams completed
their plan for an AAC assessment for the case, the researcher collected copies of the case study and the SETT Framework.

**Intervention**

When the pretest was complete, the researcher provided copies of the SETT Framework (Zabala, 2005) to teams in the control group and said, “This is the SETT Framework.” The researcher provided copies of the SETT Framework and the AAC Assessment Checklist (Birmingham & Light, 2016) to teams in the experimental group and said, “This is the SETT Framework; and this is the AAC Assessment Checklist.” The teams received as much time as they needed, but typically only reviewed the materials for 1 to 3 minutes before the posttest. The researcher did not review the materials with the teams.

**Posttest**

The researcher provided copies of the new case study to each of the teams in the control group and said, “Use the SETT Framework to plan an AAC Assessment for Daniel/Sam.” The teams read the case study and planned an AAC assessment, talking and taking notes. They received as much time as they needed.

The researcher also provided copies of a new case study to each of the teams in the experimental group and said, “Use the SETT Framework and the AAC Assessment Checklist to plan an AAC assessment for Daniel/Sam.” The teams read the case study and planned an AAC assessment, again, talking and taking notes. They received as much time as they needed.
Generalization to actual AAC assessment

The generalization phase was used to determine if the teams generalized use of the SETT Framework and the AAC Assessment Checklist for the experimental group from the case studies to actual AAC assessments for children with CCN. The parents and grandparents of the children with CCN participated in the generalization phase with the teams. The meetings for the generalization phase were scheduled to plan AT/AAC assessment and intervention, and most followed IEP meetings that identified students’ needs for AT devices and/or services.

The researcher described the study to the teams and the parents of the children with CCN in both groups: “This study is designed to improve our understanding of augmentative and alternative communication (AAC) assessment.” The researcher provided copies of the SETT Framework to teams and parents of children with CCN in the control group, following typical procedures for these meetings, and said, “Use the SETT Framework to plan an AAC assessment for (child).” The researcher provided copies of the SETT Framework (Zabala, 2005) and the AAC Assessment Checklist (Birmingham & Light, 2016) to teams and parents in the experimental group and said, “Use the SETT Framework and the AAC Assessment Checklist to plan an AAC assessment for (child).” The teams planned an AAC assessment, talking and taking notes for as much time as they needed.

Social validity

After they completed their plans in generalization, teams in the experimental group completed a written questionnaire about the AAC Assessment Checklist (Appendix G). Professionals and parents answered the following questions: (a) Do you think the AAC
Assessment Checklist helped [the assessment]; (b) What do you like about the AAC Assessment Checklist; and (c) What would you change about the checklist? The questions were designed to determine the social significance of the checklist and its outcomes (Schlosser, 1999).

Data collection and analysis

The researcher transcribed each meeting from its recording. She identified speakers by role, and transcribed turns (with new lines for each speaker). Turns were transcribed without fillers and pauses. Twenty-two percent of the transcriptions were randomly selected and checked for content reliability. A graduate student in speech-language pathology calculated the reliability of the transcripts by listening to the recordings, determining the number of accurately transcribed turns divided by the total number of accurately and inaccurately transcribed turns, and multiplying by 100. The average reliability of the transcripts was 98% (96% to 100%).

Data coding

The teams’ plans for AAC assessment in pretest, posttest, and generalization were coded across the following categories: (a) student communication needs; (b) student unmet communication needs; (c) student, family, and professional priorities; (d) student vision skills; (e) student hearing skills; (f) student motor skills; (g) student receptive language skills; (h) student expressive communication skills; (i) student literacy skills; (j) student symbol representation skills; (k) student cognitive organization skills; (l) partner supports to communication; (m) partner limitations to communication; (n) environmental supports to communication; (o) environmental limitations to communication; (p) student involvement in the assessment; (q) family involvement
in the assessment; and (r) professional involvement in the assessment. The operational definitions of the coding categories are included in Appendix H. The categories addressed students’ communication needs, skills, and opportunities (Beukelman & Mirenda, 2013), and were based on the AAC assessment components recommended by Light et al. (1998).

Three graduate students in speech-language pathology were trained in the operational definitions of the coding categories using transcripts from the pilot study (Birmingham & Light, 2016). They read and re-read each transcript for each assessment component and identified occurrences and non-occurrences on the transcription coding sheet (Appendix I). Occurrences were defined as any speakers’ reference to an assessment component at any point during the meeting. Non-occurrences were defined as no reference to an assessment component during the meeting. The graduate students coded occurrences and non-occurrences of each assessment component in transcripts from the pilot study (Birmingham & Light, 2016). Their coding was then compared to the researcher’s. Differences were resolved through discussion and revision of the operational definitions until the students reached 90% agreement with the researcher.

After the graduate students reached a standard of 90% agreement, they coded occurrences and non-occurrences of each assessment component in the transcripts from the current study. The researcher deleted instructions from transcripts before each graduate student independently coded 12 transcripts. Random numbers (i.e., Microsoft Excel) were assigned to the transcripts, and transcripts were assigned to the graduate students in order of the random numbers. The graduate students were blind to the conditions (i.e., pre- or posttest, experimental or control group). They read and re-read transcripts for each assessment component and identified occurrences and non-occurrences on the transcription coding sheet (Appendix I).
Reliability of the coding

Thirty-three percent of the transcripts from the current study were selected from each condition (pretest, posttest, and generalization in the experimental and control groups). Random numbers were used to select and assign the transcripts to the graduate students. Each graduate student independently coded an additional 7 to 9 transcripts. The researcher calculated reliability by determining the number of agreements divided by the total number of agreements and disagreements and multiplying by 100 (Table 2-3). An agreement was defined as an identified occurrence (or non-occurrence) of an assessment component within a transcript that corresponded to another coder’s identified occurrence (or non-occurrence). A disagreement was defined as an identified occurrence (or non-occurrence) of an assessment component within a transcript that did not correspond with another coder’s identified occurrence (or non-occurrence). The average agreement was 94.6% (range of 89% to 100% across transcripts). The graduate students resolved disagreements through discussion.

Table 2-3: Reliability of coding across graduate students and transcripts.

<table>
<thead>
<tr>
<th>Transcript</th>
<th>Condition</th>
<th>Agreement between graduate students 1 &amp; 2 (%)</th>
<th>Agreement between graduate students 1 &amp; 3 (%)</th>
<th>Agreement between graduate students 2 &amp; 3 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pretest control</td>
<td>94</td>
<td>89</td>
<td>94</td>
</tr>
<tr>
<td>2</td>
<td>Pretest control</td>
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<td>89</td>
<td>89</td>
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<td>3</td>
<td>Pretest experimental</td>
<td>94</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>4</td>
<td>Pretest experimental</td>
<td>94</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>5</td>
<td>Posttest control</td>
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<td>94</td>
<td>94</td>
</tr>
<tr>
<td>6</td>
<td>Posttest control</td>
<td>94</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>7</td>
<td>Posttest experimental</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>8</td>
<td>Posttest experimental</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>9</td>
<td>Generalization control</td>
<td>94</td>
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<tr>
<td>11</td>
<td>Generalization experimental</td>
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<td>100</td>
<td>100</td>
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<tr>
<td>12</td>
<td>Generalization experimental</td>
<td>100</td>
<td>100</td>
<td>94</td>
</tr>
</tbody>
</table>
Procedural reliability

After the transcriptions were coded, twenty-two percent of the recordings were randomly selected from each condition (pretest, posttest, and generalization in the experimental and control groups) and reviewed for procedural reliability. The graduate students listened to the recordings to check the researcher’s adherence to the procedures. They used the procedural reliability checklist to confirm the researcher described the study, and provided the correct instructions in each condition. The average procedural reliability was 100%. The procedural reliability checklist is included in Appendix J.

Data analysis

A mixed analysis of variance (ANOVA) was used to determine main effects and interactions of Group and Time (Hancock & Mueller, 2010). The between-subjects factor was Group (control or experimental) and the within-subjects factors was Time (pre- or posttest). Case Study Order (AB and BA) was also included as a factor to make sure there were no confounding effects. Planned paired-samples t-tests were used to determine whether there were statistically significant differences between pre- and posttests in the control and experimental groups (Kirk, 2013). Because parents and grandparents participated with professionals in generalization, an independent samples t-test was used to determine statistically significant differences between the control and experimental groups in generalization (Kirk, 2013).
Chapter 3

Results

The mean number of assessment components in each group in the pre- and posttest plans for the AAC assessments is included in Figure 3-1.

![Figure 3-1: Mean number of assessment components for control and experimental groups’ plans in pre- and posttests out of 18 possible assessment components.](image)

Pretest performance

An independent samples $t$-test was used to compare the teams’ pretest scores across conditions. There was no statistically significant difference between the control and experimental groups in the pretest, $t (10) = -.172, p = .867$. Teams in both the control and experimental groups described less than half (44%) of the assessment components in their plans for the case studies in the pretest. With the SETT Framework alone, the teams in the control group described
a mean of 8.17 assessment components ($SD = 1.72$). The pretests in the control group were an average of 11 min, 44 sec (range of 5 min, 38 sec to 16 min, 26 sec). The teams in the experimental group described a mean of 8.33 assessment components ($SD = 1.63$). The pretests in the experimental group were an average of 11 min, 57 sec (range of 7 min, 32 sec to 15 min, 44 sec).

**Posttest performance**

The teams in the control group described a mean of 7.83 assessment components in the posttest ($SD = 2.04$). With the SETT Framework alone, they demonstrated no gain compared to the pretest ($M = −0.33, SD = 1.03$). The posttests in the control group were an average of 8 min, 9 sec (range of 3 min, 4 sec to 12 min, 51 sec). The teams in the experimental group described more assessment components in their assessment plans for case studies in the posttest ($M = 16, SD = 2.52$) than in their plans in the pretest. With the addition of the AAC Assessment Checklist to the SETT Framework, they included a mean of 16 assessment components in their plans and demonstrated an average gain of $+7.67$ assessment components ($SD = 3.50$) compared to the pretest. The posttests in the experimental group were an average of 23 min, 28 sec (range of 7 min, 18 sec to 37 min, 5 sec).

A summary of the number of assessment components in the pre- and posttest plans for the AAC assessments across teams in each group is included in Table 3-1.
**Table 3-1:** The number of assessment components in the control and experimental groups’ plans in pre- and posttests out of 18 possible assessment components.

<table>
<thead>
<tr>
<th>Team</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
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</tr>
<tr>
<td>B</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>9</td>
<td>−1</td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>7</td>
<td>+1</td>
</tr>
<tr>
<td>E</td>
<td>6</td>
<td>4</td>
<td>−2</td>
</tr>
<tr>
<td>F</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>8.17 (1.72)</td>
<td>7.83 (2.04)</td>
<td>−0.33 (1.03)</td>
</tr>
<tr>
<td><strong>Experimental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>6</td>
<td>18</td>
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</tr>
<tr>
<td>L</td>
<td>8</td>
<td>18</td>
<td>+10</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>8.33 (1.63)</td>
<td>16 (2.53)</td>
<td>+7.67 (3.50)</td>
</tr>
</tbody>
</table>

A mixed analysis of variance (ANOVA) was used to determine main effects and interactions (Hancock & Mueller, 2010). An analysis of the studentized residuals showed that there was normality, as assessed by the Shapiro-Wilk test of normality. There were no outliers as assessed by no studentized residuals greater than ± 3 standard deviations. Mauchly’s test of sphericity indicated that the assumption of sphericity was met for the interaction. Accepting the assumption of sphericity indicates that the result of the interaction was not biased and no adjustment to the test was needed. Results of the ANOVA are included in Table 3-2.
Table 3-2: Analysis of variance (ANOVA) for time, group, and case study order.

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>$\eta^2_p$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>1</td>
<td>23.585</td>
<td>.747</td>
<td>.001</td>
</tr>
<tr>
<td>Case Study Order</td>
<td>1</td>
<td>.943</td>
<td>.105</td>
<td>.360</td>
</tr>
<tr>
<td>Group × Case Study Order</td>
<td>1</td>
<td>1.849</td>
<td>.188</td>
<td>.211</td>
</tr>
<tr>
<td>Error</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>21.511</td>
<td>.729</td>
<td>.002</td>
</tr>
<tr>
<td>Time × Group</td>
<td>1</td>
<td>25.60</td>
<td>.762</td>
<td>.001</td>
</tr>
<tr>
<td>Time × Case Study Order</td>
<td>1</td>
<td>.178</td>
<td>.022</td>
<td>.684</td>
</tr>
<tr>
<td>Time × Group × Case Study Order</td>
<td>1</td>
<td>.711</td>
<td>.082</td>
<td>.424</td>
</tr>
<tr>
<td>Error (Time)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was a statistically significant interaction between Time and Group, $F(1, 8) = 25.60, p = .001$. Teams in the experimental group described more assessment components in the posttest than teams in the control group. There was no statistically significant interaction between Time and Case Study Order, $F(1, 8) = 0.178, p = .684$. The order of the case studies did not affect the results. There was no statistically significant three-way interaction, $F(1, 8) = 0.711, p = .424$.

Planned paired-samples $t$-tests were used to determine whether there were statistically significant differences between pre- and posttests in the control and experimental groups (Kirk, 2013). There was no statistically significant difference between the pre- and posttest in the control group ($t(5) = −.791, p = .465$). There was a statistically significant difference between the pre- and posttest in the experimental group ($t(5) = 5.362, p = .003$). Teams in the experimental group described more assessment components in the posttest than the pretest. Planned independent-samples $t$-tests were used to determine whether there was a statistically significant difference between the control and experimental groups in the posttest. There was a statistically significant difference between the control and experimental groups in the posttest ($t
Teams in the experimental group described more assessment components in the posttest than teams in the control group.

**Assessment components in pre- and posttests**

A summary of the percentage of teams in each group that included each assessment component in pre- and posttest plans for the AAC assessments of the case studies is included in Table 3-3.

**Table 3-3**: The percentage of teams in each group that included each assessment component in their plans in the pre- and posttests.

<table>
<thead>
<tr>
<th>Assessment components</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>Communication needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication needs</td>
<td>100</td>
<td>66</td>
</tr>
<tr>
<td>Unmet communication needs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Student, family, and professional priorities</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>Student skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vision</td>
<td>50</td>
<td>16</td>
</tr>
<tr>
<td>Hearing</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Motor</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Receptive language</td>
<td>66</td>
<td>50</td>
</tr>
<tr>
<td>Expressive communication</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Literacy</td>
<td>50</td>
<td>83</td>
</tr>
<tr>
<td>Symbol representation</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>Cognitive organization</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Partner and environmental supports and limitations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner supports</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Partner limitations</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Environmental supports</td>
<td>66</td>
<td>50</td>
</tr>
<tr>
<td>Environmental limitations</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Family</td>
<td>66</td>
<td>50</td>
</tr>
<tr>
<td>Professionals</td>
<td>83</td>
<td>66</td>
</tr>
</tbody>
</table>
In the pretest with the SETT Framework alone, most of the teams (more than 60%) in the control group described communication needs; student, family, and professional priorities; motor skills; receptive language; expressive communication skills; environmental supports; and inclusion of families and other professionals in the assessment. In the pretest, most of the teams in the experimental group described communication needs; motor skills; expressive communication; partner supports; and inclusion of families and other professionals in the assessment.

In the posttest, with the SETT Framework alone, most of the teams (more than 60%) in the control group described communication needs; student, family, and professional priorities; motor skills; expressive communication; literacy skills; and inclusion of other professionals in the assessment. Most of the teams failed to describe unmet communication needs; vision; hearing; receptive language; symbol representation; cognitive organization; partner supports; partner limitations; environmental supports; environmental limitations; and inclusion of students and families in the assessment.

In the posttest, with the addition of the AAC Assessment Checklist to the SETT Framework, most of the teams (more than 60%) in the experimental group described communication needs; unmet communication needs; student, family, and professional priorities; vision skills; hearing skills; motor skills; receptive language skills; expressive communication skills; literacy skills; symbol representation skills; partner supports; partner limitations; environmental supports; and environmental limitations; and inclusion of students; families; and other professionals in the assessment. Only 50% of the teams described assessment of students’ cognitive organization skills.
Generalization to actual AAC assessments

A summary of the mean number of assessment components in the control and experimental groups’ plans for actual AAC assessments of children with CCN in generalization is included in Figure 3-2.

![Figure 3-2: Mean number of assessment components in the control and experimental groups’ plans for actual AAC assessments during the generalization condition out of 18 possible assessment components.](image)

An independent samples t-test was used to determine whether there was a statistically significant difference between the control and experimental groups in the generalization phase (Kirk, 2013). There was a statistically significant difference between the groups ($t(10) = 5.118, p = .016$). Teams in the experimental group described more components when planning actual AAC assessments in the generalization phase ($M = 17.17, SD = 1.17$) than teams in the control group ($M = 10, SD = 3.22$). There was also less variability across the teams in the experimental
group than in the control group. A summary of the number of assessment components in the teams’ generalization plans for the actual AAC assessments is included in Table 3-4.

**Table 3-4:** The number of components in plans for actual AAC assessments out of 18 possible assessment components.

<table>
<thead>
<tr>
<th>Team</th>
<th>Generalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>15</td>
</tr>
<tr>
<td>B</td>
<td>7</td>
</tr>
<tr>
<td>C</td>
<td>13</td>
</tr>
<tr>
<td>D</td>
<td>8</td>
</tr>
<tr>
<td>E</td>
<td>9</td>
</tr>
<tr>
<td>F</td>
<td>8</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>10 (3.22)</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>17</td>
</tr>
<tr>
<td>H</td>
<td>15</td>
</tr>
<tr>
<td>I</td>
<td>18</td>
</tr>
<tr>
<td>J</td>
<td>18</td>
</tr>
<tr>
<td>K</td>
<td>17</td>
</tr>
<tr>
<td>L</td>
<td>18</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>17.17 (1.17)</td>
</tr>
</tbody>
</table>

The percentage of teams in each group that included each assessment component in the generalization plans for actual AAC assessments is included in Table 3-5.
Table 3-5: The percentage of teams in each group that included each component in their plans for actual AAC assessments during generalization.

<table>
<thead>
<tr>
<th>Assessment components</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication needs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication needs</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Unmet communication needs</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>Student, family, and professional priorities</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td><strong>Student skills</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vision</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Hearing</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>Motor</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Receptive language</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Expressive communication</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Literacy</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Symbol representation</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>Cognitive organization</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td><strong>Partner and environmental supports and limitations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner supports</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Partner limitations</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>Environmental supports</td>
<td>66</td>
<td>83</td>
</tr>
<tr>
<td>Environmental limitations</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td><strong>Team</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>Family</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Professionals</td>
<td>50</td>
<td>83</td>
</tr>
</tbody>
</table>

In generalization with the SETT Framework alone, most of the teams in the control group (more than 60%) described communication needs; unmet communication needs; student, family, and professional priorities; motor skills, receptive language; expressive communication; symbol representation; partner supports; and environmental supports. Most of the teams failed to describe vision; hearing; literacy; cognitive organization; partner limitations; environmental limitations; and inclusion of students; families; and other professionals in the assessment. The teams’ plans for AAC assessment averaged 45 min, 27 sec (range of 8 min, 36 sec to 143 min, 13 sec).

In generalization, with the addition of the AAC Assessment Checklist to the SETT Framework, most of the teams in the experimental group (more than 60%) described comprehensive assessment plans that included student communication needs; unmet
communication needs; student, family, and professional priorities; vision skills; hearing skills; motor skills, receptive language; expressive communication; literacy; symbol representation; cognitive organization; partner supports; partner limitations; environmental supports; and environmental limitations; and inclusion of families and other professionals in the assessment. Only 50% described including students in the assessment. The teams’ plans for the actual AAC assessments averaged 39 min, 39 sec (range of 23 min, 0 sec to 77 min, 34 sec).

**Social validity**

**Teams**

Twenty of the professionals on the six teams in the experimental group (n = 20) completed an open-ended questionnaire about the AAC Assessment Checklist after they completed their plans for actual AAC assessments of children with CCN in generalization. Four professionals were unable to complete the open-ended questionnaire because of their schedules. A summary of their responses is included in Table 3-6.
Table 3-6: A summary of the professionals’ responses to open-ended social validity questionnaire about the AAC Assessment Checklist.

<table>
<thead>
<tr>
<th>Response</th>
<th>Number (%) of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think the AAC Assessment Checklist helped?</td>
<td></td>
</tr>
<tr>
<td>The checklist was very helpful.</td>
<td>20 (100%)</td>
</tr>
<tr>
<td>What do you like about the checklist?</td>
<td></td>
</tr>
<tr>
<td>It helped guide the discussion.</td>
<td>18 (90%)</td>
</tr>
<tr>
<td>It was organized.</td>
<td>16 (80%)</td>
</tr>
<tr>
<td>It reminded [professionals] to include important assessment components.</td>
<td>10 (50%)</td>
</tr>
<tr>
<td>It improved communication between the professionals and the parents.</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>What do you think would improve the checklist?</td>
<td></td>
</tr>
<tr>
<td>[Professionals] would not change it.</td>
<td>12 (60%)</td>
</tr>
<tr>
<td>[Professionals] would reword/redefine some of the assessment components.</td>
<td>8 (40%)</td>
</tr>
</tbody>
</table>

All of the professionals (100%) reported the checklist was helpful. For example, one SLP wrote, “The checklist was very helpful! I don't have much experience with AAC so I really learned a lot. Having a step-by-step list to talk about and discuss gave me a lot of new ideas to think about for my student. Discussing [his] receptive language skills with the team gave me a better idea of how much he understands.”

In response to the open-ended question asking what they liked about the AAC Assessment Checklist, 90% of the professionals (18 of the 20 professionals) reported that the checklist helped guide the discussion (“It is a great way to structure and move through a meeting.”); 80% (16 of the 20 professionals) reported that they liked its organization (“It is very organized and it addressed [his] communication needs.”); 50% (10 of the 20 professionals) reported that it reminded them to include important assessment components (“It reminded me to think about things we might have overlooked.”); and 25% (5 of the 20 professionals) reported that the checklist improved communication between the professionals and the parents (“Everyone was able to provide input.”).
In response to the open-ended question asking what they would change about the checklist, 60% of the professionals (12 of the 20 professionals) reported that they would not change anything (“I can't think of anything to improve the checklist.”); and 40% (8 of the 20 professionals) recommended changing the wording of some items or adding more examples (“Some terminology description might be helpful…what are symbol representation and cognitive organization skills?”).

**Families**

The parents (and grandmother) of the children with CCN in the experimental group (n = 8) also completed the open-ended social validity questionnaire about the AAC Assessment Checklist. A summary of their responses is included in Table 3-7.

**Table 3-7:** A summary of the parents’ responses to the open-ended questionnaire about the AAC Assessment Checklist.

<table>
<thead>
<tr>
<th>Response</th>
<th>Number (%) of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think the AAC Assessment Checklist helped?</td>
<td>8 (100%)</td>
</tr>
<tr>
<td>The checklist was helpful.</td>
<td></td>
</tr>
<tr>
<td>What do you like about the checklist?</td>
<td>7 (88%)</td>
</tr>
<tr>
<td>It helped guide the discussion.</td>
<td></td>
</tr>
<tr>
<td>It identified communication needs.</td>
<td>5 (63%)</td>
</tr>
<tr>
<td>It improved communication between the professionals and the parents.</td>
<td>4 (50%)</td>
</tr>
<tr>
<td>What do you think would improve the checklist?</td>
<td>6 (75%)</td>
</tr>
<tr>
<td>[Professionals] would not change it.</td>
<td></td>
</tr>
<tr>
<td>[Professionals] would reword/redefine some of the assessment components.</td>
<td>2 (25%)</td>
</tr>
</tbody>
</table>

All of the parents (100%) reported the checklist was helpful (“Extremely helpful in identifying [his] needs for improvement and direction for [his] team.”). In response to the open-
ended question asking what they liked about the AAC Assessment Checklist, 88% of the parents (7 of the 8 parents) reported that the checklist helped guide the discussion (“The checklist guided the conversation and identified needs that were not being addressed for [student].”); 63% (5 of the 8 parents) reported that it identified communication needs (“It really helped define his needs.”); and 50% (4 of the 8 parents) reported that it improved communication between professionals and parents (e.g., “I cannot tell you enough just how important your assessment checklist is for students with communication needs…I have been noticing better just how many good communication skills [she] has already. I am embarrassed to say, I have underestimated some current and potential skills. The meeting was so positive and realistic, focusing on her strengths and needs. I left with a better understanding of how the therapist looks at the situation.”).

In response to the open-ended question asking what they would change about the checklist, 75% of the parents (6 of the 8 parents) reported that they would not change anything, and 25% (2 of the 8 parents) reported that it would be helpful to change the wording (e.g., “Not all parents will know/understand what's being asked. Some terms may need explained.”).
Chapter 4
Discussion

Without effective AAC assessment and intervention, children with CCN are unable to participate in home, school, and community environments. The goal of the study was to determine the effects of a checklist on school teams’ plans for AAC assessment. The checklist was used to plan AAC assessments for case studies and for actual assessments of children with CCN. The use of the checklist in addition to the SETT Framework increased the number of assessment components that teams described in their plans for AAC assessment. This is an important step toward improving outcomes for children with CCN. The results of this study have important implications for clinical and education practice. This chapter discusses the results including the teams’ performances with only the SETT Framework, the effects of the AAC Assessment Checklist, and the generalization to plans for actual AAC assessments of children with CCN. The chapter also discusses implications for practice, limitations of the study, and future research directions.

Teams’ plans using only the SETT Framework

In the pretests with only the SETT Framework, most of the teams failed to describe important components of AAC assessments, such as sensory perceptual skills; receptive language; literacy; symbol representation; cognitive organization; partner supports; partner limitations; environmental supports; environmental limitations; and inclusion of students in the AAC assessment. These assessment components have been highlighted as important elements of AAC assessments in the research (Beukelman & Mirenda, 2013; Light et al., 1998). Omission of
these components is likely to negatively impact assessment results, and lead to ineffective intervention.

The results were not unexpected. The research suggests that teams are often unprepared to provide AAC assessment and intervention (Beukelman & Mirenda, 2013; Costigan & Light, 2010). Recent research demonstrates that SLPs’ plans for AAC assessment are typically not comprehensive. For example, Birmingham and Light (2016) reported most SLPs (more than 60%) failed to describe important assessment components (including unmet communication needs; student, family, and professional priorities; vision; hearing; literacy; symbol representation; cognitive organization; partner supports; partner limitations; environmental supports; environmental limitations; and inclusion of students, families, and professionals) in pretest plans for AAC assessments without supports. Dietz et al. (2012) also reported general practice SLPs’ plans for AAC assessments were not comprehensive. They failed to describe important components (including sensory perceptual and motor skills, and barriers to communication) in interviews about AAC assessment.

In comparison to the SLPs in the pilot study by Birmingham and Light (2016), the multidisciplinary teams in the current study described more assessment components in their pretest plans for AAC assessments. The SLPs in the pilot study described about six assessment components in the pretest, but the multidisciplinary teams in the current study described about eight assessment components. The teams in the current study described two assessment components, receptive language and inclusion of families, more frequently than the SLPs in the pilot study. There might be two reasons for the differences between the SLPs’ plans and the teams’ plans for assessment in the current study. First, it is recommended that teams complete AAC assessment and intervention to consider the range of communication needs and skills (Beukelman & Mirenda, 2013; Downing, 2005). The teams in the current study might have described more components in their plans for assessment because there were more team members
representing multiple disciplines. Second, the SETT Framework was used in the current study to organize information about AT in the pretest (Zabala, 2005), but it was not used in the pilot study. The teams might have described more components in their plans for assessment because they received copies of the SETT Framework in pre- and posttests. SLPs in the pilot study did not receive copies of the SETT Framework in the pre- and posttests (Birmingham & Light, 2016).

Although the teams in the current study described two more assessment components than the SLPs in the pilot study, their plans for AAC assessment were not comprehensive. On average, the teams omitted more than half (56%) of the important assessment components described in the research. There might be three reasons the teams’ plans were not comprehensive with the SETT Framework alone. The first reason might be that many professionals are unprepared to provide AAC assessment and intervention (e.g., Costigan & Light, 2010). They might not know what to include in AAC assessments. Fifty percent of the professionals in the control group reported having completed an undergraduate and/or graduate course in AAC, and 83% reported having attended an inservice. There are no data about the instructional content and/or approaches of these trainings. Only 66% of teams described student, family, and professional priorities, receptive language, environmental supports, and including families; 50% described vision, literacy, and partner supports; and 33% described symbol representation in the pretest. None of the teams described unmet communication needs; hearing; cognitive organization; partner limitations; environmental limitations; and including students in the pre- and posttests. The results suggest professionals in the control group might not know what components to include in an AAC assessment.

The second reason the teams’ plans for AAC assessment were not comprehensive might be that AAC assessments are complex (Beukelman & Mirenda, 2013) - too complex for teams to reliably complete from memory alone. The research suggests that there are 18 important components to include in AAC assessments. It might have been difficult for teams to remember
all of the components. Teams in the control group were inconsistent in the assessment components they described between pre- and posttests. For example, two teams that described student, family, and professional priorities in the pretest, did not describe them in the posttest. The results suggest the teams might have been unable to remember best practices for AAC assessment.

The third reason the teams’ plans for AAC assessment were not comprehensive might be that the SETT Framework was nonspecific, or that it was used incorrectly. The SETT Framework is intended to organize information about AT, but its questions are only guidelines (Zabala, 1995) and do not prompt consideration of specific assessment components. The teams in the control group typically read each question and provided general responses (“What are the functional areas of concern? What are the barriers to student progress? What are the supports to student progress?”) but their responses were not specific to AAC. For example, “What are functional areas of concern? Obviously, his communication,” “Barriers to his progress would be his CP, right?” and “The only supports that we really have…are speech, OT, and PT.” The results suggest that the SETT Framework was not specific to AAC assessment, or that it was used incorrectly.

There was variation in the number of assessment components included across the teams’ plans for AAC assessment in the pre- and posttests. The variation in the control group might be related to the teams’ composition, education, and/or experience, but the sample size (n = 6) is too small to determine the effect of each of these factors. These issues require future research.

**Effect of the addition of the AAC Assessment Checklist**

With the addition of the AAC Assessment Checklist to the SETT Framework, the teams in the experimental group provided more comprehensive plans for AAC assessment in the
posttest. Most of the teams (more than 60%) in the experimental group described student communication needs; unmet communication needs; student, family, and professional priorities; vision; hearing; motor skills; receptive language; expressive communication skills; literacy skills; symbol representation; partner supports; partner limitations; environmental supports; environmental limitations; and inclusion of students; families; and other professionals.

The addition of the AAC Assessment Checklist to the SETT Framework reduced errors of omission across assessment components between the pre- and posttests (Table 3-3). For example, 33% or fewer of the teams in the experimental group described unmet communication needs, student, family, and professional priorities, hearing, receptive language, symbol representation, cognitive organization, partner limitations, environmental limitations and including students in the assessment in the pretest, but most teams (between 50% and 100%) described them in the posttest. The reduction in errors of omission improved teams’ adherence to best practice and increased the number of assessment components described in the Participation Model.

The results were not unexpected based on the pilot study of the AAC Assessment Checklist with SLPs. The SLPs in the pilot study increased the number of components included in their plans for AAC assessment between pre- and posttests when provided with the AAC Assessment Checklist (Birmingham & Light, 2016). The teams in the experimental group in this study also increased the number of components included in their plans for AAC assessment between pre- and posttests with the AAC Assessment Checklist. There might be three mechanisms that reduced errors and improved adherence to best practice including establishing standards, supporting memory, and improving teamwork and communication (Hales & Pronovost, 2006; Hales et al., 2008; Russ et al., 2013).

The AAC Assessment Checklist might have reduced errors and improved adherence to best practice by establishing standards for AAC assessment. Only 33% of the professionals in the
experimental group reported having completed an undergraduate and/or graduate course in AAC, and 66% reported having attended an inservice. There are no data about their instructional content and/or approaches. They might have been uncertain about the components required in AAC assessments. The results suggest that the addition of the AAC Assessment Checklist to the SETT Framework in the posttest introduced teams to the important AAC assessment components and established standards for AAC assessment. Research on checklists in ICUs (Berenholtz et al., 2004) demonstrates that checklists establish clear standards and improve practice.

The AAC Assessment Checklist might have reduced errors and improved adherence to best practice by supporting memory (e.g., Hales & Pronovost, 2006; Hales et al., 2008). The teams in the experimental group might have been unable to remember the 18 assessment components. The SETT Framework required teams to recall assessment components with general questions as prompts, but the AAC Assessment Checklist provided specific prompts, and only required teams to recognize assessment components. It supported memory by summarizing best practices and chunking assessment components across work patterns or ‘pause points’. Fifty percent of the professionals reported that the checklist helped them recognize important assessment components. The professionals’ responses to the open-ended question, “What do you like about the checklist?” included, “It reminded me to think about things we might have overlooked,” and “It helped make sure we didn't miss anything.” Their responses suggest the addition of the AAC Assessment Checklist to the SETT Framework supported recognition of assessment components.

The AAC Assessment Checklist might have also reduced errors and improved adherence to best practice by improving teamwork and communication. AAC assessments require collaboration of multidisciplinary teams (Giangreco, 2000; Soto et al., 2001a; 2001b). The results suggest the addition of the AAC Assessment Checklist to the SETT Framework might have helped structure plans for AAC assessment and might have improved communication. The teams
in the experimental group used the AAC Assessment Checklist to structure discussion in their meetings; they described each assessment component in order of the checklist (e.g., What are the student’s communication needs? What are his unmet communication needs? Which of the student’s communication needs are priorities? etc.). Feedback from the professionals supported this hypothesis. They reported, “The checklist helped keep the discussion organized.” They also reported, “Everyone was able to provide input.”

Three teams in the experimental group described 100% of the assessment components in the posttest. These teams identified one professional (an SLP, SET, or OT) to read the checklist aloud while he or she and the other professionals “checked” each assessment component and recorded notes on their copies of the AAC Assessment Checklist. For example, “Okay. There’s a lot of questions, that’s helpful. I am going to start at the bottom with ‘Who’s involved in the assessment?’ He’s involved and his family is involved. We can just check that.” The results suggest it might be effective to use the checklist to structure the meeting and identify one professional to read the checklist aloud (e.g., Gawande, 2009; Haynes et al., 2008).

Teams in the current study and SLPs in the pilot study by Birmingham and Light (2016) increased the number of components included in their plans for AAC assessment in the posttests. The teams in the experimental group included a mean of 16 of 18 assessment components (89%) and the SLPs in the experimental group in the pilot study also included a mean of 16 of 18 assessment components. However, there were some differences in their plans for assessment. The assessment components the teams and the SLPs omitted were different. Only 66% of the teams in the experimental group in the current study described unmet communication needs and symbol representation in the posttest, and 50% described cognitive organization. All of the SLPs in the experimental group described unmet communication needs in the posttest, and 90% described symbol representation and cognitive organization. Only 70% of the SLPs in the experimental group described partner limitations, and inclusion of students in the assessment (Birmingham &
The differences were unexpected given the teams’ use of both the SETT Framework and the AAC Assessment Checklist. The results might be related to the teams’ understanding of checklist terminology. For example, two teams asked, “What are symbol representation and cognitive organization skills?” The results might also be related to the teams’ attention to the checklist.

In the current study, there was some variation across the teams in the number of assessment components included in their plans for AAC assessment in the posttests (range 12 to 18). All of the teams in the experimental group demonstrated gains in the posttest. Half of the teams included all assessment components in the posttest but the others included between 66% and 88% of the assessment components. It is possible that the variation across teams is related in some way to their composition, education, and/or experience. All of the teams in the experimental group described seating and positioning and selection techniques in their posttest plans for assessment, even if they did not include OTs and/or PTs on the teams; and teams with three professionals described as many assessment components as teams with seven professionals. Research is needed to investigate factors that might affect plans for assessment. The sample size (n = 6) is too small to determine the effect(s) of each factor.

Some teams in the experimental group seemed to benefit more from the addition of the AAC Assessment Checklist to the SETT Framework than others. The number of assessment components that teams described in the pretest varied from 6 to 10 assessment components (out of 18 assessment components), but the gain scores between the pre- and posttests varied from +3 to +12 assessment components. All of the teams in the experimental group with gain scores between +8 and +12 assessment components identified one professional to read the checklist aloud while he or she and others “checked” assessment components and recorded notes on their copies of the AAC Assessment Checklist – Team J also identified one professional to read the checklist aloud, but she missed two items (symbol representation and cognitive organization).
The teams in the experimental group with gain scores between +3 and +4 did not identify a professional to read the checklist aloud.

The results demonstrate that the teams in the experimental group considered significantly more assessment components with the AAC Assessment Checklist, but it is not clear that the teams considered all of the important parts of each component. According to the coding system, teams received credit for an assessment component if they considered at least one part of that component; the teams did not need to discuss all parts of each component. For example, teams received credit for references to communication needs if they discussed some part of communication needs (what the student needed to understand), even if information about another part (with whom, when, where, why, about what, or how the student needed to communicate) was omitted. Teams received credit for references to vision if they discussed some aspect of vision, even if information about visual acuity or field was omitted. The use of the AAC Assessment Checklist might be an important first step to providing comprehensive AAC assessments, but additional supports might be required to ensure that teams consider each assessment component in enough detail to support effective AAC assessment and intervention.

**Generalization**

The results seemed to generalize to plans for actual assessments for children with CCN and their families. With the SETT Framework alone, most of the teams in the control group (more than 60%) described the following assessment components during generalization: student communication needs; unmet communication needs; student, family, and professional priorities; motor skills, receptive language; expressive communication; symbol representation; partner supports; and environmental supports. Most of the teams failed to describe vision skills; hearing
skills; literacy; cognitive organization; partner limitations; environmental limitations; and inclusion of students; families; and other professionals in the assessment. They omitted important components of comprehensive AAC assessments.

With the AAC Assessment Checklist in addition to the SETT Framework, most of the teams (more than 60%) in the experimental group described student communication needs; unmet communication needs; student, family, and professional priorities; vision skills; hearing skills; motor skills, receptive language; expressive communication; literacy; symbol representation; cognitive organization; partner supports; partner limitations; environmental supports; and environmental limitations; and including families and other professionals. Only 50% of teams described including students in their plans for AAC assessment. Because the conditions changed with families of children with CCN working with the teams in the generalization condition, it is difficult to make direct comparisons between the teams’ plans for AAC assessment in posttest and generalization. However, the results suggest that the teams in the experimental group generalized the use of the AAC Assessment Checklist to plans for actual AAC assessments of children with CCN on their caseloads.

The results were not unexpected. As described earlier, checklists support the following mechanisms for reducing errors and improving adherence to best practice: establishing standards, supporting memory, and improving teamwork and communication (e.g., Berenholtz et al., 2004; Hales & Pronovost, 2006; Hales et al., 2008; Russ et al., 2013). The addition of the AAC Assessment Checklist to the SETT Framework might have helped to establish standards and/or support memory for professionals and parents of children with CCN when planning actual AAC assessments.

The results suggest the addition of the AAC Assessment Checklist to the SETT Framework also improved teamwork and communication. Checklists can be used to structure team briefings and debriefings (Haynes et al., 2009). Teams in the experimental group used the
AAC Assessment Checklist in this way, describing the assessment components in order of the checklist (What are the student’s communication needs? What are his unmet communication needs? Which of the student’s communication needs are priorities?). Professionals and parents in the experimental group reported that the checklist guided their meetings. For example, an SLP said, “[The checklist is] a great way to structure and move through a meeting.”

The AAC Assessment Checklist may have to increased the efficiency of planning actual assessments. It is interesting to note teams that described all 18 assessment components in generalization identified one professional (SLPs, SETs, or OTs) to read the checklist aloud while he or she and others “checked” assessment components. The meetings averaged 39 min, 39 sec (range of 23 min, 0 sec to 77 min, 34 sec) in the experimental group, and 45 min (range of 8 min, 36 sec to 143 min, 13 sec) in the control group.

The results of the social validity survey also suggest the addition of the AAC Assessment Checklist to the SETT Framework encouraged communication and flexibility around professionals’ roles and responsibilities. For example, an OT reported, “[The checklist] covers all areas of communication but also includes motor skills…it allows specialists to provide input about communication.”

Research suggests that checklists improve teamwork and communication (Russ et al., 2013). The results of the study suggest that the AAC Assessment Checklist might have supported positive communication and information within the team. For example, the mother of a child with CCN reported, “The meeting was so positive and realistic, focusing on her strengths and needs. I left with a better understanding of how the therapist looks at the situation.”

Although all of the teams benefitted from the addition of the AAC Assessment Checklist to the SETT Framework, there was variation across teams in the number of assessment components included in their plans for actual assessments in generalization. It is possible that the variation is related to the teams’ composition, education, and/or experience, or the characteristics
of children with CCN and their families. For example, teams might have described more 
assessment components for children cerebral palsy than children with ASD or Down syndrome 
because of their communication needs and skills. The sample size (n = 6) is too small to 
determine the effect of each factor.

It is difficult to make direct comparisons between the teams’ plans for AAC assessment 
in the posttest and generalization, but it is important to note that four teams in the control group 
increased the number of assessment components in their plans for AAC assessment between the 
posttest and generalization (range +1 to +5) without intervention. Teams in the control group 
described a mean of 7.83 assessment components in the posttest (range of 4 to 9), and 10 
assessment components in generalization (range of 7 to 15). There might be several hypotheses 
that explain the results. The increase in scores between the posttest and generalization for some 
teams in the control group might be related to the differences between a case study and an actual 
child with CCN. It might have been easier for teams to plan AAC assessments for their own 
students than for a case study. For example, an SLP commented on the case study, “I wish we had 
more information.” Alternatively, the addition of families to the teams might have supported 
better discussions and resulted in more comprehensive plans for AAC assessments. Parents might 
have contributed additional ideas to the discussion. Finally, the changes in scores for some teams 
in the control group from the posttest to generalization might reflect practice effects, but this 
seems unlikely because there were no gains in the control group between the pre- and posttest.

**Implications for practice**

The study has important implications for clinical and educational practice. The results 
suggest that school team plans for AAC assessments are not comprehensive under typical
conditions with the SETT Framework. Because school teams’ plans for AAC assessment are not comprehensive, many children with CCN may not receive appropriate AAC assessments and as a result, may not receive appropriate AAC intervention. The study provides evidence of the significant need for clinical tools to support AAC assessment.

The study provides evidence of the positive effects of the addition of the AAC Assessment Checklist to the SETT Framework. Teams in the experimental group described more components in their plans for AAC assessments, and generalized use of the checklist to their plans for actual assessments of children with CCN. The results are encouraging because the addition of the AAC Assessment Checklist to the SETT Framework seemed to reduce errors and improve teams’ adherence to best practice described in the Participation Model (Beukelman & Mirenda, 1998; Light et al., 1998; Schlosser et al., 2000). Teams received no specific instruction in the use of the checklist. The teams’ improvement followed a 1- to 3-minute preview of the AAC Assessment Checklist and the SETT Framework without specific instruction.

The addition of the AAC Assessment Checklist to the SETT Framework had a positive effect regardless of the teams’ composition. For example, teams were different sizes and included professionals with different educational backgrounds and experiences in special education and AAC. Teams also included families with different educational backgrounds and experience, and their children with CCN with different needs and skills between 4- and 15-years-old. The results suggest the addition of the AAC Assessment Checklist to the SETT Framework might also improve other school teams’ plans for AAC assessment. Results also suggest that the checklist may improve the efficiency of meetings to plan AAC assessments, potentially saving time for professionals and families.

The teams that described all 18 assessment components (100%) in the posttests and generalization phases all identified one professional to read the checklist aloud while the team “checked” each assessment component. The approach appeared to be effective; similarly
checklists in aviation and medicine often require pilots and nurses to read items aloud (FAA, 2016; Gawande, 2009). The results suggest that it might be beneficial to add instructions to the AAC Assessment Checklist that encourages teams to identify one professional to read the checklist aloud and others to “check” each assessment component as it is discussed.

The AAC Assessment Checklist was developed following an extensive literature review, feedback from experts and users, and pilot-testing. Despite the positive effects observed in this study, the results suggest revisions might improve the checklist, especially revisions to its terminology. The Federal Aviation Administration (2016) requires clear terminology for common understanding. Three teams in the experimental group reported difficulty understanding some of the terminology in the AAC Assessment Checklist (i.e., symbol representation, cognitive organization, partner supports and limitations, and environmental supports and limitations). It might help to revise the AAC Assessment Checklist to reword and/or provide definitions of some of the assessment components.

**Limitations**

There are several limitations of the study that should be considered. The first limitation of the study is the small number of teams (n = 12). An analysis completed before recruitment indicated that six teams in each group would provide enough power to detect an effect of the intervention. However, the small number of teams from a limited geographic area (rural and suburban Pennsylvania) limits the external validity of the study.

The second limitation of the study is the coding categories. The coding categories were based on the important assessment components identified in the research. However, because the
coding categories matched the AAC Assessment Checklist, they might have introduced measurement bias in favor of the experimental group that used the checklist.

The third limitation is the coding definitions. As described earlier, teams only needed to reference an assessment component; they did not need to discuss all of the important information within each assessment component in order to receive credit. While the assessment plans were much more comprehensive with the addition of the checklist, they may still have omitted important issues. Furthermore, the coding counted all assessment components equally, but the weight of assessment components is unclear and might vary depending on individual students with CCN. Research is needed to determine the relative effect of different assessment components on intervention planning and outcomes.

The AAC Assessment Checklist supported the teams in considering assessment components, but it did not provide the professionals with the knowledge and skills they needed to complete an AAC assessment. Gawande (2009) wrote, “A checklist cannot fly a plane” (p. 120). Similarly, a checklist cannot complete an AAC assessment. The AAC Assessment Checklist increased the number of assessment components in school teams’ plans for assessment, but it is not clear that the assessment plans were implemented effectively.

Another limitation of the study is the variation across teams. Teams included between two and seven professionals with different educational backgrounds and experience. The teams were randomly assigned to experimental and control groups. The results suggested variation across teams in their assessment plans, but it was not possible to determine the relative effects of team characteristics on outcomes given the small sample.

The final limitation of the study is that the AAC Assessment Checklist was used with the SETT Framework in posttests and generalization. The study cannot isolate the effect of the AAC Assessment Checklist alone (without the SETT Framework).
Future research

Future research is needed to replicate the results of the study with more school teams. Research is also needed to determine the effect of school teams’ composition, education, and/or experience on their plans for AAC assessment. Most importantly, future research is needed to determine the effect of the checklist not just on school teams’ plans for AAC assessment, but also their actual AAC assessments and interventions. The studies should include both primary dependent variables that measure school teams’ compliance with the AAC Assessment Checklist (adherence to best practices), as well as secondary variables that measure assessment and intervention outcomes for students with CCN (use of systems and strategies, device abandonment).

Research is needed to determine the effect of students with different disabilities on school teams’ plans for assessment and intervention. Lund et al. (2017) interviewed SLPs about assessments for two children, one with CP and one with ASD. The SLPs in their study described different assessment components for each child. For example, they described assessment of motor skills for children with CP, and assessment of cognitive and cognitive organizational skills for children with ASD.

Forty-one percent of the professionals in the current study reported having completed an undergraduate and/or graduate course in AAC, and 77% reported having attended an inservice in AAC. Research is needed to determine content and approaches for pre- and inservice to prepare professionals to provide AAC assessments. Research is also needed to determine which pre- and inservice instructional approaches are most effective, including clinical and educational experience, problem-based learning, and interdisciplinary education (Costigan & Light, 2010; Soto et al., 2001a; Reeves et al., 2004). It may be interesting to specifically investigate the effects of checklists within preservice and inservice training. Pretest-posttest control group designs might
be used to determine the effects of different instructional content and approaches on school teams’ knowledge and skills in AAC assessment.

Research is also needed to investigate strategies to support effective implementation and dissemination of the AAC Assessment Checklist. Specifically, research is needed to determine the effects of implementation and dissemination strategies on the uptake and use of the AAC Assessment Checklist by school teams and ultimately to evaluate the effects of checklist use on outcomes for children with CCN.

Conclusions

The current study contributes important information about the effect of the AAC Assessment Checklist used in conjunction with the SETT Framework on school teams’ plans for AAC assessment. The addition of the checklist to the SETT Framework increased the number of assessment components that teams included in their posttest and use of the checklist generalized to the teams’ plans for actual AAC assessments of children with CCN. The results of the study are encouraging because more comprehensive plans for AAC assessment might lead to more comprehensive, more effective, and more efficient AAC assessments and thereby support effective AAC interventions and improved outcomes for children with CCN.
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Appendix A

IRB Approval Letter

Date: January 15, 2016
From: Courtney Whetzel, IRB Analyst
To: Julia Birmingham

Type of Submission: Initial Study

Title of Study: The Effect of a Checklist on Multidisciplinary Augmentative and Alternative Communication (AAC) Assessment

Principal Investigator: Julia Birmingham
Study ID: STUDY00004104
Submission ID: STUDY00004104
Funding: Not Applicable
IND, IDE, or IDE: Not Applicable

Documents Approved:
- Birmingham Dissertation IRB Protocol (v.4), Category: IRB Protocol
- Birmingham Recruitment Letter Professionals (v. 1), Category: Recruitment Materials
- Birmingham Dissertation Checklist (v. 1), Category: Data Collection Instrument
- Birmingham Dissertation Consent Form Professionals (v.3), Category: Consent Form
- Birmingham Recruitment Letter Parents (v. 1), Category: Recruitment Materials
- Birmingham Recruitment Email Professionals (v. 1), Category: Recruitment Materials
- Birmingham Dissertation Consent Form Parents (v. 3), Category: Consent Form
- Birmingham Dissertation Recruitment Flyer Professionals (v. 1), Category: Recruitment Materials
- Birmingham Dissertation Case Studies (v. 1), Category: Data Collection Instrument
- Birmingham Dissertation Demographic Survey Parents (v. 1), Category: Data Collection Instrument
- Birmingham Recruitment Email Parents (v. 1), Category: Recruitment Materials
- Birmingham Dissertation Demographic Survey Professionals (v. 1), Category: Data Collection Instrument
- Birmingham Dissertation Instructions (v. 1), Category: Data Collection Instrument
- Birmingham Dissertation Recruitment Flyer Parents
On 1/15/2016, the IRB approved the above-referenced Initial Study. This approval is effective through 1/14/2017 inclusive. You must submit a continuing review form with all required explanations for this study at least 45 days before the study’s approval end date. You can submit a continuing review by navigating to the active study and clicking ‘Create Modification / CR’.

If continuing review approval is not granted before 1/14/2017, approval of this study expires on that date.

To document consent, use the consent documents that were approved and stamped by the IRB. Go to the Documents tab to download them.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within CATS IRB (http://irb.psu.edu). These requirements include, but are not limited to:

- Documenting consent
- Requesting modification(s)
- Requesting continuing review
- Closing a study
- Reporting new information about a study
- Registering an applicable clinical trial
- Maintaining research records

This correspondence should be maintained with your records.
Appendix B

Consent to Participate

CONSENT FOR RESEARCH
The Pennsylvania State University

Title of Project: The Effect of a Checklist on School Teams’ Plans for Augmentative and Alternative Communication (AAC) Assessment

Principal Investigator: Julia Birmingham, MS, CCC-SLP

Address: Department of Communication Sciences and Disorders
308 Ford Building, University Park, PA 16802

Telephone Numbers: Weekdays: 8:00 a.m. to 8:00 p.m. (610) 908-9929

Subject’s Printed Name: _______________________________

We are asking you to be in a research study.
Whether or not you take part is up to you. You can choose not to take part. You can agree to take part and later change your mind. Your decision will not be held against you.

This form gives you information about the research. Please ask questions about anything that is unclear to you and take your time to make your choice.

Some of the people who are eligible to take part in this research study may not be able to give consent because they are less than 18 years of age (a minor). Instead we will ask their parent(s)/guardian(s) to give permission for their participation in the study, and we may ask them to agree (give assent) to participate. Throughout the consent form, “you” always refers to the person who participates in the research study.

1. Why is this research study being done?
   We are doing this research to determine the effect of a checklist on school teams’ plans for augmentative and alternative communication assessment. We are asking you to participate because we want to improve communication for children with complex communication needs because of autism, cerebral palsy, Down syndrome, and other disabilities.

2. What will happen in this research study?
   To be a part of this study, you must have certification from the American Speech-Language-Hearing Association (ASHA), American Occupational Therapy Association (AOTA), American Physical Therapy Association (APTA) and/or the Department of Education.

   You must also:
   Be at least 18-years-old
   Be an assistive technology specialist, occupational therapist, physical therapist, speech-language pathologist, and/or special education teacher.
Work with at least one child with complex communication needs because of autism, cerebral palsy, Down syndrome, and/or other disabilities.

You will meet with the researcher for about an hour to complete a demographic survey about your education and experience and plan augmentative and alternative communication assessments for two boys with cerebral palsy and complex communication needs.

You also will meet with parents for an hour to talk about augmentative and alternative communication (communication boards, books, and computers). The researcher will observe and audio-record this meeting. It is important to know:

You do not have to answer any questions or do anything that you do not want to do. You can choose to stop at any time, and that will be fine.

The researcher will keep everything carefully protected (e.g., demographic surveys, audio recordings, and data from audio recordings).

The researcher will use the recordings to improve school teams’ plans for augmentative and alternative communication assessment.

3. **What are the risks and possible discomforts from being in this research study?**

No part of this research has any more risks than an assistive technology meeting with parents of a child with complex communication needs. You do not have to answer any questions or do anything that you do not want to do. You can choose to stop at any time, and that will be fine.

There is a low risk of loss of confidentiality if your information or your identity is obtained by someone other than the investigators, but precautions will be taken to prevent this from happening.

4. **What are the possible benefits from being in this research study?**

4a. **What are the possible benefits to you?**

You and your school team will have a chance to use a checklist that will improve your plans for augmentative and alternative communication assessment for a child on your caseload.

4b. **What are the possible benefits to others?**

You and your school team will have a chance to use a checklist that will improve your plans for augmentative and alternative communication assessment for other children with disabilities

5. **What other options are available instead of being in this research study?**

You may choose not to be in this research study.

6. **How long will I take part in this research study?**

You will attend a meeting with the researcher for about one hour. You will attend a meeting with parents and the researcher for another hour. The total time is two hours.
7. How will you protect my privacy and confidentiality if I decide to take part in this research study?

Efforts will be made to limit the use and sharing of your personal information to people who have a need to review this information.

- A list that matches your name with a letter-number code will be kept on a password-protected computer with the researcher.
- Audio recordings will be labeled with letter-number codes and kept on password-protected computers.
- Demographic surveys will be kept in locked cabinets and offices.

In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared without permissions granted in the optional section.

We will do our best to keep your participation in this research study confidential to the extent permitted by law but it is possible that other people may find out about your participation in this research study. For example, the following people/groups may check and copy records about this research.

- The Office for Human Research Protections in the U. S. Department of Health and Human Services
- The Institutional Review Board (committee that reviews and approves research studies)
- The Office for Research Protections.

Some of these records could contain information that personally identifies you. Reasonable efforts will be made to keep the personal information in your research record private but absolute confidentiality cannot be guaranteed.

8. What are the costs of taking part in this research study?

There are no costs to participate in the study. We will do everything we can to schedule meetings whenever they are convenient.

9. Will I be paid to take part in this research study?

You will not receive any payment or compensation for being in this research study.

10. What are my rights if I take part in this research study?

Taking part in this research study is voluntary.

- You do not have to be in this research.
- If you choose to be in this research, you have the right to stop at any time.
- If you decide not to be in this research or if you decide to stop at a later date, there will be no penalty or loss of benefits to which you are entitled.

11. If I have questions or concerns about this research study, whom should I call?
Please contact the first researcher, Julia Birmingham at (610) 908-9929 or by email at jlb733@psu.edu if you:
  ▪ Have any questions, complaints or concerns about the research.
  ▪ Believe you may have been harmed by being in the research study.

You may also contact the Office for Research Protections at (814) 865-1775, ORProtections@psu.edu if you:
  ▪ Have questions regarding your rights as a person in a research study.
  ▪ Have concerns or general questions about the research.
  ▪ You may also call this number if you cannot reach the research team or wish to talk to someone else about any concerns related to the research.

INFORMED CONSENT AND AUTHORIZATION TO TAKE PART IN RESEARCH

Signature of Person Obtaining Informed Consent

Your signature below means that you have explained the research to the subject or subject representative and have answered any questions he/she has about the research.

__________________________________________
Signature of person who explained this research

Date Time Printed Name

(Only approved investigators for this research may explain the research and obtain informed consent.)

Signature of Person Giving Informed Consent and Authorization

Before making the decision about being in this research you should have:

  Discussed this research study with a researcher
  Read the information in this form
  Had the opportunity to ask any questions

Your signature below means that you have received this information, have asked the questions you currently have about the research and those questions have been answered. You will receive a copy of the signed and dated form to keep for future reference.

Signature of Subject

By signing this consent form, you indicate that you voluntarily choose to be in this research and agree to allow your information to be used and shared as described above.

__________________________________________
Signature of Subject

Date Printed Name
Optional part(s) of the study

In addition to the main activities of the study, there are additional considerations related to the research.

The use of audio recordings and demographic information is an important part of this research. For the purpose of the study, we have outlined the steps we will take to preserve confidentiality and privacy to the greatest extent possible. Please consider how we may use this footage relative to discussions about what we have learned (for example, in publications or presentations, or for educational and training purposes), and whether or not we may keep these for future research (for example, if we wish to re-examine the data to learn additional information about the software and its use than we are now able to predict).

You can be in the main part of the research without agreeing to these optional parts.

Publications/Presentations

_____ I give permission for my data to be archived for use in publications/presentations.

_____ I do not give permission for my data to be archived for use in publications/presentations. The data will be destroyed on 12/17/2020.

Educational/Training Purposes

_____ I give permission for my data to be archived for educational and training purposes.

_____ I do not give permission for my data to be archived for educational and training purposes. The recordings will be destroyed on 12/17/2020.

Other Research

_____ I give permission for my data to be archived for research purposes outside of the present study.

_____ I do not give permission for my data to be archived for research purposes outside of the present study. The recordings will be destroyed on 12/17/2020.

Signature of Person Obtaining Informed Consent

Your signature below means that you have explained the optional part(s) to the research to the subject or subject representative and have answered any questions he/she has about the research.

_________________________ ____________________ _________________
Signature of person who explained this research Date Time Printed Name
Signature of Person Giving Informed Consent and Authorization

Before making the decision about being in this research you should have:

- Discussed this research study with a researcher
- Read the information in this form
- Had the opportunity to ask any questions

Your signature below means that you have received this information, have asked the questions you currently have about the research and those questions have been answered. You will receive a copy of the signed and dated form to keep for future reference.

Signature of Subject

By signing this consent form, you indicate that you voluntarily choose to be in this research and agree to allow your information to be used and shared as described above.

___________________________  __________  ________________
Signature of Subject     Date   Printed Name
CONSENT FOR RESEARCH
The Pennsylvania State University

Title of Project: The Effect of a Checklist on School Teams’ Plans for Augmentative and Alternative Communication Assessment

Principal Investigator: Julia Birmingham, MS, CCC-SLP

Address: Department of Communication Sciences and Disorders
308 Ford Building, University Park, PA 16802

Telephone Numbers: Weekdays: 8:00 a.m. to 8:00 p.m. (610) 908-9929

Subject’s Printed Name: ____________________________

We are asking you to be in a research study.
Whether or not you take part is up to you. You can choose not to take part. You can agree to take part and later change your mind. Your decision will not be held against you.
This form gives you information about the research. Please ask questions about anything that is unclear to you and take your time to make your choice.

Some of the people who are eligible to take part in this research study may not be able to give consent because they are less than 18 years of age (a minor). Instead we will ask their parent(s)/guardian(s) to give permission for their participation in the study, and we may ask them to agree (give assent) to participate. Throughout the consent form, “you” always refers to the person who participates in the research study.

1. Why is this research study being done?
   We are doing this research to determine the effect of a checklist on school teams’ plans for augmentative and alternative communication assessment. We are asking you to participate because we want to improve communication for children with complex communication needs because of autism, cerebral palsy, Down syndrome, and other disabilities.

2. What will happen in this research study?
   To be a part of this study, you must:

   Be the parent of a child with complex communication needs between the ages of 3- and 18-years old.

   OR

   Be a child with complex communication needs between the ages of 3- and 18-years old.
Parents will complete a demographic survey.

You will meet with your school team to talk about augmentative and alternative communication (communication boards, books, and computers). The researcher will observe and audio-record this meeting. It is important to know:

You do not have to answer any questions or do anything that you do not want to do. You can choose to stop at any time, and that will be fine.

The researcher will keep everything carefully protected (e.g., demographic surveys, audio recordings, and data from audio recordings).

The researcher will use the recording to improve school teams’ plans for augmentative and alternative communication assessment.

3. **What are the risks and possible discomforts from being in this research study?**

No part of this research has any more risk than meeting with your school team. You do not have to answer any questions or do anything that you do not want to do. You can choose to stop at any time, and that will be fine.

There is a low risk of loss of confidentiality if your information or identity is obtained by someone other than the investigators, but precautions will be taken to prevent this from happening.

4. **What are the possible benefits from being in this research study?**

4a. **What are the possible benefits to you?**

Your school team will have a chance to use a checklist that will improve their plans for augmentative and alternative communication assessment for your child.

4b. **What are the possible benefits to others?**

Your school team will have a chance to use a checklist that will improve their plans for augmentative and alternative communication assessment for other children with disabilities.

5. **What other options are available instead of being in this research study?**

You may choose not to be in this research study.

6. **How long will I take part in this research study?**

You will attend a meeting with your school team and the researcher for about one hour.

7. **How will you protect my privacy and confidentiality if I decide to take part in this research study?**

Efforts will be made to limit the use and sharing of personal information to people who have a need to review this information.
A list that matches your name with a letter-number code will be kept on a password-protected computer with the researcher.

Audio recordings will be labeled with letter-number codes and kept on password-protected computers.

Demographic surveys will be kept in locked cabinets and offices.

In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared without permissions granted in the optional section.

We will do our best to keep your participation in this research study confidential to the extent permitted by law but it is possible that other people may find out about your participation in this research study. For example, the following people/groups may check and copy records about this research.

- The Office for Human Research Protections in the U. S. Department of Health and Human Services
- The Institutional Review Board (committee that reviews and approves research studies)
- The Office for Research Protections.

Some of these records could contain information that personally identifies you. Reasonable efforts will be made to keep the personal information in your research record private but absolute confidentiality cannot be guaranteed.

8. What are the costs of taking part in this research study?
There are no costs to participate in the study. We will do everything we can to schedule meetings whenever they are convenient.

9. Will I be paid to take part in this research study?
You will not receive any payment or compensation for participating in this research study.

10. What are my rights if I take part in this research study?
Taking part in this research study is voluntary.
- You do not have to be in this research.
- If you choose to be in this research, you have the right to stop at any time.
- If you decide not to be in this research or if you decide to stop at a later date, there will be no penalty or loss of benefits to which you are entitled.

11. If I have questions or concerns about this research study, whom should I call?
Please contact the first researcher, Julia Birmingham at (610) 908-9929 or by email at jlb733@psu.edu if you:
- Have any questions, complaints or concerns about the research.
- Believe you may have been harmed by being in the research study.

You may also contact the Office for Research Protections at (814) 865-1775, ORProtections@psu.edu if you:
INFORMED CONSENT AND AUTHORIZATION TO TAKE PART IN RESEARCH

Signature of Person Obtaining Informed Consent

Your signature below means that you have explained the research to the subject or subject representative and have answered any questions he/she has about the research.

Signature of Person Giving Informed Consent and Authorization

Before making the decision about being in this research you should have:

- Discussed this research study with a researcher
- Read the information in this form
- Had the opportunity to ask any questions

Your signature below means that you have received this information, have asked the questions you currently have about the research and those questions have been answered. You will receive a copy of the signed and dated form to keep for future reference.

Signature of Subject

By signing this consent form, you indicate that you voluntarily choose to be in this research and agree to allow your information to be used and shared as described above.

Signature of Parent(s)/Guardian for Child

By signing this consent form, you indicate that you permit your child to be in this research and agree to allow his/her information to be used and shared as described above.

HRP-580 HSPO Template Version 06/19/2014
Optional part(s) of the study

In addition to the main activities of the study, there are additional considerations related to the research.

The use of audio recordings and demographic information is an important part of this research. For the purpose of the study, we have outlined the steps we will take to preserve confidentiality and privacy to the greatest extent possible. Please consider how we may use this footage relative to discussions about what we have learned (for example, in publications or presentations, or for educational and training purposes), and whether or not we may keep these for future research (for example, if we wish to re-examine the data to learn additional information about the software and its use than we are now able to predict).

You can be in the main part of the research without agreeing to these optional parts.

Publications/Presentations

_____ I give permission for my data to be archived for use in publications/presentations.

_____ I do not give permission for my data to be archived for use in publications/presentations. The data will be destroyed on 12/17/2020.

Educational/Training Purposes

_____ I give permission for my data to be archived for educational and training purposes.

_____ I do not give permission for my data to be archived for educational and training purposes. The recordings will be destroyed on 12/17/2020.

Other Research

_____ I give permission for my data to be archived for research purposes outside of the present study.

_____ I do not give permission for my data to be archived for research purposes outside of the present study. The recordings will be destroyed on 12/17/2020.

Signature of Person Obtaining Informed Consent

Your signature below means that you have explained the optional part(s) to the research to the subject or subject representative and have answered any questions he/she has about the research.

________________________________________________________________________

Signature of person who explained this research   Date   Time   Printed Name
Signature of Subject

By signing this consent form, you indicate that you voluntarily choose to be in this research and agree to allow your information to be used and shared as described above.

Signature of Subject ___________________ Date __________ Printed Name ______________

Signature of Parent(s)/Guardian for Child

By signing this consent form, you indicate that you have read the information written above and have indicated your choices for the optional part(s) of the research study.

Signature of Parent/Guardian ___________________ Date __________ Time ________ Printed Name ______________
Appendix C

Demographic Surveys

Augmentative and Alternative Communication (AAC) Assessment Study
Demographic Information

1. Name ________________________________________________________
2. Phone ________________________________________________________
3. Email ________________________________________________________
4. Gender
   ☐ Male
   ☐ Female
5. How old are you? _____________________________________________
6. What is your highest level of education?
   ☐ Bachelor’s Degree
   ☐ Master’s Degree
   ☐ Doctoral Degree
   ☐ Other:
7. Do you have licensure from your professional association (e.g., American Speech-Language-Hearing Association [ASHA], American Occupational Therapy Association [AOTA], American Physical Therapy Association [APTA]), and/or the Pennsylvania Department of Education?
   ☐ Yes
   ☐ No
8. How many years have you worked in special education? __________

Augmentative and alternative communication (AAC) includes the devices, techniques, and strategies that support or replace speech or written communication.

9. Did you receive preservice training in AAC while you were in college? If yes, approximately how many hours of preservice training? ______________
10. Did you receive preservice training in AAC while you were in graduate school? If yes, approximately how many hours of preservice training? ______________
11. Have you completed inservice training in AAC since you started working (e.g., conferences, inservice sessions, courses)? If yes, approximately how many hours of inservice training? ______________
Students with complex communication needs have little or no functional speech or writing because of developmental disabilities (e.g., autism, cerebral palsy, and intellectual disability), acquired neurological disabilities (e.g., traumatic brain injury), and degenerative neurological disabilities (e.g., muscular dystrophy).

12. Have you worked with students with complex communication needs? If yes, about how many students?

13. How old were the students? Check all that apply.

- N/A
- Less than 5-years old
- Between 5- and 8-years old
- Between 9- and 11-years old
- Between 12- and 14-years old
- Between 15- and 18-years old
- Between 19- and 21-years old

14. Have you assessed students with complex communication needs for AAC? If yes, about how many students?

15. How old were the students? Check all that apply.

- N/A
- Less than 5-years old
- Between 5- and 8-years old
- Between 9- and 11-years old
- Between 12- and 14-years old
- Between 15- and 18-years old
- Between 19- and 21-years old

16. What disabilities did the students have? Check all that apply.

- Developmental disabilities
- Autism spectrum disorders
- Cerebral palsy
- Down syndrome
- Intellectual disabilities
- Acquired neurological disabilities
- Traumatic brain injury
- Degenerative neurological disabilities
- Muscular dystrophy
- Other(s): _____________________________
Augmentative and Alternative Communication (AAC) Assessment Study  
Demographic Information for Parents of Children with Complex Communication Needs

1. Your name _____________________________________________________________

2. Email ________________________________________________________________

3. Phone ________________________________________________________________

4. Gender

   □ Male
   □ Female

5. How old are you? ______________________________________________________

6. What is your highest level of education?

   □ High school
   □ Some college
   □ Associate's Degree or Trade School
   □ Bachelor's Degree
   □ Master's Degree
   □ Doctoral Degree
   □ Other: _____________________________________________________________

7. Do you work (or have you worked)?

   □ Yes ________________________________________________________________
   □ No

8. Child's Name _________________________________________________________

9. Child’s Gender

   □ Male
   □ Female

10. How old is your child? ________________________________________________

11. What is your child’s grade? ____________________________________________

12. What is your child’s disability? _________________________________________

13. Describe your child's special education supports. Check all that apply.

Amount of special education support:

- Itinerant: Special education supports and services provided by special education personnel for 20% or less of the school day
- Supplemental: Special education supports and services provided by special education personnel for more than 20% of the day but less than 80% of the school day
- Full-Time: Special education supports and services provided by special education personnel for 80% or more of the school day

Type of special education support:

- Autism Support
- Blind-Visually Impaired Support
- Deaf and Hard of Hearing Support
- Emotional Support
- Learning Support
- Life Skills Support
- Multiple Disabilities Support
- Physical Support
- Speech and Language Support

14. Does your child attend his or her neighborhood school? (i.e., the school he or she would attend if he did not have an IEP)?

- Yes
- No

15. What do you hope will be the outcome of the meeting?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Appendix D

Case Studies

Augmentative and Alternative Communication (AAC) Assessment A

(poto)

Sam is a 7-year-old boy with cerebral palsy. He lives with his parents and brother in Pennsylvania. The family attends Wednesday and Sunday Services at the First Baptist Church. Sam loves reading with his dad and watching Spider-Man.

Sam answers questions with gestures and speech approximations. His parents report that he "is really hard to understand." He receives regular and special education at his elementary school. He also receives occupational, physical, and speech therapy.

Augmentative and Alternative Communication (AAC) Assessment B

(poto)

Daniel is a 9-year-old boy with cerebral palsy. He lives with his mother and siblings in Pennsylvania. The family speaks Spanish and English at home. Daniel loves reading with his sisters and watching the World Cup.

Daniel answers questions with gestures and speech approximations that are difficult to understand. His mother reports that he "needs to learn how to talk with more confidence." He receives regular and special education at his elementary school. He also receives occupational, physical, and speech therapy.
Appendix E

Student Environment Tasks Tools (SETT) Framework

SETT SCAFFOLD FOR GATHERING DATA—ANNOTATED
Collaboratively Gather and Analyze Information from a Variety of Sources

<table>
<thead>
<tr>
<th>EXAMINING CURRENT CONDITIONS TO ESTABLISH EDUCATIONAL NEED</th>
<th>STUDENT</th>
<th>ENVIRONMENTS</th>
<th>TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMATION RELATED SPECIFICALLY TO THE STUDENT, INCLUDING SPECIFIC AREAS OF CONCERN, SPECIAL NEEDS, CURRENT ACHIEVEMENT, INTERESTS, GOALS, ETC.</td>
<td>INFORMATION RELATED TO ANYONE WHO IS AROUND THE STUDENT OR ANYTHING THAT IS PROVIDED TO THE STUDENT.</td>
<td>INFORMATION SPECIFICALLY RELATED TO THE DETAILS OF THE TASKS THAT ARE CURRENTLY REQUIRED OF THE STUDENT OR WILL BE REQUIRED IN THE NEAR FUTURE.</td>
<td></td>
</tr>
</tbody>
</table>
· Build shared knowledge about the student that can be used to identify need for tools, guide decisions about tools, and assist in planning implementation and evaluation of effectiveness.  
· Determine what still needs to be known and how it can be found out.  
· Add additional information as it becomes available through evaluation, implementation, or discussion. | · Build shared knowledge about the environments in which the student is, or can be, expected to learn and grow. This information can be used to identify need for environmental supports and training, and assist in planning implementation and evaluation of effectiveness.  
· Determine what still needs to be known and how it can be found out.  
· Add additional information as it becomes available through evaluation, implementation or discussion. | · Build shared knowledge about the tasks that the student needs to do or learn to do that are currently difficult or impossible for the student to do at the expected level of independence.  
· This information can be used to identifying the type of tools needed, but will also play a critical role in planning implementation and evaluation of effectiveness.  
· Determine what still needs to be known and how it can be found out.  
· Add additional information as it becomes available through evaluation, implementation, discussion. |

· CIRCLE FUNCTIONAL AREA(S) OF CONCERN  
· UNDERLINE BARRIERS TO STUDENT PROGRESS  
· STAR SUPPORTS FOR STUDENT PROGRESS

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SETT forms and additional resources are available for download at http://www.joyzabala.com. Please provide feedback on effectiveness and suggestions for modifications/ revisions by email to joy@joyzabala.com.
SETT SCAFFOLD FOR GATHERING DATA
Collaboratively Gather and Analyze Information from a Variety of Sources
(use as many sheets as necessary to build shared knowledge)

Student: ___________________________ Date: _______________ Perspective: ___________________________

<table>
<thead>
<tr>
<th>DESCRIBE CURRENT CONDITIONS TO ESTABLISH EDUCATIONAL NEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDENT</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

- CIRCLE FUNCTIONAL AREA(S) OF CONCERN
- UNDERLINE BARRIERS TO STUDENT PROGRESS
- STAR SUPPORTS FOR STUDENT PROGRESS

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SETT forms and additional resources are available for download at http://www.joyzabala.com. Please provide feedback on effectiveness and suggestions for modifications/revisions by email to joy@joyzabala.com
Appendix F

Augmentative and Alternative Communication (AAC) Assessment Checklist

Each assessment check is included based on evidence that it will improve assessments for students with complex communication needs (CCN). Review and confirm each check.

<table>
<thead>
<tr>
<th>What are the student’s communication needs?</th>
<th>What are the student’s skills?</th>
<th>What are partner and environmental supports and limitations?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ What are the student’s communication needs?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What does the student need to understand?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With whom does the student need to communicate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why does the student need to communicate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About what does the student need to communicate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When and where does the student need to communicate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How does the student need to communicate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Which of the student’s communication needs are unmet?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Which of the student’s communication needs are priorities for the student? Family? School?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s vision skills? Visual field Visual acuity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the students’ hearing skills?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s motor skills? Gestures and signs Access to systems (Direct selection and/or switch) Seating and positioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s receptive language skills? Understanding words, morphology, and sentence structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s expressive communication skills? Turn-taking Natural speech and intelligibility About what and how does the student communicate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s literacy skills? Letter-sound correspondences Decoding Sight-word recognition Reading comprehension Spelling Writing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s symbol representation skills? Types of symbols (Objects, gestures, signs, photographs, line drawings, print)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are the student’s cognitive organization skills? Display (Grids, visual scenes) Symbol organization (Context, category, syntax, alphabet, other)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are partner supports to communication? Opportunities for communication Knowledge of AAC services, systems, and/or instructional strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are partner limitations to communication? Limited opportunities for communication Limited knowledge of AAC services, systems, and/or instructional strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are environmental supports to communication? Educational placement Environmental access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ What are environmental limitations to communication? Educational placement Limited environmental access Limited use (Student is unable to use the AAC system across environments)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Who is involved in the assessment?

□ Student

□ Family

□ Professionals
  - Instructional assistant
  - Regular education teacher
  - Special education teacher
  - Assistive technology specialist
  - Occupational therapist
  - Physical therapist
  - Speech-language pathologist
  - Others
Appendix G

Social Validity Questionnaire

Participant Questionnaire

1. Do you think the augmentative and alternative communication (AAC) assessment checklist helped?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. What do you like about the checklist?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3. What do you think would improve the checklist?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
## Appendix H

### Operational Definitions of Assessment Components

<table>
<thead>
<tr>
<th>Assessment Component</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication needs</td>
<td>Discussion about what the student needs to understand and with whom, when, where, why, about what and/or how he or she needs to communicate.</td>
<td>That certainly could be a good place to start...requesting favorite songs.</td>
</tr>
<tr>
<td>Unmet communication needs</td>
<td>Discussion about what the student does not currently understand and with whom, when, where, why, about what and/or how he or she does not currently communicate effectively.</td>
<td>There are things that, like, I don’t even know why she’s upset...nothing happened and she’s biting and pinching.</td>
</tr>
<tr>
<td>Student, family, and professional priorities</td>
<td>Discussion about unmet communication needs that students, families, and/or professionals consider most important.</td>
<td>That’s a big thing for mom, using [the bathroom]. Being able to tell her that he needs to use the bathroom.</td>
</tr>
<tr>
<td>Vision skills</td>
<td>Discussion about visual acuity and/or field. It also includes discussion about the type, size, placement, spacing and colors of symbols to accommodate vision.</td>
<td>I feel like for vision he does better with larger buttons... large buttons would be better.</td>
</tr>
<tr>
<td>Hearing skills</td>
<td>Discussion about hearing acuity and/or processing. It also includes discussion about auditory output.</td>
<td>Okay, she has mild hearing loss in both [ears]. The left [hearing aid]...the first week of school our new puppy ate the left [hearing aid], so she only has the right one. Which is...I’m okay with it because she usually doesn’t like both of them in anyway.</td>
</tr>
<tr>
<td>Assessment Component</td>
<td>Definition</td>
<td>Example</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Motor skills</td>
<td>Discussion about the range and accuracy of movement for gestures and signs, direct selection, and/or switch access. It includes discussion about seating and positioning.</td>
<td>She obviously doesn’t have the fine motor skills to speak with her hands. When she was little, we all went through a sign language course and we tried to use that with her when she was young. Obviously, she doesn’t have those fine motor skills.</td>
</tr>
<tr>
<td>Receptive language skills</td>
<td>Discussion about understanding spoken and/or written language, including vocabulary and sentence structure.</td>
<td>She has good receptive language. She can understand just about everything.</td>
</tr>
<tr>
<td>Expressive communication skills</td>
<td>Discussion about turn-taking patterns, initiation and response patterns, and the range and frequency of communicative functions and modes (natural speech production and intelligibility, gestures and signs, and/or aided symbols).</td>
<td>He will put your hand on the TV if he wants you to turn it off. He’ll hand you the remote if he wants to change channels.</td>
</tr>
<tr>
<td>Literacy skills</td>
<td>Discussion about reading and writing for communication. It includes letter-sound correspondence, decoding, sight-word recognition, spelling, reading comprehension and writing/typing.</td>
<td>I like to work on [letter-sound] correspondence and sight words, either as part of their articulation, or just in general finding words in alphabetical order or what not.</td>
</tr>
<tr>
<td>Symbol representation</td>
<td>Discussion about the symbols the student understands as representations of concepts. Symbols include vocalizations and speech approximations, gestures and signs, photographs, line drawings, symbols and/or written words.</td>
<td>He has some flexibility going from pictures to symbols...it’s better to work with photos.</td>
</tr>
<tr>
<td>Cognitive organization skills</td>
<td>Discussion about the way the student organizes and/or navigates symbols on grids and visual scene displays. It includes discussion about schematic (context), taxonomic (category), semantic-syntactic, alphabetic, and/or idiosyncratic organizations.</td>
<td>He’s able to understand grids...as far as symbol organization: I’ve only presented him with one board that doesn’t navigate. He’s not navigating.</td>
</tr>
<tr>
<td>Partner supports to communication</td>
<td>Discussion about communication partners’ knowledge and use of AAC services, systems, strategies, including providing wait time and expectant delay, responding to communicative attempts, asking open-ended questions, and modeling; and/or positive attitudes (provide opportunities for communication).</td>
<td>Knowledge of AAC service systems and/or instructional strategies...how do we get that level of support in the classroom?</td>
</tr>
<tr>
<td>Assessment Component</td>
<td>Definition</td>
<td>Example</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Partner limitations to communication</td>
<td>Discussion about communication restrictions related to communication partners’ lack of knowledge of AAC services, systems, strategies; and/or negative attitudes (limited opportunities for communication).</td>
<td>Sometimes... caregivers don’t provide opportunities because they forget.</td>
</tr>
<tr>
<td>Environmental supports to communication</td>
<td>Discussions about educational placement, environmental access, and/or funding that provide opportunities for communication.</td>
<td>I always have a visual... my wait symbol for when we’re waiting in line...Just having that across all environments and we work on it in the room so they know and it’s a visual.</td>
</tr>
<tr>
<td>Environmental limitations to communication</td>
<td>Discussion about restrictions related to educational placement, environmental access, and/or funding limit opportunities for communication.</td>
<td>The limited opportunities for communication... [are] in the pool.</td>
</tr>
<tr>
<td>Student involvement in the assessment</td>
<td>Discussion about gathering assessment information from students.</td>
<td>We would have to ask him about it.</td>
</tr>
<tr>
<td>Family involvement in the assessment</td>
<td>Discussion about gathering assessment information from families.</td>
<td>We would have to ask his parents about communication at home.</td>
</tr>
<tr>
<td>Professional involvement in the assessment</td>
<td>Discussion about gathering assessment information from professionals.</td>
<td>We would have to ask an OT.</td>
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</tbody>
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Appendix I
Transcription Coding Sheet

Transcription #

<table>
<thead>
<tr>
<th>Communication Needs (3)</th>
<th>□ Yes</th>
<th>□ No</th>
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<tbody>
<tr>
<td>□ Communication needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Unmet communication needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Student, family, and professional priorities</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills (8)</th>
<th>□ Yes</th>
<th>□ No</th>
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<tbody>
<tr>
<td>□ Vision skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Hearing skills</td>
<td></td>
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<tr>
<td>□ Motor skills</td>
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<td></td>
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<tr>
<td>□ Receptive language skills</td>
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<td></td>
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<tr>
<td>□ Expressive communication skills</td>
<td></td>
<td></td>
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<tr>
<td>□ Literacy skills</td>
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<td></td>
</tr>
<tr>
<td>□ Symbol representation skills</td>
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<tr>
<td>□ Cognitive organization skills</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Partner and Environmental Supports and Limitations (4)</th>
<th>□ Yes</th>
<th>□ No</th>
</tr>
</thead>
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<td>□ Partner supports</td>
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<tr>
<td>□ Partner limitations</td>
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<tr>
<td>□ Environmental supports</td>
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<tr>
<td>□ Environmental limitations</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Student, family, and professional involvement (3)</th>
<th>□ Yes</th>
<th>□ No</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Family</td>
<td></td>
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<tr>
<td>□ Professionals</td>
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</tbody>
</table>
Appendix J

Procedural Reliability Checklist

Procedural Reliability
Transcription #

Pretest (Experimental)

The researcher described the study.
“This study is designed to improve our understanding of augmentative and alternative communication (AAC) assessment.” □ Yes □ No

The researcher provided instructions.
☐ Use the SETT Framework to plan an AAC assessment for Sam/Daniel. □ Yes □ No

Pretest (Control)

The researcher described the study.
“This study is designed to improve our understanding of augmentative and alternative communication (AAC) assessment.” □ Yes □ No

The researcher provided instructions.
☐ Use the SETT Framework to plan an AAC assessment for Sam/Daniel. □ Yes □ No

Posttest (Experimental)

The researcher provided instructions.
☐ Use the SETT Framework and the AAC Assessment Checklist to plan an AAC assessment for Daniel/Sam. □ Yes □ No

Posttest (Control)

The researcher provided instructions.
☐ Use the SETT Framework to plan an AAC assessment for Sam/Daniel. □ Yes □ No

Generalization (Experimental)

The researcher described the study.
“This study is designed to improve our understanding of augmentative and alternative communication (AAC) assessment.” □ Yes □ No

The researcher provided instructions.
☐ Use the SETT Framework and the AAC Assessment Checklist to plan an AAC assessment for (child with CCN). □ Yes □ No

Generalization (Control)

The researcher described the study.
“This study is designed to improve our understanding of augmentative and alternative communication (AAC) assessment.” □ Yes □ No

The researcher provided instructions.
☐ Use the SETT Framework to plan an AAC assessment for (child with CCN). □ Yes □ No
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Presentations


