COMMUNICATION ABOUT EMOTIONS USING AAC DURING STORYBOOK READING: EFFECTS OF AN INSTRUCTION PROGRAM FOR PARENTS OF CHILDREN WITH DOWN SYNDROME

A Dissertation in
Communication Sciences and Disorders

by
Ji Young Na

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Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

August 2015
The dissertation of Ji Young Na was reviewed and approved* by the following:

Krista M. Wilkinson  
Professor of Communication Sciences and Disorders  
Dissertation Advisor  
Chair of Committee

Carol A. Miller  
Professor of Communication Sciences and Disorders

Kathryn D. R. Drager  
Professor of Communication Sciences and Disorders  
Associate Dean for Research and Graduate Education

Carrie Jackson  
Associate Professor of German and Linguistics

Erinn H. Finke  
Assistant Professor of Communication Sciences and Disorders

*Signatures are on file in the Graduate School
ABSTRACT

Children with Down syndrome often have more restricted emotion expression and recognition skills than their peers who are developing typically. Some individuals with Down syndrome have limitations in producing speech and in understanding of the speech and language of others. Effectively designed interventions may help facilitate optimal communication and functioning. However, due to a lack of awareness and resources, parents and professionals usually provide limited opportunities for these children to discuss emotions. Children who are unable to use spoken language effectively to meet their communication needs often benefit from aided Augmentative and Alternative Communication (AAC), meaning that well-designed communication tools may help children with Down syndrome communicate about emotions.

The current study used a single-subject multiple-baseline across participants design with three parent-child dyads in order to investigate the effect of an instructional program on parents’ provision of opportunities for emotion communication using aided AAC. The parents learned to ask open-ended questions (i.e., questions that cannot be answered by yes or no) relating to the type (e.g., angry), reason (e.g., It’s broken), and solution (e.g., Ask for help) for a book character’s emotions during shared reading activities with their children. This was done in order to provide the children with opportunities to converse about emotions in a familiar context. The parents also designed and used emotion communication picture boards for use during the activity.

This investigation provides evidence that the Strategies for Talking about Emotions as PartnerS (STEPS) instructional program is effective for improving parents’ provision of opportunities for discussing emotions during storybook reading with children who have Down syndrome. All participating parents used the emotion communication strategy immediately following a one-time instructional session and continued to use it for the remaining phases of the study. The children participated more actively in the discussion by making comments about
emotions when parents provided more opportunities to their children. All parents indicated that they would use the strategy during future storybook reading activities. This dissertation discusses the results and directions for future research.
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ACKNOWLEDGEMENTS

“So keep up your courage, men, for I have faith in God that it will happen just as he told me.”
Acts 27:25

First, I give glory to God for all things. I also would like to thank the following people for their invaluable support.

To my wonderful advisor and favorite mentor, Krista Wilkinson, I give very special thanks. I felt very grateful to have you as an advisor throughout my doctoral study. I remember the moment that you gave me a big welcoming smile and hug when I first stepped in Ford building on one snowy Monday in 2012. Now I know that it was not just one moment on the first day, but you have always been welcoming, calming, encouraging and supporting to me. You showed me what good leadership, scholarship and mentorship are. I can’t count how many things I have learned from you about writing, researching, teaching, and mentoring. Thank you, thank you, and thank you.

To my terrific committee, Kathy Drager, Carrie Jackson, and Carol Miller, thank you for being encouraging and supportive. I really appreciate that you were always available for me and provided me very productive and encouraging feedback. I really liked each of you not only as my wonderful committee but also as great mentors and role models.

To my great mentor, Sarah Blackstone, thank you for being supportive and encouraging. You always highlighted my strengths and encouraged me to keep going and try new things. I was very lucky to have you as my mentor throughout my doctoral studies. I can’t believe that we haven’t met each other even after three years. I can’t wait to meet with you sometime soon and give you a big hug to express my sincere appreciation.

To my very first and one of the best research mentors, Richard Hurtig, thank you for introducing AAC to me. I learned so many positive aspects of being an AAC specialist by watching you working sincerely for patients and writing, teaching, and researching for the next generation.

To my wonderful clinical supervisor and mentor, Dick Lytton, I truly appreciate and respect you. Thank you for being encouraging whenever I discussed my dissertation ideas. Thanks to you, I have learned that AAC is not about devices, but about language, individuals, and their lives.

To my research assistants, Veronica, Maria, Shannon, Tyler, Anthony, and Christine, I would not have completed data collection and analysis for this dissertation project without you. Thank you for being supportive and friendly.

To my dear friends, Danielle, Jen, Megan, Nimisha, Vanessa, Holly, Christine, Beth, Jenna, April, Rupert, Jiali, Michelle, Laura, Ji Sook, Jin-hee, Sieon and Rachael. I truly appreciate your
friendship and love. I was able to go through this long and tough journey as a doctoral student thanks to you.

And finally, to my favorite people in the world, my parents and family, I give very special thanks forever. Thank you for being my mom, dad, big brother, sister-in-law, nephew, and niece. You are the most beautiful, smart, sincere, enthusiastic, and faithful people in the world. I love you!
Chapter 1

INTRODUCTION AND REVIEW OF LITERATURE

Children with Down syndrome are often reported to be social and outgoing individuals (Jahromi, Gulsrud, & Kasari, 2008). However, these children may face challenges in the development of emotional competence that are necessary for successful social interactions. (e.g., Channell, Conners, & Barth, 2014; Kasari, Freeman, & Hughes, 2001; Pochon & Declercq, 2014). Emotional competence refers to the ability to identify and respond to one’s own and others’ emotions (Saarni, 1999). It consists of a set of skills related to emotion recognition, expression, and regulation. Emotional competence is related to critical functional outcomes in children. This includes their basic readiness for learning and development of social relationships in their childhood and possibly academic and vocational success in their later life.

Saarni (1999) emphasized the relationship between linguistic and emotional skills in children. Children with typical development can use their receptive (i.e., understanding) and expressive (i.e., speaking) language skills to build up their emotional competence in a variety of settings. As a result, development of emotional competence is supported by a child’s own linguistic experiences (e.g., discussing emotions) as well as caregivers’ linguistic input and modeling.

Individuals with Down syndrome have a general pattern of relative linguistic challenges. In particular, they often have significant weakness in expressive syntax, speech intelligibility, and spoken and/or written language comprehension (Abbeduto, Warren, & Conners, 2007; Chapman & Hesketh, 2000a). Their restricted linguistic skills might limit their comprehension and use of emotion words and related expressions. Therefore, their parents and professionals can help them
achieve optimal communication about emotions through effectively designed interventions (Wilkinson & Na, in press). Due to these limitations in producing speech as well as in understanding of the speech and language of others, visual aids such as symbols/photos, with or without words, can enhance communication in individuals with Down syndrome, particularly during early language development (e.g., Brady, 2008). Individuals with Complex Communication Needs (CCN) frequently use aided Augmentative and Alternative Communication (AAC) to express thoughts, needs, wants, and ideas more effectively. Aided AAC can range from paper and pencil to a Speech Generating Device (SGD). Children with Down syndrome, who have many challenges in language learning, can benefit from a successfully developed AAC intervention to achieve better emotional competence as well as linguistic competence.

For various reasons, there may be limited opportunities for these children to discuss emotions using well-designed communication tools such as aided emotion symbols and related phrases (Blackstone & Wilkins, 2009). In the present study, the experimenter developed and used an instruction program, named the Strategies for Talking about Emotions as Partners (STEPS). The purpose of the program was to coach three parents who have children with Down syndrome in the design and use of aided AAC. The purpose was to support an educationally effective discussion of emotions with their children, which in turn could possibly support the children’s development of emotional competence.

After the instruction was completed using the STEPS program, all three participating parents demonstrated they had learned the targeted strategies for emotion communication with a high level and rate of acquisition. They also designed and used aided AAC more frequently and appropriately after the instruction. All parents reported that they felt the STEPS program was helpful not only for their own knowledge and skills to support their children’s development of
emotional competence, but also their children’s specific emotion communication skills. They indicated that they would keep using the strategy during their book reading activities.

Theoretical Framework

Social and emotional communicative development theories

Two main theories support this study: Vygotsky’s sociocultural development theory and Saarni’s emotional competence theory. Vygotsky’s theory primarily focuses on the role of social factors, including interactions with adults, in a child’s development. Saarni’s theory describes how a child’s sociocultural context can influence the development of emotional competence by interacting with internal factors, such as motivation. These two theories support the main idea of the STEPS instruction program, which is training parents to facilitate communication about emotions with their children. Emotional competence is a long-term outcome that might be promoted by the parent training, but that was not the target of this training program. Rather, improving parent-child emotion communication was the goal of the instructional program in this investigation.

Vygotsky’s sociocultural development theory

The key of the sociocultural development theory is children’s social interactions with individuals in their surroundings (Sanders & Welk, 2005). It emphasizes that interactions and language, embedded within a cultural context, significantly influence children’s cognitive development (see Figure 1). Vygotsky suggested the Zone of Proximal Development (ZPD) to describe this idea. The ZPD refers the potential developmental level that children can attain with
the their interactions with adults or more capable peers (Daniels, 2005). In other words, a child’s learning occurs under the guidance of a person who has a higher level of ability or understanding. Vygotsky emphasized that a child’s interpersonal learning comes first through these interactions, and that intrapersonal learning allows for successful cognitive development.

Vygotsky’s approach to learning presumes that scaffolding strategies such as modeling, questioning, and feedback can support children’s assisted performance. It can also possibly facilitate self-performance later (Sanders & Welk, 2005). For example, when adults model verbal or nonverbal behaviors, a child can learn to imitate those behaviors. Feedback is considered an effective strategy when a child is in the stage of transitioning from guided performance to non-guided performance. Asking questions is another scaffolding strategy adults can use not only for testing children’s performance, but also for assisting their performance.

**Saarni’s emotional competence theory**

Saarni’s (1999) emotional competence theory conceptualized the development of emotional competence by incorporating two perspectives of emotion; the *functionalist* and the *social constructivist* perspectives (Buckley, Storino, & Saarni, 2003).

The *functionalist* perspective suggests that events that have physical or mental significance to the person can generate emotions. The person’s goals, pleasant/unpleasant sensations, social communication, and/or past experiences determine significance of a certain event. For example, a child who wants a toy but cannot reach it will experience negative emotions such as *anger* or *frustration* due to the unachieved goal.

The *social constructivist* perspective supplements the *functionalist* perspective by declaring that sociocultural background significantly influences one’s interpretation of an event that leads to a certain emotion. For example, a child from a certain culture might feel *anger* when
s/he wants a toy but cannot reach it, whereas a child from a different culture might feel *frustration* in the same situation. These different responses are influenced by their cultural differences.

Saarni (1999) highlighted that emotional competence is inseparable from social development. It includes expressive and relationship-related behaviors. This concept connects with Vygotsky’s sociocultural development theory.

Table 1 presents a brief summary of Saarni’s (1999) emotional development markers in children, age ranging 0-10 years. First, a child’s language and communication development is critical in his/her emotional development. For example, children increase in verbal comprehension and production of emotion words and in communication about emotions, particularly during their early emotional development. Second, caregivers’ “scaffolding” is critical in children’s emotional development. Caregivers not only deal with their children’s emotional circumstances, but also model their strategies for handling emotions.

<table>
<thead>
<tr>
<th>Age</th>
<th>Regulation/coping</th>
<th>Expressive behavior</th>
<th>Relationship building</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infancy:</strong> 0-12 months</td>
<td>- Self-soothing</td>
<td>Increasing coordination of expressive behaviors with emotion-eliciting circumstances</td>
<td>Socially instrumental signal use (e.g., “fake” crying to get attention)</td>
</tr>
<tr>
<td></td>
<td>- Relying on caregivers’ “scaffolding”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Learning to modulate reactivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Toddlerhood:</strong> 12 months-2½ years</td>
<td>Emergence of self-awareness of own emotional response</td>
<td>Increasing verbal comprehension and production of emotion words</td>
<td>Anticipation of different feelings toward different people</td>
</tr>
<tr>
<td></td>
<td>- Symbolic access facilitates emotion regulation</td>
<td>Pragmatic awareness that “false” facial expressions can mislead another about one’s feelings</td>
<td>- Sympathetic and prosocial behavior toward peers</td>
</tr>
<tr>
<td></td>
<td>- Communication extends child’s awareness of own feelings and of the events</td>
<td></td>
<td>- Increasing insight into others’ emotions</td>
</tr>
<tr>
<td><strong>Preschool:</strong> 2½-5 years</td>
<td>- Seeking support from caregivers still prominent</td>
<td>Adoption of “cool emotional front” with peers</td>
<td>Increasing coordination of social skills with one’s own and others’ emotions</td>
</tr>
<tr>
<td></td>
<td>- Increasing self-problem solving</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Early elementary:</strong> 5-7 years</td>
<td>Problem solving preferred</td>
<td>Use of expressive behavior to modulate relationships</td>
<td>Awareness of multiple emotions toward the same person</td>
</tr>
<tr>
<td><strong>Middle childhood:</strong> 7-10 years</td>
<td>Problem solving preferred</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Extracted from the Table 1.3. in Saarni (1999).
**Potential applications to development of emotional competence in children with CCN**

Figure 2 illustrates the potential application of these two theories of social and emotional communicative development to the development of emotional competence in children with CCN. These children’s social interactions with more capable others include clinically designed interactions, educational interactions, and natural interactions. Caregivers, professionals, and children developing typically can be the partners. Children’s language comprehension and use

![Diagram 1](image1.png)

**Figure 1.** Sociocultural development theory by Vygotsky.

![Diagram 2](image2.png)

**Figure 2.** Potential application of social communicative development theories to the development of emotional competence in children with CCN.
may be performed in a variety of formats, including symbols, manual signs, spoken language (through oral speech/SGDs), and written language. Social experiences and language interact and influence cognitive development, including the development of emotional competence.

**Emotional Competence and AAC**

Na et al. (under revision) have summarized literature concerning emotional competence as it might relate to individuals who use AAC. Many cross-sectional (Beck, Kumschick, Eid, & Klann-Delius, 2011; Kubicek & Emde, 2012; Roben, Cole, & Armstrong, 2013) and longitudinal (Aro, Laakso, Määttä, Tolvanen, & Poikkeus, 2014; Kubicek & Emde, 2012) studies have revealed a close relationship between linguistic and emotional skills in children who are developing typically even though the causal relation has not been clearly examined. Based on this body of evidence, Na et al. (under revision) suggested the possibility of the need for improved assessment and intervention strategies for development of emotional competence in children with CCN who have restricted linguistic abilities.

**Linguistic and emotional competence in children with Down syndrome**

Down syndrome is a neurodevelopmental disorder resulting from three copies (rather than two) of chromosome 21. Its prevalence is 1 in 691 births. It is the most common chromosomal disorder (Parker et al., 2010) and the most commonly known genetic cause of intellectual disability. Individuals with Down syndrome have mild to severe intellectual disabilities paired with strong adaptive behavior skills. Common physical challenges in individuals with Down syndrome include heart defects, small oral cavities, dental issues, otitis media, low vision, foreshortening of limbs, and obesity (e.g., Cohen & Winer, 1965; Courage,
Linguistic competence

Individuals with Down syndrome have a general pattern of relative linguistic strengths and challenges. They often have relatively stronger skills in communicating socially and in understanding vocabulary. However, they often have significant weaknesses in expressive syntax, speech intelligibility, and spoken and/or written language comprehension (Abbeduto et al., 2007; Chapman & Hesketh, 2000b). The most frequent challenge occurs in speech production. Ninety-five percent of parents report that unfamiliar listeners have difficulty understanding their children’s speech (Kumin, 2002). Characteristic oro-facial dysmorphologies such as a small oral cavity, low muscle tone, dental issues, and possible apraxia are known to contribute to low speech intelligibility in children with Down syndrome.

There are also other factors that restrict linguistic development and use in children with Down syndrome. Intellectual disabilities in children with Down syndrome may limit their learning and use of comprehensive and expressive language (Chapman, 2003). Upon entrance into elementary school, increased demands on oral language skills due to increased task demands and a wider variety of communication partners can result in frequent communication breakdowns (Kumin, 2002).

Wilkinson and Na (in press) emphasized the importance of effectively designed AAC interventions for improved language development in children with Down syndrome. Since individuals with Down syndrome have limitations in producing speech as well as in understanding of the speech and language of others, effectively designed interventions can help them achieve optimal communication and functioning (Branson & Demchak, 2009; Emerson et
Individuals with CCN frequently use aided AAC to express thoughts, needs, wants, and ideas effectively. Wilkinson and Na (in press) suggested that children with Down syndrome, who have many challenges in language learning, can benefit from AAC intervention to achieve better linguistic competence. They also pointed out that aided AAC can reduce motoric demands in children with Down syndrome compared to unaided AAC (e.g., gestures and signed language).

**Emotional competence**

Several studies have investigated emotional skills in children and adolescents with Down syndrome (e.g., Channell, Conners, & Barth, 2014; Kasari et al., 2001; Pochon & Declercq, 2014; Williams et al., 2005). Although these studies used various experimental designs (e.g., cross-sectional versus longitudinal study) and methodological approaches (e.g., use of static photographs of facial expressions versus dynamic videos of actor’s emotion expressions), most concluded that children and adolescents with Down syndrome have more restricted emotion-related skills than children who are developing typically.

Kasari et al. (2001) investigated children’s ability to label (e.g., “What is Suzie feeling in the spoken narrative?”), recognize (e.g., “Where is the happy face?”), and identify (e.g., “What is Suzie feeling in the acted narrative?”) simple emotions (i.e., happiness, sadness, anger, fear). Twenty children with Down syndrome (mental age [MA]: 40 months, Chronological Age [CA]: 77 months), 20 MA-matched controls, 20 CA-matched controls, and 27 children with intellectual disabilities due to other causes participated. The results demonstrated that children with Down syndrome performed worse than both MA-matched children and children with intellectual disability due to other causes at the developmental age of 4 years. The longitudinal data indicated
that the emotional skills in children with Down syndrome did not improve over two years whereas typical controls did.

Williams et al. (2005) specifically examined error patterns in emotion recognition by children with Down syndrome. Thirty-four children with Down syndrome (age range: 7.67-17.67 years), 53 children with nonspecific intellectual disabilities (age range: 6.00-17.42 years), and 39 children developing typically (age range: 2.75-5.58 years) participated. The overall result indicated that children with Down syndrome performed more poorly than other groups on the emotion matching task (e.g., “This man looks happy”) with six basic emotions (happiness, sadness, anger, surprise, fear, disgust). The error analysis revealed that overall errors from the children with Down syndrome were spread more widely across all emotions whereas the control groups had similar error patterns (e.g., answering “surprise” for “fear”).

One recent study emphasized that children with Down syndrome needed modified assessment methods for emotional skills (Channell et al., 2014). They introduced a new methodological approach to measure emotion knowledge in 19 youths with Down syndrome (age range: 6.67-18.42 years). These children and adolescents were compared with children with typical development who were at a similar developmental level (age range: 2.50-5.58 years) based on mental age according to the Peabody Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2004). In contrast to traditional emotion knowledge measurement methods using static facial expressions of emotion (i.e., photographs of facial expressions), the new methodological approach included dynamic emotion expressions (i.e., videos of a child actor’s emotion expressions) and social context cues. The results demonstrated that using this modified method, children with Down syndrome did perform at levels predicted by their developmental age.

Some studies also suggested behavioral issues, including challenging behaviors in youths with Down syndrome (e.g., Dykens, 2007; Dykens & Kasari, 1997). Challenging behaviors are defined as “behavior emitted by a learner that results in self-injury or injury of others, causes
damage to the physical environment, interferes with the acquisition of new skills, and/or socially isolates the learner” (Reichle, 1993, p 61-62). Not all challenging behaviors are directly related to one’s emotion regulation and the concept of emotional competence involves more than just emotion regulation. Yet Saarni (1999) described emotion regulation as one of the major skills of emotional competence. Thus, successful development of emotional competence in their childhood might be critical for one’s behavior management and social relationships in their youth and adult life.

Existing research on emotion communication using AAC

Na et al. (under revision) pointed out that there has been very limited research on the relationship between language and emotional skills in children with CCN, including children and adolescents with Down syndrome. Even less information is available on whether common symbol sets support communication about emotion. Thus, the literature is sparse concerning how to represent emotion vocabulary using AAC systems.

Two viewpoint papers (Blackstone & Wilkins, 2009; Brinton & Fujiki, 2009) argued that children with CCN may experience restricted development of emotional skills. Blackstone and Wilkins (2009) suggested the possibility of restricted development of emotional competence in these children. They explained that factors intrinsic to the child, as well as challenges imposed by the context, AAC systems, and task demands, might contribute to limited development of emotional competence. Intrinsic factors include difficulty (1) communicating using language, (2) expressing emotions because of physical/motor/cognitive challenges, and (3) interacting with people and the environment. Extrinsic factors include (1) partners’ difficulty interpreting gestures and/or facial expressions, (2) partners’ low awareness of the need to address emotional development, (3) myths about AAC and users of AAC, and (4) technology limitations.
Blackstone and Wilkins (2009) also discussed limited emotion representation (e.g., emotion symbols) in aided AAC systems, resulting in restricted access to conversations about emotions for children with CCN. Brinton and Fujiki's (2009) viewpoint paper also supported ideas about the possibility of restricted development of emotional skills in children with CCN and the importance of providing appropriate assessments and interventions for facilitating emotional competence in these children. They suggested that two major intervention goals for children who use AAC, facilitating social communication and basic academic skills, are closely related to their emotional competence.

Blackstone and Wilkins (2009) further emphasized the importance of access to symbols/words that depict a range of emotions for the development of emotional competence in children who use AAC. Many speech generating devices (SGDs) only have a few basic emotion symbols/words (e.g., happy, sad) and lack a full range of emotion-related communication tools (e.g., discussion of the emotional situation). They also pointed out that current SGDs usually lack features related to emotion expressions, such as inflection and pitch.

The Early Development of Emotional Competence (EDEC) assessment tool

The Early Development of Emotional Competence (EDEC) tool was developed to address the issue of lack of an effective assessment tool for emotional competence in children with CCN (see Appendix A for the screenshots of the tool and authors’ information). The EDEC tool is an evidence-based assessment tool. The interview questions in the tool were selected based on Na et al.'s (under revision) review of the literature. The EDEC tool is designed to raise awareness about communication and emotional competence and to ensure that a child’s communication intervention includes language to discuss emotions in ways that are consistent with the values and goals of the family. It is not developed for prescriptive purposes, nor as a
norm-referenced instrument. Rather, it is intended to allow professionals to collaborate with family members and teachers to gather information that can be useful to support communication about emotions.

The EDEC tool has two sections. Section I asks how parents/caregivers and/or teachers perceive the child’s temperament and behavioral characteristics. Section II asks questions about how the child expresses and recognizes emotions/feelings, how the child’s parents/caregivers express emotions within the family, and whether the child’s parents/caregivers or teachers discuss emotions/feelings with the child.

The target population of the EDEC tool is young children (birth-10 years) with CCN who have very limited speech and language skills due to various etiologies (e.g., cerebral palsy, Down syndrome, etc.). Extension of the tool to consideration for older individuals or individuals with Autism Spectrum Disorder (ASD) has not yet been conducted by the authors. Speech-language pathologists or other professionals (e.g., occupational therapists, physical therapists) who work with a child with CCN use the EDEC tool in order to interview the child’s parents/caregivers or teachers. It is expected to take from forty-five minutes to an hour to complete the interview using the EDEC tool.

A recent study (Na, 2014) examined the validity of the EDEC as an assessment tool. Ten American and 10 Korean mothers with young children who were developing typically participated. The results indicated the sensitivity of the EDEC to various contributing factors. The tool generated a range of answers in mothers’ reports on behavioral characteristics and emotional competence in children as well as mother-child communication about emotions influenced by various factors such as child’s age, child’s gender, mother’s cultural background, family religion, etc. The findings were supported by evidence in the literature.

The information from the EDEC tool can be used to determine family preferences about communication and emotions as well as areas where the family would like better supports for
communicating about emotions. For example, during Na's (2014) interviews using the EDEC tool, some mothers with children who were developing typically indicated that they used book reading and/or video watching activities as “teachable moments” for emotion education with their children. In these cases, discussing how they currently educate their children about emotions during these activities and suggesting any missing strategies could be the ideal following step.

**Proposed three steps of emotion communication using AAC**

Na et al. (under revision) proposed three practical steps for parents and clinicians to follow during a conversation about emotions with a child who uses AAC. These steps were derived from the theoretical and empirical frameworks they reviewed in the paper. These steps are suggested to occur outside moments of intensified emotional arousal because these strategies are not meant to be used for behavioral management. Rather, they are designed to help adults offer children means to think and talk about emotions using their AAC systems. Partners should focus on modeling and providing access to emotion-related content, but should not dominate the conversation by speaking on behalf of a child.

**Step 1: Providing and modeling labels for a variety of emotions**

Na et al. (under review) suggested that labeling of emotions (e.g., happy, sad) is the first step when parents and professionals have a conversation about emotions with a child. As Blackstone and Wilkins (2009) suggested, in a context of aided AAC children should have access to a variety of emotion vocabulary in their AAC systems that they can use to label emotions. They also highlighted the role of modeling by conversation partners, such as parents and teachers, based on the evidence from the studies on partners’ modeling in AAC (Binger, Kent-Walsh,
Berens, Del Campo, & Rivera, 2008; Harris & Reichle, 2004; Johnson, Inglebret, Jones, & Ray, 2006; Romski & Sevcik, 1996; Wilkinson & Hennig, 2007). They also suggested that partners use multi-modal strategies (e.g., saying “He is sad” with sad tone of voice, making a sad face, pointing to a symbol for sad) while modeling emotion labeling with children who use AAC. These multi-modal strategies support these children to have a full range of communication modes they can use in their own emotion expressions.

**Step 2: Validating and Discussing Emotions**

Na et al. (under revision) proposed validation of emotion as a second step of a conversation about emotions with a child who has CCN. This step is based on Saarni’s (1999) ideas of how children developing typically learn to identify many different emotions and related situations. In addition, Blackstone and Wilkins’s (2009) suggestion for a full range of communication about emotions with a child who uses AAC is adapted in this step. Validating emotions is discussing the reasons underlying emotions, differences in intensity, and specific cultural and contextual responses that people have to different emotions. For instance, after expressing anger to a partner using an angry symbol, a child should have access to messages for the possible reasons (e.g., “I can’t do this,” “It’s broken”) for the expressed emotion in their AAC systems. Partners’ modeling with a use of multi-modal expressions, including aided symbols, is critical in this step, too.

**Step 3: Communication about appropriate responses to emotions**

The last proposed step for a partner-child conversation about emotions using AAC is discussing possible strategies a child can use in an emotional situation. After talking about the
emotion itself and the reason for the emotion, a partner can use the moment to discuss what a child can do to deal with the emotion. For example, possible alternatives for a challenging behavior (e.g., “Ask for help,” “Take a break”) should be discussed with the child, with access to the message for those options provided in their AAC systems. Again, partners’ modeling supports the child’s learning of the way to use those strategies in the future emotional moments.

**Parent Instruction Intervention**

The current study evaluated a parent-training program in which parents were instructed in the three steps just described. Information provided in the following sections supports the rationale for provision of direct instruction on those three steps to parents (not children) in this study. First, the existing parent instruction studies in AAC are reviewed. Related factors that clinicians need to consider in parent instruction are also addressed. Then, literature on how parents generally influenced their children’s emotion learning and communication are reviewed. The importance of parent’s role in children’s emotion communication is emphasized.

**Parent’s role in AAC interventions**

Parents and caregivers spend more time with children with CCN than speech-language pathologists (Binger et al., 2008). Therefore, training parents who have children with CCN is critical in language/communication development. There have been several studies on the effects of parent instruction in AAC (e.g., Adamson, Romski, Bakeman, & Sevcik, 2010; Chaabane, Alber-Morgan, & DeBar, 2009; Kent-Walsh, Binger, & Hasham, 2010; Koppenhaver et al., 2001a; Koppenhaver, Erickson, & Skotko, 2001b; Park, Alber-Morgan, & Cannella-Malone,
Most of the studies have reported positive effects of parent instruction in AAC interventions.

Romski et al. (2010) randomly assigned parent-child pairs into augmented or non-augmented interventions in order to examine the effects of parent-implemented augmented intervention on child’s vocabulary use with symbols and spoken words. A total of 62 infants who had developmental disabilities participated (etiologies included Down syndrome, cerebral palsy, seizure disorders, and unknown disorders). Parents assigned into augmented intervention modeled aided symbol use via a SGD (e.g., GoTalk, TechSpeak). The results showed that parent training and parent-implemented augmented intervention were effective for improving the children’s use of augmented words (i.e., graphic symbols).

There are also several single-subject studies on parent instruction in AAC intervention (e.g., Binger et al., 2008; Chaabane et al., 2009; Kent-Walsh et al., 2010; Koppenhaver et al., 2001b; Park et al., 2011; Rosa-Lugo & Kent-Walsh, 2008). All of these studies reported positive effects of parent-implemented AAC interventions. For example, Chaabane et al. (2009) and Park et al. (2011) examined the effects of parent-implemented Picture Exchange Communication System (PECS; Bondy & Frost, 1994) training on children at an early symbolic stage. Both studies reported successful implementation of PECS training by mothers and increased independent picture exchange skills in young children. Particularly, in Chaabane et al. (2009), two boys with ASD, ages ranging from 5-6 years, improved the percentage of independent requesting for an item with picture cards from 0% to 83-84% when their mothers were instructed with the PECS parent training. Park et al. (2011) investigated the effects of parent-implemented PECS training on younger boys with ASD, ages ranging from 2-3 years. The overall results indicated that all three children successfully acquired independent picture exchange.

Several studies have suggested that clinicians should keep in mind the following factors when they train parents who have children with CCN. First, they need to have cultural sensitivity
when they work with parents in AAC intervention (Binger et al., 2008; McCord & Soto, 2004). In particular, AAC symbols should reflect the family culture (Na & Wilkinson, 2013). Second, service delivery models should emphasize adequate access to AAC services, knowledgeable professionals, and cost and maintenance related to parent-training in AAC (McNaughton et al., 2008). McCord and Soto (2004) described variability in parents’ responses regarding attitude about AAC. Communication partners’ frustration in getting access to AAC training, including programming and maintenance coaching, can be a serious barrier for successful parent-training in AAC. Light and McNaughton (2012) explained that clinicians must ensure that AAC systems are easy for parents to program and implement. Third, parents’ relationships with SLPs is a factor for successful parent-training in AAC. If parents and SLPs have different priorities regarding internal and external factors, it would be hard to expect successful outcome from working with parents (Marshall, Goldbart, & Phillips, 2007). Lastly, training strategies are a significant factor for parent training in AAC. Well-designed parent instruction programs would result in successful learning for parents and ultimately effective and functional AAC use for children.

**Parents’ roles in children’s communication about emotions**

A parent’s role in development of a child’s emotional knowledge and skills is essential. A review paper by Giddan, Bade, Rickenberg, and Ryley (1995) described how infants are “prewired” to receive and respond to affective cues that their caregivers provide in their environment. Caregivers interpret, label, and differentiate emotional experiences when they provide those cues. Tronick’s (1989) viewpoint paper also emphasized that infants and their mothers have mutually coordinated interactions in terms of affective communication. He suggested that infants modify their affective expressions based on their appreciation of their mothers’ affective expressions.
Mother-child conversations about emotions have been shown to be important in predicting children’s later skills for emotion recognition and expression. For example, Doan and Wang (2010) examined the relationship of mothers’ use of language about mental states and the emotional situation knowledge of their 3-year-old children (71 European and 60 Chinese). The results showed a positive relationship between mothers’ references to mental states and children’s emotion-related knowledge in both cultural groups. Cervantes and Callanan (1998) revealed that mothers use different strategies with boys as compared to girls when they have conversations about emotions. They examined mother-child conversations about emotion with 84 children, ages ranging from 2-4 years. Mothers used more explanations than labels with boys, whereas they used similar amounts of explanations and labels with girls. These studies provide evidence that parents influence children’s emotion expression and recognition.

**Storybook Reading Intervention**

In the current investigation, the parent training activity took place in the context of a naturalistic communication activity, that of storybook reading. The following sections highlight the advantages of instructing the three steps of emotion communication to parents in the context of shared book reading.

Storybook reading has been a daily routine in many modern Western families for a number of reasons (Bus, 2001). For children who are preliterate, storybook reading can provide a rich context to support language development (Justice, 2006; Van Kleeck, Stahl, & Bauer, 2003). In order to maximize the educational and interactional benefits, caregivers may use “dialogic caregiver-child book reading techniques” (Zevenbergen, Whitehurst, Van Kleeck, Stahl, & Bauer, 2003). That is, caregivers can ask questions, add information, and/or prompt their children to
participate in describing the material in the picture book. By being an “active listener” during these interactions, a child can learn to become a “storyteller.”

Storybook reading has also been increasingly used for language interventions (Kaderavek & Justice, 2002). Kaderavek and Justice (2002) explained that the interest in shared book reading is influenced by multiple variables: (1) increased awareness of emergent literacy, (2) increased emphasis on naturalistic approaches to intervention, and (3) increased support for social interactionist perspectives on language development.

There also have been parent instruction studies with storybook reading activities for language intervention (e.g., Arnold, Lonigan, Whitehurst, & Epstein, 1994; Crain-Thoreson & Dale, 1999; Lonigan & Whitehurst, 1998; Whitehurst et al., 1988). For example, Crain-Thoreson and Dale (1999) instructed parents and teachers to use dialogic reading techniques with children who have delayed language. After the instruction, parents and teachers changed their reading style and children spoke more.

**Benefits and challenges of storybook reading with children who use AAC**

Reading storybooks with children who use AAC shares the benefits (e.g., learning vocabulary, discourse skills) that children developing typically obtain from their readings. Parents and professionals can provide opportunities to learn/use vocabulary, linguistic structures, and discourse skills through joint participation with children who use AAC during storybook reading (Bedrosian, 1999).

Storybook reading offers several additional advantages specific to children who use AAC (Kent-Walsh et al., 2010). First, the vocabulary in a storybook is predictable. Therefore, vocabulary such as characters and actions in a story may be preprogrammed into the child’s AAC system. Given the vocabulary, a child has access to words/symbols s/he can use for
communicating with a partner during storybook reading. Another advantage of storybook reading for children who use AAC is that storybook reading activities require less relative focus on physical movements compared to other activities. Therefore, a child can fully participate in the activity without additional physical effort. This allows for more of a focus on communication within the context of the book.

Despite these advantages, children with CCN may be less involved in shared storybook reading when compared to their peers developing typically (Light, Binger, & Smith, 1994). Possible internal barriers in families with children who have CCN could be socioeconomic status, medical issues in children, and/or lower awareness of the benefits of shared reading activities. These barriers may result in an insufficient quantity of shared reading activities.

The quality of shared reading also matters for children’s language development. Some studies have pointed out that parents who have children with CCN present some common characteristics in their communication with children (Binger et al., 2008; Light et al., 1994). Adults often dominate conversations and choose the topics of conversation with children with CCN. That is, their conversations usually do not follow the child’s interests. Also, when adults ask questions to children, they mostly ask yes/no questions instead of wh- (e.g., what, where, who) or open-ended questions. Other challenges related to AAC use are identified in these studies. During conversations, adults often do not pause often enough and the waiting time is not sufficient for the children with CCN to formulate a response using an AAC system. Adults also often limit their conversations to things that are already in the AAC system. They focus primarily on the systems with little allowance for multimodal communication means (e.g., manual sign, vocalization, etc.). These challenges may limit active, frequent involvement by children with CCN during shared storybook reading.
Storybook reading interventions in AAC

There is a limited but growing body of AAC literature investigating the impact of using shared storybook reading as an intervention context for children with CCN (Clendon, Erickson, van Rensburg, & Amm, 2014). Storybook reading activities can be used as one context for providing “aided AAC modeling” to these children. Aided AAC modeling is pointing to and selecting picture vocabulary key(s) on an aided AAC page while talking to children with CCN (Drager, 2009). Benefits of this language input strategy include (1) receptive and expressive picture/word vocabulary development, (2) receptive and expressive syntax development through association of words with already familiar components of meaningful contexts, (3) integration of augmented communication strategies into naturally-occurring communication opportunities, and (4) enhancement of interactive receptive and expressive language turns.

Some studies have examined the effectiveness of parent instruction using the aided AAC modeling in the context of storybook reading (Binger et al., 2008; Kent-Walsh et al., 2010, 2010; Rosa-Lugo & Kent-Walsh, 2008). All of these studies demonstrated successful acquisition of the targeted strategies by parents and positive effects on children’s communication with the use of AAC in a storybook reading activity. For example, a single-subject multiple-probe study by Kent-Walsh et al. (2010) examined the effectiveness of parent instruction on the symbolic communication of children using AAC during storybook reading. Six toddlers with Down syndrome or cerebral palsy (ages ranging from 4-8 years) and their parents participated. Kent-Walsh and her colleagues used a partner instruction program called Improving Partner Applications of Augmentative and Alternative Communication (ImPAACT). The results showed that this parent-training intervention yielded highly positive results for all of the children and their mothers. The improvement rate difference of the number of turns between the baseline and the intervention phases was 100% for each child.
Many strategies for shared book reading with children have been developed (Clendon et al., 2014). Among these strategies, a very limited number have focused on storybook reading with children with CCN in the context of aided AAC. For instance, Binger, Kent-Walsh, Ewing, and Taylor (2010) introduced the “RAAP” strategy, which consists of a cuing hierarchy of “Read, Ask, Answer and Prompt.” Using this strategy, a partner (1) reads and provides aided AAC modeling, (2) asks a wh-question and provides AAC modeling, (3) answers the wh-question and provides AAC modeling, and (4) provides a verbal prompt (e.g., “Your turn”) for a child’s symbol production. Binger and her colleagues (2010) instructed three educational assistants how to use the RAAP strategy to teach students to produce symbol combinations (e.g., “Diego+fly”). All participating adults learned the strategy successfully and the participating students increased their multi-symbol production.

**Summary of Literature Review and Research Question**

Emotional competence is critical because it can influence one’s learning and social relationships. Therefore, development of emotional competence in children should be supported by adults through interactions in a variety of social settings. Children with Down syndrome often have restricted emotional competence compared to children who are developing typically. Children with Down syndrome might therefore need support through effectively designed interventions in order to develop emotional competence.

The research has revealed that parents who have children developing typically often use storybook reading activities as educational moments for their children’s development of linguistic skills. Also, there has been growing recognition of the advantages of using parent-child storybook reading for AAC interventions. In terms of a conversation about emotions during parent-child shared storybook reading, the pilot research that was previously conducted by the experimenter
suggested that eight out of 10 American mothers with children developing typically converse about the character’s emotions in the book (Na, 2014).

The current investigation does not directly target children’s emotional competence. Rather, this intervention instructed parents who have children with Down syndrome to support their children’s communication about emotions. Communicating emotions is one of the specific skills needed for emotional competence and is a building block for a child to develop emotional competence (Saarni, 1999). The main purpose of the current study was to evaluate the effectiveness of the STEPS instruction program on parents’ implementation of a strategy for communicating about emotions during storybook reading in the context of aided AAC. The following research question was investigated:

**Research Question**: What is the effect of the STEPS instruction program on a parent’s provision of open-ended questions on each of the three steps of emotion communication (label, reason, solution) with the use of emotion boards during storybook reading with a child with Down syndrome?
Chapter 2

METHODS

Research Design

Independent variable (STEPS program)

The independent variable in this study was implementation of the STEPS instruction program to teach parents how to discuss emotions using aided AAC during reading. Figure 3 shows how the STEPS program is mainly based on Na et al.’s (under revision) three proposed steps of emotion conversations (Step 1: providing and modeling labels for a variety of emotions, Step 2: validating and discussing emotions, and Step 3: communicating about appropriate responses to emotions). This program was developed to instruct conversation partners (e.g., caregivers, teachers) how to set up emotion conversations effectively in the context of storybook reading. The experimenter used the STEPS program to teach three parents to include these three steps in their conversations about emotions using aided AAC.

The STEPS instruction page (see Appendix B) prescribes the specified elements of the emotion conversation strategy. In each step (label, reason, solution), the partner begins by asking the child a wh- or an open-ended question (e.g., “How does the bunny feel here?” for labeling the emotion). The partner then waits at least 5 seconds or until the child begins his/her answer. This is done in order to provide an opportunity for the child to give his/her thoughts about the target emotion. Then, the partner responds to the presence/absence of a child’s answer. The important point here is the partner’s provision of aided AAC modeling (i.e., pointing to and selecting picture vocabulary key[s] on an aided AAC page while verbally talking to a child) while responding to a child’s answer.
There were two types of partner responses to the child’s answer. If a child’s answer was an appropriate option (e.g., “sad”, “alone”, “go home”), the partner would then repeat/paraphrase the child’s answer through aided AAC modeling (e.g., “I think bunny is sad, too,” “Yeah, he is sad because he is alone,” “You’re right. Now he can go home and see his family”). This was done to (1) to confirm that the answer was correct or appropriate and (2) to provide another modeling of the target word/expression with aided AAC use. In case that the child did not respond (e.g., “I don’t know”) or provided an inaccurate or inappropriate answer (e.g., “happy” for sad emotion), the partner models the right/appropriate answer with aided AAC modeling. The repetition of these asking, waiting and responding processes for each of three steps (label, reason, solution) provide the child opportunities to experience a wider range of conversation about emotions.

The STEPS program does not suggest a certain number of times that partners should discuss emotions during each reading (e.g., to discuss emotions at least 3 times during one reading). It is more important for a partner to discuss the character’s emotions at least once during one reading and include all three key elements of emotion communication (label, reason, solution) in the discussion. Also, this instructional program does not prescribe certain emotions to
be taught to children by partners during book reading. A partner can choose an emotion to discuss with a child depending on (1) the content of storybook, (2) the child’s current emotional knowledge (e.g., s/he needs to learn more about sadness), (3) the child’s situation/mood (e.g., s/he recently experienced sadness), and (4) the partner’s situation/mood (e.g., feeling comfortable in discussing happiness with the child).

The STEPS program is not a “challenging behavior management” program. As Na et al. (under revision) emphasized with their proposal of the three steps of an emotion conversation, the full range of emotion communication is more effective outside moments of a child’s heightened emotional arousal because one can cognitively learn better during one’s “homeostasis” (i.e., emotions are regulated, stable, and relatively constant). This is the reason why the STEPS program suggests using storybook reading as a context. In addition, a storybook usually provides a child constant visual supports about the emotional situation using a character’s body postures, gestures, and/or facial expressions. Also, a child can learn from the familiar emotional situations in the storybooks (e.g. Christmas party) and rehearse for the future application of the learned knowledge or strategy for his/her own emotional situations.

The STEPS program also includes instructions for aided AAC display design and use by a partner during emotion conversations. This is because while the program may also be used with or for children who use speech, it was specifically designed to be appropriate for partners of individuals with CCN. In this investigation, the experimenter instructed the parent to design an emotion communication board (1) to use for his/her aided AAC modeling and (2) to provide a child access to vocabulary that s/he can use for emotion communication. Although the participating children in this study mainly communicated verbally, as Wilkinson and Na (in press) emphasized, children with Down syndrome can benefit from AAC use given their potential challenges in language learning and communication. Therefore, parents’ aided AAC modeling is important to enhance effective AAC use and successful communication.
According to the STEPS program, the emotion communication board can be designed either as a separate page or as part of the child’s current AAC system. In this particular study, the experimenter guided parents to design the board as a separate low-tech (i.e., non-electronic) AAC page. The STEPS program guides the partner to include symbols of three steps on the board. Figure 4 represents an example page of an emotion communication board including all three steps. The left column has an angry symbol for the first step (label). Either the child or his/her partner can use this symbol for labeling a situation when the book character is feeling “angry.” The middle column contains five different possible reasons for the angry emotion. After discussing the emotion type, the child or partner can expand their discussion by selecting an appropriate “because” statement from these options. The right column includes three possible solutions for the angry emotion. While talking about which alternative action the book character can take in the angry situation, a child can learn and rehearse appropriate response behaviors for the emotion.

Figure 4. Example of an emotion communication board from the STEPS program.
Dependent variables (Parent measures)

There were three parent behaviors measured as dependent variables in this study: parents’ provision of open-ended questions regarding (1) the emotion’s label (e.g., “How is he feeling?”), (2) the reason for the emotion (e.g., “Why is he sad?”), and (3) the solution for the emotion in the book (e.g., “What can he do now?”). These three parent behaviors were measured and evaluated separately. That is, parents did not have to ask open-ended questions for all three steps to be recorded as having a “successful” performance. These measures revealed changes in the frequency of opportunities the parent provided for emotion communication to the child during shared storybook reading. Details about these dependent measures will be described in the “Data Analysis” section of this chapter.

Collateral variable (Child measure)

This intervention was not designed to directly improve a child’s communication about emotions. However, it is of interest to describe the child’s behavior over the course of intervention. Thus, the number of the child’s utterances related to each of the three steps of emotion communication (label, reason, solution) was calculated as a collateral measure. For instance, one child may say only one emotion name (e.g., “happy”) and not comment about the reason and the solution for the emotion at all during baseline. During intervention, this child might say emotion names three times (e.g., “happy,” “sad,” “Boy is sad”), the reasons for the emotions two times (e.g., “Eating ice cream,” “Fell down”), and the solutions for the emotions three times (e.g., “Calm down,” “Hug mommy,” “Sleep”). This data would provide initial description about the possible impact of the parent instruction on emotion communication impacts a child’s emotion-related communicative behaviors.
Design

The present study utilized a single-subject multiple-baseline across participants design (Kazdin, 2011). In this design, AB (baseline-intervention) data series for multiple participants are compared. Introduction of the intervention for each participant is staggered across time (Kratochwill et al., 2010). A single-subject multiple-baseline design is appropriate for AAC intervention studies due to the heterogeneous participants with a variety of functional profiles (Kent-Walsh et al., 2010).

In this study, AB data series were collected across three parent-child dyads on three parent behaviors (i.e., parent’s provision of open-ended questions about the label, the reason, and the solution for the emotion). Baseline data collection started with all three parents within the same week. All three dyads showed stability (i.e., no increasing/decreasing/fluctuating data) in data throughout the baseline phase. Therefore, the dyad that began baseline data collection the earliest started the intervention phase while other two dyads remained in the baseline condition. Once the first dyad started to demonstrate a treatment effect (i.e., a minimum of double the highest number in baseline) with at least three data points during the intervention phase, the second dyad began intervention while the last dyad remained in the baseline phase. The third intervention session of Dyad #1 and the first intervention session of Dyad #2 occurred on the same day. However, Dyad #2’s first intervention session (in the morning) followed Dyad #1’s third intervention session (in the evening) after confirming a treatment effect in Dyad #1’s data across the first three consecutive sessions in intervention. Once the second dyad began to show a treatment effect with at least three data points in intervention, the last dyad started the intervention condition. The total frequency (number of data points) and the period (days) of the data collection during the baseline phase varied for each of the three participating parent-child dyads.
Participants

Criteria for participation

Participants were recruited through the Centre County Down Syndrome Society (CCDSS). Flyers were shared with a small set of parents who had children of 5-10 years and who had indicated interest in participating in this type of research. The participating parents met the following inclusion criteria: (a) self-identified as monolingual speakers of English, (b) had a child who met the inclusion criteria for a child participant (see below), (c) had no known speech, language, or hearing impairments, (d) had at least a high school diploma or equivalent, and (e) had no previous participation in the related study (i.e., the assessment study in a child’s emotional competence with the use of the EDEC tool).

Bedrosian's (1999) suggested criteria for research on AAC use during storybook reading that were adapted for child selection for this study. The participating children met the following inclusion criteria: (a) in age range of 5;0 – 10;11, (b) hearing and vision within functional limits or corrected to be within functional limits, (c) a diagnosis of Down syndrome and a significant and congenital organic or motor speech impairment with 50% intelligibility or less to an unfamiliar listener, (d) emergent literacy skills, including the ability to listen to stories and answer simple open-ended questions (e.g., what, how, and why) based on stories, (e) previous or current exposure to aided AAC systems with a minimum of 10 graphic symbols, (f) receptive vocabulary at or above a 2-year developmental level as measured by the PPVT-4; Dunn & Dunn, 2004), and (g) no diagnosis of emotional/psychiatric disorders.
Screening of participant skills

Once potential participants contacted the experimenter, they were provided with a link to an online pre-screening survey following a brief phone/email conversation. The online survey contained a total of nine questions and was designed to take approximately 5-10 minutes. The survey questions asked the potential participants about some of the participant characteristics included in the inclusion criteria (e.g., parent’s education level, child’s hearing and vision, previous AAC experience). Upon receipt of the parent’s response to the survey, the experimenter reviewed the response to determine the parent’s eligibility for inclusion in the study.

The first three parent-child dyads who contacted the experimenter were selected for screening. The experimenter and a research assistant visited each candidate’s home. Both parent and child participated in the screening. Parents were involved in two assessment processes. First, the experimenter had a brief initial interview with each parent in order to collect basic information about the parent’s hopes and concerns for this study and the child’s general interests/preferences, physical/mental limitations, and book reading. The information about the three participating parent-child dyads that was collected from these conversations is presented in “Participant Demographics and Characteristics” section of Chapter 3. The experimenter then used the EDEC tool (refer to Chapter 1 and Appendix A for information about the tool) to interview the parent regarding his/her child’s overall personality, emotional competence, and their parent-child interactions about emotions. There was a second EDEC tool interview with the parents at the end of this study. The comparison information of the pre- and post-study EDEC interview is provided in “Discussion” section of Chapter 4. Although the assessment results collected from the parents were not used as participant selection criteria, they provided valuable information about the participating parent-child dyads. For example, the EDEC tool interview results provided basic information about the parent’s perception of the child’s behavioral characteristics, emotion
expression, and emotion recognition skills. In particular, parents’ reports about how they normally talk or do not talk about emotions during shared book reading were discussed during the instructional session.

There were two child evaluation measures in this screening. The children’s receptive vocabulary skills were assessed using the PPVT-4 (Dunn & Dunn, 2004). The PPVT-4 measures receptive vocabulary without requiring reading or writing skills and has normative data from ages 3;6 – 90+ years. As noted in the inclusion criteria above, the participants’ children had to achieve a score at or above a two-year developmental level when a raw score is converted to the age equivalent.

While conducting the PPVT-4, the child’s natural conversation with the examiner was audio-recorded for measuring speech intelligibility. After the screening session, two unfamiliar listeners (research assistants were not present during the child’s screening session) listened to the audio and recorded the proportion that they could understand using a 1-100 percentage scale (e.g., 50% intelligible). First, raters transcribed the child’s speech. They were allowed to listen to the audio only once. For words/sentences they couldn’t understand and transcribe, they marked “unclear.” After transcribing, they determined the proportion of intelligible speech. As described in the inclusion criteria, only children who had at or less than 50% speech intelligibility were included in this study.

The children’s emotion knowledge was assessed using the facial expressions subscale of the Assessment of Children’s Emotion Skills (ACES; Schultz, Izard, Ackerman, & Youngstrom, 2001). This subscale contains 26 photograph items and assesses the child’s ability to understand emotions conveyed through other children’s facial expressions. A child was presented with each color-printed photograph of a child’s facial expression and asked if the child felt happy, sad, mad, scared, or no feeling. Throughout the test with the ACES, a child was also allowed to answer the examiner’s questions by pointing to the emotion name cards on the presented page (see Appendix
The ACES results were not used for participant selection, but the results were discussed during the instructional session with the parents.

Following completion of these tests, each child selected a preferred book series to read during the baseline and intervention reading sessions. Randomly selected example books of the three selected storybook series (Mercer Mayer’s *Little Critter* series, Houghton Mifflin’s *Curious George* series, and Marilyn Sadler’s *P. J. Funny Bunny* series; see Appendix D for more information about these storybook series) were presented and the child chose one of them. The child read the selected book during the first baseline reading. Using the book by the child, each parent designed his/her own emotion communication board to use during the first baseline reading session. Details about the parents’ emotion communication board designs are provided in “Materials” section of this chapter.

**Materials**

**Instruction materials**

**Parent instruction handouts**

Two parent instruction handouts were provided to the participating parents during the instruction session. One was a diagram of the STEPS program (see Figure 3), which represented the three steps of emotion communication (label, reason, solution). The other was the STEPS program instruction page (Appendix B), which contained detailed information about each step of emotion communication. These two handouts were primarily used during Stage 2 (strategy description) of the instruction (see “Eight Stages of Communication Partner Instruction” section
in this chapter for information about the instruction stages). Parents were allowed to keep these handouts for their reference during and between readings.

**Sample video of book reading**

During Stage 3 (strategy demonstration) of the instruction, the experimenter used a sample video of storybook reading. Trained research assistants role-played as a parent and child dyad to demonstrate how to include the three steps of emotion communication (label, reason, solution) during a shared book reading activity in the video. Following the video, parents were allowed to ask questions. Parents had an opportunity practice role-playing the strategies demonstrated in the video during Stage 3 and Stage 5 of the instruction.

**Example of emotion communication board**

The experimenter showed an example emotion communication board to facilitate parents’ understanding of how to include the three steps of emotion communication when designing a communication board, (Figure 4). This example board included picture symbols for “angry,” possible reasons for the emotion (e.g., “It’s broken”), and possible solutions (e.g., “Breathe”) to resolve the situation. Parents were allowed to refer this example emotion communication board when they designed their own boards for use during storybook reading.
Data collection materials

Storybook

Kent-Walsh et al.'s (2010) book selection guidelines were adapted for this investigation. The selected book series (1) had illustrations, (2) incorporated text and storylines that were appropriate to the child’s receptive language level, cultural background, and interests, (3) had at least two different categories of emotions related to the story (e.g., positive emotions such as happy, negative emotions such as angry, intermediate emotions such as surprised), and (d) included at least 10 double page spreads (i.e., 20 pages total).

As Appendix D represents, three storybook series were selected for this study: Mercer Mayer’s Little Critter books, Houghton Mifflin’s Curious George series, and Marilyn Sadler’s P. J. Funny Bunny series. A total of 32 randomly selected books were used for data collection (10 Little Critter books, 12 Curious George books, and 10 P. J. Funny Bunny books). Each participant dyad reported that they had previously read only one or two books out of the books they read in this study. Throughout the investigation, the participating parent-child dyads had access to the selected books only during the research sessions.

Emotion communication boards

During each parent-child shared reading activity, an emotion communication board was presented within the parent and child’s reach. Parents’ board pointing was necessary when they responded to children’s answers in order to provide visual supports for their emotion discussion and to model board use to children. Children were allowed to use any communication mode during their emotion communication, including pointing to the communication board.
All emotion communication boards used during data collection sessions were designed by the participating parents (see Appendix E for examples of parents’ boards). At the end of each session, parents selected vocabulary they would like to include in the boards that they would use in the next reading session. After each session, one of the trained research team members used Boardmaker computer software to make the participants’ emotion boards with Picture Communication Symbols (PCS; Mayer-Johnson, 1992). The research assistant selected symbols to match the vocabulary that the parents chose for their boards. Symbols for the words that the parents selected were arranged on the board as the parent requested. Words were also included in the boards for all participating dyads since all three children were able to read or learning to read at the time of the study. The completed one-page board was printed in color and provided to the parent before his/her reading. The experimenter always asked whether the board was designed as the parents wanted before they began their reading. During baseline phase, the experimenter did not provide any prompting or feedback on the parents’ board use although the boards were available to be used during their readings. During the intervention phase, parents received explicit prompting and feedback on their board use during reading. Details about the experimenters’ prompting and feedback provided in intervention phase is described in the “Procedures” section of this chapter.

**Video camera**

Each reading session was video-recorded for data analysis. A Philips CAM300WH/37 12 MP Digital Camera was used. The experimenter or one of the research assistants set up the camera in front of the parent-child dyad using the tripod in the beginning of each session. The camera was set up to capture (1) the parent’s face and hands, (2) the child’s face and hands, (3) the book, and (4) the emotion communication board. All research team members who were
responsible for operating the camera had a series of guided practice sessions with the camera (Haidet, Tate, Divirgilio-Thomas, Kolanowski, & Happ, 2009). The purpose of the training was to promote consistency in operating the equipment. During these training sessions, research assistants taped one another during a storybook reading activity, which was followed by a discussion.

A relatively small camera (5.4 x 3.3 x 2 inches) was selected in order to minimize the participants’ reactivity to being recorded. Reactivity is the “response between the researcher and the participant during data collection that affects the natural course of behavior as a result of being observed” (Haidet et al., 2009, p 466). The screening session was also videotaped as a “sensitizing” session in order to help the participants to feel more comfortable about being videotaped and to promote more natural behavior during future readings in front of the camera. In addition, video recording was started a few minutes before each reading, while the experimenter was conversing with the parent-child dyads, as another effort to decrease the participants’ reactivity.

**Procedures**

The experiment consisted of four phases (baseline, intervention, generalization, and maintenance) and a one-time instructional session. The instructional session occurred between the baseline and the intervention phases. Sessions took place two to three times per week with the following exceptions: the first week of the baseline phase, the last week of the generalization phase, and during the week of spring break. All sessions were at least one day apart to avoid carry-over effects. Total days of participation in this study during baseline, intervention and generalization phases were 43 days for Dyad #1, 35 days for Dyad #2, and 43 days for Dyad #3.
Dyad #1’s sessions were an average of 3.3 days apart, Dyad #2’s were an average of 2.5 days apart, and Dyad #3’s were an average of 2.9 days apart.

All reading sessions and the instruction session required a quiet space in the participants’ homes. All participants decided to read in their living rooms or bedrooms. No other family members actively joined the book readings (e.g., answering the parent’s questions).

The experimenter asked the parent to answer a few questions at the beginning of each reading session in order to make sure that no other confounding variables influenced the outcome measures. The checklist consisted of questions about the parent-child dyad’s history since the last reading session, including the number of storybooks they had read, any purposeful emotion education at school or at home, and emotional events the child had experienced. The form also asked about the parent-child dyad’s physical and mental condition on the day of reading.

**Baseline phase**

In baseline sessions, the participating parents were asked to read the selected books as they normally would. They did not know what was being measured in this phase. The experimenter did not provide any instruction, prompting, or feedback on their book reading. There was no prompting or feedback on their board use, although the boards were available to be used during their readings. At the end of each session, the child selected the book to read during the next session and the parent designed a one-page emotion communication board for the selected book.

The criterion for completion of baseline was either (1) five data points, or (2) three data points in a row with zero scores (Kratochwill et al., 2010). Kratochwill et al. (2010) suggested that “a baseline phase of fewer than five data points may be appropriate” (p 12) as long as the researcher in the study decides on a reasonable application of a standard to the particular research
topic and specifies any deviations from the standard. In this study, if the participating parent had multiple consecutive zero scores with overall low variability, additional data points (possibly producing another zero score) were not required in baseline. For example, the parents of Dyad #2 and Dyad #3 had zero scores for the first three data points, so they did not need extended data collection in baseline. Although the parent of Dyad #1 had a score of 1 for the first data point in baseline, she had zero scores for the next two consecutive data points and the variability was extremely low. Therefore Dyad #1, who first started intervention phase, also had three data points in baseline. Dyad #2 had four and Dyad #3 had five data points in baseline. After the measurements showed stability judged by visual analysis (see “Visual analysis of data” section of this chapter for more information) of the graphed data (Kratochwill et al., 2010), instruction was initiated with one dyad while the others remained in the baseline condition.

**Instructional session**

There was a one-time instructional session between the baseline and intervention phases. Only parents participated in the instruction session and children were not involved, except the parent-child role-play at the end of the instruction session. While parents were involved in this procedure, a research assistant entertained the child in nearby area of the same room. Each of the instruction sessions with three parents took about one hour. Parents were encouraged to ask questions throughout the instruction session. Procedural integrity of the instruction was tested by a trained coder. Detailed information about procedural integrity check can be found in the “Reliability” section of Chapter 2.
Eight stages of communication partner instruction

Kent-Walsh and McNaughton (2005) suggested the eight stages of communication partner instruction. Several studies have adapted these stages in communication partner instruction programs and demonstrated the effectiveness of this instruction framework (e.g., Binger et al., 2008; Rosa-Lugo & Kent-Walsh, 2008). The eight instruction stages are (1) pretest and commitment to instructional program, (2) strategy description, (3) strategy demonstration, (4) verbal practice of strategy, (5) controlled practice and feedback, (6) advanced practice and feedback, (7) posttest and commitment to long-term strategy use, and (8) generalization of targeted strategy use. In the present study, these eight stages were adapted for the instructional session using the STEPS program. Stage 1-6 occurred during the instruction session, Stage 7 occurred in the intervention phase, and Stage 8 occurred during the generalization phase. The following sections present the specific procedural details of each stage.

Stage 1 (Pretest and commitment to instructional program). During Stage 1, the experimenter first provided feedback on the EDEC and the ACES results. After summarizing the child’s emotion expression and recognition skills based on those assessment results, the discussion focused on parent-child discussions about emotions during storybook reading. The experimenter then provided feedback on the parent’s performance of the target behavior during baseline (i.e., asking open-ended questions about the label, the reason, and the solution for emotions in the book). All three parents agreed that they could benefit from participating in the STEPS program and affirmed their commitment.

Stage 2 (Strategy description). There were two parts in this stage of the instructional program. First, the experimenter instructed the parents about the three steps of emotion communication (label, reason, solution) using the instructional handouts (see “Instruction materials” section for more information about these handouts). Parents were taught to include the
three steps when they converse about emotions during book reading. In particular, the experimenter instructed them to ask open-ended questions and wait at least 5 seconds or until their child answered, then respond to the child’s presence/absence of answer.

The second part of this stage involved designing an emotion communication board. Using the example board (see Figure 4), the experimenter instructed parents how to include the three key elements of emotion communication when they designed the board that they would use during storybook reading. They had guided practice to select vocabulary for inclusion in an emotion communication board for an example storybook.

Stage 3 (Strategy demonstration). There were two types of strategy demonstration in this stage. First, a sample video of emotion communication during shared book reading was played for the parents (see the “Instructional materials” section in this chapter for more information about the sample video). While watching the video, the experimenter explained how the parent could apply the modeled behaviors in the video to his/her emotion discussion during book reading. There was also a role-play to demonstrate the target strategy. The experimenter played the parent’s role and the parent played the child’s role. While reading a sample book with the parent, the experimenter picked one situation/page that the character was experiencing a certain emotion in. She then modeled asking open-ended questions about the label, the reason, and the solution for an emotion.

Stage 4 (Verbal practice of strategy). During Stage 4, the parents took a verbal quiz to demonstrate their learning of the targeted strategy. The experimenter asked them to verbally list and explain the three steps of emotion communication (label, reason, solution). They were allowed to use the provided handouts while answering the quiz questions. All three parents got them correct on the first trial. The parents received feedback based on the results of the verbal quiz.
Stage 5 (Controlled practice and feedback). This stage consisted of another type of role-play between the experimenter and the parent. This time, the parent played a parent’s role and the experimenter played a child’s role in order to provide the parent an opportunity for practicing in a controlled setting. The parent was asked to imitate the experimenter’s modeling that was provided during the previous role-play in Stage 3. There were gradual fading of the experimenter’s prompting and feedback during this practice.

Stage 6 (Advanced practice and feedback). In this stage, parents practiced the learned strategy with their children. Prompts and feedback were gradually faded based on observation. Parents were asked to practice with their children in the same way that they did during the role-play with the experimenter.

Intervention phase

Each participating dyad began the intervention phase after the one-time instruction session. The main differences between baseline and the intervention phases were that (1) the parents were asked and prompted to apply the learned strategies for emotion communication during book reading, and (2) the parents received feedback on their implementation of the learned strategy as needed. The experimenter assisted the parent in generating action plans (e.g., practicing between sessions) for maintenance and generalization of the targeted strategy. Parents were also encouraged to ask questions. The intervention phase continued until there were least five data points and the target behavior set showed stability.
Generalization phase

The generalization phase was Stage 8 (generalization of targeted strategy use) of the instructional program. After each dyad completed the intervention phase, three generalization probes were taken using a different book series from the one used during intervention. At the end of the last intervention session each child selected a different book series to read during the generalization phase. The participating dyads’ reading activities were identical to those in the intervention phase. The first probe began within one week following completion of the intervention phase. Based on Kent-Walsh and McNaughton's (2005) suggestions, the experimenter (1) elicited feedback on the impact of implementation of the learned strategy from the parent by encouraging questions, (2) assisted the parent in generating action plans for maintenance and generalization of the strategy, and (3) provided feedback on the parent’s performance and emotion board designs.

Maintenance phase

Three maintenance probes were conducted within 2-6 weeks following completion of the generalization phase. During the maintenance probes, the participants’ continued use of the strategies during storybook reading was monitored. In each session, children were asked to select a book to read from the two book series they had read during the baseline, intervention, and generalization phases. The participating dyads’ reading activities were identical with those in the intervention phase. There was no provision of prompting and feedback on the parents’ performance.
Social validation

To ensure that the instruction program was socially valid, the participating parents completed a satisfaction survey (see Appendix F). The survey contained seven questions, including questions regarding their level of satisfaction with the instructional program (e.g., “Was it helpful to learn the emotion communication strategy?”, “What did you like the most about participating in this study?”) and future use of the strategy (“Would you use the strategy when you read a storybook with your child in the future?”). In addition, in order to appreciate the indirect effect of the instructional program on people in the participants’ social circles, the last question of the survey asked: “Have you talked to any others (e.g., teachers, other family members, other parents with/without children who have Down syndrome) about this study and/or the emotion conversation strategy you learned?” Parents’ verbal sharing about their satisfaction with the intervention is included in social validation data.

Reliability

Coding reliability

Inter-rater reliability was calculated for the coding analysis on the dependent (parent measures) and the collateral (child measure) variables in order to establish the integrity of data collection. Twenty percent of the sessions in each phase were randomly selected (3 baseline sessions, 3 intervention sessions, and 2 generalization sessions). The second research assistant reviewed the selected videos and coded the behaviors without reference to the original data. Point-by-point agreement was calculated by dividing the total number of agreements by the total number of agreements, disagreements, and omissions and multiplied by 100. The mean percentage of inter-rater agreement on the parent measures was 100% during baseline, 95.8%
during intervention, and 100% during generalization. The mean agreement scores for the child measure were 100% during baseline, 92% during intervention, and 87.1% during generalization.

**Procedural reliability**

Procedural integrity of instruction was tested to ensure that the instructor consistently followed Kent-Walsh and McNaughton's (2005) stages of communication partner instruction with all participants during the instructional session. Only the first six stages were included in this evaluation in the instructional session because Stage 7 (posttest and commitment to long-term strategy use) occurred during the intervention phase and Stage 8 (generalization of targeted strategy use) occurred during the generalization phase. Three research assistants were trained for the procedural integrity check before the instruction sessions. Each person watched the entire videotaped instruction, which was conducted with one participating dyad, and evaluated the instruction using the provided evaluation form (see Appendix G). They recorded “Yes” or “No” for each of the six stages to indicate if the instructor implemented each stage as described in the form (e.g., Stage 1: The instructor provided feedback based on the EDEC interview results and baseline observations and introduced the target strategy). They were asked to provide reasons for any “No” answers. The number of stages correctly implemented was divided by the total number of the instruction stages (i.e., the number of correct, incorrect, and omitted stages; six) and multiplied by 100 to obtain the procedural integrity score. All three research assistants answered “Yes” for all stages. Therefore, the average procedural integrity score for instruction was 100% (6/6*100).
Data Analysis

Coding

Haidet et al. (2009) suggested that observational measures employ prearranged coding schemes to quantify behavior. Prior to the onset of data collection, the experimenter developed coding schemes (see Appendix H) for the parent and child behaviors being measured in this study. Using these coding schemes, the trained research assistants assigned codes to the participating dyads’ behaviors. In order to achieve acceptable levels of reliability between coders and reduce variability in scoring (Haidet et al., 2009), each research assistant was trained with a standardized training procedure (e.g., practice coding with a sample video). The training included operational definitions of terms (e.g., modeling, prompting) and interpretation of the behaviors to be coded with specific examples. These trained research assistants were blind to the research question, the total number of sessions, and the temporal order of sessions. The entire reading from each session was included for data analysis because the behavior being measured occurred at various points (e.g., in the beginning of reading, at the end of reading). As a result, none of the participating dyads’ emotion conversations was missed in data analysis.

Data coding procedures for parent measure

Using the parent behavior coding scheme (Appendix H), the trained research assistants recorded the occurrence of the targeted three parent behaviors (i.e., asking open-ended questions for the label, the reason, and the solution for an emotion in the book). Since each of these three behaviors did not depend on any others and they were coded separately, coders did not have to wait until they observed all three. For example, if a parent asked an open-ended question for only the reason for the emotion (e.g., “The boy is sad here. Why?”), a coder counted it as a successful
implementation of the target behavior for the reason element, but not for other two (i.e., label and solution). The parent behavior coding scheme included the description and examples of those behaviors. Every time a coder observed a parent’s provision of an open-ended question on any of the label, the reason, and the solution for the emotion, the coder recorded the time (e.g., 3:37) and the parent’s question (e.g., “How is he feeling there?” for emotion label, “Why is he sad?” for the reason, “What can he do now?” for the solution).

Parents’ questions with the following characteristics were excluded in coding. First, yes/no questions which included the target answer (e.g., “Is the bunny happy there?”) were excluded in coding. Second, questions had to be about the book character’s emotions, not about the child’s or anybody else’s emotions (e.g., “How would you feel there?”, “What can you do when you are sad?”). As Na et al., (under revision) suggested, having a full range (label, reason, solution) of emotion communication outside of a child’s own emotional situation is better for more effective cognitive learning. Thus, this investigation only focused on the parent-child communication about the book character’s emotion. Third, if the parent provided cueing (e.g., pointing to the corresponding emotion symbol on the board) when s/he asked the open-ended question, the question was excluded in coding. Pointing to the board without specifying the correct answer was acceptable.

Following the parent’s provision of open-ended questions, the coder also recorded if the parent (1) waited for at least 5 seconds or until the child began his/her answer and (2) then responded to the child’s answer. This waiting behavior was defined as not producing utterances in any communication mode (e.g., oral speech, pointing to the book/board, manual sign) while directly looking at a child to convey an expectation for him/her to take a conversational turn (Remington-Gurney, 2013). When parents repeated/rephrased their open-ended questions multiple times, the coder started to record 5-second waiting following the last question. Board pointing was necessary for a parent’s correct response.
Data coding procedures for child measure

Children’s behaviors were analyzed using the child behavior coding scheme (Appendix H). The trained research assistants recorded utterances that included the label, the reason, and the solution of emotions in the book. They had to record four types of information about those utterances including (1) the time, (2) the utterance, (3) the communication mode(s) the child used for the utterance, and (4) the related emotion. Acceptable communication modes for a child’s behavior included intelligible words, aided AAC (e.g., pointing to the emotion communication board), manual signs/approximations of sign, and other gestures (e.g., pointing to the book, putting the pointing finger over the mouth). Those children did not have to talk about the label, the reason, and the solution for the emotion in that specific order. Continuous communicative behaviors, such as repetitive speech or repeated pointing at a symbol without pause, were considered as one time event. That is, if a communicative behavior was repeated within 10-second pause, the subsequent repetitions were not counted as new utterances unless there was a communicative interruption by a parent. For example, if a child says “happy, happy, happy,” it will be considered as a single utterance for emotion labeling.

Children’s utterances did not have to be complete (i.e., a finished sentence) or grammatically correct so long as they contained the three steps of emotion communication. Unfinished (e.g., “She is sad because of the broken….”) and/or grammatically incomplete (e.g., “He is sing”) utterances were included in coding. Also, the child’s utterances did not have to be the “right” answer the parent was expecting. This is because the purpose of the coding was to count the frequency of a child’s emotion-related utterances, not evaluating the child’s emotion knowledge. For example, even though a child said “happy” for sad emotion, the utterance was still accepted and coded because the utterance included the emotion’s label.
Visual analysis of data

Visual analysis of the data was used (Kratochwill et al., 2010) in order to evaluate the treatment effect in this study (i.e., the causal relation between the independent variable and dependent variables). The data across phases had to demonstrate changes in the targeted direction in the dependent measures in order to decide if the instructional program was effective (e.g., increase of the parent measures in this study). At least three demonstrations of the same pattern of changes across phases were needed. Visual analysis of data in single-subject design employed six features: (1) level, (2) trend, (3) variability, (4) immediacy of the effect, (5) overlap, and (6) consistency of data patterns across similar phases (Kratochwill et al., 2010).  

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1 (1) Level: Mean score for the data within each phase
(2) Trend: Slope of the line connecting the mean score of the first and the second half data points in a phase
(3) Variability: Range or standard deviation of data in a phase
(4) Immediacy of the effect: Change in level between the last three data points in one phase and the first three data points of the next
(5) Overlap: Proportion of data from one phase that overlaps with data from the previous phase
(6) Consistency of data patterns across similar phases: Consistency in the data patterns from phases with the same conditions
Chapter 3

RESULTS

Participant Demographics and Characteristics

The first three parent-child dyads who were screened met all the inclusion criteria. These participating dyads were recruited from State College and the surrounding areas in Pennsylvania. The study did not begin until they signed the consent, and all procedures were approved by the IRB of the Pennsylvania State University. All participating parents also provided informed consent for their children’s participation according to the policies and procedures of the Office for Research Protections at the Pennsylvania State University. As presented in the Table 2, there were two mother-child dyads and one father-child dyad. The following sections present the specific demographic details and characteristics of these three parent-child dyads, including their EDEC interview results.

Although all three children’s primary communication mode was natural speech at the time of the study, all had current and/or previous experiences with aided AAC systems. Dyad #1’s child had experienced a SGD when she was a toddler through a previous AAC research study. The parent also reported the child had experience with an iPad\(^2\) for communication purposes. Dyad #3 also had participated in an AAC research project and had used a SGD from 8 months to 3 years of age. The parent also reported the child had used an iPad for communication. The child from Dyad #2 was using picture boards for communication during school activities at the time of the study.

\(^2\) The iPad is a registered trademark of Apple, Inc., 1 Infinite Loop, Cupertino, CA 95014, USA.
Table 2. Demographic information for three parent-child dyads.

<table>
<thead>
<tr>
<th>Parent age (marital status), gender, highest education level, and occupation</th>
<th>Child CA (years:months), gender, and sibling status</th>
<th>Primary disability</th>
<th>Communication modes</th>
<th>PPVT-4</th>
<th>ACES Facial expression subscale score</th>
<th>Speech intelligibility average rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad #1 - Parent 40 (married) Female Master’s degree</td>
<td>Dyad #1 - Child 8:9 Female 2 siblings</td>
<td>DS</td>
<td>Current: Natural speech Previous: Natural speech, manual signs, SGD</td>
<td>86</td>
<td>7:2</td>
<td>55.56% (5 correct items out of 9 answered items)</td>
</tr>
<tr>
<td>Dyad #2 - Parent 40 (married) Female Master’s degree</td>
<td>Dyad #2 - Child 5:1 Male 1 sibling</td>
<td>DS</td>
<td>Current: Natural speech, picture boards Previous: Natural speech, manual signs, SGD</td>
<td>91</td>
<td>4:5</td>
<td>50% (5 correct items out of 10 answered items)</td>
</tr>
<tr>
<td>Dyad #3 - Parent 51 (married) Male Master’s degree</td>
<td>Dyad #3 - Child 9:8 Female 1 sibling</td>
<td>DS</td>
<td>Current: Natural speech Previous: Natural speech, manual signs</td>
<td>65</td>
<td>5:9</td>
<td>31.25% (5 correct items out of 16 answered items)</td>
</tr>
</tbody>
</table>

Note. Pseudonyms have been used for participants (parents and children). DS = Down Syndrome; CA = Chronological Age; PPVT-4 = Peabody Picture Vocabulary Test - 4th edition (Dunn & Dunn, 1997); SS = Standard score; AE = Age Equivalent score; ACES = Assessment of Children’s Emotion Skills (Shultz et al., 2001). Speech intelligibility was rated by two unfamiliar listeners per participant and the average of those two ratings is presented in this table.

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3 All parents had professional occupations. Their occupations are not presented in Table 2 for confidentiality purposes. The information is available upon request.
Dyad #1

Dyad #1 was a mother-daughter dyad. The parent was a 40-year-old mother. She participated in the study with her daughter, an 8-year-old girl with Down syndrome. The parent reported her child’s hearing and vision to be within functional limits in the pre-screening survey. The parent reported that the child owned glasses, but she did not wear them often. She did not wear her glasses while reading in this study. The PPVT results indicated that the developmental level of her receptive vocabulary was 7;2. Based on the ACES score, she was able to recognize the emotion presented by a child’s facial expressions with 55.56% accuracy (5 correct items out of 9 answered items). The child primarily used her natural speech to communicate. Her speech intelligibility was 50%. The survey result indicated that the child had skills for answering simple open-ended questions based on stories.

Based on the parent interview results conducted using the EDEC tool in the screening session, the child of Dyad #1 was active and social in general. She was very vocal when she felt upset or happy about anything. The parent also described the child as a “daddy’s girl” because she often enjoyed doing things with him. No intentional self-injurious behaviors, aggressive behaviors, or property destruction were reported by the parent.

In terms of the child’s emotion expressions, the parent described that the child often expressed most of the basic emotions (e.g., love, anger, disgust, fear, and happiness) with the exceptions of sadness and surprise (expressed sometimes). She also reported that the child had expressed most of the secondary emotions (e.g., adoration, amazement, disappointment, pride) at least once, with the exception of nervousness. Although the child had some words in her emotion vocabulary inventory (e.g., happy, mad, sad, love, excited, afraid), she usually had a hard time having a connected conversation about the emotion (e.g., describing what caused the emotion or what she wanted for the situation). She also used nonlinguistic methods of emotion expression,
such as facial expressions, body postures, gestures, and vocalizations. In terms of emotion recognition skills, the parent reported that the child often noticed other’s emotions right away when someone was upset and tried to make them feel better.

The parent of Dyad #1 answered that she rarely prompted the child to label emotions because the child would label her own or others’ emotions without any prompting. When the parent was asked what emotions she would feel comfortable to express in front of the child, she answered that she tried to be honest with all types of emotions with her children for educational purposes (i.e., modeling of emotion expression).

The child of Dyad #1 liked to read books a lot and book reading was a favorite daily routine in her family. The child read 2-3 books with her mother/father everyday either in the basement “library” or in the bedroom. Her favorite books were the Curious George series. She had read some Little Critter books but not P. J. Funny Bunny books. The parent reported that she sometimes asked the child questions about basic emotion labels in books (e.g., “How does the little boy feel?” “How would that make you feel?”) in order to help the child identify them.

**Dyad #2**

Dyad #2 was a mother-son dyad. The parent of Dyad #2 was a 40-year-old mother. She participated in the study with her 5-year-old boy with Down syndrome. The parent reported the child’s hearing and corrected vision to be within functional limits. He wore his glasses in every reading session. The child’s PPVT result indicated that the developmental level of his receptive vocabulary was 4;5. Based on the ACES score, he was able to recognize emotions presented by photographs of a child’s facial expressions with 50% accuracy (5 correct items out of 10 answered items). The child used his natural speech as primary communication mode. His speech
intelligibility was 39%. The survey result also indicated that this child had skills for answering simple open-ended questions based on stories.

According to the EDEC tool interview, the child of Dyad #2 was an outgoing, optimistic, stubborn, and sensitive boy. In terms of his peer interaction, the mother reported that he was often reserved and shy with his peers in general though he had particular kids with whom he wanted to interact. On the other hand, she indicated her concerns about his excessive openness to other individuals, including strangers. This child did not have a history of intentional self-injurious behaviors, aggressive behaviors, or property destruction.

The mother stated that the boy expressed love and happiness often, anger, fear, sadness and surprise sometimes, and disgust rarely. She also reported that she had seen him expressing all of the presented secondary emotions (e.g., adoration, amazement, disappointment). His emotion vocabulary inventory included happy, sad, excited, love, mad, and scared. He also used some nonlinguistic methods of emotion expressions, including facial expressions, body postures, gestures, and vocalizations. The mother also reported that the child used fewer than six words to have a connected discussion about emotions (e.g., what happened to cause the emotion). In terms of his emotion recognition skills, the parent answered that the child often labeled others’ emotions (e.g., “Lizzy’s sad today”).

The parent of Dyad #2 reported that her prompting for the child’s emotion labeling occurred most of the time because checking in how he was doing was a “big thing” to her. Her strategies for input included asking questions (e.g., “How are you feeling?”,”Why are you angry?”) and sharing her own emotions as a response to certain behaviors (e.g., “Mommy feels sad when you hurt others”). In terms of her own emotion expressions in front of him, she answered that she would express positive emotions such as love and pride to reinforce the boy’s positive behaviors whereas she would feel less comfortable to express sadness in the presence of her child.
According to his mother, the child’s favorite activity was book reading and he particularly liked a certain elephant book. This child had also read some *Curious George* and *Little Critter* books, but not *P. J. Funny Bunny* books. Dyad #2 spent 5-10 minutes per book every day at his bedtime. In terms of emotion discussion during book reading, the parent answered that she had focused on reading rather than discussing emotions in the book. She rarely asked questions about emotions in the book (e.g., “Do you think they are happy or sad?”). The parent indicated during the EDEC screening interview that participating in this study would be helpful in terms of her son’s emotional learning during book reading.

**Dyad #3**

Dyad #3 was a father-daughter Dyad. The parent of Dyad #3 was a 51 year-old father and the child was a 9-year-old girl with Down syndrome. The father reported the child’s hearing and vision to be within functional limits. She did not wear glasses. Her PPVT test result indicated that the developmental level of her receptive vocabulary was 5;9. Based on the ACES score, she was able to recognize emotions presented by photographs of a child’s facial expressions with 31% accuracy (5 correct items out of 16 answered items). Natural speech was her primary communication mode. Her speech intelligibility was 45.5%. According to the pre-screening survey result, the child had skills for answering simple open-ended questions based on stories.

The child of Dyad #3 was reported to be an active, charismatic, stubborn, and sensitive child. She liked music, school, princesses, and the color pink. She loved her family and her learning support teachers that she worked with at school. She was also attached to her stuffed elephant. She had difficulty transitioning from one activity to another and her attention span was relatively short. In terms of her interactions with others, she was more reserved and followed her peers’ lead. The parent also indicated his concerns about her excessive openness to other
individuals including strangers. The child did not have a history of intentional self-injurious behaviors, aggressive behaviors, or property destruction.

The father reported that the child expressed *love*, *happiness*, and *surprise* often, *anger* sometimes, and *sadness*, *disgust*, and *fear* rarely. She also expressed all of the presented secondary emotions according to her father’s report. Her emotion vocabulary inventory included *love*, *mad*, *afraid*, *scared*, *happy*, *sad*, *excited*, and *nervous*. She also used some nonlinguistic methods of emotion expression, including facial expressions, body postures, gestures, and vocalizations. The father reported that the child was good at explaining the events/situations related to an emotion and would use more than 20 words in her description of the related story. The child’s recognizing and labeling of others’ emotions (e.g., “Are you sad?”) also occurred frequently according to her father’s report.

In terms of the parent’s emotion expression in front of the child, he reported that the child had seen the full range of emotions from him except anger. In terms of his prompting for the child’s emotion labeling, he tended to ask more about the child’s school events (e.g., “What went on at school?”, “How did that work?”) rather than asking about her emotions (e.g., “How do you feel about that?”). When gearing up for a nervous moments or unwinding afterward with this child, this father used “distraction” as a strategy. That is, he tried to have limited conversations about the event ahead/afterward to help her.

The child of Dyad #3 got to pick two books to read every bedtime with her mother or father. They usually spent about 20 minutes for this reading each day. The child liked some *Curious George* books and read some *Little Critter* books, but not *P. J. Funny Bunny* books. During reading, the parent focused on the basic plot of a story during his reading (e.g., “What’s going on?”, “What do you think about that?”) and had not discussed emotions in books with her before.
Parent Measures

Provision of opportunities to discuss emotions in the book

Figure 5 represents the parents’ data in each session (Baseline [B] 1-5 sessions, Intervention [I] 1-5 sessions, and Generalization [G] 1-3 sessions). The maintenance data is not presented in this dissertation because the data analysis is ongoing. The number of open-ended questions (y-axis) on the label, the reason, and the solution for the emotion asked by the parents were measured as three dependent variables. The results of visual analysis of parents’ data are presented.

Frequency of asking open-ended questions on emotion

Level. The level (i.e., mean score) of data in baseline was zero for all three steps (label, reason, solution) across all participating parents except one data point from Dyad #1 (i.e., 0.3). None of the parents asked open-ended questions about the label, the reason, or the solution emotions in the book during baseline sessions (i.e., 0 for all data points throughout B1-B5 sessions) with the exception of the parent of Dyad #1. The parent of Dyad #1 asked only one open-ended question about the label of the character’s emotion during baseline (“Now, how do you think Bill feels?”), but did not ask open-ended questions on the reason or the solution for the emotion. During the first intervention session, all parents started to ask open-ended questions about these three elements as trained during the instructional session. All parents met the criterion for successful performance (i.e., at least double of the highest data in baseline) in the first intervention session. The total number of open-ended questions that were asked by the parents during the first intervention session significantly increased across all elements compared to data in baseline. For example, the parent of Dyad #3 did not discuss emotions with his child at all
Figure 5. Total number of open-ended questions asked by the three participating parents to their children with Down syndrome regarding the label, the reason, and the solution for emotions in the book. The time unit for each data point was one book reading.
during baseline, but he asked three open-ended questions for the label (e.g., “How do you think he feels?”), four for the reason (e.g., “Why do you think he is scared over there?”), and three for the solution (e.g., “What do you think George can do if he feels sad the nurse yelled at him?”) during the first intervention session. The mean of data in intervention phase was 2.4 (label, reason, solution) for the parent of Dyad #1, 3.4 (label), 3.2 (reason), and 2.4 (solution) for the parent of Dyad #2, and 2.8 (label), 3 (reason), and 2.4 (solution) for the parent of Dyad #3. All parents met the criterion of treatment effect throughout the remaining intervention sessions (I2-I5).

**Trend.** There were no dramatic upward/downward trends during the baseline and intervention phases. That is, the difference between the average of first half and that of second half of data points in each phase was zero or minimal for all three elements (label, reason, solution) across participants. The parent of Dyad #3 had a slightly increasing (2.7→3) average for the emotion label and stable (e.g., 3→3) averages for both the reason and the solution for the emotion, while the parent of Dyad #1 had slightly decreasing (2.7→2.3) averages for all three elements. The parent of Dyad #2 had a stable (e.g., 3.3→3.3) average for the emotion label, a slightly increasing (e.g., 3→3.3) average for the reason, and a slightly decreasing (e.g., 2.7→2.3) average for the solution.

**Variability.** The variability of data was extremely low during baseline because almost all data points were zero for all participants. In the intervention phase, variability of data became greater but was still low. Dyad #1’s data throughout all intervention sessions were the most consistent with the lowest variability. The range of data was one (highest data point, 3; lowest data point, 2) for all three steps of emotion communication. The parent of Dyad #3 had a
difference of one to two between the highest and the lowest data points. Dyad #2 had the greatest variability in data in intervention phase with a difference of two between the highest and the lowest data points for all three elements.

*Immediacy of the effect.* Immediacy of the effect was determined by looking at changes in level, trend, and variability during the phase transition between the last three data points in baseline phase and the first three data points in intervention phase. Overall, all participating parents showed an immediate effect of intervention for all three steps of emotion communication. For example, during the first three sessions in intervention, all participants had greater levels of data (Dyad #1, 2.5; Dyad #2, 3.3, Dyad #3, 2.5) on emotion labeling compared to their baseline levels (Dyad #1, 0.3; Dyad #2 and Dyad #3, 0). The trend of data for all participants was stable (Dyad #1 and Dyad #2) or slightly increasing (Dyad #2) during those three data points. Although the parent of Dyad #2 had slightly greater variability (range: 2) in data than other two parents (range: 1) on emotion labeling during the first three sessions in intervention, her data points were stabilized from the second session in intervention.

*Overlap.* There were no overlapping data points across the baseline and intervention phases for all participating parents. Therefore, the overlap score was zero for all three steps of emotion communication across participants.

*Consistency of data patterns across similar phases.* All three parents’ baseline data were compared in order to examine the consistency of data patterns in the baseline condition. The baseline data were extremely consistent across participants because all had zero scores, with the exception of one data point. This indicated that none of the parents were performing the target behavior before they were instructed with the STEPS program. All three parents’ intervention data were also compared separately. Following the onset of the intervention phase, all parents had very similar data patterns, with greater scores compared to their baseline data. No parents’ data went back to baseline level during the intervention phase.
The parents of all three dyads continued to ask open-ended questions on the three steps of emotion communication during the generalization phase. For example, on average, the parent of Dyad #2 asked open-ended questions on the emotion label 3.3 times per session (e.g., “How do you think George feels?”), on the reason for the emotion 3.3 times (e.g., “So, why is George happy?”), and on the solution for the emotion 2.7 times (e.g., “What could he do since he is happy?”). No one’s data in the generalization phase had overlapping data points with their data in baseline phase.

**Rate of asking open-ended questions on emotion**

The rate of parents’ performance was examined by measuring how many times the parent asked open-ended questions on the three steps (label, reason, solution) per minute (see Table 3). The total number of open-ended questions asked by parents was divided by the total time (measured in minutes) of each book reading. The average rates in baseline sessions were zero for all parents (with the exception of one session for Dyad #1) because they did not ask open-ended questions at all during baseline. During intervention phase, the rate of each parent’s performance was significantly increased. For example, the parent of Dyad #1 asked open-ended questions about the label of the emotion 0.89 times in one minute. On average, the parent of Dyad #1 had the highest and the most consistent rates (label, 0.89; reason, 0.87; solution, 0.87) and the parent of Dyad #2 had the lowest and least consistent rates (label, 0.32; reason, 0.26; solution, 0.71).
Table 3. Rate of parents' discussion of three steps of emotion communication (label, reason, & strategy).

<table>
<thead>
<tr>
<th></th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
<th>Baseline Average</th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>I4</th>
<th>I5</th>
<th>Intervention Average</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>Generalization Average</th>
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</thead>
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<td>-</td>
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<td>0.40</td>
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<tr>
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<td>0.00</td>
<td>0.00</td>
<td>-</td>
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<td>0.00</td>
<td>0.00</td>
<td>-</td>
<td>-</td>
<td>0.00</td>
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<td>0.23</td>
<td>0.40</td>
<td>0.24</td>
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<td>0.41</td>
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<td>0.00</td>
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<td>0.00</td>
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<td>0.00</td>
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<td>0.18</td>
<td>0.17</td>
<td>0.21</td>
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<td>0.50</td>
<td>0.06</td>
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</tr>
</tbody>
</table>

*Note: Unit = Number of open-ended questions per minute; - = No session.*

**Proportion of open-ended questions followed by waiting and responding**

During the instructional session, all parents were trained to wait after asking an open-ended question for at least five seconds or until the child began his/her answer. They were also trained to respond to the presence/absence of the child’s answer. As the coding schemes presents, a successful response consisted of (1) reflective listening to a child’s correct/appropriate answer, and (2) modeling of the correct
answer. The parents had to use the emotion communication boards in both cases.

As presented in Table 4, during baseline phase almost none of the parents asked an open-ended question on emotions, with the exception of one question from Dyad #1. Therefore the proportion was not calculated, with the exception of Dyad #1’s average proportion score on emotion labeling (33%).

During the intervention phase, all parents started to wait and respond after asking an open-ended question about an emotion. The parent of Dyad #1 waited for and responded to a child’s answer the most consistently throughout the intervention sessions (label, 93%; reason, 87%; solution, 93%). In her first intervention session, she missed some opportunities to wait for and respond to a child’s answer after her open-ended questions. However, from the second intervention session onward her open-ended questions were always followed by successful waiting and responding with a proportion score of 100%. The parent of Dyad #2 had the second most successful scores for waiting for and responding to the child’s answer after her questions. On average, she waited for and responded to the child’s answer following 78% of her questions on an emotion’s label, 90% of her questions on the reason, and 53% of her questions on the solution. Dyad #3’s waiting and responding were the least consistent (label, 40%; reason, 55%; solution, 57%). He waited for and responded to his child’s answer half of the times on average. He was more successful with waiting and responding on all three steps of emotion communication during the first few intervention sessions (I1, I2) compared to the later sessions (I4, I5).
Table 4. Proportion of parents' emotion discussion with all three stages of emotion communication (ask, wait, & respond).

<table>
<thead>
<tr>
<th>Dyad #1</th>
<th>Baseline Average</th>
<th>Intervention Average</th>
<th>Generalization Average</th>
</tr>
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<td>B2</td>
<td>B3</td>
<td>B4</td>
</tr>
<tr>
<td>Label</td>
<td>100 N/A N/A - -</td>
<td>33 67 100 100 100 100</td>
<td>93 100 100 50</td>
</tr>
<tr>
<td>Parent</td>
<td>Reason N/A N/A - -</td>
<td>0 33 100 100 100 100</td>
<td>87 100 100 100</td>
</tr>
<tr>
<td>Solution</td>
<td>N/A N/A N/A - -</td>
<td>0 67 100 100 100 100</td>
<td>93 100 100 100</td>
</tr>
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</table>

<table>
<thead>
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<th>Generalization Average</th>
</tr>
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<tbody>
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<td>B1</td>
<td>B2</td>
<td>B3</td>
<td>B4</td>
</tr>
<tr>
<td>Label</td>
<td>N/A N/A N/A N/A N/A</td>
<td>0 50 100 100 67 75</td>
<td>78 100 75 67</td>
</tr>
<tr>
<td>Parent</td>
<td>Reason N/A N/A N/A N/A</td>
<td>0 50 100 100 100 100</td>
<td>90 100 100 100</td>
</tr>
<tr>
<td>Solution</td>
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<td>0 0 100 67 0 100</td>
<td>53 100 100 100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dyad #3</th>
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<th>Generalization Average</th>
</tr>
</thead>
<tbody>
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<td>B3</td>
<td>B4</td>
</tr>
<tr>
<td>Label</td>
<td>N/A N/A N/A N/A N/A</td>
<td>0 67 100 33 0 0</td>
<td>40 0 33 67</td>
</tr>
<tr>
<td>Parent</td>
<td>Reason N/A N/A N/A N/A</td>
<td>0 75 100 33 33 33</td>
<td>55 100 50 67</td>
</tr>
<tr>
<td>Solution</td>
<td>N/A N/A N/A N/A N/A</td>
<td>0 100 50 100 0 33</td>
<td>57 100 100 50</td>
</tr>
</tbody>
</table>

Note: Unit: %; Proportion = (Number of times parents ask, wait, and respond) / (Number of times parents ask) *100; N/A = No open-ended question; - = No session.
Emotion board design

Number of symbol expressions on parents’ boards

During baseline, all parents never (Dyad #3) or rarely (Dyad #1 and #2) included symbols for the three steps of emotion communication on their boards (see Appendix E for examples of parents’ boards). Instead, they primarily included symbols related to the story of each book, including characters (e.g., friends), actions (e.g., sailing), objects (e.g., pizza), and so on. Only the parents of Dyad #1 and Dyad #2 included a few emotion symbols, such as “happy” and “mad,” on some of their boards. However, none of the parents included symbol expressions for the reason or the solution for emotions in the book on their boards. When the intervention phase began, all parents started to include single- or multi-symbol expressions for the label, the reason, and the solution for emotions in the book on their boards as trained during the instructional session. On average, the parent of Dyad #1 included the most symbols for these steps per board (label, 4 [e.g., “Scared”]; reason, 3.2 [e.g. “The food is going to fall”]; solution, 4.2 [e.g., “Ask for help”]). The parents of Dyad #2 and Dyad #3 included a similar average number of emotion communication elements per board (e.g., Dyad #2’s average: label, 2.8 [e.g., “Happy”]; reason, 2.8 [e.g., “Found his mitt”]; solution, 2.8 [e.g., “Tell his mom”]).

All parents continued to include similar numbers of symbol expressions related to the three steps on their boards during the generalization phase as compared to the intervention phase (e.g., Dyad #2: label, 3 [e.g., “nervous”]; reason, 3 [e.g., “waiting for the ghost”]; solution, 3 [e.g., “talk to his friends”]).
Types of emotion symbols (label) included on parents’ boards

As Appendix D shows, each storybook contained at least two different categories of emotions (positive, negative and intermediate emotions). During the intervention phase, all parents included various types of emotions on their emotion communication boards. No parent focused solely on a certain category of emotions across sessions. For example, the parent of Dyad #2 included four positive emotion symbols (e.g., happy, loving), five negative emotion symbols (e.g., sad, mad), and three intermediate emotion symbols (e.g., surprised, scared) on her boards throughout the intervention phase.

Child Measures

Number of emotion-related utterances

Figure 6 represents the children’s data on the collateral measure, which was the number of children’s utterances related to the label, the reason, and the solution for emotions in the book. During baseline, all children never (Dyad #3) or rarely (Dyad #1 and Dyad #2) produced utterances on those three steps of emotion communication. For example, the level of Dyad #1’s data in baseline phase was 0.33 for emotion label and zero for other two elements. When intervention phase began, all children started to produce multiple utterances on all three steps. All three children showed immediacy of the effect. For example, the child of Dyad #3 showed the greatest changes during the first three intervention sessions (label, 0→4.7; reason, 0→7.3; solution, 0→4.3). When comparing all baseline and intervention sessions, the children of Dyad #2 and Dyad #3 showed the greatest changes in the level of data across phases. For example, the child of Dyad #3 did not produce emotion-related utterances during baseline at all,
Figure 6. Total number of children's utterances on the label, the reason, and the solution for emotions in the book. The time unit for each data point was one book reading.
but she produced 4.4 utterances on emotion label (e.g., “Scared”, “Surprised), 5.8 utterances on the reason (e.g., “Dragon”, “The man”), and 3.8 utterances on the solution (e.g., “Look at other people”, “Help”) per reading session on average. Although the child of Dyad #1 produced relatively fewer utterances compared to the other children, she also showed great changes in the level of data across phases (e.g., level change for emotion label: 0.33→3.2). Dyad #1’s data was more consistent throughout intervention sessions (range: label, 4; reason, 2; solution, 2), while other two had more variability in their data (e.g., Dyad #2’s range: label, 5; reason, 4; solution, 7).

In general, all of the children’s data showed a decreasing trend, with the exception of Dyad #2. For example, Dyad #3’s average of data for the reason for the emotion during the first half of the intervention sessions was 7.3, while during the second half it was 3.3. Dyad #2’s data on the reason was stable and his data on the solution had an increasing trend in intervention.

For all children, there were no overlapping data points across phases. Both the baseline and intervention phases for all children showed consistency of data in the same condition, representing great changes in all behavior that was being measured.

All children continued to produce emotion-related utterances during the generalization phase. For example, on average, the child of Dyad #3 produced 3.7 utterances on the emotion’s label (e.g., “happy”), 3.3 utterances on the reason (e.g., “He has a new baby”), and 3.7 utterances on solution (e.g., “Show his friends”). No one’s data had overlapping data points with their data in baseline phase.

**Rate of emotion-related utterances**

Table 5 represents how many utterances each child produced on the label, the reason, and
Table 5. Rate of children’s utterances on the label, the reason, and the solution for emotions in the book.

<table>
<thead>
<tr>
<th>Dyad #1</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
<th>Baseline Average</th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>I4</th>
<th>I5</th>
<th>Intervention Average</th>
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<th>G2</th>
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*Note: Unit = Number of utterances per minute; - = No session.*

The rate of children’s utterances on the label, the reason, and the solution for emotions in the book per minute during each session. The average rates in baseline for all children were zero or very close to zero because they rarely commented about emotions in the book during reading. When the intervention phase began, the rate of each child’s emotion-related utterances significantly increased and was maintained throughout the intervention phase. For example, the child of Dyad #3 produced utterances on the emotion’s label 0.44 times per minute on average. She also commented about the reason for the emotion 0.62 times per minute and the solution 0.33 times per minute on average, making great changes from her baseline rates. All children produced the most utterances on the reason for the emotion per minute on average although there were individual differences (Dyad #1, 0.89; Dyad #2,
Communication mode used in emotion discussion

All three children only used oral speech during emotion conversations during baseline. However, during intervention, multi-modal communication was observed from all three children. They used four different communication modes when they produced emotion-related utterances: (1) oral speech, (2) board pointing, (3) book pointing, and (4) other gestures. Overall, they primarily used oral speech during their emotion conversations (Dyad #1, 73% [e.g., “a monster in cave”]; Dyad #2, 84% [e.g., “big mess”]; Dyad #3, 77% [e.g., “because he got an idea”]). When they used other communication modes, they mostly used oral speech simultaneously. For example, the child of Dyad #1 said “nervous” verbally and also pointed to the nervous symbol on the emotion communication board when he labeled the book character’s emotion. Another example is that the child of Dyad #2 pointed to the book picture (i.e., little sister covering her eyes with hands) while saying, “Little sister is sad” verbally. The children of Dyad #2 and Dyad #3 produced a few utterances only by pointing to the symbols on the presented emotion communication boards. For example, the child of Dyad #3 selected the scared symbol on the board without any verbal answers when her father asked how the character was feeling in the book. The participating children sometimes used other types of gestures with their oral speech (Dyad #1, 3% [e.g., showing pointing finger for “go”]; Dyad #2, 3% [e.g., stop sign with her palm]; Dyad #3, 1% [e.g., pretending like she was putting on a hat for “keep his hat”]).
Parents’ Preceding Behaviors of Children’s Emotion-related Utterances

During intervention phase, all children produced the highest number of emotion-related utterances after their parents’ open-ended questions. The child of Dyad #1 produced 87.3% of her emotion-related utterances when she answered her mother’s open-ended questions on the emotions in the book (e.g., parent’s question, “Why do you think he feels upset?”; child’s answer, “To find necklace. He love his necklace”). The child of Dyad #2 produced 67.1% of his emotion-related utterances and the child of Dyad #3 produced 85.8% of her emotion-related utterances as responses to their parents’ open-ended questions on the emotions in the book. Children sometimes (Dyad #1, 5.1%; Dyad #2, 20.2%; Dyad #3, 11.1%) produced emotion-related utterances following their parents’ modeling of those utterances. For example, when the parent from Dyad #2 modeled the reason for the character’s sad emotion (e.g., “You think his mommy is unhappy because LC made a mess?”), the child imitated a part of the parent’s utterance (e.g., “big mess”). Children rarely (Dyad #1, 7.6%; Dyad #2, 11.1%; Dyad #3, 3.2%) initiated their emotion-related utterances without their parents’ open-ended questions or modeling. During the generalization phase, all children continued to produce the highest number of emotion-related utterances following their parents’ open-ended questions on emotions in the book (Dyad #1, 83.3%; Dyad #2, 69.7%; Dyad #3, 84.2%).

Social Validation

All participating parents indicated that they would definitely keep using the emotion communication strategy they had learned (i.e., providing opportunities to discuss the label, the reason, and the solution for emotions in the book) during their book reading. All parents reported that the instructional program was easy/very easy and it was helpful/very helpful. What they
particularly liked about participating in this study was related to their child’s benefits:

(Dyad #1 - Parent)

“She sometimes misuses the emotion terms. She sometimes says that she is scared when she is not really scared, but maybe upset. So, I think this study will be really helpful for her.”

(Dyad #2 - Parent)

“He says that he is scared of a certain school activity, but it is not scary to other kids at all. So, he couldn’t join the activity. I don’t understand why he is scared of it.”

“It (this study) will be definitely be beneficial for my child.”

(Dyad #3 - Parent)

“It is somewhat difficult for her to connect an abstract concept like emotions with real situations. So, having these specific situations in these storybooks is going to be really helpful for her to learn about emotions.”

“It (this study) gave us more strategies to deal with her fear of thunderstorms.”

Parents also shared that they had tried to incorporate the strategy during their daily reading between sessions. One parent shared that during their recent book reading, the parent was able to ask an open-ended question on the solution (“What do you think he can do?”) for the character’s emotion “naturally” and the child was able to come up with her own answer (“He
should keep looking”) “successfully.” He commented that “that came from this study.” Two of the three parents also stated that they talked about the study with their children’s schoolteachers and that the teachers’ reactions were positive (“interested” or “intrigued”).

Two of the three parents indicated that they would have appreciated fewer or less frequent sessions in this study. However, when the participants were asked what would make this instructional program better, two of the three parents answered that nothing should be changed in this study. The other one suggested using more example videos during the instructional session.
Chapter 4

DISCUSSION

This investigation provides evidence that the STEPS instructional program was effective in improving parents’ provision of opportunities for discussing emotions in the context of aided AAC during storybook reading with their children who have Down syndrome. All participating parents were able to use the emotion communication strategy immediately following a one-time instructional session, and continue to use it in the remaining phases of the study. All parents benefited from having self-designed emotion boards during their discussion of emotions as a reminder for the three steps of emotion communication. In addition, although all participating children were using natural speech as primary communication mode at the time of the study, having the emotion communication boards presented as visual supports provided various benefits for effective emotion communication. The results are discussed in relation to the research question. The limitations of the study and directions for future research are also presented.

What is the Effect of the STEPS Program?

Parents’ prompting for emotion discussion

The present study was designed to answer the following research question: What is the effect of the STEPS instruction program on a parent’s provision of open-ended questions on each of the three steps of emotion communication (label, reason, solution) with the use of emotion boards during storybook reading with a child with Down syndrome?
During baseline, all participating parents never (Dyads #2 and #3) or rarely (Dyad #1) provided opportunities for their children to discuss emotions by asking open-ended questions on the label, the reason, and the solution for a character’s emotions in a book. These results were mostly consistent with their reports that they made during the pre-experiment EDEC tool interview. During the interview, the parent of Dyad #1 answered that she sometimes asked about the label and the reason for the character’s emotions during book reading. Dyad #2 said that she only rarely asked about the emotion labels. The parent of Dyad #3 reported that he had never asked about the emotions in the book during storybook reading. This indicates that the parents’ performances during baseline reflect their “normal behaviors” during storybook reading with their children.

The parent instruction conducted using the STEPS program between baseline and intervention phases was simple. The experimenter instructed the parents to ask open-ended questions, first, on the emotion’s label, second, on the reason for the emotion, and third, on the solution for the emotion when they found an emotional situation/expression in the book they wanted to discuss with their children. When this instruction was provided to the participating parents, they had similar reactions to the strategy. First, they reported that the strategy was new to them. Second, they shared that the strategy was easy to understand. Third, they indicated that they needed this type of intervention/instruction because their children had some difficulties with emotion communication.

After the instructional session, during intervention, all parents demonstrated significant changes in their provision of opportunities for children to discuss emotions during storybook reading. All parents asked 2-4 open-ended questions on the label, the reason, and the solution for emotions in the book in the first intervention session. Although each parent had individual differences in data (e.g., the parent of Dyad #2 often asked fewer open-ended questions on the
solution for an emotion), everyone’s data was clearly differentiated from their data in baseline, showing the effect of the intervention.

As reviewed in Chapter 1, effectively-designed parent instruction interventions (e.g., Binger et al., 2008; Chaabane et al., 2009; Kent-Walsh et al., 2010; Rosa-Lugo & Kent-Walsh, 2008) resulted in successful implementation of the strategy. Thus, this investigation provides evidence that the STEPS program is an effective instructional program for improving parents’ provision of opportunities for emotion discussion during storybook reading with their children who have Down syndrome. Possible applications of the program to parents who have children with other disabilities will be discussed in the “Future Directions” section of this chapter.

**Parents’ aided AAC modeling**

Although parents’ aided AAC modeling was not the direct outcome measure in this investigation, instructing partners how to design and use emotion communication boards that include the three steps of emotion communication (label, reason, solution) was a part of the STEPS program. The results revealed that the participating parents successfully learned to design and use emotion communication boards to provide aided AAC modeling during book reading following instruction with the STEPS program. During baseline, all parents never (Dyad #3) or rarely (Dyads #1 and #2) included emotion-related symbol expressions on their children’s communication boards. Following the instructional session, during intervention, they had systematically organized single- or multi-symbol expressions for the label, the reason, and the solution for emotions in the book on their children’s boards. Parents often (e.g., Dyad #1: label, 93%; reason, 87%; solution, 93%) provided aided AAC modeling by pointing to these symbol expressions while verbally modeling emotion-related utterances.
As discussed in Chapter 1, aided AAC modeling has many possible advantages in children’s language development. Although the participating children were mainly using their natural speech for communication, as Wilkinson and Na (in press) emphasized, effectively designed AAC interventions can result in better language development and communication in children with Down syndrome. Although there was no direct measurement on the children’s linguistic skills in the present study, the collateral measure revealed that the participating children produced more (e.g., Dyad #3: label, 0→4.7; reason, 0→7.3; solution, 0→4.3) emotion-related utterances per book reading during intervention. These utterances included various emotion vocabulary (e.g., nervous, surprised) and multi-word sentences (e.g., “A man in a hat save him”). In addition, the children’s aided AAC use occurred naturally (i.e., without adults’ direct request) and was integrated with oral speech. They either imitated their parents’ board pointing or initiated board pointing to answer their parents’ emotion-related questions.

In addition to the benefit for the children who participated, having an emotion communication board present during emotion discussion was advantageous for parents as a means to format their communication about emotions. For example, parents pre-planned their discussion about emotions prior to each storybook reading by designing an emotion communication board and using the pre-designed board as a guide for discussion during reading.

Parent’s perception of children’s emotional competence

The EDEC tool interview data indicate changes in parents’ perception of their children’s emotion expression and recognition. In this investigation, there were two parent interviews
conducted using the EDEC tool: (1) the pre-experimental and (2) the post-experimental EDEC tool interviews. When comparing the pre- and the post-experimental EDEC tool interview results, there were some changes in parents’ reports on their children’s emotional competence. The parent of Dyad #1 reported a difference in the child’s emotion expression and recognition skills. For example, during the pre-experimental interview, she reported that the child would not join in others’ negative emotions such as anger and sadness unless they directly affected her. However, during the post-experimental interview, she reported that the child would be very empathetic and always seek to help someone who experienced negative emotions such as anger or sadness. The parent of Dyad #2 reported a difference in the child’s emotion expression and her supports for her child’s emotion expression. For instance, during the pre-experimental interview, the parent reported that the child used only speech for his emotion expressions, whereas during the post-experimental interview she selected speech, manual signs, symbols/text on non-electronic communication display, and symbols/text on mobile device/computer with apps/software as her son’s methods of expressing emotions. The parent of Dyad #3 also reported a difference in his child’s emotion expression. He reported that his child used 11-20 emotion words during the pre-experimental interview, whereas he only reported 6-10 emotion words during the post-experimental interview.

These changes in parents’ reports on their children’s emotion expression and recognition could possibly be caused by (1) changes in children’s emotional skills and parents’ recognition of those changes, (2) changes in parents’ perception with the unchanged emotional skills in children, or (3) changes in parents’ attitude toward the EDEC tool interview after participating in the study. In any of these three cases, the post-experimental EDEC tool interview data support the positive influence of the STEPS program on the parents’ perception of children’s emotional skills.
Limitations and Future Directions

Although this investigation provides evidence for the effectiveness of the STEPS instructional program, there are a few limitations that future research can consider. First, the limited sample size is a potential limitation of the current investigation in light of only three participating parent-child dyads. Kratochwill et al. (2010) have suggested at least three demonstrations of the intervention effect as one of the criteria for demonstrating evidence of a relation between an independent variable and an outcome variable in a single-subject design study. Therefore, many studies have had a sample size of three (e.g., Binger et al., 2008; Kent-Walsh, Binger, & Buchanan, 2015; Kent-Walsh et al., 2010). Future research in this topic must include replication with a large number of participants with the same characteristics (i.e., parent-child dyads with children who have Down syndrome). Including children with varying disabilities and linguistic levels, as well as children from a range of cultural, linguistic, and socioeconomic backgrounds, would provide beneficial information about the effectiveness of the STEPS program. In addition, including multiple fathers in future studies would provide more generalized information about the effectiveness of the STEPS program on instructing fathers who have children with Down syndrome. The current investigation only included one father. Phares, Rojas, Thurston, Hankinson, and Lamb (2010) pointed out that fathers are significantly less involved in clinical interventions for their children as compared to mothers. Thus, including more fathers in further investigations would be beneficial both experimentally and clinically.

Second, another limitation of the current investigation relates to the relatively wide range of child ages. This research explored the effectiveness of the STEPS instructional program on parents’ provision of opportunities for emotion discussion to children, age ranging in 5-10 years. The participating children had a relatively large gap in their ages. For instance, the child from Dyad #2 was 5 years old and the child from Dyad #3 was 9 years old. The benefit of including
children in a wide age range was that it allowed examination of the effectiveness of the STEPS instructional program on parents’ emotion communication with a 5-year-old, an 8-year-old and a 9-year old. Future investigation with multiple participants in a narrower age range (e.g., three 5-year-old children and their parents) will provide stronger evidence for the effectiveness of the STEPS program for population in the particular age range.

Third, this investigation examined broad linguistic performance in parent-child dyads by examining parents’ provision of opportunities for communicating the three different steps of emotion communication (label, reason, solution). Future investigation examining parents’ specific communicative skills – such as aided AAC modeling with multi-symbol message production – would be beneficial. In addition, in terms of children’s linguistic skills, examining more specifically-defined linguistic goals in a future study – such as emotion symbol use and multi-symbol message production during emotion discussion – would also provide useful information about the effectiveness of the STEPS instructional program.

Fourth, a limited type of aided AAC was used in the current investigation given that only a low-tech communication board was available during reading sessions. The main reason for using a paper communication board was that none of the participating children used high-tech AAC systems at the time of the investigation. Future research with a variety of aided AAC options would provide valuable information about the effectiveness of the instructional program with different types of aided AAC systems. In this case, having parents of children who are current users of aided AAC systems participate in the study would provide valuable information about the application and influence of the instruction program to current AAC users and their parents.

In terms of emotion page design, allowing parents to select symbols for their emotion communication boards would be also beneficial. In the current investigation, although parents selected vocabulary for their boards and checked the selected symbols on their boards before each
reading, the research team selected the corresponding symbols using the Boardmaker software. Additionally, including/excluding distractors (e.g., non-emotion related symbols) on an emotion communication board could be a new variable that can be used to examine the accuracy of a parent’s or a child’s board pointing.

Lastly, addressing the following considerations in future investigation would be advantageous. One is qualitatively analyzing parent-child conversations about emotions in a future analysis. This paper only presents the quantitatively analyzed data (e.g., the frequency of open-ended questions). However, analyzing qualitative aspects of parent-child conversations – such as which emotional events were selected by the parent and how children reacted to emotion discussion – would provide valuable information about parent-child emotion communication in the context of storybook reading, particularly in relation to the use of aided AAC.

Replicating this investigation with a different emotional context in place of storybook reading is another consideration for future research. For example, the STEPS program could be used for teaching parents to have a conversation about emotions during or after watching a video. Use of social media for emotion discussion could be more appropriate to older children than using storybooks.

Another consideration is an analysis of visual attention patterns in parent-child dyads during emotion communication with the use of aided AAC in the context of storybook reading. In the current investigation, although attempting to capture parent’s and children’s voice production and body movements, book placement, and board placement during reading, video recording could not capture their visual fixations (i.e., which point they were looking at). Exploring parent-child dyad’s visual attention patterns during emotion conversations would provide significant information, particularly in terms of emotion symbol and AAC page design. For example, knowing if a child fixates at (1) the character’s sad face on the book page, (2) the sad symbol on the AAC system, (3) the parent’s facial expression of sad emotion, or (4) combination of these
while discussing a sad emotion would be helpful when designing future interventions. Use of eye-tracking technology could enable this investigation and analysis. Eye-tracking technology using glasses, such as Tobii glasses 2⁴, would be appropriate to explore visual attention patterns during shared book reading activities.

Conclusions

This investigation provides evidence that the STEPS instructional program is effective in improving parents’ provision of opportunities for emotion discussion in the context of aided AAC during storybook reading with their children who have Down syndrome. All participating parents were able to use the emotion communication strategy immediately following a one-time instructional session and to continue to use it in the remaining phases of the study. Social validation data reflect that the STEPS program is easy for parents to learn. In addition, it turned out that when parents provided more opportunities to their children by asking open-ended questions on the label, the reason, and the solution for the emotions in a book, those children participated more actively in the emotion discussion by making comments about the character’s emotions. All parents reported that participating in this study was helpful because they had never thought about discussing the book character’s emotions in that way before. They indicated that they would definitely use the strategy during their future storybook reading activities. They also reported that they expect that changes in their own behaviors would possibly result in changes in their children’s behaviors related to emotion discussion and regulation.

⁴ The Tobii glasses 2 is a registered trademark of Tobii Technology, S-182 17 Danderyd Sweden.
REFERENCES


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http://doi.org/10.1037/0012-1649.24.4.552


Appendix A

Screenshots of the EDEC Tool

ABOUT THE EDEC TOOL

What Is the EDEC Tool?
The EDEC tool is a descriptive instrument designed to elicit information about how families and professionals talk about emotions with children with complex communication needs (CCN). It consists of an interview conducted by a professional with a child’s family as well as with other service professionals.

Why Did We Develop the EDEC Tool?
The EDEC tool seeks to raise awareness about the relation of language and emotional competence, and to ensure that a child’s communication intervention includes language to discuss emotions in ways that are consistent with the values and goals of the family. It is not developed for prescriptive purposes, but as a norm-referenced instrument. Rather, it is intended to allow professionals to collaborate with family members and other professionals to gather information that can be useful to support communication about emotion.

Target Population
The EDEC tool was developed with a target population of young children (birth-10 years) with CCN, who have very limited speech and language skills due to various etiologies (e.g., cerebral palsy, Down syndrome, etc.). Extensive use of the tool for consideration for older individuals or individuals with autism spectrum disorder has not yet been conducted by the authors.

Who Uses the EDEC Tool?
Speech-language pathologists or other professionals (e.g., OT, PT), who work with a child with CCN, use the EDEC tool in order to interview the child’s caregivers or other professionals (e.g., teachers). It is recommended to interview both the child’s caregiver and teacher (when possible) in order to have a better understanding about the child’s characteristics across diverse settings.

How Long Will It Take?
It will probably take you from forty-five minutes to an hour to complete the interview using the EDEC tool. Previous interviews took from thirty minutes to an hour, if you run out of time, you may save a partially completed interview responses and resume it later.

Languages
The EDEC tool is intended to be used across different languages. Currently, we have Danish, English, Korean, and Spanish versions available. Dutch, French, and German versions will be available in the future. Please contact the author for other languages.

Online Version
The EDEC tool is also available online. To access the EDEC tool, you need to use a link, provided by the author of the tool. Please contact the author if you are interested.

CONTENTS and ORGANIZATION

- This EDEC Tool has two sections: Section I asks informants about their child’s temperament; Section II asks informants questions about the child’s understanding of emotion/feelings, the child’s parents/caregivers express emotion within the family, and whether the child’s parents/caregivers talk with the child about emotion/feelings.
- We recommend you to start from Section I because information gathered in Section I may help the interviewee have a better understanding of the child before discussing the child’s emotion expression and recognition.
- Examples suggested for each question can be provided to the parent/caregiver or teacher if needed.

*If the parent/teacher feels uncomfortable answering any question, you may skip it.
EARLY DEVELOPMENT OF EMOTIONAL COMPETENCE: A TOOL FOR CHILDREN WITH COMPLEX COMMUNICATION NEEDS (CCN) (Na, Wilkinson, Epilea, Rangel, Townsend, Thistle, Feldman, & Blackstone, 2014)

BACKGROUND INFORMATION. Please enter all information listed below.

Child (initials): [ ]

Date of Birth: [ ]

Nationality: [ ]

Children's diagnosis: [ ]

Date of Interview: [ ]

Examiner (initials): [ ]

Profession: [ ]

Informant (initials): [ ]

Role [e.g., parent, teacher]: [ ]

Language used during the interview: Danish [ ]

Dutch [ ]

English [ ]

French [ ]

German [ ]

Korean [ ]

Spanish [ ]

Other [ ]

This is the end of BACKGROUND INFORMATION. 

Please go on to SECTION 1.

*If the parent/teacher feels uncomfortable answering any question, you may skip it.

EARLY DEVELOPMENT OF EMOTIONAL COMPETENCE: A TOOL FOR CHILDREN WITH COMPLEX COMMUNICATION NEEDS (CCN) (Na, Wilkinson, Epilea, Rangel, Townsend, Thistle, Feldman, & Blackstone, 2014)

SECTION 1. QUESTIONS ABOUT TEMPERAMENT/BEHAVIORAL CHARACTERISTICS (adapted from Caspi & Shiner, 2008)

Temperament refers to characteristics of a specific person that affect the person's thinking, behavior, and reactions to experiences. The examiner asks the informant about the child with complex communication needs using questions as stated below.

1a. Basic descriptors - open ended

"We are interested in learning a little bit about (name)'s overall personality. Can you describe (name) a little for me?"

Write down the adjective that the caregiver offers spontaneously.

Responses for each role will be along the following scale: Usually, much like choice a; Usually, much like choice b; Not really on either extreme; Not sure.

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<th>Responses for each role will be along the following scale: Usually, much like choice a; Usually, much like choice b; Not really on either extreme; Not sure.</th>
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<td>1. Activity 1a. Active - INBETWEEN - 1b. Relaxed</td>
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<tr>
<td>2. Rhythm (with/without pattern) 2a. Predictable - INBETWEEN - 2b. Unpredictable (fluctuating)</td>
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<tr>
<td>5. Intensity of reaction 5a. Charismatic - INBETWEEN - 5b. Reserved</td>
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<tr>
<td>7. Persistence 7a. Longer - INBETWEEN - 7b. Shorter</td>
</tr>
<tr>
<td>8. Sensory Threshold (sensitivity to stimulation) 8a. Sensitive - INBETWEEN - 8b. Able to ignore</td>
</tr>
</tbody>
</table>

COMMENTS

2. Sociability

*Does (name) seem to enjoy being with others?*

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>NOT SURE</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>

*If the parent/teacher feels uncomfortable answering any question, you may skip it.
### 3. Social closeness/affection

*Would you describe [name] as affectionate, in general?*

*Who is [name] most likely to show affection with?*

Write the answer to the second question in the *comments* section.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>NOT SURE</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### 4. People to whom child is attached

*Who in particular does [name] show strong attachment to and in what ways does s/he show it, even if s/he usually only shows it in ways other than affection? For example, does [name] show distress when a particular person leaves or joy when that person returns?*

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### 5. Poor interaction

*Describe how [name] interacts with peers. For instance, does he try to play with peers? In general, does he get along with them when s/he does play?*

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### 6. Reaction to strangers

*How often does [name] show a fear of strangers? Does s/he seem scared during unfamiliar situations? What is an example of [name]'s reaction to a new person/situation?*

<table>
<thead>
<tr>
<th>OFTEN</th>
<th>SOMETIMES</th>
<th>RARELY</th>
<th>NEVER</th>
<th>NOT SURE</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### 7. Temper

*Many kids go through at least a phase when they have temper tantrums. Does [name] have temper tantrums?*

If caregiver says yes, ask: *How often (e.g., 1 time per day), would you say? When that happens, what do you or other adults do in response?*

*If the parent/teacher feels uncomfortable answering any question, you may skip it.*

### 8. Self-injury

*When [name] gets upset, does s/he ever do anything to intentionally hurt him/herself? Sometimes kids will bite their hands, or pinch themselves.*

If caregiver says yes, ask: *How often (e.g., 1 time per day), would you say? When that happens, what does [name] do? What do you or other adults do in response?*

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### 9. Aggressive behavior

*Does s/he ever do anything to intentionally hurt other people, like biting, hitting, or pinching others?*

If caregiver says yes, ask: *How often (e.g., 1 time per day), would you say? When that happens, what does [name] do? What do you or other adults do in response?*

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### 10. Property destruction

*Does [name] ever do anything to intentionally damage property?*

If caregiver says yes, ask: *How often (e.g., 1 time per day), would you say? When that happens, what does [name] do? What do you or other adults do in response?*

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
</table>

### Summary

Re-cap what you’ve heard the parent/caregiver say, including 2-3 positive traits/behaviors.

*I’d like to take a moment to review what we’ve covered so far. You’ve said that [name] is [2-3 positive traits/behaviors]. Is there anything I’ve missed?*

<table>
<thead>
<tr>
<th>COMMENTS</th>
</tr>
</thead>
</table>

This is the end of SECTION I.

Please go on to SECTION II.

*If the parent/teacher feels uncomfortable answering any question, you may skip it.*
### SECTION II. QUESTIONS ABOUT CHILD WITH COMPLEX COMMUNICATION NEEDS & FAMILY DYNAMICS

List & adapt from researchers identifying "primary" and "secondary/tertiary" emotions (Cheery, Ariva, & Littwood, 1973 and Parrett, 2005)

In this section, parents/caregivers can report directly on how their family deals with emotions in the presence of the child. Teachers and clinicians will report their observations.

1a. Common emotions the child expresses

"First, I'd like to talk a little bit about what emotions your child expresses. I'm interested in how often your child expresses emotions like love, anger, and so forth. I'd like you to think about whether your child expresses each emotion often, sometimes, rarely, or never. If you're not sure, just let me know, ok?"

"How often does your child express (here, go through each emotion under 1a, one by one)?"

If the informant answers "not sure", please ask "Why aren't you sure?" For example, perhaps the user simply has not observed the behavior or perhaps he/she feels the child lacks the opportunity to demonstrate the behavior.

<table>
<thead>
<tr>
<th>COMMON EMOTIONS</th>
<th>OFTEN</th>
<th>SOMETIMES</th>
<th>RARELY</th>
<th>NEVER</th>
<th>NOT SURE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affection/Love</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disgust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joy/happiness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sadness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surprise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1b. Other emotions that the child expresses.

"Thank you. Those first emotions were ones that are considered to be ones that develop fairly early. I'd like to talk about some of the other emotions that often develop later or may be harder to express. As I read these ones, just tell me if you've ever seen your child expressing the emotion."

"Does your child express (here, go through each emotion under 1b, one by one)?"

<table>
<thead>
<tr>
<th>OTHER EMOTIONS</th>
<th>YES</th>
<th>NO</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amazement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheerfulness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disappointment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excitement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jealousy/Fear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pride</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervousness/Anxiety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imitation/frustration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shame/embarrassment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*If the parent/teacher feels uncomfortable answering any question, you may skip it.

---

### Branching Point #1

- *If only the "Nonlinguistic" methods (facial expressions through vocalisations) are used, skip to Question #7*
- *If any of the "Linguistic" methods (speech through writing) are used, with or without nonlinguistic, go to Question #3*

---

3a. Nonlinguistic

- Facial expressions
- Body gestures
- Gestures
- Vocalisations
- Other

**EXAMPLE**

- Speech
- Manual signs
- Symbols/text on non-electronic communication display
- Symbols/text on simple AAC device
- Symbols/text on synthesized speech AAC device
- Symbols/text on mobile device/computer with assistive software
- Writing
- Other

**Branching Point #2**

*Ask question 3 only if aided modes (symbols/text) are selected from question 2. If not, go to question 2b.

3b. "How many aided modes (symbols/text) are available on your system to label emotions? What specific ones does (name) have?"

- Less than 5 graphic symbols/words
- 6 to 10 graphic symbols/words
- 11 to 20 graphic symbols/words
- More than 20 graphic symbols/words
- More than 50 graphic symbols/words

*If the parent/teacher feels uncomfortable answering any question, you may skip it.*
### Early Development of Emotional Competence: A Tool for Children with Complex Communication Needs

#### 3b. "How many signs, words, or other symbols does (name) use to label emotions? What specific words or symbols does (name) use?"
- Less than 6 graphic symbols/words/signs
- 6 to 10 graphic symbols/words/signs
- 11 to 20 graphic symbols/words/signs
- More than 20 graphic symbols/words/signs

#### 3c. "How many signs, words, or other symbols does (name) use to talk about the related events? (e.g., why (s)he feels the emotion, what (s)he wants) What specific words or symbols does (name) use?"
- Less than 6 graphic symbols/words/signs
- 6 to 10 graphic symbols/words/signs
- 11 to 20 graphic symbols/words/signs
- More than 20 graphic symbols/words/signs

#### 4. Settings of use

<table>
<thead>
<tr>
<th></th>
<th>OFTEN</th>
<th>SOMETIMES</th>
<th>RARELY</th>
<th>NEVER</th>
<th>NOT SURE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Does (name) use these (signs, spoken words, and/or graphic symbols) in lots of different settings, like home, school, leisure activities in the community, church, etc.?&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 5. Labelling others' emotions

<table>
<thead>
<tr>
<th></th>
<th>OFTEN</th>
<th>SOMETIMES</th>
<th>RARELY</th>
<th>NEVER</th>
<th>NOT SURE</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Does (name) label or comment on emotions he/she sees other people expressing? Please give an example.&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 6. Prompting by parent/caregiver for verbal labeling

<table>
<thead>
<tr>
<th></th>
<th>MOST OF THE TIME</th>
<th>SOMETIMES</th>
<th>ONLY OCCASIONALLY</th>
<th>NEVER</th>
<th>NOT SURE</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Different families/caregivers may vary in how they prompt their children's verbal labeling of emotions. How often do you try to get (name) to label his/her own emotions using words, signs, or symbols?&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the caregiver responds "sometimes" or "most of the time", ask for an example.
If the caregiver responds "occasionally" or "never", ask: "OK, thanks. What do you do instead?"

*If the parent/teacher feels uncomfortable answering any question, you may skip it.*

---

#### 7. Parent/caregiver response

- Respond to emotion itself
- Talk about the reason for the emotion
- Talk about a solution to the emotion
- Ignore the emotion

#### 8. Child recognition of/response to emotions

8a. "Let's talk a little bit about how (name) responds to others' emotions. How does (name) respond when other people are expressing emotion? For instance, does (name) join in when everyone is cheering at a sports event? (or other culturally appropriate event)? What does (name) do if a classmate sprains his knee on the playground?"

8b. "About how often does (name) show these responses?"

<table>
<thead>
<tr>
<th></th>
<th>MOST OF THE TIME</th>
<th>SOMETIMES</th>
<th>ONLY OCCASIONALLY</th>
<th>NEVER</th>
<th>NOT SURE</th>
<th>EXAMPLE</th>
</tr>
</thead>
</table>

#### 9. Emotion expression by caregivers: Part 1

- "Different families/caregivers may vary in how they feel about expressing emotion in front of children. What kind of emotions do you feel comfortable expressing in front of (name)? Why, or is in what situations would this occur?"

#### 10. Emotion expression by caregivers: Part 2

- "Are there any emotions you try not to express when you are with (name)? Why, or is in what situations would this occur?"

*If the parent/teacher feels uncomfortable answering any question, you may skip it.*
### Early Development of Emotional Competence: A Tool for Children with Complex Communication Needs

#### 11. Strategies for input

"When you do share or talk about emotions with your child, what things do you say or do? For instance, do you read books about it together? Do you explain the emotions? Do you demonstrate it somehow?"

<table>
<thead>
<tr>
<th>nf</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Not Sure</th>
<th>Example</th>
</tr>
</thead>
</table>

#### 12. Managing anxious occasions

"We all experience anxiety before or during difficult or challenging tasks. How do you and your child "grow up" for such tasks or events, and how do you "unwind" afterward? What seems to work best?"

(e.g., hospital visits, first day of school etc.)

#### 13. Interacting with media (books, videos, etc.) - general

"Does (name) enjoy listening to (and/or reading) stories, watching videos, etc. (This question highlights the key role that books, stories, videos, and other media can play in exposing children to emotional experiences.) Can you give me an example?"

<table>
<thead>
<tr>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Not Sure</th>
<th>Example</th>
</tr>
</thead>
</table>

#### 14. Interacting with media (books, videos, etc.) - input

"When you are reading books or watching TV/movies, do you talk about the emotions that the characters are experiencing?"

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Example</th>
</tr>
</thead>
</table>

This is the end of EDEC Tool.

Thank you for your participation!

*If the parent/teacher feels uncomfortable answering any question, you may skip it.*
### Appendix B

**STEPS Instruction Page**

<table>
<thead>
<tr>
<th>1. Labeling of Emotion</th>
<th>(1) Ask</th>
<th>(2) Wait</th>
<th>(3) Respond</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(ex) “How does bunny feel?”</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Ask your child the what emotion the character is experiencing in the book.</td>
<td></td>
<td></td>
<td>(ex 1) “You’re right. Bunny is sad.”</td>
</tr>
<tr>
<td>● Place the emotion board within reach, but do not provide any cues (e.g., pointing to the board)</td>
<td></td>
<td></td>
<td>● When your child said the right emotion name, listen reflectively (repeating back a child’s response) while pointing to the emotion symbol on the board.</td>
</tr>
<tr>
<td>● You can repeat/rephrase 1-2 times your question to assist your child’s understanding.</td>
<td></td>
<td></td>
<td>(ex 2) “Bunny is sad.”</td>
</tr>
<tr>
<td></td>
<td>pause</td>
<td></td>
<td>● When your child said differently or did not respond within 10 seconds, tell the right emotion name while pointing to the emotion symbol on the board.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. “Because” statement</td>
<td>(1) Ask</td>
<td>(2) Wait</td>
<td>(1) Respond</td>
</tr>
<tr>
<td><strong>(ex) “Why does bunny feel sad?”</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Ask the why the character is experiencing the emotion in the book.</td>
<td></td>
<td></td>
<td>(ex 1) “You’re right. Bunny is sad because he has no friends.”</td>
</tr>
<tr>
<td>● Place the emotion board within your child’s reach, but do not provide any cues (e.g., pointing to the board)</td>
<td></td>
<td></td>
<td>● When your child said the right reason for the emotion, listen reflectively (repeating back a child’s response).</td>
</tr>
<tr>
<td>● You can repeat/rephrase 1-2 times your question to assist your child’s understanding.</td>
<td></td>
<td></td>
<td>(ex 2) “Bunny is sad because he has no friends.”</td>
</tr>
<tr>
<td></td>
<td>pause</td>
<td></td>
<td>● When your child said differently or did not respond within 10 seconds, tell the right answer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● If there is a corresponding “because” statement on the emotion board, point to it while you speak.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Solution for the Emotion</td>
<td>(1) Ask</td>
<td>(2) Wait</td>
<td>(1) Respond</td>
</tr>
<tr>
<td><strong>(ex) “What can Bunny do?”</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Ask your child the action the character can/may take to deal with the emotion in the book.</td>
<td></td>
<td></td>
<td>(ex 1) “You’re right. Bunny can tell them to play together.”</td>
</tr>
<tr>
<td>● Place the emotion board within your child’s reach, but do not provide any cues (e.g., pointing to the board)</td>
<td></td>
<td></td>
<td>● When your child said an appropriate solution for the emotion, listen reflectively (repeating back a child’s response).</td>
</tr>
<tr>
<td>● You can repeat/rephrase 1-2 times your question to assist your child’s understanding.</td>
<td></td>
<td></td>
<td>(ex 2) “Bunny can tell them to play together.”</td>
</tr>
<tr>
<td></td>
<td>pause</td>
<td></td>
<td>● When your child said differently or did not respond within 10 seconds, tell an appropriate solution for the emotion.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● If there is a corresponding strategy statement on the emotion board, point to it while you speak.</td>
</tr>
</tbody>
</table>
Appendix C

Emotion Name Cards for the Facial Expressions Subscale of the ACES

This page of emotion name cards is not a part of the original ACES packet. It was designed by the experimenter in order to provide access to the emotion vocabulary to the participating children.
Appendix D

List of Storybooks with the Examples of Emotions in the Book

Storybooks including at least two different categories (i.e., positive, negative and intermediate) of emotions were used in this study.

<table>
<thead>
<tr>
<th>Book series</th>
<th>Book title</th>
<th>Example Emotions in the book</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Little Critter</strong></td>
<td>All by Myself</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative: disappointed</td>
</tr>
<tr>
<td></td>
<td>I Just Forgot</td>
<td>Positive: loving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: relieved</td>
</tr>
<tr>
<td></td>
<td>Just a Big Storm</td>
<td>Negative: sad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared</td>
</tr>
<tr>
<td></td>
<td>Just a Bully</td>
<td>Positive: happy, loving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative: angry, sad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared, worried</td>
</tr>
<tr>
<td></td>
<td>Just a Mess</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative: mad</td>
</tr>
<tr>
<td></td>
<td>Just for You</td>
<td>Positive: proud, happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: surprised</td>
</tr>
<tr>
<td></td>
<td>Just Grandpa and Me</td>
<td>Positive: happy, proud</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative: angry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared, excited</td>
</tr>
<tr>
<td></td>
<td>Just Me and My Mom</td>
<td>Negative: angry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared, excited</td>
</tr>
<tr>
<td></td>
<td>The New Baby</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: excited</td>
</tr>
<tr>
<td></td>
<td>What a Bad Dream</td>
<td>Negative: sad, upset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared</td>
</tr>
<tr>
<td><strong>Curious George</strong></td>
<td>Curious George and the Firefighters</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td>Curious George Chasing Waves</td>
<td>Negative: sad</td>
</tr>
<tr>
<td></td>
<td>Curious George Goes Camping</td>
<td>Positive: happy, loving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared</td>
</tr>
<tr>
<td></td>
<td>Curious George Goes to a Costume Party</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared</td>
</tr>
<tr>
<td></td>
<td>Curious George Goes to a Movie</td>
<td>Positive: delighted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative: sad, mad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared, surprised</td>
</tr>
<tr>
<td></td>
<td>Curious George Goes to the Dentist</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative: sad, angry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: surprised, scared</td>
</tr>
<tr>
<td></td>
<td>Curious George Haunted Halloween</td>
<td>Positive: happy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermediate: scared</td>
</tr>
<tr>
<td>Title</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>-----------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Curious George in the Snow</td>
<td>Positive: glad, happy</td>
<td></td>
</tr>
<tr>
<td>Curious George Saves His Pennies</td>
<td>Positive: happy</td>
<td>Negative: sad</td>
</tr>
<tr>
<td>Curious George Windy Delivery</td>
<td>Positive: happy</td>
<td>Negative: angry</td>
</tr>
<tr>
<td>Happy Thanksgiving Curious George</td>
<td>Positive: happy</td>
<td>Negative: upset</td>
</tr>
<tr>
<td>Merry Christmas Curious George</td>
<td>Positive: happy</td>
<td>Negative: angry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>Positive</th>
<th>Negative</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. J. Funny Bunny by Marilyn Sadler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedtime for Bunnies</td>
<td>Positive: happy, loving</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Negative: angry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honey Bunny Funnybunny</td>
<td>Positive: happy, loving</td>
<td>Negative: angry, sad</td>
<td></td>
</tr>
<tr>
<td>Honey Bunny's Honey Bear</td>
<td>Positive: happy</td>
<td>Negative: sad</td>
<td>Intermediate: embarrassed</td>
</tr>
<tr>
<td>It's Not Easy Being a Bunny</td>
<td>Positive: happy, loving</td>
<td>Negative: angry, sad</td>
<td></td>
</tr>
<tr>
<td>Knock, Knock, It's P.J. Funnybunny!</td>
<td>Positive: happy, loving</td>
<td>Negative: sad</td>
<td>Intermediate: surprised</td>
</tr>
<tr>
<td>P.J. Funnybunny Camps Out</td>
<td>Positive: happy</td>
<td></td>
<td>Intermediate: scared, excited</td>
</tr>
<tr>
<td>P.J. Funnybunny’s Bag of Tricks</td>
<td>Positive: happy</td>
<td>Negative: mad</td>
<td></td>
</tr>
<tr>
<td>P.J. the Spoiled Bunny</td>
<td>Positive: happy</td>
<td>Negative: angry, sad</td>
<td></td>
</tr>
<tr>
<td>The Very Bad Bunny</td>
<td>Positive: happy</td>
<td>Negative: angry</td>
<td>Intermediate: surprised, excited</td>
</tr>
</tbody>
</table>

*Note:* Three categories of emotions based on the emotional valence (Wilkinson & Snell, 2011) were used for categorization of emotions included in these storybooks: positive emotions such as *happy* and *loving*, negative emotions such as *angry* and *sad*, and intermediate emotions such as *scared* and *bored*. Research assistants reviewed each storybook and evaluated emotions in the book.
Appendix E

Examples of Parents’ Emotion Communication Boards

Baseline Phase

<table>
<thead>
<tr>
<th>happy</th>
<th>sledding</th>
<th>experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="happy" /></td>
<td><img src="image" alt="sledding" /></td>
<td><img src="image" alt="experiment" /></td>
</tr>
<tr>
<td>sailing</td>
<td>surprised</td>
<td>snow</td>
</tr>
<tr>
<td><img src="image" alt="sailing" /></td>
<td><img src="image" alt="surprised" /></td>
<td><img src="image" alt="snow" /></td>
</tr>
</tbody>
</table>

*Note:* Dyad #1’s B1 session; Book title: *Curious George Windy Delivery.*

<table>
<thead>
<tr>
<th>mom</th>
<th>train</th>
<th>scared</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="mom" /></td>
<td><img src="image" alt="train" /></td>
<td><img src="image" alt="scared" /></td>
</tr>
<tr>
<td>fish</td>
<td>mad</td>
<td>funny</td>
</tr>
<tr>
<td><img src="image" alt="fish" /></td>
<td><img src="image" alt="mad" /></td>
<td><img src="image" alt="funny" /></td>
</tr>
<tr>
<td>yuck</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="yuck" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* Dyad #2’s B2 session; Book title: *Little Critter Just Me and My Mom.*
Note: Dyad #3’s B1 session; Book title: *Curious George in the Snow*.

**Intervention Phase**

Note: Dyad #1’s I3 session; Book title: *Merry Christmas Curious George*. 

---

*medal*  
*snow*  
*hot chocolate*

*money*  
*sled*  
*house*
Note: Dyad #2’s I5 session; Book title: Little Critter Just Grandpa and Me.

Note: Dyad #3’s I4 session; Book title: Curious George Goes to the Dentist.
Appendix F

Satisfaction Survey

We truly appreciate your participation in this study! We are very interested in your experience with this parent instruction program. Please mark the option that best represents your opinion.

1. Difficulty level of the parent instruction program
   How difficult was it to understand and use the taught emotion communication strategy?

<table>
<thead>
<tr>
<th>Very easy</th>
<th>Easy</th>
<th>Moderate</th>
<th>Difficult</th>
<th>Very difficult</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments/Examples:

_______________________________________________________________________
_______________________________________________________________________

2. Value of the parent instruction program
   Was it helpful to learn emotion communication strategy (i.e., talking about name of, reason for, and solution for the emotion) as a conversation partner of your child?

<table>
<thead>
<tr>
<th>Very helpful</th>
<th>Helpful</th>
<th>Moderate</th>
<th>Not helpful</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments/Examples:

_______________________________________________________________________
_______________________________________________________________________

3. Future use of the emotion communication strategy
   Would you use the taught emotion communication strategy (i.e., talking about name of, reason for, and solution for the emotion) when you read a storybook with your child in the future?

<table>
<thead>
<tr>
<th>I definitely WOULD use it</th>
<th>I probably WOULD use it</th>
<th>I may or may not use it</th>
<th>I probably would NOT use it</th>
<th>I definitely would NOT use it</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. What did you like the most about participating in this study?
_______________________________________________________________________
_______________________________________________________________________

5. What did you like the least about participating in this study?
_______________________________________________________________________
_______________________________________________________________________

6. What would make this parent instruction program better?
_______________________________________________________________________
_______________________________________________________________________

7. Have you talked to any others (e.g., other mothers who have children with/without Down syndrome, your child’s teachers, your family members) about this study or the emotion conversation strategy you learned from this study? If so, what did you share with them and what were their reactions?
_______________________________________________________________________
_______________________________________________________________________

Thank you!

If you have any questions or concerns about this survey, or about any part of the study, you can contact me at the information below.

**Ji Young Na, M.A., CF-SLP**
Department of Communication Sciences and Disorders
308 Ford Building, Penn State University, University Park, PA, USA 16802.

E-Mail: jzn129@psu.edu
Phone: (319) 631-9374
Appendix G

Procedural Integrity Evaluation Form

Evaluation date: ____________
Evaluator name: ____________

Directions

- Before watching a video-recorded session of parent instruction, read this sheet thoroughly and understand the procedural standard
- Watch a video-recorded session of parent instruction
- Write “Yes” or “No” in the “Correctly implemented?” column
- Write the reason for the “No” answer only

<table>
<thead>
<tr>
<th>Stages</th>
<th>Instructor’s Role</th>
<th>Correctly implemented? (Yes/No)</th>
<th>Reason</th>
</tr>
</thead>
</table>
| Stage 1 | **Pretest & commitment to instructional program**  
- Provide feedback based on the EDEC interview results and baseline observations  
- Introduce the target strategy | | |
| Stage 2 | **Strategy description**  
- Describe the targeted strategy and method for remembering the steps using the handouts  
- Discuss the impact of implementing the strategy | | |
| Stage 3 | **Strategy demonstration**  
- Model how to use the targeted strategy during storybook reading through a role play with a parent  
- After the demonstration of the strategy, explain | | |
| Stage 4 | **Verbal practice of strategy**  
- Give a verbal quiz to the participant about the targeted strategy  
- Discuss the results of the verbal quiz | | |
| Stage 5 | **Controlled practice and feedback**  
- Provide an opportunity for a parent to practice the learned strategy with the instructor during storybook reading through a role play  
- Provide prompting and feedback | | |
| Stage 6 | **Advanced practice and feedback**  
- Provide an opportunity for a parent to practice the learned strategy with his/her child during storybook reading through a role play  
- Provide prompting and feedback | | |
| **Total number of correctly implemented stages** | ( ) | | |
| **Procedural Integrity Score** | ( )/6*100= % | | |
Parent behavior coding scheme

<table>
<thead>
<tr>
<th>Levels of opportunity</th>
<th>a. Opportunity</th>
<th>b. Wait after opportunity</th>
<th>c. Response after opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coding instruction</td>
<td>- Whenever you observe the following behaviors, record time in video. - Then, transcribe a parent’s related utterance (see examples below). - If there is no observed target behavior, write “None.” (ex) 3:45 – “Bunny feels sad” (label) (ex) 3:45 – “Bunny feels sad because he is alone” (“because” statement) (ex) 3:45 – “Bunny can go home” (solution)</td>
<td>- For each opportunity you recorded on the left column (i.e., “a. Opportunity”), record the presence/absence of a parent’s response afterward. - Then, transcribe a parent’s related utterance (see examples below). - Only a parent’s response with a use of the provided board will be considered as a successful responding except when the target symbol is not provided on the board (count it as a successful response). - If a parent does not use a board while speaking, record his/her utterances, but mark “No board use” (see example below).</td>
<td>- For each opportunity you recorded on the first column (i.e., “a. Opportunity”), record the presence/absence of a parent’s response afterward. - Then, transcribe a parent’s related utterance (see examples below).</td>
</tr>
</tbody>
</table>

(1) No prompt, model

A parent modeled what emotion the character was experiencing in the book (emotion name), the reason for the emotion (“because” statement), and/or what the character can do in the situation (solution) WITHOUT prompting (e.g., asking a question). (ex) “Bunny feels sad.” (label) (ex) “Bunny feels sad because he is

A parent waited for at least 5 seconds or until a child begins his/her response to the parent’s modeling while directly looking at a child to convey an expectation for him/her to take a conversational turn. If a child begins his/her response right after a parent’s modeling, code it as successful waiting, minimum 5-second pause

A parent listened reflectively a child’s response to his/her modeling (repeating back a child’s response) while pointing to the emotion symbol on the board. (ex) “You’re right. Bunny is sad.” (with pointing) (ex) “You’re right. Bunny is sad because he has no friends.” (with pointing) (ex) “You’re right. Bunny can tell them to play together.” (with pointing) When a child said differently or did not respond, a parent responded in an appropriate way. (ex) “Bunny is sad” (with pointing) (ex) “Bunny is sad because he has no friends” (with pointing) (ex) “Bunny can tell them to play together”
<table>
<thead>
<tr>
<th></th>
<th>Prompt for label</th>
<th>Prompt for “because” statement</th>
<th>Prompt for solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>A parent asked a child what emotion the character was experiencing in the book without any cueing (e.g., pointing to the emotion symbol on the board). (ex) “How does Bunny feel?”</td>
<td>A parent waited for at least 5 seconds or until a child begins his/her response to the parent’s modeling while directly looking at a child to convey an expectation for him/her to take a conversational turn. minimum 5-second pause</td>
<td>When a child said the right emotion name, a parent listened reflectively while pointing to the emotion symbol on the board. (ex) “You’re right. Bunny is sad.” (with pointing) When a child said differently or did not respond, a parent told the right emotion name while pointing to the emotion symbol on the board. (ex) “Bunny is sad.” (with pointing)</td>
</tr>
<tr>
<td>(3)</td>
<td>A parent asked a child the reason why the character was experiencing the emotion in the book WITHOUT any cueing (e.g., pointing to the emotion symbol on the board). (ex) “Why does Bunny feel sad?”</td>
<td>A parent waited for at least 5 seconds or until a child begins his/her response to the parent’s question while directly looking at a child to convey an expectation for him/her to take a conversational turn. If a child begins his/her response right after a parent’s modeling, code it as successful waiting. minimum 5-second pause</td>
<td>When a child said the right reason for the emotion, a parent listened reflectively while pointing to the corresponding “because” statement on the board. (ex) “You’re right. Bunny is sad because he has no friends.” (with pointing) When a child said differently or did not respond, a parent told the right reason for the emotion while pointing to the corresponding “because” statement on the board. (ex) “Bunny is sad because he has no friends.” (with pointing)</td>
</tr>
<tr>
<td>(4)</td>
<td>A parent asked a child the action the character can/may take to deal with the emotion in the book WITHOUT any cueing (e.g., pointing to the emotion symbol on the board). (ex) “What can Bunny do?”</td>
<td>A parent waited for at least 5 seconds or until a child begins his/her response to the parent’s question while directly looking at a child to convey an expectation for him/her to take a conversational turn. If a child begins his/her response right after a parent’s modeling, code it as successful waiting. minimum 5-second pause</td>
<td>When a child said an appropriate strategy for the emotion, a parent listened reflectively while pointing to the corresponding solution symbol on the board. (ex) “You’re right. Bunny can tell them to play together.” (with pointing) When a child said differently or did not respond, a parent told an appropriate strategy for the emotion while pointing to the corresponding solution symbol on the board. (ex) “Bunny can tell them to play together.” (with pointing)</td>
</tr>
</tbody>
</table>
Child behavior coding scheme

**Type (1) Emotion labeling**
- A child uses an **EMOTION NAME** (e.g., happy) to talk about the character’s emotion in the book
- Don’t count if it is about the child’s own or somebody else’s emotion
  Count a child’s question about the emotion name also (e.g., Is he mad?).

<table>
<thead>
<tr>
<th>Utterance (time)</th>
<th>Parent’s preceding behavior</th>
<th>Related Emotion</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ex) “happy” (4:04)</td>
<td>- None</td>
<td>(ex) happy</td>
<td>(ex) Speech</td>
</tr>
<tr>
<td>(ex) “Sad, sad, sad” (1:02)</td>
<td>- Modeling</td>
<td>(ex) excited</td>
<td>(ex) Pointing to the board</td>
</tr>
<tr>
<td>(ex) “I think Bunny is happy.” (12’25”)</td>
<td>- Asking</td>
<td>(ex) nervous</td>
<td>(ex) Pointing to the book</td>
</tr>
<tr>
<td>(ex) “Mad?” (6:20)</td>
<td>- Waiting</td>
<td>(ex) upset</td>
<td>(ex) Gesture</td>
</tr>
</tbody>
</table>

**Type (2) “Because” statement**
- A child talks about the **REASON** why the character feels the emotion in the book
- Don’t count if it is about the child’s own or somebody else’s emotion
  Count a child’s question about the reason for the emotion also (e.g., Is he sad because he is sick?).

<table>
<thead>
<tr>
<th>Utterance (time)</th>
<th>Parent’s preceding behavior</th>
<th>Related Emotion</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ex) “They’re making fun of Critter.” (38:12)</td>
<td>- None</td>
<td>(ex) happy</td>
<td>(ex) Speech</td>
</tr>
<tr>
<td>(ex) “He is alone.” (3:26)</td>
<td>- Modeling</td>
<td>(ex) excited</td>
<td>(ex) Pointing to the board</td>
</tr>
<tr>
<td>(ex) “Bunny lost his hat” (1:18)</td>
<td>- Asking</td>
<td>(ex) nervous</td>
<td>(ex) Pointing to the book</td>
</tr>
<tr>
<td>(ex) “Is he happy because his mom?” (0:10)</td>
<td>- Waiting</td>
<td>(ex) upset</td>
<td>(ex) Gesture</td>
</tr>
</tbody>
</table>

**Type (3) Solution/consequence**
- A child discuss what the character can/may do (**ACTION**) in the given emotional situation.
- Don’t count if it is about the child’s own or somebody else’s emotion
  Count a child’s question about the solution for/consequence of the emotion also (e.g., Can he go home now?).

<table>
<thead>
<tr>
<th>Utterance (time)</th>
<th>Parent’s preceding behavior</th>
<th>Related Emotion</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ex) “Tell mom” (5:08)</td>
<td>- None</td>
<td>(ex) happy</td>
<td>(ex) Speech</td>
</tr>
<tr>
<td>(ex) “Bunny need to find his mom” (5’50”)</td>
<td>- Modeling</td>
<td>(ex) excited</td>
<td>(ex) Pointing to the board</td>
</tr>
<tr>
<td>(ex) “Critter go home” (0:01)</td>
<td>- Asking</td>
<td>(ex) nervous</td>
<td>(ex) Pointing to the book</td>
</tr>
<tr>
<td>(ex) “Can he go home now?” (7:46)</td>
<td>- Waiting</td>
<td>(ex) upset</td>
<td>(ex) Gesture</td>
</tr>
</tbody>
</table>

**Type (4) Other utterances**
- Count the number of the **rest** of a child’s utterances (not related to emotion labeling, “because” statement, and solution/strategy)
- You have to count every utterance of the child except the ones you already counted above for the type (1)-(3).
<table>
<thead>
<tr>
<th>Utterance (time)</th>
<th>Parent’s preceding behavior</th>
<th>Related Emotion</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ex) “I’ll turn the page”</td>
<td>- None</td>
<td>(ex) happy</td>
<td>(ex) Speech</td>
</tr>
</tbody>
</table>


(ex) “Critter is really fast!”
VITA

Ji Young Na

EDUCATION
Ph.D. 2015, The Pennsylvania State University, University Park, PA
M.A. 2012, The University of Iowa, Iowa City, IA
B.A. 2007, Kyung Hee University, Seoul, Republic of Korea

SELECTED PUBLICATIONS


SELECTED PRESENTATIONS


*** Designated as a Meritorious Poster Submission by ASHA.


SELECTED AWARDS/HONORS
2012-2015 AAC Leadership Project, U.S. Dept. of Education grant (#H325D110008)
2014 Graduate Student Research Endowment, Penn State (#933-53 Fund 19200)
2014 Hintz Family Endowment Travel Grant, Penn State
2014 Global Programs Graduate Student Travel Grant, Penn State
2012 Student Professional Development Fund, Penn State