This dissertation titled
Supporting Individuals with Complex Communication Needs to Capture and Share
Active Recreational Experiences

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Abstract

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Supporting Individuals with Complex Communication Needs to Capture and Share Active Recreational Experiences

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Adaptive sport and recreational programs provide rich opportunities for communication and participation while also providing enjoyable and meaningful experiences for people with significant physical and communication disabilities. Programs rely on the skills, support, and dedication from community-based volunteers. Active recreation typically occurs in natural outdoor settings which can provide ideal contexts for capturing photos and videos that may be shared with others. The research project employed a distance training called the CAPTURE & Share program. The program provided instruction to volunteers about how to support people with disabilities to effectively collect and share digital artifacts (e.g., photos, videos) during an adaptive sport activity (i.e., kayaking). The first objective was to implement and evaluate the effectiveness of the distance training program for the volunteers. The second objective was to gather the perspectives of volunteers, participants with complex communication needs (CCN), and their caregivers before and after implementation of the CAPTURE & Share program. The project was divided into two studies: (a) implementation of the distance training program; and (b) use and application of the program during a series of recreational activities. An experimental single-subject research design with multiple baselines was used to investigate the training program in study 1 and Participatory Action Research (PAR) provided a framework for the application phase in study 2. During a
series of three kayaking lessons, the volunteers implemented their plans and had an opportunity to engage in feedback sessions to share ideas, reflect, and revise their plans. Caregivers and participants with CCN provided their perspectives before and after lessons to better understand their activity patterns relative to capturing and sharing digital media. Results indicated that all volunteers were successful in learning the program as they effectively demonstrated their ability to apply new knowledge to a series of hypothetical probes. Additionally, a thematic analysis of the volunteer feedback sessions revealed five primary themes: (a) the steps of the program, (b) feedback, (c) barriers, (d) supports, and (e) benefits. Lastly, a descriptive analysis of participant and caregiver interviews provided information about benefits and general experiences relative to collecting and sharing digital artifacts during recreational activities. Implications are discussed for volunteers, active recreational programs, speech-language pathologists and related professionals, and caregivers and participants with CCN.
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Chapter 1: Introduction

Individuals with complex communication needs (CCN) due to developmental or acquired disabilities have limited opportunities to participate and engage in their communities (Balandin, 2011; Light & McNaughton, 2015; Mirenda, 2014; Raghavendra, Virgo, Olsson, Connell, & Lane, 2011). The concepts of participation, engagement, and interaction have gained more prominence in the research and literature relative to people with CCN (Alant, 2017; Batorowicz, Campbell, Von Tetzchner, King & Missiuna, 2014; Thirumanickam, Raghavendra, & Olsson, 2011). This is due to the understanding that individuals with CCN have limited social networks and often experience loneliness which can have a negative impact on their quality of life (Balandin, 2011; Ballin & Balandin, 2007; Hamm & Mirenda, 2006; Light & McNaughton, 2015; Mirenda, 2014).

Previous research has revealed that restrictions in social participation and community integration continue to exist for individuals with CCN (Balandin, 2011; Batorowicz et al., 2014; Clarke et al., 2011; Light and McNaughton, 2014; Raghavendra et al., 2011). Due to significant communication challenges combined with limited social networks and inadequate facilitator support, isolation and feelings of loneliness and depression are common risk factors for people with CCN (Balandin, 2011, Ballin & Balandin, 2007; Hamm & Mirenda, 2006). Restrictions in participation and social interactions can lead to loneliness, reduced social networks and have a negative impact on developing communicative competence (Ballin & Balandin, 2007; Light & McNaughton, 2014; Raghavendra et al., 2011).
Waller (2006) reported that sharing and recalling past experiences can support the development and maintenance of friendships while allowing people to express their personal identity. Participation in recreation can improve quality of life for people with disabilities and CCN (Zabriskie, Lundberg, & Groff, 2005) and provide meaningful social opportunities and interactions with volunteers, families, and other participants (Hajjar, McCarthy, Benigno, & Chabot, 2016). Having increased opportunities to communicate and interact with others will allow people with CCN to achieve communicative competence and full participation.

Community-based recreational activities supported by volunteers provide unique settings for capturing photos and videos of meaningful events and experiences that can be shared with others. Photos and videos are universally accepted channels of expression and are used to support communication for educational, employment, health, and social functions (Light & McNaughton, 2014; Raghavendra, Newman, Grace, & Wood, 2013). In our society, there is an increased trend to use photos and videos to express our identity, enhance social interactions and make instant connections with people on a global scale (Light & McNaughton, 2014; Shane, Blackstone, Vanderheiden, Williams, & DeRuyter, 2012; Van Dijck, 2008).

In the current study, volunteers were trained to develop plans to facilitate participation to support people with CCN to capture their experiences before, during, and after recreational lessons. In study 1, the volunteers learned a novel training program called the CAPTURE & Share program (Hajjar, 2017), which included the following components: C = Cameras; A = Adapt; P = Practice; T = Take Photos or Video; U = Use Context; R = Review photos and videos; and E = Edit photos and videos. In the
application phase during study 2, the volunteers had an opportunity to generalize their learning by supporting participants to collect and capture media during a series of three adaptive kayaking lessons. During the lessons, photos and videos were taken from the volunteers’ and participants’ perspectives and then shared via face-to-face and digital methods.

The International Classification of Functioning, Disability and Health (ICF) (World Health Organization[WHO], 2013) provides a framework to assist in guiding research involving people with CCN (Raghavendra, Bornman, Granlund, & Bjorck-Akesson, 2007). The ICF model states that disability is a complex social phenomenon in which intervention must consider intrinsic factors related to the person and extrinsic factors related to the individual’s environment (Light & McNaughton, 2015).

A critical extrinsic factor to consider is the role of facilitators as communication partners (Huer & Threats, 2016). Communication partners play a critical role in creating opportunities for increased interaction and engagement across educational, home, and vocational settings for people who use augmentative and alternative communication (AAC) (Binger, Kent-Walsh, Ewing, & Taylor, 2010; Calculator, 1999; Kent-Walsh, Binger, & Hasham, 2010; Kent-Walsh & Light, 2003; McNaughton, Light, & Gulla, 2003). Raghavendra et al. (2011) suggested that training and building positive experiences with communication partners may foster collaboration with key stakeholders across community organizations. Finally, Patel and Threats (2016) advocate for the social model of disability and the importance of empowering communication partners to play a significant role to fully integrate people with disabilities into all aspects of a society.
Previous research indicates that volunteers in community-based recreation settings serve as key supports to people with CCN (Hajjar et al., 2016). Findings indicate that volunteers reduce participation barriers and provide critical supports for physical access, learning, and communication. Hajjar and McCarthy (2015) conducted a study training volunteer/rider dyads at a therapeutic horseback riding facility in Athens, OH. The outcomes revealed that volunteers were effective in providing riders with increased opportunities for choice making and communicative interactions before and after riding lessons.

The current research was divided into two related studies: (a) distance training for volunteers, and (b) application and feedback during recreational activities. Mixed methodology was used as study 1 provided the foundation for study 2. The first study used a single-case research with multiple baselines across subjects to evaluate the training across baseline, intervention, postintervention, maintenance, and generalization phases (Kazdin, 2011; Kratochwill et al., 2010; McReynolds & Thompson, 1986). The second study employed qualitative methodology (Creswell, 2007; Patton, 2002) to collect volunteer, participant, and caregiver perspectives about implementation of the program across a series of recreational activities.

The CAPTURE & Share program used in study 1 was developed by the research team and originated from the training program used in the therapeutic horseback riding setting. The previous training (i.e., take-home program) was expanded into a distance training program which could be accessed online in an asynchronous manner based on the volunteers’ schedules. After the volunteers were trained, they were evaluated relative to their ability to apply the training to a series of hypothetical probes. Single-case
research was used to validate the program across 6 different volunteers. After completing the training, volunteers were given an opportunity to apply the strategy during active recreational experiences while paired with a participant with CCN. The outcomes from the application of the strategy in a natural context were examined using a qualitative approach.

Participatory Action Research (PAR) (Heblethwaite & Curley, 2015; McDonald, 2012; Northway, 2010) provided a framework for study 2. PAR is a social process of collaborative learning typically employed across natural settings (Kemmis & McTaggart, 2005). Collaboration with stakeholders is critical to the success of PAR as they serve as coresearchers throughout the entire process. This type of collaborative partnership between research participants and researchers has precedence in the field of AAC and recreational therapy (Blackstone, Williams & Joyce, 2002; Light, Page, Curran, & Pitkin, 2007; Walton, Schleien, Brake, Trovato, & Oakes, 2012). In the present study, volunteers, participants with CCN, and caregivers were all considered coresearchers. These stakeholders provided their perspectives on the CAPTURE and Share program during feedback sessions and interviews. In study 2, the volunteers had an opportunity to apply their skills learned from the distance training in a natural setting, working collaboratively with participants with CCN and their caregivers.

The community of stakeholders in the current study were all connected through the same adaptive sport program which included volunteers, participants with CCN, and their caregivers. After the volunteers received training about how to plan for capturing media in recreation, they supported participants with CCN to collect digital photos and videos during three consecutive kayaking lessons. After all digital media artifacts were
collected, participants with CCN and their caregivers shared the artifacts with people in their social networks. PAR provided a framework to provide structure to study 2 and allowed volunteers and participant’s maximum flexibility as they captured media, considered other viewpoints, and made any necessary modifications.
Chapter 2: Literature Review

Value of Community-Based Recreation

In the last decade, there has been increased research relative to people with CCN in the areas of community participation and engagement (Datillo et al., 2008; Mirenda, 2014). Because employment and postsecondary education opportunities for people with CCN are limited (Light & McNaughton, 2015; Mirenda, 2014), it is important to consider the impact of participation across community-based activities of recreation and leisure in providing a higher quality of life standard.

Many opportunities for active and adaptive recreation are available across the United States and Canada. Disabled Sports USA is an umbrella organization that certifies over 120 chapters that serve 60,000 athletes with a wide range of physical, cognitive, and communication disabilities. Previous research has focused on participation in community-based recreational activities (Datillo, Benedek-Wood & McLeod, 2010; Mirenda, 2014); however, there has been limited focus on how to enhance the entire experience for all stakeholders and extend the benefits from this context into other aspects of people’s lives.

Programs that promote and support active recreation for people with significant disabilities are uniquely specialized in terms of equipment, gear, and instructor skill. These programs are specially designed; however, they are typically located in settings accessed by the general public. Recreation often occurs in community-based settings depending upon the types of natural resources offered in the regional area (e.g., lakes, ski mountains, hiking trails, bike paths). Adaptive recreation programs reduce physical
barriers and provide an inclusive experience for all participants with the support of dedicated volunteers (Hajjar et al., 2016).

Active recreational programs such as adaptive skiing and equine-assisted activities and therapies are rich with opportunities for meaningful interactions and communicative exchange. These types of programs have received positive support from previous research in the fields of recreation and leisure studies (Chun, Lee, Lundberg, McCormick, & Heo, 2008; Hawkins, Ryan, Cory & Donaldson, 2014; Zabriski et al., 2005). In a survey with skiers with physical and/or cognitive disabilities from the Adaptive Sports Center in Crested Butte, Colorado, strong connections were identified between participation in community-based adaptive sports and improved quality of life (Chun et al., 2008). Also, Zabriskie et al. (2005) discussed the positive influence of active recreation such as skiing and horseback riding on overall health, development of athletic identity, and increased quality of life by conducting survey research with individuals with physical and cognitive disabilities. Hawkins et al. (2014) conducted single-case research with children with autism spectrum disorder and found that equine-assisted therapy had positive effects on gross motor skills, body coordination, strength, and agility.

Participation in community based recreational activities can have extensive benefits for children and adults with disabilities and CCN (Datillo et al., 2008; Hajjar & McCarthy, 2016; Patterson & Pegg, 2009; Potvin, Prelock, & Snider, 2008). These types of activities can reduce behavioral and emotional distress, build social networks, and improve physical health (Lundberg, Bennet & Smith, 2011). The infrastructure of
recreational programs supports the process of developing relationships, increasing engagement, and fostering independence through teaching new skills (Datillo, Kleiber, & Williams, 1998; Datillo et al., 2008). For some individuals with disabilities who are unable to work full- or part-time, recreational pursuits may rival employment and be defined as “serious leisure” activities or central life interests (Patterson & Pegg, 2009). Furthermore, Patterson and Pegg (2009), determined that serious engagement in leisure activities provides people with intellectual disabilities the necessary confidence to communicate, acquire new skills that build self-esteem, and facilitate social inclusion across community settings.

Accessing appropriate recreational programs can be challenging for families and individuals who present with CCN (Batorowicz et al., 2014; Dattilo, 2008). Barriers include lack of facilitator skills and knowledge as well as negative societal attitudes (Dattilo et al., 2010). In previous research, parents of children who use aided communication, discussed barriers such as impatient communication partners, limited opportunities for interactions with peers, and challenges using high technology devices in outdoor settings (Batorowicz et al., 2014). For individuals with CCN and physical disabilities, preplanned supports and structure are necessary around the entire experience to ensure successful participation, interaction, and social relationships (Batorowicz, McDougall, & Shepherd, 2006; Hajjar & McCarthy, 2016).

Community-based recreational programs rely on program staff, volunteers, and committed caregivers as they support individuals through a process of learning and mutual engagement. King et al. (2014) found that youth with severe disabilities seek to
develop social relationships during leisure and activity settings and that support from others (e.g., parents, attendants, volunteers) can enable active participation. In leisure and recreational programs, volunteers are important members of the support team and play a critical role in ensuring the success of the experience by reducing physical and attitudinal barriers.

**Volunteers Make the Difference**

In many community-based recreational programs, volunteers are the backbone of the organization and work towards ensuring a safe and enjoyable experience for people with disabilities. Hajjar et al. (2016) interviewed volunteers from adaptive ski and therapeutic riding programs and found that individuals come to the experience due to a lifelong interest, which they enjoy sharing with others while also demonstrating a strong level of commitment to teach and serve. Volunteers make important contributions to activities of leisure as they engage in the process of assisting the leisure experiences of others, while simultaneously undertaking a recreational activity themselves (Lockstone-Binney, Holmes, Smith, & Baum, 2010).

The nature of adapted sport activities is such that many accommodations have been made to assist people with disabilities in accessing the sport. For example, in activities such as adaptive skiing or adaptive cycling, specialized equipment is necessary in addition to support from volunteers. The volunteers are a major part of the adaptive sport infrastructure and work in synchrony with participants to recognize and implement accommodations to improve recreational experiences. Volunteers, under the guidance of program directors and certified therapeutic recreation specialists, have been successful in making sports and outdoor activities physically accessible to everyone in society.
Many types of opportunity barriers have been eliminated, in large part because of the work of volunteers in settings of adaptive sport and outdoor recreation.

Despite frequent interactions with individuals with CCN, volunteers are unlikely to have received specific training in communication or methods to encourage independence or participation. Individuals can learn to be skilled communication partners by increasing awareness of how their actions may enhance the interaction and increase opportunities for meaningful exchange. Previous research has shown that explicit communication partner training has been effective in educating both caregivers and paraprofessionals who communicate and interact with individuals with CCN (Binger, Kent-Walsh, Berens, Del Campo, & Rivera, 2008; Binger et al., 2010; Kent-Walsh et al., 2010).

**Adult Learning Principles and Preferences**

The volunteers who participated in this study were all adults who had previous experience supporting individuals with disabilities in active recreation. According to Knowles, Holton, and Swanson (1998), it is important to consider the following key principles when engaging adults in new learning: (a) the relevance of the new learning content; (b) how the content will be useful in their lives; and, (c) how their prior experience and knowledge will integrate with the new learning content. These key principles were considered during the development of the strategy training by including comprehension checks and using hypothetical case study probes.

Furthermore, Thiessen and Beukelman (2013), discussed four different types of learning mode preferences for adults who support individuals who use AAC:
independent, small group, case study, and step-by-step. According to Thiessen and Beukelman (2013), adult facilitators report a strong preference for learning using case studies as part of the instructional content.

A case study was embedded into the distance-training program to highlight the components of the CAPTURE and Share program. The case study was about an individual named Mary who has cerebral palsy, uses AAC, and participates in active recreation. The case study was introduced in module two as the volunteers were learning about action items and steps of the strategy. As part of the comprehension checks within training modules two-five, the case study provided a context for the volunteers when answering multiple-choice or open-ended questions about the program.

**Training Communication Partners**

Communication partners have been essential in planning appropriate supports for people with CCN as they access recreation in the community. Previous research has considered the role of partners and their experiences supporting individuals with CCN across educational, community, and recreational settings (Blackstone, Williams, & Wilkins, 2007; Collier, Rothwell, Vanzo, & Carbone, 2015; Douglas, Light, & McNaughton, 2012; Kent-Walsh & McNaughton, 2005). McNaughton and Light (2013) indicated that future research should consider not only the impact of technology on individuals who use AAC but also facilitator knowledge and skills. Hanson, Beukelman, and Yorkston (2013) discussed the need to focus training on communication partners to assist them with the shared communicative burden that exists when a speaker’s intelligibility is compromised.
Communication interactions with individuals with CCN vary widely from interactions that occur with individuals who primarily use natural speech (Light, 2003). There may be specific challenges due to access and/or opportunity barriers. For example, individuals with CCN often use multiple modalities to communicate; a speech-generating device (SGD) may be one component of an AAC system, but individuals may also use sign language, gestures, verbal approximations, or other types of visual support (Beukelman & Mirenda, 2013). Because of this, unfamiliar listeners may have challenges interpreting multimodal communication or may be unsure about how to initiate and sustain interactions. Additionally, when interacting with people who use AAC, partners have been found to interrupt, take most conversational turns, ask frequent yes/no questions, and provide fewer opportunities for communication during structured activities (Binger et al., 2008; Kent-Walsh et al., 2010).

Previous research has informed the AAC community about the characteristics and strategies of communication partners across educational and vocational settings (Calculator, 1999; Kent-Walsh & Light, 2003; McNaughton, Light, & Gulla, 2003). This research indicates that partners play a critical role in facilitating the success of individuals who use AAC (Kent-Walsh & McNaughton, 2005). There is limited research examining the role and perspectives of volunteers who support individuals with significant disabilities in leisure and recreational settings. Volunteers in these programs have served as advocates and ambassadors for participants with disabilities (Hajjar et al., 2016). Recreational settings present an array of unique challenges for volunteers; however, extensive opportunities exist to empower these stakeholders to enhance the experience.
Kent-Walsh and McNaughton (2005) reported that communication partner instruction is known to be a critical component in successful AAC intervention. Communication partners need to acquire specific skills learned in a structured and systematic manner to be effective and to interact naturally with individuals who use AAC (Kent-Walsh & McNaughton, 2005). Kent-Walsh and McNaughton (2005) developed an eight-step protocol based on the strategy instruction model proposed by Ellis, Deshler, Lenz, Schumaker, and Clark (1991). This protocol offers a useful model for providing partner instruction to enhance outcomes for individuals who use AAC by providing evidence-based information to assist partners in learning targeted strategies, implementing the strategies, and maintaining long-term use.

Partner training programs have proven to be effective across a range of settings and have been used as a tool in the establishment and investigation of new interventions. Currently, several programs and guidelines exist that are based on the general principles of strategy instruction outlined by Kent-Walsh and McNaughton (2005). Some examples of these programs are: (a) ImPAACT (improving partner applications for augmentative communication techniques); (b) IPLAN (identify activities for communication, provide means for communication, locate and provide vocabulary, arrange environment, use interaction strategies); and (c) MORE (model AAC, offer opportunities for communication, respond to communication, extend communication) (Douglas et al., 2012; Kent-Walsh & McNaughton, 2005).

Kent-Walsh et al. (2010) investigated the effects of using the ImPAACT program to instruct parents on the symbolic communication of children who use AAC during storybook reading. As a result of the training intervention, parents learned to accurately
implement a communication-partner strategy and the children who used AAC increased their communicative turn-taking and language use. Findings indicated that the parent-instruction program applied within the context of storybook reading episodes improved parent-child interaction patterns as well as facilitating communicative expression and pragmatic skills in children who use AAC. The parents in the study learned to use new interaction patterns, as they were expected to provide their children with increased opportunities for taking turns.

Factors that influence training include the content of the program, projected outcomes, and the location and characteristics of the specific individuals who are participating in the training. Binger and Kent-Walsh (2012) recommended that long-term outcomes be considered when developing training programs for partners. Their research reported specific guidelines for establishing best practice in partner training: (a) identifying behaviors that are clearly tied to client outcomes; (b) selecting skills that are easy to identify; (c) practicing partner techniques prior to application; (d) starting small and expanding after success; and, (e) focusing on one situation within a specific setting.

**Distance Learning and Instructional Technology**

Due to the continued development and growth of the Internet, distance training has been recognized as a viable method for educating stakeholders (Light et al., 2007; McCarthy, Light, & McNaughton, 2007; Thiessen & Beukelman, 2013). Light et al. (2007) trained individuals who use AAC to become mentors. The study investigated the effects of a distance instructional program focusing on the areas of sociorelational skills and collaborative problem-solving. The instruction was designed to prepare experienced AAC users to serve as mentors to younger individuals who use AAC. The effect of the
training was measured using probes consisting of role-play examples based on experiences of adolescents and young adults who use ACC. The investigators reported that all the participants successfully acquired the target skills introduced in the training program. Quinn, Beukelman, and Thiessen (2011) compared remote access learning with side-by-side instruction for adults learning how to use unfamiliar AAC software. Even though the accuracy of performance for learning the software was similar, the participants reported that they preferred the remote-access condition.

In the present research, a distance training was employed to teach adult volunteers how to support people with CCN to capture, edit, and share digital artifacts gathered during community-based recreational activities. Throughout the implementation of the distance training, volunteers applied their newly learned skills to hypothetical case studies describing individuals with CCN who participate in active recreation. The distance training, which was divided into five modules, provided volunteers with information to assist them to make a comprehensive plan that would be implemented in study 2.

**Validation of instructional programs.** Single-case designs have been used to investigate individualized communication partner strategy instruction training programs with parents and educational assistants (Binger et al., 2010; Kent-Walsh et al., 2010). This type of design provides a rigorous evaluation of intervention effects and is often used in both applied and clinical disciplines such as psychology, education, and communication sciences and disorders (Kratochwill et al., 2010). Kent-Walsh, Murza, Malani, and Binger (2015) conducted a systematic review and meta-analysis of AAC partner instruction intervention literature and found that partner instruction has positive
effects on the communication performance of individuals using AAC. Previous research has used single-case designs to validate distance training programs (Light et al., 2007; McCarthy et al., 2007). McCarthy et al. (2007), used an online instructional program to teach problem-solving skills to five young adults with cerebral palsy who use AAC. In the study, the authors successfully taught five participants a systematic method to solve problems by finding solutions to hypothetical scenarios and to generalize the strategy to everyday problems in their own lives. The investigators developed an online instructional program by adapting a program from Light et al. (2007). The online instructional program included an introduction followed by seven lessons. Participants reached criterion by demonstrating greater than 80% accuracy as they successfully applied elements of the program when completing intervention probes.

**Why CAPTURE and Share?**

Capturing and sharing past experiences builds social closeness, enhances relationships, and supports the development of communicative competence across operational, linguistic, social, and strategic domains for people with CCN who use AAC (Light & McNaughton, 2014). To stay connected with family and friends or reach out to meet new people, it is important for individuals with CCN to share their experiences (Beukelman, Hux, Dietz, McKelvey, & Weissling, 2015; Shane et al., 2012). By using digital artifacts to share past experiences, people who use AAC have enhanced their communicative interactions by moving beyond typical transactional functions such as requesting to more interactional functions such as telling stories or taking the lead role in conversations (Waller, 2006). More recent research in AAC has discussed how individuals with CCN access and engage with social media to find information, interact
with others, or share visual artifacts (Caron & Light, 2015; Caron & Light, 2016; Paterson, 2017).

Due to the increased functionality and portability of mobile technology, it has been possible to more readily capture experiences and effectively share digital artifacts. However, with the influx of technology along with a plethora of digital applications to support sharing, these types of media products have imposed increased linguistic and operational demands for people with CCN (Light & McNaughton, 2014; McNaughton & Light, 2013). With the support of knowledgeable facilitators, people with CCN have benefited from learning methods to facilitate digital sharing to increase opportunities for communication and exchange with a wider network of partners.

Individuals with CCN have reported benefits of using technology and social media to communicate and engage with people across both face-to-face and digital platforms. Kagohara et al. (2013) conducted a systematic review of research on the use of iPods and iPads and the results suggest that these types of devices are viable assistive technology options for individuals with developmental disabilities. Shane et al. (2012) provided an extensive list of communicative functions with examples of specific technology options to support people with CCN to participate in the digital world across a range of settings. Caron and Light (2015) reported that persons with amyotrophic lateral sclerosis who use AAC use social media as a tool to increase communication opportunities and connections to partners while allowing for independence and improved quality of life. McNaughton and Light (2013) discussed the importance of further investigating types of mobile technology across the life span for people with developmental and acquired disabilities with a specific focus on a broader range of
communication acts that will enhance social closeness, information exchange and participation in society.

As a result of collecting and capturing digital media from recreational experiences, people with CCN and their caregivers will have an increased inventory of artifacts for sharing. Regardless of their method for sharing, people with CCN will benefit from having personalized photos and videos for (a) recollection and reflection of autobiographical memories, (b) supplementation for communication and natural speech, and/or (c) building and maintaining social networks across face-to-face or digital platforms.

**Recollection and reflection of autobiographical memories.** Photography historically has been used as a tool for remembering (Van Dijck, 2008) and to support the sharing of autobiographical memories. Autobiographical memories have a strong social function across the lifespan and are important for purposes such as teaching and informing others while also supporting intimacy and empathy with communication partners (Alea & Bluck, 2003). Furthermore, autobiographical memories not only facilitate social interactions, but also encourage self-reflection and can aid in constructing a sense of self over time (Fivush, Haden, & Reese, 2006). These memories may serve a basic social function by providing content for communicative interactions and bonding, while also engaging partners, making personal connections and encouraging listeners to participate in conversational exchange (Bluck, Alea, Habermans, & Rubin, 2005). Waller (2006) reported that sharing and recalling past experiences can support the development and maintenance of friendships while also allowing people to express their personal
identity. Photographs and video can serve as natural supports to aid people with disabilities in sharing memories and/or constructing personal narratives.

Van Dijck (2008) discussed the differences between younger and older generations and their use of photography for recollection and making connections with others. He indicated that older individuals use photography as a memory tool and younger individuals prefer to use photos to support social communication, which directly impacts peer bonding and interaction. Instead of organizing photos in albums and looking at them later, younger individuals tend to display photos as a part of their current conversations to strengthen social bonds and express their personal identity. Van Dijck (2008) reported that youth regard pictures as circulating messages which create a cycle of continual exchange in which personal photographs mix with public images.

Previous research has investigated the importance of using personally relevant contextualized photographs with adults and children who use AAC (Dietz, Wiessling, Griffith, McKelvey, & Macke, 2014; McKelvey, Hux, Dietz, & Beukelman, 2010; Soto, Solomon-Rice, & Caputo, 2009). Sharing narratives can be facilitated by personalized artifacts because they offer a visual prompt that contributes to storytelling. For example, adults with aphasia who have CCN preferred to use personalized photographs in the co-construction of messages with communication partners (McKelvey, Hux, Dietz, & Beukelman, 2010). Also, the use of personally relevant photographs and text was perceived as helpful when individuals with aphasia were retelling personal narratives (Dietz et al., 2014). Personalized artifacts have also been used in the educational setting. Soto et al. (2009) conducted single-case research in which personally relevant
photographs assisted three school-age children who use AAC to produce personal narratives.

**Communication support through supplementation.** Today, people with and without disabilities use visual artifacts (e.g., photographs, videos) to supplement, support, and clarify communication during face-to-face interactions (Beukelman, Taylor, & Ullman, 2013). There are many advantages to using visual artifacts to enhance and supplement communication (Light and McNaughton, 2014). For example, photographs and videos may improve sharing because they bypass potential language and literacy limitations for people with CCN and can serve as universal visual symbols reducing barriers of language and communication (Caron & Light, 2015). Most communication on social media can be supplemented with the use of visual images as some sites restrict message length and generally rely less on extensive linguistic content (Light & McNaughton, 2014).

Engebretsen, Harmen, Beukelman, and Hux (2014) determined that typical young and older adults referenced photographs as a supplemental rather than a primary communication strategy during face-to-face interactions. Visual information such as photographs shared on mobile technology can play an important role in supplementing the verbal expression of both communication partners and people with CCN (Hanson et al., 2013). Van Dijk (2008) reported that photographs are a vehicle for expression becoming more like spoken language and directly impacting communication and social interaction.

**Face-to-face and digital sharing.** In the past, AAC focused primarily on face-to-face interactions; today, many interactions also occur via social media (Beukelman et al.,
2015; Dietz et al., 2014). According to Shane et al. (2012), people who use AAC are more frequently extending face-to-face and interpersonal communication across digital platforms on the World Wide Web. Digital media artifacts are pervasive throughout social media platforms and dominate digital content for some individuals. With the increase in social media applications, photos and videos have become more universally recognized as acceptable methods for expressive communication across society (Light & McNaughton, 2014).

For people with CCN to fully participate and engage in social media platforms they may need training and assistance from communication partners to facilitate access, and establish an appropriate digital infrastructure (e.g., computers, Internet connectivity, social media applications). Caron and Light (2016) determined that adults with cerebral palsy who use AAC and social media would benefit from learning specific operational and technical skills to consistently access digital platforms, manage different types of media, and supplement face-to-face interactions. More individuals with CCN will access social media for sharing and other social functions as the technologies that facilitate digital capture and storage continue to integrate more seamlessly with AAC systems (Raghavendra et al., 2013).

Today, sharing digital artifacts has become more prevalent than keeping artifacts stored away in a traditional album for later review (Engebretsen et al., 2014; Hanson et al., 2013; Van Dijck, 2008). Internet and social media use has increased for the general population due to greater availability of mobile technology and devices, improved connectivity and access, and an influx of various applications that support communication and social interaction (e.g., Facebook, Twitter, Instagram).
People with CCN also engage with mainstream and mobile technologies more frequently for communication, sharing, and social interaction (Caron & Light, 2015). Furthermore, McNaughton & Light (2013) stressed the importance of increasing and improving methods for people with CCN to access communication across a variety of platforms including social media and other multimedia outlets and applications. Methods for sharing that involve technology and social media can allow for more flexibility and efficient communication for people with CCN (Caron & Light, 2015). Williams, Crezman, and McNaughton (2008) discussed the importance of accepting a broader definition of communication that includes the use of photos and video to share experiences and connect with friends and family.

Due to the availability of tablets and mobile technology, people with and without disabilities are more frequently sharing their opinions, viewpoints, and life experiences in a quick and seamless manner using photos and videos. These types of media artifacts have become essential components in our culture to extend face-to-face interactions and support increased social exchange. As technology continues to advance, capturing and sharing images will become more frequent, efficient, and accessible for people with disabilities and CCN. This will lead to greater opportunities for individuals to communicate about past experiences, supplement their natural speech, and share their stories. Lastly, two areas of research have informed the AAC community about the importance of context-rich photographs to support the coconstruction of messages and the potential of visual scene displays for adults and children.

*Context-rich photos and videos.* According to Dietz, McKelvey, and Beukelman (2006), images that are context rich establish an effective medium for conversational
interactions and provide people with CCN information to support exchanges. Digital artifacts that provide context will more effectively support interactions and supplement communication (Dietz et al., 2006). Engebretsen et al. (2014) reported that photographs provided by caregivers to support AAC often lack engagement among people in a scene or between people and the background. Because of the increase in using personalized photographs in AAC systems, stakeholders will need to better understand strategies that will guide and direct more effective capture of images integrating scenes and people performing activities or participating in events.

**Visual scene displays.** Digital artifacts may be used in visual scene displays (VSDs) to reduce cognitive and linguistic demands and provide visual supports to maximize communication and participation (Beukelman, Hux, Dietz, McKelvey, & Weissling, 2015; Beukelman & Mirenda, 2013; Light & McNaughton, 2015). VSDs currently use static photographs to offer personalized visual-contextual support for people with aphasia and other complex communication needs as they navigate AAC systems or express communicative intent (Dietz et al., 2006). In addition to using still photographs for VSDs, the Rehabilitation Engineering Research Center (RERC) on AAC is currently involved in research to develop technology to support interactive video visual-scene displays.

**Participatory Action Research**

In PAR, it is common for a specific community to be examined and for the research to reveal a deeper understanding of the people and the overall culture from that community. Kemmis and McTaggart (2005) described this process as the spiral of self-reflection, a constant cycle of planning, acting, reflecting, and revising that occurs among
the community of coresearchers involved and invested in the project. For example, Walton et al. (2012) used Photovoice methodology to collaborate with researchers, community members, and adults with intellectual and developmental disabilities. Photovoice is a type of PAR that incorporates photography and gives a voice to those typically unheard. In the study, Walton et al. (2012) trained adults with disabilities and community members best practices relative to photography and capturing personal experiences using digital cameras. Individuals with disabilities were matched with community members to form collaborative dyads that were responsible for completing a series of different photography assignments. After photo capture, the dyads participated in interviews to support the development of narratives that would accompany the photographs when displayed in community exhibitions.

AAC and PAR. Blackstone et al. (2002) discussed the importance of PAR and specifically how partnerships in research can have a positive impact on people with disabilities, service providers, and researchers. For example, Krogh and Lindsay (1999) used PAR in their investigation that recognized the perspectives of people with disabilities relative to the future of designing research in AAC. They suggested that for personal and societal change to occur for people who use AAC, their voices must be an equal part of the research process along with other related stakeholders. Based on their findings, Krogh and Lindsay (1999) determined that fostering research partnerships with people with disabilities and other stakeholders has great value. They concluded that PAR can have a dual effect not only by meeting research goals but also by being clinically relevant and beneficial for people across all levels of society.
In previous research conducted by the AAC-RERC, PAR approaches were used with young children without disabilities who were presented with a task to design assistive technology for children with CCN. According to Light et al. (2007), the children designed innovative technology that had more differences than similar features with existing AAC systems. As part of the PAR process, the children offered their priorities and preferences about the designs with the intent to encourage AAC developers in the future to make systems more appealing and easier for children with disabilities to use.

**Research Questions**

This research investigated how communication partners supported the *CAPTURE & Share* program for people with CCN. Because digital media are pervasive in our society and used for a range of social, economic, educational, and leisure purposes, it is important to ensure that people with CCN have access to personalized artifacts such as photos and videos. Recreational activities are rich with diverse opportunities to collect these types of artifacts. It is beneficial for individuals with CCN to capture their experiences so they can have photos and videos to recall and reflect, supplement and coconstruct messages, and share with others across face-to-face and digital platforms.

The research was divided into two studies: (a) distance training for volunteers and (b) application and feedback during recreational activities. The following research questions were addressed:
1. What is the effect of the training on: (a) the volunteers’ acquisition of the CAPTURE & Share program; (b) the volunteers’ generalization of the strategy to a person they are or could work with in their affiliated organization; and, (c) their maintenance of the target strategy over time?

2. Considering the application of the training program during a series of adaptive recreational activities: (a) what are the experiences and perspectives of volunteers after program application; and (b) what are the experiences and perspectives of participants with CCN and their caregivers after implementation of the program?

**General Method**

This research employed mixed methodology using single-case research followed by qualitative inquiry. In study 1 a single-case research design with multiple baselines across subjects was used to evaluate the training across baseline, intervention, maintenance, and generalization phases (Kazdin, 2011; Kratochwill et al., 2010; McReynolds & Thompson, 1986). In study 2, qualitative methodology (Creswell, 2007; Patton, 2002) was used to collect volunteer, participant, and caregiver perspectives about implementation of the program across a series of recreational activities. PAR (Hebblethwaite & Curley, 2015; MacDonald, 2012; Northway, 2010) was used as a framework in study 2.

Six volunteers were recruited to document the effectiveness of the training program in study 1; 3 volunteers were in the initial group and 3 volunteers were in the replication group. Eighteen written probes consisting of hypothetical scenarios describing people with disabilities who participate in active recreation were developed and used to
track the volunteers’ acquisition and understanding of the training. All the probes had the same stimulus question and were used across all phases of the single-case study. Probes were used one time and not replaced in the original pool after they were randomly selected for use.

Five of the 6 volunteers from study 1 participated in study 2 which occurred during recreational activities with 5 individuals with CCN. The volunteers were paired with an individual with CCN during this phase of the project. The volunteers supported individuals with CCN to CAPTURE & Share digital artifacts using the strategy learned in study 1. After applying the CAPTURE & Share program, the volunteers shared their perspectives in a series of feedback sessions which occurred immediately after each recreational activity. Additional information was collected from the individuals with CCN and their caregivers before and after they participated in the recreational activities.
Chapter 3: Distance Training Program (Study 1)

In study 1, the volunteers participated in a single case multiple baseline design with replication. This method was used to validate the instructional program as volunteers worked to reach criterion on multiple consecutive occasions. The independent variable was the distance-training program. The program was developed for this study and consisted of an introduction followed by five separate modules. The dependent variable was the percent accuracy of implementation of the targeted training elements as measured by the volunteers’ ability to generate an implementation plan (i.e., written response to a probe) to support the process of photo/video capture and sharing during active recreation. A scoring rubric was used to track the volunteers’ performance on written probes throughout the five phases of the study.

Method

Participants. Volunteers were recruited through purposive sampling (Patton, 2002). This kind of sampling method is justified when individuals come from a specialized or uniquely qualified subset of the population (Suri, 2011). All volunteers were from the same adaptive sport program located in New Hampshire, USA. The director of the active recreational program nominated the volunteers based on the following inclusionary criteria: (a) were 18 years or older; (b) passed appropriate background checks to be a volunteer; (c) had a high school diploma or GED equivalent; (d) were native English speakers; (e) had consistent Internet connectivity and access to email; and, (e) had adequate physical skills and ability to manipulate cameras and small electronics.
Participant demographics. Volunteers completed a demographic questionnaire prior to starting study 1. See Table 1 for demographic information about the volunteers.
<table>
<thead>
<tr>
<th>Volunteer</th>
<th>Peg</th>
<th>Melanie</th>
<th>Allison</th>
<th>Danielle</th>
<th>Amy</th>
<th>Morgan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>72</td>
<td>32</td>
<td>53</td>
<td>54</td>
<td>21</td>
<td>67</td>
</tr>
<tr>
<td>State</td>
<td>MA</td>
<td>MA</td>
<td>NH</td>
<td>NH</td>
<td>NH</td>
<td>NH</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>Married</td>
<td>Married</td>
<td>Married</td>
<td>Not married</td>
<td>Married</td>
</tr>
<tr>
<td>Current or past occupation</td>
<td>Physical therapist</td>
<td>Speech-therapist</td>
<td>Reading specialist</td>
<td>Information technology</td>
<td>College student</td>
<td>High school teacher</td>
</tr>
<tr>
<td>Employment status</td>
<td>Retired</td>
<td>Full-time</td>
<td>Full-time</td>
<td>Retired</td>
<td>Student</td>
<td>Retired</td>
</tr>
<tr>
<td>Highest education level</td>
<td>Master’s degree</td>
<td>Master’s degree</td>
<td>Master’s degree</td>
<td>Bachelor’s degree</td>
<td>Bachelor’s degree</td>
<td>Bachelor’s degree</td>
</tr>
<tr>
<td>Years volunteering with adaptive sport</td>
<td>33</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Experience with action cameras and accessories&lt;sup&gt;a&lt;/sup&gt;</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Experience with social media&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<sup>a</sup>Note. Volunteers were asked if they had previously used specific action cameras and accessories given a list of possible options.

<sup>b</sup>Volunteers were asked if they had used social media in the past year and were given a list of applications to indicate use.
Materials. In study 1, the effectiveness of the CAPTURE & Share program was evaluated. The strategy was taught to the volunteers using a distance instructional program administered via a password-protected website. The principal investigator sent volunteers links to the training modules for each section of the strategy upon their completion of measures of the dependent variable (i.e., hypothetical probes) in the intervention phase. Information about the development of the CAPTURE & Share program and the instructional methods used to teach the strategy are included in this section.

Development of the instructional program. The CAPTURE & Share program was adapted from the “take-home” strategy that was implemented prior to this study in a therapeutic horseback-riding program. The “take-home” strategy included six steps that were taught in person to volunteers to increase opportunities for communication and to support riders to share and talk about their riding lesson. The “take-home” strategy was previously validated using a single-case research design across two time periods (Hajjar & McCarthy, 2015).

The CAPTURE & Share program extended beyond the “take-home” strategy and was modified for distance instruction. The modified instructional strategy was developed for use across a range of active and passive recreational activities in which people with CCN may participate. The CAPTURE & Share program was used in this study because: (a) it included the key elements for documenting an experience; (b) it was simple; (c) it used an acronym that was easy to remember; (d) a modified version had been used effectively in previous research; and, (e) it was based on key principles of task
analytical and strategy instruction. The steps of the CAPTURE & Share program are described in the next section.

The CAPTURE & Share program included a total of eight steps to be considered by communication partners as they developed a plan to support photo and/or video capture for individuals with CCN who participate in active recreation. To learn the CAPTURE & Share program, volunteers were expected to label each step, generate an action item relative to what they would say or do at each step, consider barriers and supports for themselves at each step, and finally, consider barriers and supports for participants with CCN at each step.

The acronym CAPTURE represents the first seven steps of the program that was taught to the volunteers: Cameras; Adapt; Practice; Take photos & video; Use context; Review photos and video; and Edit photos & video. The last step of the program was “share.” In addition to learning the eight steps, volunteers were asked to generate associated action items to correspond with each step.

Action items were defined as what a volunteer may say or do to complete each step as they developed their plan to support sharing. The associated action items were tailored to each step, and the volunteer was required to independently consider what type of action item they would use based on the individual’s skills and characteristics. During the instructional program, volunteers learned to consider action items by generating examples for each step within the training modules. See Table 2 for a complete list of the steps and corresponding action items.
Table 2

*Steps and Action Items in the CAPTURE & Share Program*

<table>
<thead>
<tr>
<th>Initial letter</th>
<th>Step</th>
<th>Action item</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Camera</td>
<td>Show and label camera</td>
</tr>
<tr>
<td>A</td>
<td>Adapt</td>
<td>Give options for wear or mount</td>
</tr>
<tr>
<td>P</td>
<td>Practice</td>
<td>Practice taking a photo and video</td>
</tr>
<tr>
<td>T</td>
<td>Take photos &amp; videos</td>
<td>Collect photos/videos before, during, and after</td>
</tr>
<tr>
<td>U</td>
<td>Use context</td>
<td>Suggest and direct capture</td>
</tr>
<tr>
<td>R</td>
<td>Review</td>
<td>Compare artifacts and find a favorite</td>
</tr>
<tr>
<td>E</td>
<td>Edit</td>
<td>Add a caption or trim</td>
</tr>
<tr>
<td>&amp; Share</td>
<td>Share media</td>
<td>Decide what and how to share</td>
</tr>
</tbody>
</table>

In the last part of the *CAPTURE & Share* program, volunteers were prompted to consider intrinsic and extrinsic factors relative to themselves as well as the participants they support in active recreation. The World Health Organization’s International Classification of Functioning, Disability and Health (WHO/ICF, 2013) provided a framework for volunteers to consider personal barriers and supports. The ICF framework was used to develop content for the training program. Part one of the WHO/ICF (2013) describes functioning and disability across two components: (a) body structure and function, and (b) activities and participation. Part two of the WHO/ICF (2013) focuses on contextual factors: (a) environmental factors (e.g., attitudes, physical environment, knowledge and skill of communication partners), and (b) personal factors which represent...
an individual’s traits besides disability (e.g., age, motivation, interests, education level, or lifestyle habits) (Fannin, 2016; Raghavendra et al., 2007) In addition to an individuals’ body structure and function profile, contextual factors (e.g., communication partner skills, attitudes of partners) may have a significant impact on an individual’s daily function and may facilitate or restrict activity and/or participation at all levels (Raghavendra et al., 2007).

After labeling each step and corresponding action item, volunteers were asked to consider barriers and supports for themselves and for individuals with CCN. Using the ICF framework, volunteers practiced generating barriers and supports based on specific information provided in the training. As the volunteers learned the strategy, they were asked not only to consider the characteristics and skills of the person with CCN but also to determine the impact of contextual factors such as the environment or personal factors unique to everyone. Volunteers had opportunities to consider and practice developing barriers and supports throughout assessment tasks embedded in the training modules.

See Appendix A for an example of a complete plan for the hypothetical case study “Mary.” The plan which is presented in a table, includes all four components of the CAPTURE & Share program: (a) strategy step, (b) action item for each step, (c) barriers and supports for volunteer, and (d) barriers and supports for participant with CCN. This document represents an example of an accurate and complete plan that was provided to the volunteers after they submitted their response to the comprehension check in module 5.

**Instructional program.** The program instruction included an introduction followed by five lessons contained in five separate modules. The introduction was
created as a Word document that contained visuals to assist the volunteers in accessing and interacting with each of the modules. The introduction was presented to the volunteers prior to the first module. The modules were created in Power Point using visuals and text with accompanying audio for each content slide. The audio was recorded separately and integrated with each slide in the module. Each Power Point presentation was transferred into a video file and integrated with the software program Zaption\(^1\) to allow access to intermittent comprehension checks that included multiple-choice and open-response type questions. See Appendix B for an email address to request audio and videos of the training modules from the principal investigator.

For the full text of the voice over script that accompanied each slide in the five modules, see Appendix C. Throughout the training modules, a hypothetical case study was used to demonstrate application and use of the *CAPTURE & Share* program. Over the course of the instructional program, volunteers were taught to make a plan to support a participant with CCN to share their recreational experience. The volunteers’ complete plan included all the related components of the *CAPTURE & Share* program.

**Introduction.** Prior to viewing the first instructional module, volunteers were provided with general information about how to access and view the modules, including the learning content and assessments. See Appendix D for the introduction and instructions to access the modules. Volunteers were instructed on the general layout and procedures for interacting with each module. Directions were provided about watching videos and listening to audio that was integrated into each slide. Lastly, volunteers were

\(^1\) Zaption was an interactive tool used for creating and sharing video content. The tool created quizzes, open-ended responses, and provided a method to receive feedback from users. On 9/30/16, Zaption was shut down and acquired by Workday.
informed about the process for completing comprehension checks at the end of each training module. The comprehension checks contained multiple-choice questions and open-ended responses.

**Comprehension checks.** During each module, volunteers engaged in periodic comprehension checks to ensure that they were continually attending and successfully learning the steps of the strategy. They engaged in open-ended type responses after viewing key content throughout the slides in each module. At the end of each module, volunteers were also expected to complete a set of multiple-choice questions, which reviewed new content but also reviewed content from previously viewed modules. See Appendix E for examples of open-ended response questions and multiple-choice questions that were used in the training modules. Volunteers were expected to achieve 80% accuracy on multiple choice questions presented at the end of training modules 1-4. If 80% accuracy was not achieved, the volunteers were asked to review their incorrect responses. Upon completion of the multiple-choice items, volunteers received immediate feedback about which responses were correct or incorrect. Volunteers were asked to review incorrect responses prior to starting the next training module. Results from the comprehension checks are presented in the results section.

**Training module 1.** After reviewing the introduction, the volunteers were provided a link to the first of the five training modules. Module 1, which was approximately 5 minutes in length, introduced the entire CAPTURE & Share program. Each step of the strategy was presented on a separate slide with the corresponding initial letter of the key word (i.e., “c” for cameras, “a” for adapt, “p” for practice), enlarged and highlighted to aid the volunteers in learning and remembering the steps. Also, each
content slide was accompanied by an audio voiceover to introduce information and assist the volunteers to recall the steps of the strategy. Content slides were followed by intermittent slides with questions to keep the volunteers engaged and ensure they are understanding the information.

In training module 1, visual and auditory prompts were provided to the volunteers as the eight steps of the strategy were introduced along with examples of corresponding “say” or “do” action items. At the end of the module, volunteers were expected to label each step and provide an example of an action item that would be associated with each step (e.g., “adapt,” “show and label options for wear vs. mount”). Multiple-choice and open-response questions were administered to ensure volunteers could match appropriate action items with each step and list the eight steps of the strategy. At this phase of the training, the volunteers were expected to recognize and label the strategy steps and action items prior to applying this knowledge to a hypothetical case study. Volunteers were required to achieve 80% accuracy or greater on the assessment items.

*Training module 2.* This module was approximately 15 minutes in length and introduced the concept of developing a plan to complete the steps of the strategy while also considering barriers and supports at each step. A table was introduced to the volunteers to assist them to organize information across four component areas of the plan: (a) program steps, (b) action items, (c) barriers/supports participant, and (d) barriers/supports volunteer. The four component areas for the plan were highlighted and examples were provided at each step of the strategy.

Visual and auditory prompts highlighting each step of the strategy were provided to the volunteers to facilitate learning. During this training module, volunteers had an
opportunity to type in each step and action item in a gradual forward chaining progression which sequentially linked individual components of the strategy (Kameenui & Simmons, 1990; Smith, 1999). While volunteers typed in their responses, they could view the previous steps of the strategy and could also check the accuracy of their responses in the next slide to support errorless learning (Kameenui & Simmons, 1990). By the end of the module, the volunteers could view the eight steps of the strategy as well as the corresponding action items all located in the same table.

Also in module 2, the volunteers were also introduced to a hypothetical case study of an individual named Mary who uses AAC and participates in active recreation. Thiessen and Beukelman (2013) discussed that some adult learners preferred case studies and that adult facilitators reported a relatively strong preference to learn through the case study mode. At this point in the training, volunteers were introduced to the case study about Mary and were responsible for generating the initial steps of a plan to support her in sharing her recreational experience.

Upon completion of module 2, the volunteers generated content for the first two columns of the table by typing the program step and a corresponding say or do action item. In addition, the volunteers answered eight multiple-choice questions about the strategy and were asked to match the eight program steps with a corresponding action item. The volunteers were expected to achieve 80% accuracy or better on the assessment task in module 2.

Training module 3. Module 3 was approximately 12 minutes in length and reviewed the first two components of the plan while also introducing a new component relative to barriers and supports for participants. After reviewing the first two sections of
the plan (i.e., steps and action items), these components received less focus in this module as the volunteers were provided with more detailed information about how to consider barriers and supports for participants with CCN. At this phase of the training, the volunteers continued to build their plan to support Mary to share her recreational experience. The primary focus of module 3 was to teach the volunteers how to generate ideas relative to barriers and supports for Mary at each step of the strategy.

Using the framework from the ICF (WHO, 2013) and the Participation Model (Beukelman & Mirenda, 2013), training module 3 organized barriers and supports in two major areas: (a) body structure/function and activity and (b) contextual/environmental and personal. Body structure/function and activity barriers and supports were described in the following areas: (a) communication functions, (b) sensory/perceptual functions, (c) movement related functions, and (d) cognitive/mental/psychosocial functions. Contextual/environmental and personal barriers and supports were described in the following areas: (a) communication partner support and relationships, (b) availability of technology and AAC system, (c) resources, services, and physical setting, and (d) psychosocial factors such as motivation, attitudes, and resiliency.

The ‘Mary’ case study was used to assist the volunteers to visualize the development of their plan and to review the previous components that had already been considered. Because the first two components of the plan had been reviewed extensively in modules 1 and 2, only visual supports were provided to review this specific content with the volunteers. Prior to generating their own unique barriers and supports for Mary, the volunteers reviewed examples of appropriate barriers and supports for each step of the strategy. In this module, the volunteers were provided with “important point”
sentences that were extracted from the case study and associated with each specific step of the strategy. The “important point” sentences were highlighted to provide the volunteers with clear examples of what types of information were pertinent to generate specific barriers or supports for the participant.

For the comprehension checks in this module, the volunteers were expected to generate the steps and action items for the strategy and were asked to generate one barrier and one support that may hinder or facilitate Mary’s participation at each step. Volunteers also completed multiple-choice questions and identified examples of barriers and supports related to the steps of the CAPTURE & Share program. Volunteers were required to achieve 80% or greater on the multiple-choice questions.

The principal investigator reviewed the volunteers’ barrier and support statements to ensure that each statement met the following criteria: (a) each step of the strategy had at least one barrier or support statement for Mary; (b) each step of the strategy had one barrier or support statement for the volunteer; (c) the barrier or support statement for Mary was related and appropriate to the specific step or action item; and, (d) the barrier or support statement for the volunteer was related and appropriate to the specific step or action item.

*Training module 4.* Module 4 reviewed the primary components of how to make a complete plan for sharing and also introduced how to identify barriers and supports for the volunteers at each step of the strategy. This module was approximately 10 minutes in length, not including the time for the volunteers to complete the compression checks at the end.
The training content in this module was based on the framework from the environmental factors of the ICF (WHO, 2013) and opportunity barriers from the Participation Model (Beukelman & Mirenda, 2013). Volunteers were asked to consider external factors relative to the environment, equipment, or availability of technology in addition to their own personal skills, knowledge, and attitudes.

After reviewing the first three sections of the plan (i.e., steps, action items, and participant with CCN barriers and supports), the volunteers were provided with a basic framework to consider barriers and supports for themselves relative to each step of the strategy. While viewing and interacting with this training module, the volunteers were expected to continue to link the components of their plan together using a forward-chaining method.

The case study example was presented again to support the volunteers in developing a plan for participation in capture. Volunteers were provided with an opportunity to review previously completed sections prior to adding the next components of their plan. As the volunteers moved through each step of the strategy they viewed examples of barriers and supports for volunteers and were then provided with an opportunity to practice generating their own personal examples.

At the end of the module, volunteers answered multiple-choice questions about specific barriers and supports at each step. For example, volunteers were asked to select an appropriate response about types of barriers or supports that may exist when implementing specific steps of the strategy. The criteria from module 3 were used for judging barriers and supports that the volunteers generated.
Training module 5. In training module 5, which was approximately five minutes in length, the volunteers reviewed all four components of the plan and had an opportunity to generate a complete plan to support Mary to share her recreational experience. After practicing how to develop a plan with gradually faded supports in modules 1-4, the volunteers were provided with a blank template to generate their plan without examples or visual supports. In this module, which provided the least amount of support, the volunteers were given the prompt: “Consider how you would make a plan to assist Mary in sharing her experience. Type your plan in the box below.”

The volunteers were expected to type the four components of the plan, providing the eight steps and corresponding action items. Volunteers were also expected to generate barriers and supports for the participant and themselves for each step of the plan. The principal investigator reviewed the volunteers’ complete plans to ensure that each plan included the following criteria: (a) all eight steps of the strategy; (b) eight corresponding action items that were appropriately associated with each step; (c) an appropriate barrier or support for the participant associated with each step; and, (d) an appropriate barrier or support for the volunteer associated with each step.

Table 3 contains a summary of the content included in each training module and the type of assessment tasks embedded in each module. Assessment tasks included both open-ended responses and multiple-choice questions.
Table 3

*Content and Comprehension Checks in Training Modules*

<table>
<thead>
<tr>
<th>Module</th>
<th>Content</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eight steps of the strategy and associated action items for each step</td>
<td>• Open response: Type steps of the strategy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multiple-choice questions (steps)</td>
</tr>
<tr>
<td>2</td>
<td>Eight steps and action items</td>
<td>• Open response: Type steps and action items using the plan</td>
</tr>
<tr>
<td></td>
<td>Plan/table to document the strategy</td>
<td>• Multiple-choice questions (action items)</td>
</tr>
<tr>
<td></td>
<td>Case study example</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Eight steps and action items</td>
<td>• Open response: Type participant barriers and supports for the case study</td>
</tr>
<tr>
<td></td>
<td>Barriers and supports for a participant with CCN</td>
<td>• Multiple-choice questions (barriers or supports participant)</td>
</tr>
<tr>
<td></td>
<td>Plan/table to document the strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Case study example</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Eight steps and action items</td>
<td>• Open response: Type volunteer barriers and supports for the case study</td>
</tr>
<tr>
<td></td>
<td>Barriers and supports for a participant with CCN</td>
<td>• Multiple-choice questions (barriers or supports volunteers)</td>
</tr>
<tr>
<td></td>
<td>Barriers and supports for volunteers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan/table to document strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Case study example</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Plan to document strategy</td>
<td>• Open response: Type out a complete plan based on the case study</td>
</tr>
<tr>
<td></td>
<td>Case study example</td>
<td></td>
</tr>
</tbody>
</table>

**Feedback**

The instructor provided feedback to the volunteers after they completed each training module. The feedback was provided to ensure that the volunteers understood the
sequence of the program and were using appropriate examples based on the information from the case study.

Throughout the modules, the volunteers received different types of feedback. For multiple-choice questions, feedback was immediate so the volunteers could view if their responses were correct or incorrect. Feedback for open-ended questions was generated after the principal investigator reviewed the volunteers’ responses within the module and then sent nonspecific feedback to them as needed via email. Volunteers who achieved 80% accuracy or better by answering questions and applying steps of the strategy were sent an email, which communicated successful completion of the module. Volunteers who did not achieve 80% accuracy were asked to review the content related to their incorrect responses and answer the question again. All volunteers scored a minimum of 80% accuracy or better on comprehension tasks presented after the modules.

The most common types of feedback statements sent to the volunteers were related to: (a) missing a barrier or support for either the participant or volunteer; (b) missing a step or action item; and, (c) providing an unrelated or incorrect barrier or support for a specific step of the strategy.

**Instructional Procedures**

The *CAPTURE & Share* program was designed and implemented using an instructional strategy sequence adapted from Kent-Walsh and McNaughton (2005). Based on evidence-based models that support adult learners, the instructional procedures were modified for online distance training (Ellis et al., 1991; Lumpkin, Achen, & Dodd, 2015; Reeves & Reeves, 2008). Models of strategy instruction have been successfully implemented with a wide range of individuals with CCN across a range of settings with a
variety of communication partners (Carter & Maxwell, 1998; Datillo & Light, 1993; Kent-Walsh et al., 2010).

The strategy instruction applied in this study focused on teaching volunteers from active recreational settings a sequence of steps to support individuals to share their recreational experiences. Furthermore, the CAPTURE & Share program contained a specific implementation sequence geared towards volunteers and other facilitators with consideration for more generalized use across a variety of natural settings. A potential outcome of the successful application of the program would be that volunteers not only would support sharing and interaction but also establish methods to facilitate participation and create increased opportunities for communication.

The instructional procedures included seven activities, in which some of the activities were combined to modify the instruction for distance training. Specifically, the instructional procedures included the following: (a) pretest, (b) describe and demonstrate, (c) practice and receive feedback, (d) posttest, and (d) generalization.

**Pretest.** Prior to instruction, the volunteers were introduced to the procedures and training protocol for the instructional strategy. Volunteers expressed their commitment to learning the strategy after reviewing consent forms and replying to an introductory email from the principal investigator. See Appendix F for the introduction email. After volunteers expressed their commitment to participating in the study and learning the strategy, they were sent an online survey to collect demographic information. Additional information was collected relative to the volunteers’ experiences supporting people with disabilities during active recreation and previous experience relative to using capture technology and social media. Any questions or concerns related to preintervention skills
or commitment to participation in the training were managed through email communication with the volunteers.

During the pretest phase, the volunteers responded to a minimum of three hypothetical probes of the dependent variable. These measures were done with at least 2-3 days between each measure and constituted the baseline phase for each participant. In each probe, volunteers were asked to make a plan and describe how they would support an individual with CCN to share their recreational experience. No feedback was given on these probes.

In summary, during the pretest phase, the volunteers: (a) confirmed their commitment to participate; (b) shared their concerns and personal strengths; and, (c) engaged in providing responses to measure their spontaneous use of the targeted strategy.

**Describe and demonstrate.** After volunteers completed their pretest (i.e., baseline) they received the introduction to access the training modules. Since there were 6 volunteers who participated in study 1, the start time to begin the intervention was staggered based on their position in their group and successful completion of intervention probes (i.e., above 80% accuracy on two consecutive intervention probes). Volunteers who did not start the intervention continued to complete intermittent baseline probes.

The total time for each volunteer to complete all the training modules was approximately 45 minutes. The tasks provided an opportunity for the volunteers to demonstrate their knowledge in periodic comprehension checks as they practiced learning the strategy. The training modules introduced the 8-step CAPTURE & Share program across the four components of the plan. In each module, the individual components of the plan (e.g., program steps, action items, barriers or supports participants, barriers or
supports volunteers) were outlined using a visual template/table in which the volunteers gradually added content over the course of the five modules.

In the first two modules, the volunteers learned about the eight individual steps of the strategy and the associated action items that corresponded with each step. In the next modules, different types of barriers and supports for participants and volunteers were described and then paired with each step of the strategy. After receiving a description of all the steps of the strategy, corresponding action items, and barriers and supports, the training concluded with a case study demonstrating how to apply the strategy.

A case study was embedded into the training modules so the volunteers could learn to integrate the components of the strategy into a complete plan. As the training progressed, various parts of the case study were highlighted to demonstrate how to apply the steps of the strategy to an individual with CCN. The hypothetical case study was used across the training modules to demonstrate appropriate use of the strategy and to guide the volunteers in practicing the strategy.

**Practice and receive feedback.** Within each module, the volunteers were provided with opportunities to practice generating the steps of the strategy by building a complete plan. The volunteers practiced listing the steps and action items for the strategy while also generating ideas for personal and environmental barriers and supports. By the last module, the volunteers could view a complete example of a plan based on the hypothetical case study. Additional opportunities for practice were embedded into the assessment tasks that followed each module in the form of open-ended and multiple-choice questions.
**Posttest.** To track the volunteers’ acquisition of the training, posttesting occurred intermittently after volunteers completed all the training modules. Volunteers completed a posttest probe by providing a written response to the principal investigator. The volunteers’ written response to the probe was scored using the 32-point rubric. The volunteers’ response to the posttest probe was compared to their pretest response. Based on this comparison, the principal investigator provided feedback via email to the volunteers based on their ability to apply the strategy.

**Generalization.** After successfully completing all the training modules, the volunteers were paired with an adult with a disability who would be participating in kayaking lessons offered through an adaptive sport program in Southern New Hampshire. After the volunteers completed the posttest probe, they were provided with an opportunity to generate a written plan for the individual with CCN who they would be supporting during a series of upcoming recreational activities.

The generalization stage of the strategy instruction occurred after the intervention phase as volunteers were provided with a description (i.e., case study probe) of the participant they would be supporting in study 2. The volunteers were asked to generate a written plan to support the individual to share their recreational experience. After the volunteers submitted their plans to the principal investigator, they received feedback and were then ready to participate in study 2.

**Procedures**

Six participants were enrolled in the single case multiple baseline study. The 6 participants were randomly placed in two groups of 3 individuals each. In group one there were 3 volunteers (Peg, Melanie, and Amy) and in the replication group there were
3 different volunteers (Danielle, Allison, and Morgan). Volunteers’ real names have been replaced with pseudonyms. Each single case included five phases: baseline, intervention, post, generalization, and maintenance.

The complete study (i.e., studies 1 and 2) was approved by the Institutional Review Board at Ohio University on April 28, 2016. Prior to participating in the study, the volunteers signed a consent form and were provided with a general description of the purpose of the study along with the estimated time commitment over the course of the research. Volunteers and participants with CCN received compensation for their participation upon completion of the study.

Prior to collecting baseline data, the volunteers completed an online survey, which focused on collecting demographic information and data related to past experiences with volunteering, adaptive sport, and the use of digital technology and social media.

**Baseline.** During the baseline phase, volunteers completed regular probes of the dependent variable via email to measure their ability to make a plan to support someone with CCN to share their recreational experience. Hypothetical probes, sent via email, were randomly assigned without replacement from a bank of 18 probes.

The principal investigator managed the distribution of probes via email with all volunteers and sent them acknowledgement of receipt of all responses. No other feedback was provided during baseline. The directions for each probe were identical: “*Read the case study. Consider how you would support the individual to share their recreational experience. Make a plan to assist the person in sharing his or her experience. Type your plan below.*” See the section on the dependent variable for more information.
Baseline measures were recorded for a minimum of three probes and were continued until a stable baseline was established. A stable baseline was defined as a minimum of three, non-ascending measures (Horner et al., 2005; Kazdin, 2011). After a stable baseline was achieved, the strategy instruction was introduced to the first volunteer, while the other volunteers remained at baseline. The volunteers remaining at baseline completed periodic probes of the dependent variable to ensure stable responses prior to starting the strategy instruction (Horner et al., 2005).

To limit the amount of time that volunteers were working at baseline without instruction, multiple probes of the dependent variable were used as intermittent protection against history threats to ensure experimental control. This limited extensive negative practice, particularly by the third volunteer in each set who spent the most time at baseline.

A scoring rubric was used to measure the volunteers’ ability to plan, recall, and record specific elements of the program. See Appendix G for the scoring rubric. Volunteers received points for labeling steps, action items, and specific barriers and supports relative to themselves and participants with CCN. After receiving the volunteers’ written responses for each probe, the principal investigator scored each written response using the rubric. All typed responses and completed rubrics were saved in a secure folder for future interrater reliability tasks after all data were collected.

Volunteers completed one baseline generalization probe that was distributed prior to completing their first probe of the dependent variable. The instructions for the baseline generalization probe followed the same instructions as the probes of the dependent variable, except the volunteers were asked to describe how they would support sharing
with an individual for whom they had supported in a previous recreational activity. The response for the completed baseline generalization probe was scored using the same scoring rubric.

**Intervention.** The distance training intervention included an introduction followed by five modules. Once the volunteers started the intervention they were instructed to complete a module in 5 to 7 days. If the volunteers had not completed modules in the requested timeframe, they were sent a reminder email.

Across the five training modules, volunteers were taught about the program steps, associated action items, and barriers and supports included in the strategy. Training content was distributed across the modules so that the volunteers could learn each section of the strategy in a gradual progression. In the first and second module, volunteers were introduced to the program steps and action items, while in the third and fourth modules; volunteers were asked to consider barriers or supports for themselves and participants with CCN. In the fifth module, the volunteers were expected to integrate the content from the four modules and write a complete plan about an individual case study.

Comprehension checks were embedded in all the training modules. The volunteers were required to achieve 80% accuracy in all assessment tasks prior to receiving a new module. Volunteers were asked to type steps and associated action items (i.e., what you may say or do at each step) or generate barriers and supports at each step. At the end of modules 1-4, the volunteers were also asked to respond to multiple-choice questions about the training content. The primary goal for the intervention was for the volunteer to learn the steps of the strategy and apply the strategy to a case study using all
the components of the plan (e.g., program step, action item for each step, barrier or support for the participant, barrier or support for the volunteer at each step).

**Benchmarks in intervention.** During the intervention phase, volunteers completed probes to measure the dependent variable and to track how the participants progressed in learning the *CAPTURE & Share* program. After completing modules 2, 4, and 5, the volunteers were sent a probe, which instructed them to generate a typed response. After receiving the response, the principal investigator scored and recorded the volunteers’ responses to the probe and then sent nonspecific feedback if necessary. The volunteers were not allowed to change their responses based on the nonspecific feedback to ensure that measures of the dependent variable were valid throughout the study.

Essentially, this feedback was a component of the strategy instruction and had no impact on measuring and recording the dependent variable. If volunteers were provided with nonspecific feedback, their written response was not rescored. Examples of nonspecific feedback provided to the volunteers reminded them to include all steps of the program, include a minimum of one barrier and one support for either the volunteer or participant with CCN, and to remember to provide an “action item” associated with each step of the program.

After completing modules 2, 4, and 5, the volunteers were asked to complete their response to the hypothetical probe and send it to the principal investigator in a period of 5 days. If the volunteers did not submit their written response to the probe in 5 days, they were provided with an email reminder to submit their response as soon as possible. All the volunteers submitted their written responses to probes within a maximum of 8 days from receiving the probe.
In the response to the probe, the volunteers were expected to use information from the CAPTURE & Share program to generate a plan for sharing. The maximum score for each written response was 32 points and was based on the scoring rubric. Criterion level of performance for use of the CAPTURE & Share program was set at 80% accuracy for each probe (successful use of 26/32 components). Once the volunteer scored 80% accuracy or greater on two consecutive probes they were considered to have reached criterion performance. When a volunteer reached criterion in this manner, the next volunteer began strategy instruction. This process was identical for both sets of volunteers who were participating in the training.

Prior to starting module 5, volunteers were required to complete one probe with a minimum of 80% accuracy. All the volunteers reached criterion on their probes after training module 4 and then moved directly to training module 5. If a volunteer did not reach criterion after training module 4, they would have been sent a guide that outlined the four components of the plan including all the steps of the strategy. The volunteer would have been asked to review the guide in relation to their response, and consider any nonspecific feedback. After this period of nonspecific feedback and review, the volunteer would have been sent a different probe and would be instructed to carefully review their response prior to sending it back. Volunteers were required to complete all the modules even if they reached criterion prior to module 5 to ensure that each one of them had an opportunity for sufficient practice across a range of examples before completing the intervention.

Completion of intervention (post). After the volunteers achieved two consecutive scores that were above 80% accuracy (i.e., a minimum of 26 points out of a
total of 32 points) during the intervention phase, the volunteers completed a probe in the postintervention phase. This probe was sent to the volunteers after completion of the full training, including the completion of written probes and any corresponding feedback provided during the intervention phase. The probe in the postintervention phase was administered to evaluate the volunteer’s performance upon completion of the training elements completed over the course of the intervention phase.

If volunteers had scored below the criterion level of 80% in this phase, they would have been asked to repeat the previous training module. This did not happen for any of the 6 volunteers.

**Generalization.** After the volunteers completed the intervention phase and had submitted their post probe, one generalization probe was sent using information specific to the individual with CCN for whom they would be supporting in study 2. Generalization measures were taken to assess whether the volunteers could apply the strategy to an individual they would be supporting during a recreational activity.

Volunteers were sent a probe that described the participant with whom they would be supporting in study 2 and the volunteers were asked to generate a written plan for this individual. The generalization probe was delivered within 2 weeks following the completion of the intervention phase and was scored using the same rubric from the baseline and intervention phases.

**Maintenance.** Maintenance probes were disseminated to volunteers 2 and 4 weeks following the completion of the instructional program. The purpose of these probes was to monitor the volunteers continued use of the CAPTURE & Share program over time. The volunteers were asked to generate a response to two randomly selected
probes, which they had not seen during the other phases of the study. The probes were taken from the remaining set of probes that had not been previously used. Volunteers were provided with the same instructions as in previous phases.

All the volunteers reached criterion during this phase. If the volunteers’ performance had decreased below criterion they would have been provided with additional instruction and provided with feedback until criterion was reached.

Measures and Data Analysis

Volunteers’ ability to learn and apply the CAPTURE & Share program was assessed by reviewing their use of the components of the strategy in response to hypothetical case study probes. They were asked to generate a plan for sharing by applying the components of the strategy. All responses that the volunteers generated were sent back to the principal investigator for scoring and analysis.

Hypothetical probes. All probes were eight sentences in length and provided the following information about an individual with CCN: (a) age and type of disability, (b) social network, (c) receptive and expressive communication, (d) social-pragmatic skills, (e) physical and motor skills, (f) sensory/perceptual ability, (g) type of daily activity (i.e., job, school, or other), and (h) type of recreational activity the person will engage in. Volunteers were asked to respond to the same prompts for each hypothetical probe. See Appendix H for all 18 probes.

The hypothetical probes were used to measure the volunteers’ acquisition of the CAPTURE & Share program. Volunteers were expected to label the steps and associated action items in the strategy. In a complete response, volunteers demonstrated they could
think critically about the case study by determining which types of barriers and supports existed at each step. The final product resulted in a comprehensive plan that outlined how the volunteers would support an individual with CCN and what considerations would be needed to ensure full participation across the activity.

The volunteers sent their typed responses to the principal investigator via email which were then scored using a rubric developed specifically for this research project. The maximum score on the rubric was 32 points. The rubric contained a set of items that were included in the strategy used to make a complete plan for sharing. Using the rubric, volunteers received points across four components of the plan: (a) the name of the step, (b) a say or do action item associated with the step, (c) a barrier or support for the participant to complete the step, and (d) a barrier or support for the volunteer to complete the step.

In previous research, probes have been used to measure how individuals learn and apply information (Light et al., 2007; McCarthy et al., 2007). McCarthy et al. (2007) trained participants who use AAC in a problem-solving strategy. Probes were used to collect baseline and intervention data to track progress. The elements from the problem-solving strategy were tracked as they were applied to hypothetical scenarios posed in probes and delivered via email. The 5 participants in the study successfully completed the program and learned to implement the elements of the strategy to hypothetical problems presented in the probes as well as problems in their own lives.

Furthermore, Light et al. (2007) investigated the effects of a distance instructional program to teach sociorelational skills and collaborative problem-solving skills to adults who use AAC. The instruction was designed to prepare participants with experience
using AAC to serve as mentors to younger individuals who use AAC. The effect of the training was measured using probes consisting of role-play examples based on experiences of adolescents and young adults who use ACC. The investigators report that all the participants successfully acquired the target skills.

**Format of probes.** All probes had an identical format with eight sentences and provided the following information about an individual with CCN: (a) age and type of disability, (b) social networks, (c) receptive and expressive communication, (d) social-pragmatic skills, (e) physical and motor skills, (f) sensory/perceptual skills, (g) type of daily activity (e.g., job, school), and (h) type of recreational activity. Volunteers were asked to respond to the same prompt for each hypothetical probe. The prompt was located at the top of the probe: “Read the case study. Consider how you would support the individual to share their recreational experience. Make a plan to assist the person in sharing his or her experience. Type your plan below.”

The 18 probes, including the generalization probe had a mean Flesch-Kincaid grade level score of 10.3 with a grade level range of 7.6 to 12. The entire pool of 18 probes along with their individual Flesch-Kincaid grade level can be found in Appendix H.

**Schedule of delivery of the probes.** Hypothetical case study probes were used to assess the volunteers’ ability to learn the strategy instruction. Volunteers generated written responses to probes in baseline, intervention, post intervention, and during maintenance. A summary of the schedule for the delivery of the probes is in Table 4.
Table 4

*Schedule for Delivery of Hypothetical Case Study Probes*

<table>
<thead>
<tr>
<th>Phase</th>
<th>Number of probes</th>
<th>Conditions required</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline generalization</td>
<td>1</td>
<td>Nonascending</td>
<td>With first baseline probe</td>
</tr>
<tr>
<td>Baseline</td>
<td>3 (minimum)</td>
<td>Consistent, nonascending</td>
<td>Prior to instruction</td>
</tr>
<tr>
<td>Intervention</td>
<td>1</td>
<td>None</td>
<td>After module 2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>At least 80% accuracy</td>
<td>After module 4</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>At least 80% accuracy</td>
<td>After module 5</td>
</tr>
<tr>
<td>Postinstruction</td>
<td>1</td>
<td>At least 80% accuracy</td>
<td>After intervention phase</td>
</tr>
<tr>
<td>Generalization</td>
<td>1</td>
<td>At least 80% accuracy</td>
<td>After post</td>
</tr>
<tr>
<td>Maintenance</td>
<td>2 (minimum)</td>
<td>At least 80% accuracy</td>
<td>2 and 4 weeks after intervention</td>
</tr>
</tbody>
</table>

**Scoring components of the CAPTURE & Share program.** Volunteers’ responses to the probes were scored based on their ability to accurately use components of the CAPTURE & Share program. There were 32 components in the strategy and a list of the components is contained in Appendix I. Volunteers received 1 point for each required component that was included in their written response. The maximum score was 32 points if all the components were included and the minimum score was 0 if the volunteer did not include any of the components. One point was given for each correct label or mention of the step in the plan, one point for each associated action item, and one point for each barrier or support that was included for the participant and the volunteer at each step.
The scoring system was based on rubrics used in previous research that involved strategy instruction for individuals who use AAC (Hajjar & McCarthy, 2015; Light et al., 2007; McCarthy et al., 2007) and from operational definitions of the target components in the strategy.

**Generalization measures.** One generalization measure was taken during baseline and one measure after the post intervention phase. The baseline generalization probe was administered immediately prior to the first baseline probe to observe how the volunteers responded to the stimulus question when asked to consider a participant they had previously supported in recreation. In contrast, the postintervention generalization probe was administered to assess how the volunteers would apply the *CAPTURE and Share* program to a participant they would be working with in study 2.

Only 5 of the 6 volunteers completed the postintervention generalization probe because it was written to describe a participant with CCN whom the volunteers would be supporting in study 2. Because only 5 participants with CCN were recruited and available to participate in study 2; Morgan, the sixth volunteer, did not complete this probe. A potential sixth participant with CCN was unable to participate in study 2 due to lack of transportation to and from the kayaking lessons. In study 2, each volunteer was matched with the same participant with CCN during the 3 recreational lessons.

All the volunteers completed one baseline generalization probe that was distributed at the same time the volunteers completed their first probe of the dependent variable. The instructions for the baseline generalization probe followed the same instructions as the probes of the dependent variable, except the volunteers were asked to describe how they would support sharing with an individual for whom they had
supported in a previous recreational activity. The response for the completed baseline generalization probe was scored using the same scoring rubric as the other written response including the postintervention generalization probe.

During the postintervention generalization phase, the 5 volunteers participating in study 2 were provided with a probe that described the participant with CCN for whom they would be supporting. The instructions for this probe were the same as the other probes and it was delivered within 2 weeks following the completion of the intervention phase. The postintervention generalization probes are included with the other hypothetical case study probes in Appendix H.

**Reliability.** All written responses that were generated by the volunteers were scored using the scoring rubric. The principal investigator completed all initial scoring using the rubric and saved these files in a secure folder with all names deidentified.

Two graduate students were trained in the coding procedures until they met the defined standard with at least 90% accuracy. Operational definitions were developed to assist the coders in identifying the four primary components (e.g., step, action items, barriers or supports). See Appendix J for the operational definitions used in coding the volunteer’s responses to the probes.

Periodic checks of the coders’ scores against the standard occurred after the principal investigator received three responses from the first coder and then three responses from the second coder. This process was followed until all the responses were coded to protect against “observer drift.” Each of the coders worked independently and scored 25% of the probes. The probe responses were randomly selected across all the volunteers’ responses and the coders were blind to the phase condition (i.e., baseline,
intervention, maintenance) of the responses to minimize bias. Interrater reliability (# of agreements divided by the # of agreements plus disagreements for each probe) was 93% across probes.

**Time required to complete the program.** The instructional time for each volunteer was also recorded. The times were based on the amount of time each volunteer spent viewing the training module content and completing assessment tasks during and after the training. Time was logged automatically as part of the website’s operational procedures. The average amount of time across the 6 volunteers was 43 minutes and 10 seconds. The times reported in the table were calculated by the online instructional modules. Table 5 includes the time that each volunteer was logged into the five training modules.
Table 5

Total Time Volunteers Spent Viewing Training Modules

<table>
<thead>
<tr>
<th>Volunteer</th>
<th>Total time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peg</td>
<td>42 minutes, 25 seconds</td>
</tr>
<tr>
<td>Melanie</td>
<td>42 minutes, 0 seconds</td>
</tr>
<tr>
<td>Amy</td>
<td>43 minutes, 15 seconds</td>
</tr>
<tr>
<td>Danielle</td>
<td>43 minutes, 30 seconds</td>
</tr>
<tr>
<td>Allison</td>
<td>42 minutes, 40 seconds</td>
</tr>
<tr>
<td>Morgan</td>
<td>43 minutes, 30 seconds</td>
</tr>
</tbody>
</table>

**Improvement rate difference.** To determine the effect of the intervention on the volunteers’ ability to apply the strategy, the number of components (out of 32 points) that were included in the response was calculated and graphed at baseline, intervention, postintervention, maintenance and generalization phases. The effect of the intervention on the volunteers’ application of the strategy was determined by visual comparison of baseline values to intervention values. All data were graphically and visually inspected for changes in trend, level, and variability (Horner et al., 2005; Kazdin, 2011; Kratochwill et al., 2010).

In addition to visual analysis, Improvement Rate Difference (IRD) was used to report the IRD value and effect size. IRD was selected as it is commonly used in the analysis of single-case research with multiple baselines (Kent-Walsh et al., 2015; Parker, Vannest, Davis, & Sauber, 2011) and is part of the group of non-overlap approaches that also includes Percentage of Nonoverlap Data (PND) (Balthazar et al., 2016). IRD is
defined as the number of improved data points divided by the total data points in the selected phase. In the baseline phase this indicates a data point that ties or exceeds any data point in the treatment phase and an improved data point at intervention phase is defined as one which exceeds all points in the baseline phase (Parker et al., 2011).

**Social validation.** Volunteers, parents, and preprofessional speech-language pathology students socially validated the research project to ensure the validity of goals, functionality, and outcomes (Schlosser, 1999). Additionally, the volunteers completed a Likert-type rating scale after the last feedback session including a section for comments. See Appendix K for the rating scale. The rating scale asked volunteers about the usefulness of the program and if they would recommend the program to other volunteers in recreation.

Additional social validation feedback was gathered from other stakeholders. Two parents of individuals with CCN and two preprofessional speech-language pathology students reviewed randomly selected volunteer responses at baseline and after intervention. To control for order effects, the presentation of the probe responses was randomized and the parents and preprofessional students were blind to the phase of the response (e.g., baseline or postintervention). After reading the responses, they were asked forced-choice questions about which written response/plan was more complete and comprehensive relative to supporting participants with CCN to share their experiences. See Appendix L for the questions that were posed to parents and preprofessional SLPs.
Results

Data are presented for the volunteers’ acquisition, generalization, and maintenance of the CAPTURE & Share program; social validation outcomes are also included.

Acquisition, generalization, and maintenance. Figures 1 and 2 show the volunteers’ application of the components of the CAPTURE & Share program in response to the hypothetical probes presented during baseline, intervention, postintervention, generalization, and maintenance phases.
Figure 1. Total number of points earned by volunteers in group one responding to hypothetical probes. The dotted line between baseline and intervention phases is bolder than the other lines to indicate that volunteers started to receive instruction. During the intervention phase, volunteers responded periodically to probes.
Figure 2. Total number of points earned by volunteers in replication group responding to hypothetical probes. The dotted line between baseline and intervention phases is bolder than the other lines to indicate that volunteers started to receive instruction. During the intervention phase, the volunteers periodically responded to probes. *Since Morgan did not participate in study 2, she did not complete a generalization probe. Generalization probes were about participants with CCN who were in study 2.
Upon visual inspection of the figures, there was 100% nonoverlapping data points between the baseline and intervention phases for all 6 volunteers, demonstrating a strong effect of the instructional strategy. The improvement rate difference (IRD) between the baseline phase and the intervention phase for each volunteer was calculated at 1 or 100% improvement from baseline, indicating strong effects (Kent-Walsh et al. 2015; Vannest, Parker, Gonan, & Adiguzel, 2016). Baseline performance was stable for all volunteers with minimal variability and no upward trend. Furthermore, there was a significant increase in level between baseline and intervention phases for all volunteers.

The volunteers implemented the strategy at baseline ranging from a mean accuracy of 2% (.66/32 components) for Danielle and Allison to a mean accuracy of 25% (8/32 components) for Melanie. All volunteer participants demonstrated a positive learning curve during intervention to reach criterion (greater than 80% accuracy) as seen by successfully applying the steps of the strategy. All volunteers reached criterion after training module 4 and then again at the end of module 5, fulfilling the requirement of each volunteer achieving two consecutive responses at a minimum of 80% accuracy prior to completing a postinstruction probe.

The results of study 1 revealed that the volunteers were successful in applying the content of the strategy in a gradual manner based on when they received specific instruction. For example, after the volunteers completed training modules 1 and 2, they completed their first intervention probe and all scored in the range of 15-18 points indicating that they had successfully learned content specifically included in the first two
modules (i.e., steps and action items). Next, after completing training modules 3 and 4, the volunteers responded to their second intervention probe and all achieved criterion at 80% accuracy by scoring at or above 26 points. By gradually reaching criterion, this indicates that the volunteers were successful in generating a complete plan for sharing by applying the content from modules 1 and 2, with new content from modules 3 and 4. Finally, after completing training module 5, all the volunteers again achieved criterion by scoring at or above 26 points in their responses to the hypothetical probes. This performance demonstrates that the volunteers successfully learned the strategy and could effectively integrate the information from the five modules.

After each volunteer achieved two consecutive scores of 80% accuracy or above (26/32 points) in the intervention phase, they transitioned to the postinstruction phase. All volunteers demonstrated greater than 80% accuracy during the postinstruction phase.

**Comprehension checks.** The volunteers completed two types of comprehension checks during and after each training module as they were learning the *CAPTURE & Share* program. Some questions required a typed open-ended response and other questions were in multiple-choice question format. In module 5, the volunteers were asked to generate a complete plan about the case study including all steps, action items, and barriers and supports for each step. All the volunteers achieved above 80% accuracy on the assessment tasks presented after module 5.

The volunteers were successful in achieving above 80% accuracy for all assessment tasks during all modules. For the open-ended responses, volunteers occasionally missed specific steps included in the strategy. When this occurred, the first
author provided feedback to volunteers informing them about the missing content. The volunteers were asked to resubmit their response adding the missing elements. If volunteers made errors on multiple-choice items, they received immediate feedback from the instructional program and could review the correct response. Table 6 presents the data in the form of percentage accuracy results for each volunteer associated with each module.

Table 6

*Volunteers’ Percentage Accuracy Correct for Comprehension Checks*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Module 1</th>
<th>Module 2</th>
<th>Module 3</th>
<th>Module 4</th>
<th>Module 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peg</td>
<td>100</td>
<td>88</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Melanie</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Amy</td>
<td>88</td>
<td>100</td>
<td>100</td>
<td>92</td>
<td>90</td>
</tr>
<tr>
<td>Danielle</td>
<td>100</td>
<td>88</td>
<td>100</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Allison</td>
<td>88</td>
<td>100</td>
<td>88</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Morgan</td>
<td>100</td>
<td>100</td>
<td>88</td>
<td>83</td>
<td>90</td>
</tr>
</tbody>
</table>

**Generalization.** At baseline, prior to instruction, none of the volunteers were successful in reaching criterion. Scores on the generalization probes at baseline ranged from 9% inclusion of strategy components for Amy and Allison to 16% inclusion of strategy components for Melanie and Danielle.
Analysis of the postinstruction generalization probes indicated that the volunteers generalized the use of the *CAPTURE & Share* program to participants they would be supporting in study 2. The generalization probes presented after the intervention phase were completed by 5 out of the 6 volunteers. One of the volunteers, Morgan, did not participate in study 2 and therefore did not complete a generalization probe after intervention. The generalization probes contained information about the participants with CCN with whom the volunteers would be supporting during study 2. Study 2 involved application of the strategy instruction during recreational activities and was conducted after the volunteers completed the training modules. As seen in Figure 1 and 2, the volunteers applied the strategy successfully, ranging from 84% inclusion of the strategy components for Amy to 100% of the strategy components for Peg, Melanie, and Danielle.

**Maintenance.** Figures 1 and 2 display the maintenance data for the volunteers. The maintenance probes were distributed to assess the volunteers’ ability to apply the *CAPTURE & Share* program over an extended period of time postinstruction. Probes were distributed to the volunteers 2 and 4 weeks after the final intervention probe. All volunteers demonstrated maintenance of the strategy as seen by their ability to achieve a minimum of 80% accuracy in successfully applying the strategy components to hypothetical probes.

**Social Validation Measures**

**Volunteers.** The 5 volunteers who were in both studies completed a questionnaire asking them about the usefulness of the training, if the training increased their ability to support sharing, and if they would recommend the training to other volunteers. All volunteers agreed that that distance strategy instruction training increased their ability to
understand and use the program. Also, all volunteers agreed that the online training was useful and that the training increased their ability to support individuals with CCN to share their recreational experiences. Finally, all volunteers indicated they would recommend the training to other volunteers who support individuals with disabilities.

Volunteers also contributed general comments about the training. Peg shared that “the training program brought the potential for improved communication into focus. The program offered a unique formula which was not difficult to follow and seemed to assure that the communication goals were attainable.” Another volunteer Danielle shared,

I really liked the training and methodology for capturing and sharing a participant’s recreational experience. I think the methodology could be taken further and modified to apply to any adaptive lesson in most activities to be used as a general approach to instructing an individual in recreational activities.

**Stakeholder review.** Two preprofessional SLPs and two parents who have children with disabilities were also asked to review responses to probes that were generated during baseline and postintervention to indicate which responses demonstrated a more complete version of a volunteer’s plan to support sharing. Of the stakeholders, 100% selected the postintervention response as the one where the volunteers presented a more complete plan to support participants with CCN to share. See Table 7 for the outcomes relative to the number and percentage of stakeholders who selected the more complete plan.
Table 7

<table>
<thead>
<tr>
<th>Phase</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Postinstruction</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Unable to Determine</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Discussion**

The results of this study demonstrate that the strategy instruction program was highly successful and that all the volunteers applied their new knowledge, showing a strong learning effect. All volunteers quickly achieved a high level of accuracy relative to their ability to generate a complete plan to support people with CCN to share their recreational experiences. The outcomes of the study are discussed below along with reasons why the volunteers were successful in acquiring and applying the newly learned strategy.

**Previous AAC research with communication partners.** Research in the areas of AAC, special education, and other related disciplines have found communication partner interventions to have strong learning effects for partners and benefits for individuals who use AAC (Binger et al. 2010; Kent-Walsh et al. 2010; Kent-Walsh et al. 2015). Kent-Walsh et al. (2015) recommended that partner-focused dependent variables should be the “driving force” of partner-instruction investigations and that any behavior change of individuals using AAC are critical, but should be reported in a secondary manner. The primary outcome for study 1 revealed that the volunteers were efficient and
highly successful in learning to apply the CAPTURE & Share program. This outcome supports the notion that a significant change in partner learning did occur because of the intervention.

Previous communication partner research in AAC has paid a considerable amount of attention on targeting the effectiveness of specific communication partner skills (e.g., modeling, expectant delay, prompting) with a focus on improving how partners support social and linguistic competency for individuals with CCN. Upon review of single-case research focusing on communication partners, it is evident that outcomes for individuals using AAC have most commonly been reported across the pragmatic domain (Trottier, Kamp, & Mirenda, 2011) with a few studies investigating both pragmatic and semantic outcomes (Kent-Walsh et al., 2010). In contrast, this study focused on teaching volunteers strategies to facilitate participation when supporting people with CCN. Outcomes for caregivers and people with CCN will be the focus of study 2 and will include information about their ability to fully engage and participate in all the steps of the CAPTURE & Share program.

Research in communication partner training in AAC has traditionally occurred in home or educational settings (Binger et al. 2010; Kent-Walsh et al., 2010; Wolowiec-Fisher & Shogren, 2012). Kent-Walsh et al. (2010) conducted a study with mothers and their children who use AAC engaged in storybook reading in the home setting. Binger et al. (2010) also investigated the role of educational assistants working with students who use AAC in the school setting, both parents and educators were trained in the context of their natural daily tasks and/or work responsibilities. Wolowiec-Fisher & Shogren (2012)
reported that AAC stakeholders should incorporate natural communication partners into interventions and systems of support for communication and social engagement.

Like previous research with communication partners, the present study was conducted with the expectation that skills acquired in the training would be applied across a natural context. In this study, the natural contexts were outdoor recreational settings. After the volunteers completed the distance training in study 1, they had an opportunity to generate and implement a plan to collect and share digital artifacts during three consecutive kayaking lessons.

Communication partner research in AAC has not focused on training volunteers who support people with CCN as they access sport and recreation. Although this population has received limited attention in the AAC literature, it represents a growing number of individuals who have consistent interactions with people with CCN and their caregivers across natural community settings.

**Volunteers as communication partners.** Understanding the experiences of communication partners who engage and support individuals with CCN is an important consideration in AAC intervention (Collier et al., 2015; Douglas et al., 2012; Kent-Walsh & McNaughton, 2005; Kent-Walsh et al., 2015). McNaughton and Light (2015) indicated that future research should consider the impact of facilitators and extrinsic environmental factors relative to participation, communication, and social outcomes for individuals that require AAC across real-world contexts.

Unlike previous research involving communication partners, the individuals in study 1 were community-based volunteers who support people with CCN to access and participate in active recreation. Previous research (Hajjar et al., 2016) reported that
volunteers play a critical role to enhance the entire recreational experience for people with CCN by offering opportunities for communication, supporting participation, and engaging in consistent communication with caregivers and other stakeholders. Furthermore, Hajjar et al. (2016) determined that experienced volunteers are willing and eager to learn more to enhance the entire recreational experience by supporting increased communication and participation.

**Training facilitators to plan for participation.** Although the topic of participation for people with CCN has been in the AAC literature (Balandin, 2011; Batorowicz et al., 2014; Raghavendra et al., 2011), limited attention has focused on how to support and train communication partners to plan for participation.

In the current study, volunteers from a recreational program were taught a strategy to support people with CCN to share their recreational experiences. In conjunction with learning specific steps of the strategy, the volunteers also considered their own strengths and limitations as well as potential barriers and supports for people with CCN. Although some targeted communication skills (e.g., asking open-ended questions, provide choices) were embedded in the strategy, the primary focus for the volunteers was in the domain of planning full participation at each step of the strategy. Volunteers were taught to consider ways to maximize independence at each step of the process and ensure that opportunities for capture considered the perspectives of both volunteers and participants. During the training, the planning process was highlighted, to encourage volunteers to think about strategies to support more independent capture and full participation.
**Distance learning.** Unlike previous communication partner research in AAC (Binger et al., 2010; Datillo & Light, 1993; Kent-Walsh et al., 2010), this study employed a distance-training program for partners who were volunteers in active recreation. Partner training for AAC stakeholders has more commonly been provided in-person across educational and home settings with teachers, peers, or parents. In the current study, community-based volunteers were trained using a distance learning approach.

Distance training has some precedence in AAC literature specifically in the areas of teaching problem-solving skills to individuals who use AAC (Light et al., 2007; McCarthy et al., 2007) and web-based AAC instruction for special education teachers (Lebel, Olshtain, & Weiss, 2005). The AAC Mentor Project (Light et al., 2007) used an instructional design that was self-paced by the participants and delivered via an accessible web page. Like the volunteers in the present study, the participants in the Mentor Project successfully acquired the target skills of the web-based instructional program in an efficient and accurate manner.

Self-paced distance training offered via web-based instruction was an effective approach for the volunteers for a range of reasons: (a) volunteers had flexible daily and seasonal work schedules; (b) volunteers could work from home/less travel time to program site; (c) asynchronous nature of the modules; (d) all volunteers had consistent Internet and computer access; and, (e) volunteers demonstrated good time efficiency relative to completing the training modules.

With the advances and accessibility of technology and considering the burden on volunteers for attending in-person trainings, a distance training approach was deemed more efficient and sensible to train these types of communication partners. The training
content was appropriate for distance education as volunteers were introduced to the initial steps for a specific strategy that they would apply in future kayaking lessons. The volunteers learned the strategy at their own pace and participated in intermittent comprehension checks to ensure they were understanding the key concepts from the training. All the volunteers successfully completed the five training modules with good time efficiency and performed with a high degree of accuracy on the comprehension checks. The volunteers spent approximately 45-60 minutes completing the introduction and the five training modules, including the comprehension tasks.

Factors that contributed to acquisition of the training. The 6 volunteers who participated in the distance training were successful in completing the 5 modules and scoring above 80% accuracy on all comprehension checks. Furthermore, the volunteers successfully applied their knowledge from the training as they generated plans for participants with CCN described in hypothetical case studies. In their written responses to hypothetical probes during and after the intervention phase, volunteers wrote comprehensive plans. Their goal was to generate a complete plan that included 26/32 required key elements to achieve 80% accuracy or above. The following three factors contributed to the volunteer’s successful acquisition and application of the training program: (a) factors of the training program, (b) factors of the volunteers, and (c) factors of the dependent variable.

Factors of the training program. The following factors relative to the distance training program contributed to the volunteers’ learning and successful application of information to the hypothetical probes: (a) systematic teaching method with periodic comprehension checks, (b) simple and relevant content presented in an efficient manner,
(c) focus on empowerment, and (d) training content based on a previous study which trained volunteers in recreation.

The distance-training program was based on key instructional techniques that have been discussed and validated in the literature. This model of strategy instruction has been successfully implemented in previous research across a range of settings with communication partners (Carter & Maxwell, 1998; Datillo & Light, 1993; Kent-Walsh et al., 2010). The training was developed using a systematic teaching method with a series of comprehension checks to ensure that the volunteers were successfully acquiring new knowledge. The cognitive strategy instruction model (Ellis et al., 1991) later modified for use with AAC facilitators (Kent-Walsh & McNaughton, 2005), served as a foundation for instruction with the volunteers who engaged in the distance-training program. The following techniques were applied to the content of the strategy instruction: (a) linking component skills in a sequential manner, (b) using key adult learning principles, and (c) providing instructional content via distance learning.

Supportive feedback (Schepis & Reid, 2003) was also an important component that the principal investigator used throughout the intervention phase with the volunteers. Periodically, volunteers were provided with positive messages and supportive statements to encourage them to continue to engage with the training modules in a timely manner. Furthermore, periodic comprehension checks were included as part of each training module. For example, if volunteers selected an incorrect response to a multiple-choice question, the correct response would immediately be highlighted so the volunteers could see the appropriate answer. Additionally, nonspecific feedback was used if volunteers did
not include specific steps or action items or neglected to include a volunteer or participant barrier or support.

Key learning principles outlined by Knowles et al. (1998) stress that learning content must be relevant, useful, and tied to prior experiences and background knowledge. These principles are important as adult learners integrate new knowledge and map learning to previous experience. The components of the CAPTURE & Share program (i.e., cameras, adapt, practice, take photo or video, use context, review, edit and share) were found to be highly learnable as the steps were simple and included in an easily remembered acronym relevant to the activity of taking photos or video. Also, the learning content was presented using a sequential approach with new content being linked to previous content in a manner that encouraged review and repetition to aid in the acquisition of learning.

The CAPTURE & Share program was modified for use as a distance-training program. The primary components of the training sequence outlined by Kent-Walsh and McNaughton (2005) were preserved; however, some steps were combined or modified for online instruction. Combining training elements reduced the overall amount of time that was needed for the volunteers to complete the program. Furthermore, the distance training allowed the volunteers to self-pace their involvement and engage in the training based on their personal schedules.

The strategy instruction applied in the present study focused on teaching and empowering experienced volunteers from active recreational settings to support individuals with CCN to collect and share digital artifacts. The volunteers learned new skills that improved their ability to support participants with CCN and create more
opportunities for communication during recreational experiences. The training encouraged volunteers to consider alternative ways to facilitate participation and assist participants with CCN to document their recreational activities. By providing additional training to volunteers, they became more invested in the process of maximizing independence for participants. Volunteers learned to provide additional opportunities for communication and interaction and were successful in supporting full participation across the entire experience.

In the future, training programs for volunteers without previous disability or recreational experience may require additional modifications or additions to recognize the unique learning needs of this population. Additional training modules may be necessary to educate new volunteers about different types of disabilities and basic strategies to support independence. Despite having a lifelong interest in the specific shared activity, it is possible that new volunteers may have never had prior engagement or interaction with individuals with disabilities. Future training for volunteers with less experience may involve a combination of distance learning and direct supervision from more experienced volunteers and recreational professionals.

Lastly, the findings in the present study build upon a previous study which trained volunteers in a therapeutic riding program. The distance training used in the present study evolved from an in-person training program implemented with four riding volunteers. Hajjar and McCarthy (2015) taught riding volunteers a strategy to enhance communication opportunities before, after, and even outside of riding sessions by collecting items to share with others about their riding lesson. During the in-person training, the volunteers learned a systematic method to support child and adult riders to
capture their experience by taking pictures, videos, or selecting related items (e.g., braided horse hair, hoof prints) to share with family and friends after their lesson. Results revealed that the riding volunteers were successful in learning and applying the instructional strategy.

**Factors of volunteers.** Volunteers are unique communication partners who find ways to integrate their desire to serve others with competing personal and professional responsibilities present in their own lives. The following factors contributed to the volunteer’s success with learning the distance training program and applying the information to hypothetical case studies: (a) prior experience facilitating recreation with people who have disabilities, (b) flexible schedules and time to participate, and (c) prior education and experience with technology and access to the Internet.

The volunteers in this study had a range of 2-33 years of experience volunteering with adaptive sport and recreation for people with disabilities. As seen in their responses to the hypothetical probes, volunteers often used their previous knowledge and expertise to supplement the training content and provide responses that were complete and comprehensive. This was specifically noted when volunteers recognized their own personal barriers and supports and appropriately applied them to various steps (e.g., cameras, adapt, practice) of the plan.

The volunteers in the current study made time to complete the training modules and generate repeated written responses to the hypothetical probes. The volunteer participants in this study were either retired or had summers off from their primary jobs. They demonstrated a strong commitment to serving the adaptive program when most of
them were on vacation from their full-time jobs. This level of commitment is not surprising as some volunteers consistently travel over an hour to teach weekly lessons at the program site during the winter and summer seasons. These characteristics of the volunteers were beneficial as they were self-motivated and self-disciplined to complete the distance training prior to the application phase in study 2.

Education, prior experience with technology, and consistent access to the Internet were also positive factors that supported volunteers’ performance in the training. These logistical and demographic factors relative to the volunteers were critical reasons why they could engage and interact efficiently and successfully with the distance-training program. Volunteers successfully followed the program directions and procedures in the training and did not require additional directions to be provided on an independent basis. They all had personal access to computers and the Internet, which allowed them to view trainings and complete comprehension checks and other tasks based on their own schedules. If volunteers had not had consistent access to technology or reliable connectivity to the Internet, they would have needed to rely on public resources (e.g., public library computers), which would have been inconvenient and might have extended their timelines for completion.

Factors of the dependent variable. Volunteers’ ability to learn and apply the CAPTURE & Share program was assessed by their written responses to hypothetical case study probes. Volunteers were expected to apply the components of the strategy and demonstrate that they could think critically about the case study to determine what barriers and supports existed at each step.
In the present study, the principal investigator created the hypothetical case study probes about individuals with CCN who engage in various types of active recreation. Each probe was eight sentences in length and included a summary of individuals’ personal skills and characteristics across a range of domains such as physical/motor, sensory/perceptual, and language/communication. Probes also included examples of different types of adaptive recreation. Even though the volunteers had not participated in each type of recreation included in the probes (e.g., adaptive surfing, adaptive shooting), the strategy was general and applicable to all types of activities. The volunteers were successful in generating complete responses to the probes after they received the necessary information during the training modules.

Based on the written responses, it was evident that the volunteers had enough information from the hypothetical probes to consistently develop complete plans. The amount and type of information included in the probes was adequate; all volunteers worked to develop a plan which included a minimum of 26 out of the 32 total elements in the CAPTURE & Share program.

Most adults with disabilities have extensive medical and personal files containing detailed health-related and background information that can be difficult to interpret and understand. The extent and type of information included in these types of files is not typically necessary for stakeholders in recreation to review and access. It seems more appropriate to provide stakeholders (e.g., volunteers) with the most pertinent information about an individual with a disability. In the present study, the most relevant pieces of information were included in the hypothetical case studies to simulate the type of information that volunteers are likely to receive about participants in active recreation.
However, on some occasions, volunteers may require more detailed or current information about participants. For example, information about an illness or current condition, recent or upcoming surgery, or perhaps information related to educational or staff transitions may be important to acknowledge. In these instances, program directors will need to supply this type of information to volunteers based on the individual situation and condition of the participant with a disability. In summary, it seems appropriate to reduce extraneous information and provide only key points about individuals with disabilities who will be engaging in active recreation. This type of information will effectively prepare and assist volunteers to develop complete plans for participation and success.

**Implications of findings.** Upon review of Figures 1 and 2, it is evident that the current training program was effective in teaching the volunteers how to apply the CAPTURE & Share program. Based on the delineation of the five training modules, a clear upward trend was observed during the intervention phase; this trend indicated a strong learning effect. Volunteers acquired the information in a sequential and systematic manner with respect to when specific content was presented. Implications will be discussed for volunteers in active recreation, participants with CCN and their caregivers, and active recreational programs.

**Volunteers in active recreation.** Volunteers facilitate full participation in recreational activities. They are responsible for ensuring the safety and enjoyment for participants across the entire experience. Volunteers in active recreation will directly benefit from learning new skills and strategies to create communication opportunities and understand the potential barriers and supports relative to participation and interaction.
Due to participation in the training, volunteers may become empowered to be ambassadors for establishing a culture of communication and participation in active recreation. In this study, volunteers learned a training program and then applied the program to hypothetical case studies. Volunteers were successful in applying program components and describing how their personal skills and characteristics may impact the experience.

In the future, the distance-training program could be implemented with additional groups of volunteers to create an environment that values the capture process as an important step to facilitate sharing and expanding opportunities for communication and socialization. Volunteers will eventually become experts in how to prepare for upcoming challenges and implement strategies to effectively support the use of the program. Once they are familiar with the process, volunteers could support other volunteers and ensure that individuals entering the recreational setting understand the importance and impact of capturing and collecting personal media.

Because volunteers are typically in teams, it will be important for them to work together to support participants to document and share their recreational experiences. Experienced volunteers could assist in training new volunteers about how to plan and apply components of the CAPTURE & Share program during recreation. Additionally, by working collaboratively with caregivers and participants, volunteers will be further empowered to support communication and plan for participation. Collaboration between volunteers and other stakeholders will enhance recreational experiences as additional benefits are realized across the areas of socialization and communication. With an increased focus on capturing and sharing recreational experiences, the community of
volunteers and other stakeholders will support a culture of social exchange and reciprocal communication.

**Participants with CCN and caregivers.** A culture of trained and committed volunteers will benefit participants with CCN and their caregivers. Volunteers in recreation can create inclusive and calming environments that support communication and the process of collecting and sharing photos and videos. Participants with CCN will have more opportunities to socialize and capture their experiences with the assistance of trained volunteers. Furthermore, participants will have increased opportunities to share and communicate with others about their experience. Participants with CCN will consistently have greater opportunities to capture their memories and will feel more comfortable sharing their stories in an environment that provides time and creates an inclusive space for communication and engagement.

**Active recreational programs.** Volunteers and recreational professionals make leisure and active recreation accessible to individuals with disabilities and their caregivers. It is worthwhile to partner with volunteers and program directors to consider how participation and communication can be enhanced across the experience. Recreational programs will benefit from having trained and skilled volunteers in areas that support inclusion, participation, and increasing opportunities for social engagement.

Distance training modules may be beneficial to recreational programs as a method to supplement in-person trainings that typically happen during orientation. If programs had an option to provide distance training, volunteers would be able to complete trainings based on their personal schedules. As seen in this study, volunteers would benefit from the self-paced format of the training with occasional comprehension checks to ensure
they are learning the content. Distance training is a good option to ensure that volunteers who live across a wide geographic area have consistent access to opportunities for continuing education. Adaptive sport programs may be located far from urban areas, as they require more rural features and resources such as ski mountains, lakes, or hiking trails. Distance training may also be a good option for adaptive recreational programs that wish to provide supplemental training opportunities for their volunteers. Due to the nature of specific types of adaptive recreation, in-person training will always be necessary; however, distance training may serve as an effective supplement for some content areas.

**Limitations of the study.** The current study made an important contribution to previous research relative to communication partners in AAC. This study validated a strategy instruction program that was aimed at volunteers who support participants in active recreation. Volunteers in active recreation have received limited attention in AAC research and this study served to recognize and acknowledge these individuals as critical communication partners who have frequent and consistent interaction with individuals with CCN and their caregivers. Despite the success of the CAPTURE & Share program, there are several limitations that should be considered as the results are interpreted and directions for future research are considered.

**Instructional modifications.** Even though the strategy instruction was deemed effective, it is important to consider modifications that may be implemented to improve the program and consider potential outcomes for participants with CCN and their caregivers. The strategy instruction contained five training modules, which seemed to be
enough to include all the key content, as all the volunteers successfully reached criterion. Potential changes to the training program are based on which areas the volunteers most frequently received feedback: (a) not including all the program steps or action items, and (b) not including a barrier or support for each step.

Program components. The CAPTURE & Share acronym served as a good tool for the recall of the specific steps of the strategy. However, some volunteers occasionally missed a step and it is possible that combining steps of the strategy may streamline the learning and planning process for volunteers. By reducing the number of program steps, this would allow volunteers to consider additional areas that may be necessary for successful application. In the future, program steps maybe combined in a manner that divides the strategy into fewer components, with a greater focus on facilitating communication and planning for full participation.

Barriers and supports. For some steps of the strategy instruction, it was challenging for volunteers to generate examples related to barriers or supports. On some occasions, volunteers were unable to include a specific barrier or support and other times their responses were repetitive. In several of the “barrier” type statements, volunteers frequently mentioned limited knowledge about specific technology or equipment. However, volunteers who had previous experience with technology, capture, or social media repeatedly indicated this area as a support. In the future, it may be more efficient to ask volunteers to consider general barriers and supports for the entire strategy instead of individual statements related to each step.

Experience of volunteers. All the volunteers in this study had over 2 years of experience supporting individuals with disabilities in active recreation. The volunteers
were quick to learn the strategy and apply it to the hypothetical case studies. The strategy instruction may not be appropriate for new volunteers or volunteers with minimal experience (i.e., under 2 years). Prior to learning the CAPTURE & Share program, volunteers with less experience may benefit from training content relative to general information about people with disabilities and common adaptations that are required to improve access and participation. It is possible that this type of content could be developed in separate on-line modules or presented as in-person training sessions that are conducted prior to distance instruction.

Newer volunteers may not be as effective in applying the CAPTURE & Share program as they are working to understand their new roles in addition to the technical aspects of the experience. Furthermore, it may be difficult for volunteers with less experience to initially focus on the CAPTURE & Share program while they are also managing issues relative to access, safety, and equipment.

**Generalization tasks.** Only experienced volunteers who had previous interaction with individuals with disabilities in recreation would have been able to complete the baseline generalization probe. The probe, which was delivered at the start of the study, asked volunteers to consider generating a plan for sharing with an individual with whom they had previously supported in recreation. This type of generalization probe would not have been appropriate for volunteers without previous experience.

An additional limitation involved the strategy instruction training. Kent-Walsh and McNaughton (2005) define generalization of the targeted strategy use as the final step in communication partner instruction. In the current study, the volunteers did not have an opportunity to apply their knowledge to a different case study example. Instead,
the same case study (e.g., Mary) was used throughout the distance training modules to teach the volunteers to apply the strategy. To more closely align with the Kent-Walsh and McNaughton (2005) stages of partner instruction, a different case study should have been included, possibly in a sixth module. This second case study would have provided the volunteers with an additional opportunity to apply the strategy within the modules of the training program. Despite not having this additional case study to support generalization, it did not seem to impact the ability of the volunteers to learn and apply the training content.

**Maintenance tasks.** The timing of the distribution of maintenance probes was also a limitation in this study. In the present study, maintenance probes were conducted 2 and 4 weeks after the completion of the strategy instruction. The timing of the completion of the probes overlapped with the application phase of study 2. During study 2, the volunteers had an opportunity to apply the strategy during a recreational activity with an individual with CCN. It is possible that since the volunteers were actively using the strategy in the field, it may have impacted their performance in completing the maintenance probes. The volunteers did not receive additional training during the application phase; however, the fact that they were actively using the CAPTURE & Share program may have been an unfair influence as they generated written responses to maintenance probes. All the volunteers were successful in reaching criterion (at or above 80% accuracy) during the two maintenance probes.

Due to the overall timeline and sequence of both studies it was difficult to avoid some overlap between studies 1 and 2. Since study 2 was completed during the
participants’ regularly scheduled kayaking lessons, the principal investigator had no control in planning when the application phase would begin.

It may be necessary to develop a review module for those volunteers that may have large gaps in time (i.e., over 6 months) in between using the *CAPTURE and Share* program. The new module may be used to assist volunteers to maintain their skills using the strategy.

**General limitations.** All the volunteer participants were from the same adaptive sport program. It is possible that volunteers from other adaptive programs may have different experiences or skills in areas related to the *CAPTURE & Share* program. Adaptive sport programs may currently use capture technology to document their programs so some volunteers may already participate in these types of activities with the participants they support. In the current research, it was necessary to have volunteers from the same program since they would be applying the knowledge gained from study 1 during the application phase in study 2.

**Directions for future research.** Future research would be beneficial to determine how modifications to the *CAPTURE & Share* program may impact performance and maximize training efficiency for volunteers. Modifications may include a reduction in the number of steps in the program, general consideration of barriers and supports, and inclusion of different case study examples throughout the training modules.

Currently, there are eight steps in the *CAPTURE & Share* program and it is possible that this number could be reduced to streamline the program and allow for additional opportunities for communication and participation at each step. Next, since volunteers had the most difficulty with including barriers and supports for each step of
the program, it may be more efficient to have volunteers consider general barriers and supports across the entire program. Also, by modifying the amount of information provided in the case study probes, this would impact how the volunteers respond and apply the strategy.

Future research should also consider different variations relative to the types of volunteers that participate in the training. For example, how would performance on the training be different with less experienced volunteers or volunteers with no experience? Also, since volunteers typically work collaboratively to support active recreation, how would the training incorporate an approach that involves the ideas and perspectives of other volunteers? Next, what if a larger group of volunteers received training? How would the results be different by including a larger and more diverse group of volunteers across multiple programs and/or geographic regions?

Lastly, although the distance training was successful, it may be beneficial to incorporate an in-person training component with a focus on operational skills and accessories for learning to use capture technology. Many of the barriers and supports listed by volunteers were related to technology and use of accessories to support independent capture. An additional training component that focuses on these areas may be beneficial to the volunteers and may result in fewer barriers reported by volunteers.

**Conclusion.** All the volunteers successfully learned the *CAPTURE & Share* program in study 1. The current study provided clear validation of the effectiveness of the instructional program that was taught via distance learning. The volunteers reported a high level of satisfaction with the program. Based on responses from social validation tasks, volunteers would recommend the program to other volunteers who support people
with CCN in active recreational pursuits. Furthermore, the volunteers gained new knowledge about how to support photo and video capture and effectively considered barriers and supports for themselves and people with CCN.
Chapter 4: Program Application (Study 2)

PAR provided an appropriate framework for this study due to the collaborative nature of the project and the number of opportunities that stakeholders had to provide input and feedback. In this study, volunteers, participants with CCN, and caregivers engaged in a social and collaborative process of learning and research. These stakeholders were committed and contributed to the inclusive process of PAR on multiple occasions throughout the study. All stakeholders in study 2 had the opportunity to share their perspectives about the CAPTURE & Share program. Volunteers engaged in weekly feedback sessions after each kayaking lesson and caregivers and participants with CCN had face-to-face and phone interviews with the principal investigator.

Method

Participants. Purposive sampling (Patton, 2002) was used to recruit participants with CCN and their caregivers. This type of sampling was necessary since all the volunteers and participants with CCN were from the same adaptive sport program. Five of the volunteers from study 1 also participated in study 2.

Participants with CCN. The director of the adaptive program was asked to nominate 4 to 6 individuals with CCN. All participants with CCN were expected to meet the following inclusionary criteria: (a) were 10 years or older; (b) had significant challenges using natural speech to meet daily communication needs per caregiver report and observation; (c) used AAC to meet some or all of their daily communication needs; (d) were able to make choices from a field of two items; (e) provided reliable yes/no responses to simple questions; (f) participated in summer seasonal adaptive recreation and sport; and, (g) had a caregiver or service provider who agreed to participate in
interviews and complete data collection documents if the participant did not have the capacity to do so.

The adaptive sport program was in the Northeast region of the United States. In 2016, the program served 100 individuals with disabilities with the support of approximately 65 community members who completed over 600 hours of lessons across a range of summer and winter sports. The program offers the following adaptive sports to people with disabilities: alpine skiing, snowboarding, snowshoeing, cycling, kayaking, hiking, and target shooting.

Volunteers. Five out of the 6 volunteers participated in study 2. Since only 5 participants with CCN were recruited for study 2, only 5 volunteers were needed to be part of this phase of the study. Each volunteer was matched with a participant with CCN for study 2. Morgan, the last volunteer who was recruited for study 1, did not participate in study 2. The 5 volunteers who successfully completed study 1 and participated in study 2 were Allison, Amy, Danielle, Melanie and Peg. See Table 1 in study 1 for information about the volunteers.

Characteristics of participants with CCN. In addition to the 5 volunteers, 5 individuals with CCN participated in study 2. See Table 8 for a description of the participants with CCN.
Table 8

*Characteristics of Participants With CCN*

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Age</th>
<th>Disability</th>
<th>Work</th>
<th>Communication</th>
<th>Recreation</th>
<th>FCP-R: Level of impairment</th>
<th>FCP-R: Level of impairment</th>
<th>FCP-R: Level of impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol</td>
<td>F</td>
<td>31</td>
<td>Cognitive</td>
<td>Part-time</td>
<td>Natural speech</td>
<td>Skiing</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Jeff</td>
<td>M</td>
<td>27</td>
<td>Global delay</td>
<td>Not working</td>
<td>Vocalizations + multiple modalities</td>
<td>Swimming, cycling, skiing</td>
<td>Severe</td>
<td>Severe</td>
<td>Profound</td>
</tr>
<tr>
<td>Julie</td>
<td>F</td>
<td>29</td>
<td>Global delay</td>
<td>Not working</td>
<td>Vocalizations + multiple modalities</td>
<td>Skiing, riding, cycling</td>
<td>Severe</td>
<td>Severe</td>
<td>Profound</td>
</tr>
<tr>
<td>Mike</td>
<td>M</td>
<td>64</td>
<td>TBI post 17 years</td>
<td>Retired</td>
<td>Natural speech</td>
<td>Skiing, cycling</td>
<td>Mild</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>Sam</td>
<td>M</td>
<td>50</td>
<td>TBI post 25 years</td>
<td>Not working</td>
<td>Vocalizations + multiple modalities</td>
<td>Skiing, cycling, hiking</td>
<td>Severe</td>
<td>Severe</td>
<td>Profound</td>
</tr>
</tbody>
</table>

*Note.* FCP-R = Functional Communication Profile-Revised, TBI = traumatic brain injury. Pseudonyms have been used to protect participant’s identity.
All participants with CCN had previously kayaked with the adaptive sport program. Participants with CCN and their caregivers paid for each lesson, which included instruction from a certified therapeutic recreation specialist (CTRS), kayak rental and equipment modifications, and volunteer support. Prior to the first kayaking lesson, participants with CCN and their primary caregivers met with the principal investigator to learn about the procedures of the study, sign consent forms, and provide information about background and experience with photo and video capture. Information about participants with CCN was gathered from administration of the Functional Communication Profile-Revised (FCP-R) (Kleiman, 2003) completed by caregivers with assistance from the principal investigator.

Each participant profile contains general information based on the outcomes from the individuals FCP-R and their performance during the series of kayaking lessons. Profiles also provide information about the volunteer that supported each participant along with a brief description of the activity including a special event or consideration unique to the volunteer/participant dyad. See Appendix M for a selection of photos that provide additional background and visual information to accompany each participant profile.

**Carol.** Carol was a 31-year-old woman with a diagnosis of cognitive impairment after meningitis at 24 months old. She lived at home with her parents. According to the FCP-R, her level of impairment was noted to be moderate in the following areas: sensory, motor, and expressive and receptive language. Also, based on the FCP-R and observations by the principal investigator, she was noted to have moderate pragmatic/social limitations. Her mother reported that she has limited opportunities for
socializing and difficulty maintaining friendships. Carol has participated in a wide range of adaptive sports and activities such as horseback riding, skiing, and volleyball with various adaptive programs in her state and local community. In the past, she has enjoyed performing arts therapy and worked part-time on a seasonal basis as a gardener.

During the kayaking lessons, she rarely initiated verbal language but was capable of functional speech production. In addition to verbal language, she used multiple unaided methods (e.g., pointing, head nod) to communicate with others. During one lesson, Carol was excited to get a photo of a turtle on a log. This photo later became a favorite during the review-and-edit phases as it was selected for a caption and then shared with her family. Carol also enjoyed taking photos of herself with her volunteer.

*Paired with Melanie.* Carol was paired with Melanie as a volunteer during all three lessons. Melanie worked as a school-based SLP and observed an increase in Carol’s initiation and exchange of verbal communication during the kayaking lessons, especially when taking videos. Carol and Melanie completed each lesson in the same tandem kayak with Carol in the front and Melanie in the back. Carol tried several methods for wearing and adapting the camera during her lessons. She required assistance to understand how to direct the camera and point it towards her desired target. After reviewing the photos, Carol and her volunteer also had time to edit the photos by adding captions to their favorites shots.

*Jeff.* Jeff was a 27-year-old man with a diagnosis of microcephaly, seizure disorder, and global developmental delay. He was the younger sibling to Julie. Jeff lived in his own apartment with professional caregivers. His mother and stepfather lived in the
same town and saw him on a weekly basis. Based on review of the completed FCP-R, Jeff was assessed with a severe level of impairment in the areas of motor, behavior, language, sensory, and pragmatics. Jeff’s mother reported that he also used multiple modalities for communication and infrequently used his iPad with picture symbols and photos. Based on his mother’s report and observations from the volunteers during the lessons, it was evident that Jeff primarily relied on multimodal communication as he used modified sign language, facial expressions, and physical movements to communicate with familiar and unfamiliar partners.

During the lessons, Jeff enjoyed taking photos and videos as well as reviewing media artifacts. He was attentive to the entire process and frequently used gestures and modified sign language to initiate and demonstrate purposeful intent. On one occasion, he repeatedly initiated a modified sign for “broken” while in his kayak to refer to one of the action cameras that had lost its paired connection to the iPad that his volunteer was using. Because the volunteer was having difficulty pairing the devices using Bluetooth, Jeff thought that the camera was broken and was attempting to communicate this to his volunteer.

*Paired with Danielle.* During all three lessons, Danielle was the volunteer who supported Jeff to use the *CAPTURE & Share* program. Danielle was in an individual kayak as Jeff’s mother or stepfather assisted with paddling in a tandem kayak. Danielle was a retired information technology specialist who volunteered with the adaptive snow sports program. She supported Jeff in trying a range of adaptations to increase his independence for photo and video collection. Jeff was easily distracted and it was
challenging for him to direct the camera to a preferred target using the wearable adaptations (e.g., chest strap, head strap, or floaty handle mount).

**Julie.** Julie was a 29-year old woman with complex physical, cognitive, and communication needs because of microcephaly, seizure disorder, and global developmental delay. She lived in her own apartment with professional caregivers; however, her mother and stepfather resided in the same town and engaged in activities with her on a weekly basis. According to her mother, Julie’s level of impairment as described by the FCP-R was determined to be severe/profound in all areas (i.e., sensory, motor, behavior, attention, language, and pragmatic). Furthermore, her mother reported that Julie also used multiple methods to communicate including inconsistent use of eye-gaze as well as upper and lower extremity movements. Julie’s mother reported that she was nonspeaking and required full-time caregiver support. In previous years, she had participated in a range of adaptive sport programs including skiing, kayaking, and swimming.

When planning for photo and video capture for Julie, the best option for adapting the position of the camera was a clamp that could hold the camera on a mount and be clipped to the front of the boat next to her. In addition to using the boat mount to hold the camera, photos and videos were also taken from the perspectives of other participants. This allowed for a greater number of digital artifacts to be collected across the three lessons.

**Paired with Peg.** Peg was a retired physical therapist who enjoyed the challenge of making recreational activities accessible for people with significant disabilities. In the past, Peg had directed and volunteered with adaptive recreational programs for over 30
years. During the first two kayaking lessons, Peg was in a tandem kayak with Julie. In the third lesson Julie’s mother participated and was in tandem with her while Peg was in an individual kayak. Peg and the technology support volunteer, assisted Julie in trying several types of adaptations to capture her experience. Communication was a challenge that Peg noted while she supported Julie.

While kayaking, Julie would often put her right hand in the water and would splash and move her hand in what seemed to be a systematic manner. By repeatedly splashing the water, Julie’s mother and her volunteer, Peg, thought she was indicating her enjoyment in the activity and was making a request to continue. Peg talked about this interaction during the first feedback session after lesson one:

When I would ask her questions she would stop what she was doing and try and turn to look at me, she could not turn all the way around, but when she stopped splashing, I thought that meant more. One time she was splashing me and I asked her if she wanted to go fast. She would stop splashing, so I assumed she was saying yes, and when I would go fast she would just keep dragging her hand in the water.

Mike. Mike was a 64-year-old man who had a traumatic brain injury in 1999. He lived in his own apartment and depended on daily assistance from professional caregivers. He did not currently drive or work. Recreation consumed a great deal of Mike’s time as he participated in the following seasonal activities: skiing, cycling, and rafting. Mike also reported that he had previously enjoyed skydiving and hang gliding.

Based on caregiver report and observation by the principal investigator, Mike presented with a severe level of impairment in motor, speech, and oral skills assessed on the FCP-R. His level of impairment was deemed to be moderate for pragmatic and expressive language skills and mild for skills relative to behavior and receptive language.
His primary method for communication was natural speech; however, his connected speech was considered unintelligible greater than 50% of the time with unfamiliar listeners.

Mike preferred other people taking photos of him and requested on multiple occasions to have a photo with the program director. His volunteer met his request and found it helpful that Mike had specific ideas for photo capture during the experience. On one occasion, Mike had difficulty with his seating and general positioning in the kayak. This issue required additional equipment modifications, which impacted his ability to wear the chest strap and camera in a comfortable manner. While kayaking, Mike was actively holding and using the paddle which prevented him from using the hand-held options for photo/video capture.

*Paired with Allison.* Allison was a reading specialist in the local school district. Even though Mike missed the first session due to a scheduling error, Allison attended the first session and used that time to learn more about the capture equipment by trying it out independently while kayaking. When Mike participated in the lessons, Allison provided support for capturing photos and videos from a solo kayak. During the lessons, Mike tried a chest strap and a head strap to hold his cameras. Neither option was a great match for him as the chest strap was difficult to manage over his large life jacket and when using the head strap, he found it difficult to maintain adequate control for turning and looking towards targets for capture.

*Sam.* Sam was a 50-year-old man who had an anoxic brain injury in 1991. He lived in his own apartment with full-time paid caregivers. Based on information from the FCP-R completed by his sister (i.e., guardian), primary caregiver, and the principal
investigator, he was assessed with a severe level of impairment across the areas of motor, expressive language, and oral and speech abilities. Sam was unable to use natural speech and presented with grossly intact receptive language skills. He could consistently produce vocalizations and use other types of multimodal communication such as gestures, pointing, and head nods. Sam also had an iPad with picture symbols and photos; however, infrequently used this for communication. During the prelesson interview, Sam indicated he was agreeable to participate in capture activities by producing vocalizations, laughter, and facial expressions such as smiling.

Sam used several different cameras and options for wearable adaptations based on his preference, comfort, and his position in the kayak. He collected artifacts by wearing the camera on his chest or around his head. Because Sam was wearing a hat, the most challenging aspect for him was directing photo capture when he used the camera attached to a head strap. Also, Sam required repeated verbal cues to keep his head in a neutral position vs. extending his neck and looking up towards the sky. Sam had the most success collecting videos wearing the camera using a chest strap instead of a head strap. With the camera in this position, he could independently paddle and not have to be concerned about turning his head to get his target shot. When paddling, Sam used rubber straps that held his hands in place so he could be as independent as possible while kayaking. This modification provided him with better grip support and improved his ability to independently paddle and control the direction of the kayak.

*Paired with Amy.* Amy, who was a college student in the discipline of recreation, had previous experience volunteering in adaptive sport settings. During the three lessons, Sam was in a tandem kayak with the principal investigator while Amy provided support.
from a solo kayak. This allowed Amy to more easily help Sam when making camera modifications or collecting media from multiple perspectives. Sam enjoyed interacting and engaging with the other volunteers and participants across the entire recreational experience. By vocalizing and gaining the attention of others in the group, he created many opportunities for photo and video capture.

**Materials.** The materials in study 2 included an inventory of cameras, technology, and adaptations (e.g., harnesses, mounts) to support the *CAPTURE & Share* process. Also, the Functional Communication Profile-Revised (FCP-R) (Kleiman, 2003) was used as a measure to collect formal information about the participants’ speech and language skills and abilities. Additional materials for study 2 included interview guides, questionnaires, and topic boards used to facilitate feedback sessions.

*Functional Communication Profile-Revised.* With input and assistance from family members or caregivers, the principal investigator administered the Functional Communication Profile-Revised (FCP-R; Kleiman, 2003) to all participants to provide a description of each person’s level of impairment relative to sensory/motor skills, pragmatic/social skills, behavior, speech, and expressive and receptive language skills.

The FCP-R is a criterion-referenced instrument that provides an overall inventory of an individual’s communication ability, mode of communication, and degree of independence. The raters observe the individual and may use direct assessment, informal observation, interview, or review of records to determine the level of functioning in specific areas such as oral comprehension, self-expression, or use of descriptive language. Several social pragmatic areas are also reviewed. Based on the items checked in each of the areas, the administrator makes a determination about the severity level,
ranging from a mild to profound level of impairment. Table 8 includes the levels of impairment for receptive and expressive language and speech skills for the 5 participants with CCN.

Initial administration of the FCP-R occurred during a prelesson meeting with the principal investigator and participants’ caregivers. Additional time was provided for caregivers to complete sections at home if needed. For example, Sam’s sister also served as his guardian and lived in another state, so the principal investigator interviewed her over the phone and also emailed her a copy of the FCP-R for her to complete. In addition, Carol’s mother also requested time to complete portions of the FCP-R at home. The FCP-R was selected because it was appropriate for individuals with acquired and developmental disorders across a range of severity levels. Also, it was important to gather information across a range of characteristics for each individual with CCN. The FCP-R provided a broad description of each person in terms of their current physical/motor, sensory/perceptual, language, social, and cognitive abilities.

**Equipment and accessories.** The project involved an extensive list of action camera equipment and wearable accessories for both volunteers and participants with CCN. The specific equipment and accessories used for photo and video capture can be found in Appendix N. Wearable and handheld accessories were available for all camera types with various options for head straps, chest straps, and boat mounts. All technical equipment also had waterproof casing or protective gear to prevent water damage. Additional equipment included SD memory cards, iPads, and flash drives for storing media artifacts.
Other materials. Documents created by the principal investigator were used to gather information from caregivers and participants with CCN relative to prelesson collection and sharing and postlesson status and feedback. Also, the principal investigator generated a topic list to facilitate feedback sessions with the volunteers.

See Appendix O for the prelesson guide used to gather information about participants’ experiences collecting and sharing photos and videos. This guide was used during the initial in-person meeting with caregivers and individuals with CCN. See Appendix P for the postlesson feedback questions. Postlesson feedback was gathered during phone calls with caregivers 45-days after the last kayaking lesson. Finally, Appendix Q includes a list of potential topics that were discussed during the three feedback sessions.

Procedures. For both volunteers and participants with CCN, the procedures for study 2 were integrated within the existing structure of the three kayaking lessons. After completing study 1, the volunteers applied the skills they acquired from the distance training program to support participants with CCN during their regularly scheduled kayaking lessons. In addition to the training from study 1, volunteers also had a brief period of orientation relative to equipment and gear before engaging in the application phase. Input was gathered from both volunteers and the program director prior to matching volunteers and participants with CCN. The program director made recommendations for dyads based on the volunteers’ experience and sport proficiency as well as the individual skills and characteristics of each participant with CCN.

During application, volunteers were encouraged to follow the steps of the CAPTURE & Share program as they facilitated participation and considered their plan to
support photo and video capture. After each kayaking lesson, volunteers met as a group with the principal investigator to provide feedback, share perspectives, and make modifications to their plan for the next lesson. During the feedback sessions, the volunteers focused primarily on the topic of capture and collection of digital artifacts.

During the feedback sessions, volunteers shared their field experiences and employed active problem solving through an iterative process of revision and reflection. The volunteers were encouraged to engage in a cyclical process across four primary areas: (a) application, (b) feedback, (c) reflection, and (d) planning. As volunteers discussed the implementation of the CAPTURE & Share program, they focused on making modifications and improvements for future sessions. Concepts such as feedback, reflection, and planning have been discussed in the context of the spiral of self-reflection, which is part of the process of PAR (Kemmis & McTaggart, 2005).

See Figure 3 which provides a visual map of the primary components of study 1 and 2. The figure highlights how aspects of PAR were integrated across the entire process. Stakeholders were provided with ample opportunities to share their perspectives, collaborate, and actively impact the outcomes of the study.
Figure 3. A visual map that depicts the primary components of studies 1 and 2. A total of five components are depicted in the visual map: (a) training and input; (b) matching partners and participants; (c) volunteer application and feedback loop; (d) caregiver sharing; and (e) caregiver feedback.

The volunteers in this study engaged in the components of the reflective cycle in a collaborative manner as they contributed their perspectives based on their personal experiences during the lessons. Throughout the feedback sessions, the volunteers appreciated the social nature of the group as the members openly shared their success and ongoing challenges. Since the volunteers provided immediate observations based on their experiences, they quickly realized common barriers and were efficient in suggesting modifications for the next application. The process was fluid in nature and at times the
components merged as volunteers worked to accurately describe their experiences, recognize the perspectives of others, and consider future iterations.

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Also during feedback sessions, the principal investigator provided suggested topics (e.g., equipment issues, communication) to get the conversation started until the volunteers dictated the nature of the conversation. Most comments focused on strategies to support more effective and independent capture and collection of digital media.

After each feedback session with the volunteers, the principal investigator sent caregivers and participants 1-2 photos from the lesson to provide an example of the captured media and generate more interest in the process of sharing. Upon completion of all three lessons, participants with CCN and their caregivers were provided with a password-protected flash drive containing a complete collection of their personal artifacts (i.e., photos and videos). The caregivers were asked to review, share, and distribute their artifacts how they wish, according to their own schedules and personal preferences.
Caregivers were given 45-days to share; however, were not provided with any type of goal or specific number relative to sharing photos or videos.

The approach to sharing that was used in this study, aligned well with PAR. It allowed caregivers and participants with CCN to be in control of the outcome and to determine to what extent they would share and disseminate their media artifacts. After the caregivers had time to share their photos and videos, they participated in a structured phone conversation with the principal investigator. During the conversation, the caregivers provided information about their sharing habits, including frequency, type, and extent of social networks.

**Volunteers.** Each week, volunteers engaged in three, 2-hour lessons with their participants followed by a 30-45-minute feedback session with the other volunteers. The volunteers participated in three activities during study 2: (a) preparation for the CAPTURE & Share program, (b) application of the CAPTURE & Share program, and (c) discussion during feedback sessions.

**Preparation for the CAPTURE & Share program.** Prior to the first lesson, the adaptive sport program director matched each volunteer with a participant and decided which volunteers would paddle in tandem vs. solo kayaks. Decisions were made based on the volunteer’s kayaking skills and experience in conjunction with the characteristics and skills of the participants with CCN. This decision was also influenced by which participants with CCN had family members who would be participating and available to assist during the lessons. Volunteers supported the same participant with CCN during all three kayaking lessons.
Prior to the first kayaking lesson, the volunteers were asked to consider the plans they had developed during the training period and to make their best effort to implement the steps of the program. Volunteers were reminded to consider different perspectives for photo and video capture and to consider their personal barriers and supports. For example, if a person with CCN did not want to wear a camera or was unable to wear or hold a camera, then photos or videos could be taken by the volunteer from a different perspective. The volunteers were also told that photo and video capture should not interfere with the safety or enjoyment of the lesson. The volunteers were not told to collect a specific number of photos or videos during each lesson.

Before the first kayaking lesson, volunteers were provided with instructions about how to take a photos or videos with a specific camera (e.g., GoPro®, Polaroid Cube, or iPod). In addition, volunteers were told how to pair capture technology using specific applications developed by GoPro® and Polaroid. To provide volunteers with the ability to assist and direct photo and video capture, action cameras were paired with the tablets using Bluetooth technology. Because of this, volunteers had the ability to trigger cameras while they provided cues to engage participants in the process of photo and video capture. Volunteers arrived early before the first kayaking lesson to have time to try cameras and to practice the procedure of pairing cameras with tablets.

Application of the CAPTURE & Share program. Each kayaking lesson was 2 hours in length including time for loading, paddling and unloading. Approximately 90 minutes was spent on the water with approximately 30 minutes for preparation before the lesson and unloading after the lesson. Volunteers were involved in all aspects of the lesson. Caregivers and additional program staff were also in solo kayaks and available to
assist with any needs on the water. Furthermore, a volunteer with specific skills in technology (i.e., technology support volunteer) was also available if anyone had difficulty managing their cameras during the lessons. The technology support volunteer assisted program volunteers and participants with CCN to turn cameras on/off, reset Bluetooth connections, and switch cameras to capture different perspectives.

Prior to getting into the kayaks, volunteers assisted participants with adjusting cameras by using various mounts or wearable accessories. After adjustments and modifications were made to cameras and accessories, the volunteers and participants went out on the lake. While on the lake, each dyad was asked to stay in proximity of the larger group and was asked to take photos and videos at their own pace. Volunteers and participants with CCN were expected to communicate with each other about taking turns with cameras, acquiring assistance if needed, and collecting a range of media from different perspectives.

*Feedback about the CAPTURE & Share program.* After each kayaking session, volunteers participated in feedback sessions to debrief and share their experiences. Each session, which was approximately 30-40 minutes in duration was audio recorded and occurred on the program site immediately after each lesson.

The principal investigator facilitated each of the three feedback sessions with volunteers. During the sessions, volunteers were led through a process of active reflection and were provided with opportunities to give feedback in areas such as benefits, barriers, modifications, and solutions based on their experiences in applying the *CAPTURE & Share* program. The principal investigator used an empathic approach (Ryan, Gandha,
Culbertson, & Carlson, 2014) by maintaining some control over the discussion content but mostly allowing the volunteers to lead the conversation and interact with each other.

**Participants with CCN and caregivers.** Participants with CCN engaged in their regularly scheduled summer kayaking lessons with the adaptive sport program. All participants with CCN and their caregivers participated in the following: (a) prelesson meeting, (b) three kayaking lessons, (c) independent sharing of photos and videos, and (d) postlesson conversation.

**Prelesson meeting.** The principal investigator contacted caregivers to set up an initial meeting 1 to 2 weeks prior to the first kayaking lesson. During the meeting, participants and caregivers talked about their past experiences using cameras and collecting digital artifacts from recreational experiences. The purpose of this initial meeting was to: (a) complete the consent process and provide an overview of procedures; (b) meet participants with CCN and their caregiver/guardian to answer any questions; (c) conduct/start the FCP-R; (d) gather prelesson information; and, (e) provide individuals with an opportunity to try equipment and accessories.

**Participation in kayaking lessons.** Four out of the 5 participants with CCN engaged in all three scheduled lessons over the course of the three-week period (i.e., one lesson each week). One participant Mike, was unable to attend the first lesson due to a scheduling conflict.

Each lesson took place at a different lake and participants and caregivers were responsible for transportation to the lake. Once individuals arrived for their lesson, they were greeted by their volunteer and program staff. Prelesson events that occurred prior
to getting into the kayak included gathering necessary equipment and accessories, trying on and securing life jackets, holding cameras, trying on wearable accessories and taking a few photos.

Once participants were seated in their kayaks, final fitting and modifications were made to maximize use of the cameras and to ensure comfort and safety during the lesson. All participants with CCN rode in the front of the tandem kayaks. While on the water, volunteers in solo kayaks stayed close to their paired participants to ensure consistent Bluetooth connectivity between cameras and tablets. During the lessons, volunteers and individuals with CCN independently managed their own photo and video capture. If anyone required capture and/or technical assistance at any time, they had access to the technical support volunteer who was on the water in a solo kayak.

*Sharing photos and videos.* After gathering digital artifacts over the series of three different lessons, participants with CCN and their caregivers were provided with a period of 45-days to disseminate and share their digital artifacts via in-person or digital methods.

Upon conclusion of the third kayaking lesson, participants with CCN and their caregivers were given an encrypted flash drive that contained each student’s individual photos and videos. The flash drives were loaded with personalized artifacts from their recent kayaking lessons containing digital photos and/or videos taken from the perspective of the volunteers and participants with CCN.

Once the caregivers and participants with CCN received their flash drive, their only instructions were to share their digital artifacts in a manner that was comfortable to them. The principal investigator did not communicate any type of directive or guideline to encourage sharing. The process of consumer driven dissemination aligned well with
the PAR framework as it encouraged participants to be engaged in all aspects of the research project and share results with others in their community (MacDonald, 2012).

*Postlesson feedback.* After the period of 45-days, the principal investigator set up phone conversations with all caregivers and participants with CCN. Interviews were semistructured in nature, because the goal was to provide caregivers and participants a means to share their perspectives relative to the program including their personal experiences. The caregivers and participants were asked to provide their perspectives about capturing artifacts, sharing artifacts, and any general feedback and recommendations about the program. The interviews were audio recorded and were between 15-30 minutes in duration. All interviews were transcribed by a graduate assistant and reviewed by the principal investigator in preparation for the descriptive analysis of the outcomes and comparison to prelesson experiences.

**Data analysis.** Data from the combined feedback sessions were analyzed along with pre- and postlesson information provided from caregivers and guardians.

*Feedback sessions with volunteers.* Transcripts from each feedback session were read and reviewed on three occasions by the principal investigator. In addition, field notes taken by the principal investigator were used to provide supplementary information about each feedback session. Individual areas of focus emerged from each of the three feedback sessions. The focus areas showed how the volunteers discussion progressed and how issues evolved over the course of the three sessions. Each of the three feedback sessions was summarized based on the primary topics of discussion: (a) introduction and initial recommendations, (b) familiarity, barriers and solutions, and (c) realities in the capture process.
Furthermore, combined data from the three sessions was also analyzed following the procedures recommended by Creswell (2007) and Kvale and Brinkman (2009). Combined data from the feedback sessions was triangulated using a process involving crystallization, peer review, external audit, and a member check.

*Crystallization.* The principal investigator independently read and reviewed the feedback session transcripts to prepare for the crystallization process. The process started by breaking up the transcription text into the smallest units of information that could informatively stand alone (Kvale & Brinkman, 2009). These units of information were called “thought units” and were typically a short phrase, sentence, or perhaps multiple sentences that did not make sense if separated or left alone (e.g., “We did all photos today, we didn’t do any videos”; “I don’t want to misinterpret anything he is trying to tell me, so I agree with you that, that communication is a challenge”).

The principal investigator organized the feedback session data into thought units and started the preliminary process of categorizing the units into general thematic areas. After initially reviewing and organizing the data, the principal investigator and a graduate research assistant reviewed the thought units and engaged in a collaborative process to modify and develop mutually exclusive primary themes. Also, as the thought units were further reviewed, additional modifications were made relative to combining or separating existing units. The task of generating themes and finalizing thought units was iterative in nature and based on constant revision and reorganization by both individuals involved in the crystallization process.

Five primary themes emerged from the data post hoc based on concept driven coding and similarities observed across the final 402 thought units. After the primary
coding process was complete, the principal investigator generated operational definitions for the primary and secondary coding themes. The principal investigator and a graduate research assistant reviewed the operational definitions and recoded the data. Any disagreements were discussed and agreed upon between the principal investigator and graduate research assistant. If the coders agreed that a thought unit could not be coded within the five primary themes it was labeled as “not codable.” Primary and subthemes were organized and numerically coded using Excel.

*Peer review.* Throughout the entire study, the principle investigator’s advisor served as the primary individual responsible for peer review. This individual who was familiar with the project and the objectives of the research, served in the role of providing consistent constructive feedback during all procedures and aspects of data collection and analysis across both studies. Support was provided through active listening and discussion, asking questions, and making suggestions based on his previous research and clinical experience.

*External audit.* A graduate student who had not been involved in the crystallization process participated as an external audit completing tasks to ensure interrater reliability. The graduate student reviewed the thought units across all five volunteers along with the operational definitions for the primary and subthemes. See Appendix R for the operational definitions. The principal investigator met with the graduate student to conduct training and to ensure the student was well prepared to complete the reliability check. The graduate student practiced coding 25 sample thought units and received feedback from the principal investigator about her accuracy in completing the task. Once the student reached 90% agreement during the practice
sessions, the graduate student received a document with a randomly selected sample representing 20% of the total thought units. The graduate student and the principal investigator worked independently to review and code the thought units and achieved 89% agreement in coding the units based on the primary themes and 98% agreement in coding units based on subthemes (calculated by number in agreement divided by total number of thought units coded).

*Member check.* During the member check process, the interpretation of the data went back to the volunteers to provide them with an opportunity for validation and feedback (Creswell, 2007). The principal investigator sent an email to each of the 5 volunteers with a summary of the five primary themes and corresponding subthemes. The document contained quotes from the feedback sessions associated with each theme and subtheme. Four out of the 5 volunteers responded to the principal investigator and verified that the summary accurately represented their perspectives and comments related to their experiences in applying the *CAPTURE & Share* program. The volunteers did not provide any additional comments or feedback.

*Pre- and postlesson information from caregivers.* All information from caregivers was reviewed and organized by the principal investigator. Caregiver prelesson meeting notes were compared to postlesson conversation transcripts. The principal investigator reviewed field notes and read transcripts on multiple occasions to extract relevant information based on the categories from the primary topics of discussion. A descriptive analysis of the content was conducted by the principal investigator and categorized into two primary areas: (a) capturing and sharing recreational experiences, and (b) benefits of the *CAPTURE & Share* program.
Perspectives from caregivers and individuals with CCN were collected before and after the kayaking lessons. Pre- and postlesson information was compared to determine the impact of the CAPTURE & Share program on the extent, type, and frequency of sharing as well as the reported benefits from the program. In the results section, this information is presented in a descriptive manner organized by each participant with CCN. Data relative to benefits of the CAPTURE & Share program are reported in a combined descriptive summary, which includes the perspectives of all caregivers.

Results

Results will be presented from two stakeholder groups in study 2: (a) volunteers, and (b) caregivers and participants with CCN.

Individual feedback sessions for volunteers. Over the course of the three feedback sessions, the volunteers shared ideas across a range of topics. As the volunteers gained more experience implementing the CAPTURE & Share program, their ideas and feedback evolved from introductory remarks to more creative and realistic solutions. Upon analysis of each transcript, three distinct focus areas emerged from the data. In session one, the volunteers focused on introductions, individual recommendations and getting to know the participants they were supporting. In session two, volunteers indicated they were more comfortable with the equipment and the overall process of the CAPTURE & Share program. They reported that even though they were more familiar with the cameras, some barriers did still exist. Lastly, in session three, the volunteers discussed how to expand upon the program and make changes that could be sustainable over time.
Feedback session one: Introductions and initial recommendations. Based on analysis of the data from the first feedback session, it was evident that the volunteers primarily focused on getting to know the participants and generating individual recommendations about how to support their engagement in the capture process. The volunteers also discussed how they balanced kayaking and capture during the first lesson and how they supported each participant. Overall, the volunteers shared their perspectives on what they could do to improve the capture process considering the unique environment and the nature of the activity.

Feedback session two: Familiarity, barriers, and solutions. The transcript from the second feedback session revealed that the volunteers thought that familiarity was key. Having an initial understanding about the person as well as the capture technology, facilitated the collection process while kayaking. Volunteers reported that they were more aware of what they needed to do to support capture and to ensure that a decent collection of digital media would be available for review. During the second feedback session, the volunteers focused on more collective challenges while also working towards potential solutions. For example, the volunteers discussed the issue of not having enough time to review and edit the digital photos. They indicated that it may be possible to review and edit photos, if there was more time and adequate space. Volunteers proposed recommendations such as coming in early from the lesson or perhaps reviewing photos prior to the lesson.

Feedback session three: Realities in the capture process. After the third session, the volunteers had encountered a wide range of issues relative to capturing digital media during recreation. Additionally, since the third kayaking lesson occurred on a very windy
day, it made the water choppy and added an extra challenge for the volunteers to manage. With this said, the volunteers and program directors reacted to the rough water and adjusted accordingly. For example, more time was spent around the edges of the lake exploring coves and bridges near the inlet. This diversion led to a variety of scenes and backgrounds for various types of photos and video to be captured. In one video that Sam took while wearing a GoPro® on a chest strap, white caps are clearly visible on the water indicating waves and high wind across the lake.

Overall, volunteers indicated they were pleased with their problem-solving skills and how they responded to various challenges (e.g., overheated cameras, straps not fitting). Furthermore, one volunteer shared how she maintained a balance between the activities of kayaking and capturing media. She indicated that by the third lesson she was more successful with integrating capture with kayaking. In closing, volunteers also discussed future applications for digital media across educational and/or community contexts.

**Combined feedback sessions for volunteers.** As noted in the section above, the volunteers in each feedback session discussed important areas that evolved over the course of the 3 weeks. The focus areas changed after each session as volunteers learned to build on their experiences and become more comfortable with the technology and the overall process.

To gain a deeper understanding of the volunteers’ shared knowledge and experience, it was also important to conduct a thematic analysis in the spirit of rigorous qualitative inquiry. It is beneficial to present the data in areas that can be easily understood by consumers and other stakeholders. The primary themes generated during
the analysis phase were numbered for organization purposes. Table 9 provides a summary of the five primary themes, eight subthemes, and examples of specific quotes associated with each theme.
<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Steps of the Program</td>
<td>1.1 Cameras, adapt, practice, take photos, use context</td>
<td>We had the boat mount which seemed to work.</td>
</tr>
<tr>
<td></td>
<td>1.2 Review and edit</td>
<td>He wanted to look at the pictures himself.</td>
</tr>
<tr>
<td></td>
<td>1.3 Share</td>
<td>He seemed like he wanted to show his pictures to his family later.</td>
</tr>
<tr>
<td>2. Feedback</td>
<td>2.1 Immediate application</td>
<td>For a different perspective we will start with a selfie.</td>
</tr>
<tr>
<td></td>
<td>2.2 Future directions</td>
<td>The program has a lot of classroom applications.</td>
</tr>
<tr>
<td></td>
<td>2.3 Training program</td>
<td>It was good you included the personal barriers.</td>
</tr>
<tr>
<td>3. Barriers</td>
<td>3.1 Stakeholders</td>
<td>I think sometimes she forgot about the camera.</td>
</tr>
<tr>
<td></td>
<td>3.2 Technology and gear</td>
<td>The Polaroid overheated.</td>
</tr>
<tr>
<td>4. Supports</td>
<td></td>
<td>I am going to show you how to do it, then we will do it together, and then you will do it on your own.</td>
</tr>
<tr>
<td>5. Benefits</td>
<td></td>
<td>It was nice to have the videos and to talk to her mother about that.</td>
</tr>
</tbody>
</table>
For some themes, examples of participatory interaction (Belzile & Öberg, 2012) are included to demonstrate how the volunteers’ contributions impacted each other and influenced the process of planning and problem solving. The principal investigator and the graduate research assistant extracted 402 thought units from the data across the three sessions with the volunteers. See Table 10 for the number of thought units for each volunteer across the five primary themes.

Table 10

*Number of Thought Units for Each Volunteer*

<table>
<thead>
<tr>
<th>Volunteer</th>
<th>Steps</th>
<th>Feedback</th>
<th>Barriers</th>
<th>Supports</th>
<th>Benefits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allison</td>
<td>15</td>
<td>23</td>
<td>21</td>
<td>3</td>
<td>6</td>
<td>68</td>
</tr>
<tr>
<td>Amy</td>
<td>8</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Danielle</td>
<td>21</td>
<td>54</td>
<td>36</td>
<td>5</td>
<td>14</td>
<td>130</td>
</tr>
<tr>
<td>Melanie</td>
<td>49</td>
<td>14</td>
<td>33</td>
<td>10</td>
<td>6</td>
<td>112</td>
</tr>
<tr>
<td>Peg</td>
<td>15</td>
<td>21</td>
<td>20</td>
<td>5</td>
<td>12</td>
<td>73</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>115</td>
<td>117</td>
<td>23</td>
<td>39</td>
<td>402</td>
</tr>
</tbody>
</table>

**Theme 1: Steps of the CAPTURE & Share program.** All the volunteers talked about the eight steps of the *CAPTURE & Share* program relative to their participants with CCN and other stakeholders such as parents or caregivers. This theme included three subthemes which were divided across the steps of program application: (a) cameras, adapt, practice, take photos and videos, and use context; (b) review and edit; and, (c)
share. Most of the discussion in the feedback sessions was related to the first five steps of
the program as the volunteers facilitated the collection of digital artifacts during the
kayaking lessons.

The following exchange between four of the volunteers in the second feedback
session was an example of participant interaction (Belzile & Œberg, 2012) and
demonstrated how the volunteers considered capture technology when making their
plans. The dialogue provided a glimpse of how the volunteers collectively shared their
ideas for making modifications to support capture while also considering the
characteristics of the participants with CCN:

Principal investigator: Okay, so let’s go over your plans for next time.

Danielle: I think what we’ll start with next time, is we’ll do some selfies. I’ll have
Jeff take a few selfies. I’ll try to have him do some with the hand mount.

Peg: Well, I decided that the boat mount would be fun because it would add
perspective that we haven’t had before. But I would also like to review a couple
pictures with her before the lesson.

Allison: I’ll get the mount for you and hopefully Mike will be paddling more this
time. I think I would like to get some video of him, it would be great, to get some
shots of him paddling. After, I want to look at the pictures I took and see if he
would enjoy looking at them.

Melanie: I may try a mount or I was thinking just now that we could probably do
a selfie stick pretty well ‘cause I can kind of move in my boat without having
huge problems, and one of the successes was that her mom had identified that she
doesn’t get smiles from her often on camera, but we did have success with the
selfies last week. When she is a little bit more smiling, I would like to try to get
more of her actually animated.

Melanie: Yeah, trying to maybe bomb her a little bit more, so if we’re talking and
she’s really animated and happy, then trying to get a picture of this, either because
it’s mounted or because we can do it on the selfie stick.

Amy: For Sam, let’s try the mount and get him more interactive in the whole
process of taking videos and pictures.
Principal investigator/Moderator: So, I’ll give you guys the selfie stick next time to have on the boat, and we’ll just put the iPod in there as well and you guys can try that.

_Cameras, adapt, practice, take, and use context._ All the volunteers discussed how they would support independence and capturing multiple perspectives by using cameras and various accessories. Some volunteers talked specifically about ways to adapt how the participants would hold or wear the cameras. Danielle stated that, “I think with the head mount he would have the same issue, so an external mount may be a good option for him to try.”

All the volunteers talked about taking photos and videos during the experience. Melanie mentioned that some methods were more successful than others: “We did have success taking the selfie last week with the stick, but with the Polaroid Cube, she would look around with her eyes, but I don’t think the camera was moving a lot as it was on her head.”

The first five steps of the _CAPTURE & Share_ program seemed to generate the most discussion among the volunteers as they were learning about the features of the action cameras and the various methods for modification to facilitate more independent capture. Danielle was impressed that Jeff “had a good understanding that he was wearing the camera.” Furthermore, she discussed how to support the capture connection with him and find the best accessories to encourage independence:

It was great because he understood that he was wearing the camera so he was really into it, however, an external mount may be a good option to try for him or maybe the hand mount as well. My plan is to have the camera first and then when we get the mount, we will mount it and then he can have full control.
**Review and edit.** All the volunteers discussed the review and edit steps of the CAPTURE & Share program and ways to more naturally incorporate these steps into the activity. Most frequently, the volunteers reported challenges relative to the specific areas of review and edit. These components will also be discussed under the barriers theme.

Peg, the volunteer with the most experience, focused on the logistics of where she could review and edit after the activity while also considering her own limitations about how to use the technology. She indicated that, “I think the only weak parts to do were the review and edit, because of limited time and space and my inability to actually access the device.” Allison agreed with Peg in this area, stating, “I would build time right in the lesson to review and edit if that’s important, it can be hard to find a place to review the photos, but I think it was good to have this time to review as I saw a family together looking at the photos.”

The following exchange is another example of participant interaction and demonstrates how the volunteers further developed an idea to support the review and edit components. This example shows why it is important to consider participant interaction as the volunteers coconstructed a meaningful solution based on the success of one of the volunteers. The volunteers in this exchange were interested in the success that Melanie had and how they could also support the review and edit steps with their participants:

Principal investigator: Any other ways to think about how we could add the review and edit component either now or later?

Melanie: I think what I did worked well, I wrote down on a piece of paper what she wanted to say and have as a caption on her photo, and then handing it over for a quick edit. So I mean we did actually end up editing our picture that she picked but it took a while.
Danielle: So last week you added in a caption?

Melanie: Yeah, we added a caption to one of the photos last week.

Danielle: That’s great. You did the whole program. You get an A plus. You get to the head of the class!

Melanie: I think writing down what she wanted to say and then that way it can be edited later could be a good potential thing to do for just a quick “Oh, this is what she wants to say about it” and then putting it on later.

Allison: This is simple but could we just come back from kayaking 5 minutes earlier?

Principal investigator: Well, I don’t know, let me talk to the director.

Amy: We can even ask their parents or caregivers or whoever is with them if they could just stay a few more minutes just to review the pictures.

Danielle: That’s a good idea. Have a time allocated with the family. That might actually be easier to do. So I guess we need a plan for actually doing the editing. Do we have a plan for that?

Principal investigator: Alright, I’ll email the director and talk to caregivers, I’ll put it out there and say, we would like to have a chance to review and edit some of the pictures…can people stay 10 more minutes or can we come in early from kayaking?

**Share.** Despite all the volunteers making comments about sharing, their focus in this area was more limited. This was likely due to greater attention to the steps related to the collection and capture of artifacts during the activity. Also, the volunteers did not have adequate time or access to facilitate opportunities for sharing.

Melanie talked about the difference between sharing after skiing vs. kayaking: “I feel like it’s easier at the ski mountain to use the share component because there is a setting to sit and relax afterwards.” Amy shared her perspective relative to the participant she supported: “It seemed like Sam wanted to show his pictures to family members and friends later by saying, this is what I did today, look at this.” Due to the nature of the
activity and limited time allotted for sharing, the volunteers did not have a significant impact on creating more opportunities for the dissemination of digital artifacts. Instead, these opportunities were created by caregivers as they had more time and influence to support participants in this area.

**Theme 2: Feedback.** All the volunteers provided feedback about the *CAPTURE & Share* program. Since the volunteers had multiple opportunities to implement the program, they shared a range of perspectives based on their personal experiences, observations, and their personal and professional backgrounds. This theme was organized into the following three subthemes: (a) immediate application, (b) future directions, and (c) the *CAPTURE & Share* training program.

The three subthemes provided clarification and a good understanding about the volunteer’s discussion and process for solving issues related to the *CAPTURE & Share* program across the three kayaking lessons. Thought units coded under the subtheme ‘immediate application’ were related to current problems or issues that the volunteers addressed over the course of the research project. The volunteers implemented many of the proposed ideas during the second and third kayaking lessons. Next, thought units coded under the subtheme, “future directions,” included ideas or suggestions for possible iterations of the *CAPTURE & Share* program across other settings. Finally, units coded under the subtheme “distance training program” included statements relative to the distance training program and how it could be improved or expanded.

**Immediate application.** The feedback sessions were conducted immediately after the kayaking lessons. The 5 volunteers shared feedback across several areas and discussed proposed changes to be implemented during the next kayaking lesson.
Examples across three areas are provided that demonstrate different types of feedback relative to immediate application: (a) communication and interaction, (b) equipment and gear, and (c) methods to improve capture.

Communication and interaction. Two of the volunteers specifically discussed communication and their plans for future sessions. Amy shared, “I feel like I can work on doing better with communication with Sam, I think just interacting with him more, I feel like will be helpful in the next session.” Danielle also focused on planning for better photo capture and specifically mentioned the idea of working consistently with the same participants to use signals saying, “I’m not sure, but I think I’m going to have to slow down the process to make a signal system work better, a lot of this is based on repetition and having the same individual really helps.”

Equipment and gear. Four out of the 5 volunteers had not previously used the capture equipment that was part of the program so there was ample discussion about which cameras and wearable adaptions may be appropriate for each participant. Amy shared her perspective: “I think we got better shots from him when he was wearing the chest strap.” In response to that, Allison indicated that she would like to try a chest strap with the participant she was supporting. Danielle added that she was having difficulty using the head strap with her participant and had other ideas about how to improve photo capture: “Until we have a mount, I think I would like to just hold and control the camera.” The process of sharing feedback about mounts, cameras, and accessories was important for the volunteers as they talked about how to modify their plans for improving capture while considering the different types of equipment that was available. Lastly,
Danielle suggested, “I think a positive of all of this is doing it a second and third time and becoming more familiar each time with the equipment is a great help.”

Three of the volunteers discussed issues related to glare, as it was necessary for the volunteers to see pictures on the camera and tablet screens during the outdoor activity. Danielle mentioned the issue of glare which led to a discussion about potential solutions: “If we could create some sort of screen over the iPad for glare protection that would be great.” In response to this issue, Peg suggested, “Do you remember photographers use to go inside a little hood, maybe if we had some hoods to block the light that would work.” After this discussion, it was decided that beach towels could be trialed during the kayaking lessons to block sunlight and provide coverage for volunteers to intermittently check their screens during the activity.

*Improving capture.* All the volunteers discussed how they could improve upon the types of photos and videos they were capturing during the kayaking lessons. Two volunteers talked about the idea of being able to review photos and videos so that they were confident that the media they were capturing was clear and appropriate for sharing. Allison shared, “I want to look at the photos I took and see if he would enjoy sharing them.” Also, on this topic, Peg stated, “I think I need to see the photos next time, so I can understand better how we did.” This discussion encouraged the volunteers to spend time personally reviewing the photos and videos they took so they could be better informed about the types of media they were capturing.

For example, Allison considered, “I think I would like to get some more video next time and I know Mike wants a photo of himself and the director, cause I know he likes her.” Danielle also shared: “Just to get a different perspective of him actually
participating in the activity, I think we will start with a selfie next time.” Finally, Melanie mentioned her idea to capture a specific type of photo:

When she is a little bit more smiley next time, I would like to try to get more of her actually animated, I thought it would be nice for her to have a different shot that she has not had yet.

**Future directions.** In addition to discussing ideas and modifications for immediate application, volunteers also considered future directions relative to the *CAPTURE & Share* program. These suggestions could potentially improve the program or be implemented as extension activities by SLPs or other related professionals across different types of contexts (e.g., schools, clinics, home). Perspectives about future directions are presented across two areas: (a) the *CAPTURE & Share* program in other settings, and (b) classroom applications.

*The CAPTURE & Share program in other settings.* The volunteers discussed how most of the participants in the kayaking program also engaged in multiple adaptive sports, such as skiing, cycling, or hiking. Three volunteers discussed how the application of the *CAPTURE & Share* program might be different in other types of adaptive snow sport settings. Melanie mentioned that the post skiing routine typically included social opportunities with other volunteers or participants: “It would be easier at the ski mountain to follow the program because I could meet someone in the lodge ten minutes after the lesson to complete the review and edit steps.” Additionally, Danielle shared, “we do hang around more for some reason after skiing vs. paddling and it seems to be a period of time where some people are kind of sitting around for a little bit.” Lastly, despite the type of recreational activity, Danielle stressed the importance of maintaining focus on the activity vs. the *CAPTURE & Share* program: “You know the only thing I’d be very
cautious of is to not make the picture taking the event and to not burden people or increase frustration.”

Classroom applications. Even though the participants with CCN were not students, the volunteers still discussed the value of program carry over into the educational setting. Three of the volunteers had currently or previously worked in public school settings so they provided a few ideas of how photos and videos may be beneficial in the classroom.

Allison shared, “I see the program having a lot of classroom applications and I know as a classroom teacher that I’ve used pictures and photos for students for writing and it’s been amazing for them to write from their real experience.” Also, when considering school-age participants, Danielle mentioned the possibility of informing teachers about the program: “I wonder if letting their teachers know would be a good idea, the students may want to bring those pictures into their school and classroom.” Lastly, Allison mentioned the idea of having participants practice using and wearing capture technology in the classroom or home setting: “If you are doing that whole I do, we do, you do; if you would do that whole series ahead of time like maybe in a classroom or separate quiet area.”

The CAPTURE & Share training program. In the last feedback session, volunteers had an opportunity to provide feedback about the quality of the distance training. Volunteers had positive comments about the training modules and discussed ideas about how to modify the training and focus on larger groups of volunteers. Melanie thought that the training could be incorporated into the annual orientation for volunteers in the adaptive sport program:
I think that using this type of program with modules and having it be part of the annual training program could be good, volunteers would have to complete the training and take quizzes to make sure they were paying attention.

Melanie also mentioned that the training program would be beneficial for volunteers who have not had a lot of experience supporting people with communication disorders:

It would be beneficial for volunteers in general in an adaptive program because often times when I hear or see something that I would tweak as a speech pathologist, when people are either giving directions, or trying to communicate with someone that has a communication disorder, you just know that they don’t do it everyday.

Danielle suggested that a separate training might be helpful to focus specifically on technology and the various operational skills for the equipment: “The volunteers first interaction with technology should not be with the participants, but separate from the participants so that volunteers could get used to the technology and then introduce it in the context of the activity.” Furthermore, Danielle indicated, “Until I actually do it, is when I get closer to understanding it.”

Lastly, Danielle talked about how the training encouraged volunteers to consider their own personal barriers or supports:

I’m usually thinking about the participants’ barriers, not my own barriers, so it was good that you had us consider our personal barriers, and I liked that that was included because it is not something that I typically do. I had to reflect on this during the training and say, okay, what is my issue here?

**Theme 3: Barriers.** Considering the nature and novelty of the *CAPTURE & Share* program it was not unexpected that all the volunteers encountered different types of barriers during the kayaking lessons. Based upon analysis of the data, two primary
types of barriers were determined: (a) stakeholder (e.g., volunteer, participant or caregiver), and (b) technology and equipment (e.g., cameras, accessories, kayaks).

**Stakeholders.** Barriers for stakeholders were discussed by volunteers in two key areas: (a) communication, and (b) skills and characteristics of participants. Volunteers discussed challenges around communicating including how to naturally engage with people who rely on multiple modalities for expression. Danielle indicated,

I think there is a gap in learning communication systems. I personally feel that’s that hardest thing to get over. Personally my most uncomfortable times with people is the communication, it’s a big personal barrier for me. I really get intimidated by the lack of being able to communicate effectively.

Amy talked about a challenge she has encountered as a volunteer supporting participants in adaptive recreation: “I just don’t want to misinterpret anything that he is trying to tell me. I agree with you that that communication is a challenge.”

Danielle realized that sometimes she created the communication barrier by speaking too much during a recreational activity. She shared an example of how the CAPTURE & Share program helped her realize that excessive talking was a personal barrier that she now recognized and wanted to change, “I just kept hearing my own voice, in the video that I took. I was annoying myself, ‘Take the video’, ‘hold your hand up’, it was just too much direction that I was giving to Jeff.”

Volunteers also discussed stakeholder barriers relative to specific participants and their ability to be independent with photo and video capture during the kayaking lessons. Melanie talked about the multiple tasks that needed to be considered while capturing photos and videos:
I think head positioning was a challenge. She does not really know where her head is so it’s hard to say, ‘look at the bridge’, so she is looking at the bridge but not looking all the way at the bridge, but she still uses her eyes to track as opposed to turning her whole head or her whole body, I think she sometimes forgot about the camera.

Danielle shared that when she was supporting Jeff she noticed, “He has a short attention span, so he would be looking all around, it was sometimes difficult to get his attention to focus.” Amy indicated, “At times it felt like a lot for Sam to do.” Peg agreed with Amy and noticed, “Sam was trying to talk, paddle, and communicate with you all at the same time.”

Lastly, three of the volunteers focused on what they referred to as the most challenging aspect of the CAPTURE & Share program, “Review and edit.” Allison shared, “It’s hard to find a place to actually review the photos and then edit them.” The review and edit steps were also discussed earlier in the results section under the first theme.

**Technology and equipment.** All volunteers discussed barriers relative to technology and equipment. Allison stated, “There’s a balance with the technology and the enjoyment of the activity.” Barriers are reported to inform stakeholders (e.g., therapists, parents, caregivers, teachers) about the challenges encountered and possible solutions for future iterations of the program. Technology and equipment barriers were primarily associated with cameras, glare, inability to zoom, and accessories to make cameras wearable.

Three different capture devices were used during the project: a GoPro® camera, a Polaroid Cube, and an iPod Touch. Most of the technical issues were related to the Polaroid cube. The volunteers complained that the Cube did not pair well via Bluetooth
with the iPads. Melanie indicated, “The Polaroid overheated and the button was hard to push.”

Next, all the volunteers were challenged by glare. The volunteers that were using tablets to control photo and video capture had the most trouble in this area. Allison admitted, “I had trouble with the glare and it was not that sunny today, I am imagining when its more sunny, it will be more of an issue.” Amy agreed saying, “I found that same problem as well, the sun glare was difficult to deal with.” Furthermore, Danielle added, “The glare was definitely an issue, even with the brightness turned up it was still really hard to see.”

Also, due to the nature of the kayaking activity, it was sometimes difficult for volunteers to capture close-up shots of people. Danielle shared her disappointment not having the ability to zoom: “The ability to zoom, you know, we don’t really have that”; “the need to zoom, it would be nice in this environment to have the ability to zoom, it would be really helpful. It would be good for photos at least to be able to get the close ups.”

Wearable camera accessories were helpful for some participants and not helpful for others. Peg reported on some significant problems trying to use a head strap and camera with Julie: “Once you tightened it down enough to firm the weight of the camera, then it turned her forehead red and she tried to flip it off several times.” Amy also discussed a problem using a head strap and camera with Sam: “The camera was a little too far up, because he liked to look up at everything, he was filming the sky, at the beginning it was mainly pointed up at the tree tops.” For Allison who was supporting Mike, she recognized that he may need to use an accessory to make the camera wearable:
“He likes to paddle and will be holding on to the paddle, so I don’t think holding a camera will work for him.”

**Theme 4: Supports.** Four out of the 5 volunteers discussed supports they used during the lessons to facilitate success with the *CAPTURE & Share* program. While supporting participants with CCN, the volunteers applied steps of the program and also relied on their personal and professional background and experience.

Melanie, a SLP found, “just prompting was the most effective, I tried to get her to look around the entire group.” Allison, a reading specialist, shared her strategy for teaching: “I’m going to show you how to do it and then we’re going to do it together and then you do it on your own.” Danielle, a retired information technology professional, revealed, “a lot of times for Jeff, it’s a physical touch to get him to turn when he is very focused in the other direction.” She found that providing a light physical cue was helpful to focus Jeff’s attention and reduce his tendency for distraction.

Other types of support that were discussed focused on technology and teaching how to use capture devices. Some volunteers were comfortable with technology and others relied on assistance from the technical support volunteer. Peg shared, “actually, I didn’t have too much trouble with the technology, actually because I had help.” (i.e., technology support volunteer). Peg also discussed other ways to facilitate media capture: “Seeing the photos and videos before will support my understanding to review the photos later with Julie.” Danielle admitted, “being familiar the second and third time with the equipment was a great help.”
Theme 5: Benefits. All volunteers recognized benefits from having participants
with CCN engaged in the CAPTURE & Share program. Benefits were primarily
discussed in the context of perceived benefits for participants with CCN and their
caregivers, although volunteers mentioned some benefits they received because of
facilitating the program. For example, Peg shared,

We knew that by doing this activity that there was something else that was going
to be our focus and that we were actually out to do something else which is to
have a lot of fun. I actually liked the program a lot because of the added
challenge.

The volunteers mentioned perceived benefits relative to participants with CCN.
They indicated that the CAPTURE & Share program facilitated fun, enjoyment, and
provided an additional activity to focus on during the kayaking lesson. Melanie reported,
“it was fun when we beached ourselves, it was cool to get out of the boat and take a selfie
with Carol in the boat.” Melanie also indicated, “it was great to take photos of other
people with the selfie stick.” The activity of taking photos was meaningful, and
facilitated a connection between participants and volunteers. Allison shared, “I felt that
taking photos, especially the selfies, really connected the volunteers with the participants.
I think the participants really seemed to enjoy it too, everyone seemed happy, nobody
was uncomfortable.”

Danielle shared perceived benefits relative to Jeff including his response to using
the program during kayaking. She reported, “he was pretty easy to motivate and I thought
the program was really good for him.” Furthermore, Danielle shared additional details
that she observed when Jeff was collecting and reviewing photos:
You know once he got the camera in front of him he smiled and seemed to like it. He really enjoyed looking at himself, especially when we took the selfie. It was fun for me to see him enjoying himself and looking at his own images. He seemed to enjoy looking at himself more than his sister. I would like to do this again, being part of the program definitely makes you want to do it again.

Volunteers also discussed benefits they perceived for caregivers, including parents. Melanie talked about how Carol’s mother was happy to have photos of her smiling: “One of the successes was that her mom had identified that she does not get smiles from Carol often on camera, her mom was really happy to get that.”

Other volunteers mentioned perceived benefits for family and caregivers and how the photos and videos created a shared space for interaction. Because of having more digital artifacts, families and caregivers now had additional opportunities to interact and engage with each other. Allison said, “I think it was good as the family was together looking at the photos.” Furthermore, Peg recognized that having video created opportunities for volunteers to interact with caregivers: “It was really nice to have the video and to be able to have that to talk to her mother about.” Finally, Amy shared, “I think just to have the participants be able to show their experiences after they do it was very helpful.”

**Conversations with caregivers and participants.** Perspectives from caregivers and individuals with CCN were collected before and after the kayaking lessons with the adaptive sport program. Information was gathered during the prelesson meeting and in a conversation at the end of the 45-day period for sharing. This information is presented across two primary areas: (a) capturing and sharing recreational experiences, and (b) benefits of the CAPTURE & Share program. Data are presented in a descriptive manner
based on the principal investigators’ review and analysis of transcripts, field notes, and other documents.

**Capturing and sharing recreational experiences.** In this section, data from the caregivers and participants are presented individually in a descriptive manner. For each participant and caregiver, a summary is included describing how individuals captured and shared recreational experiences before and after participating in the research project.

**Carol.** Based on the prelesson data from Carol’s mother, Carol had not previously taken photos or videos during recreational experiences. Carol’s mother reported that her dad occasionally took photos of her skiing or playing softball. Furthermore, she reported that the photos and videos had not been edited (i.e., captions or trim) and she only shared with family members via email or limited social media. Both Carol and her mother reported that they were not satisfied with the amount of media that had been taken prior to participating in the research project. They would both like to collect more photos and videos.

Initially, Carol’s mother expressed concern about teaching her daughter how to access social media for sharing. She would like to find a way to support her daughter to be independent with social media; despite her limitations in cognition and language. Generally, Carol and her mother would like to extend their sharing to include more friends in addition to family. Carol’s mother believed that the **CAPTURE & Share** program may encourage her daughter to be more independent.

Carol had multiple opportunities to collect digital media during her kayaking lessons. She took photos and video with support from her volunteer who was in a tandem kayak with her. According to Carol’s mother, photos and videos had been shared with all
immediate family members. She has also shared photos with Carol’s ski coach and is also planning to share with her case manager. She has not used social media and does not have a plan to introduce this option to facilitate sharing.

Carol’s mother reported that the CAPTURE & Share program was a successful experience for her daughter as it increased her opportunities for communication and specifically, a greater number of unprompted attempts to initiate conversation with others. She also expressed that the program provided multiple opportunities for interaction and increased her daughter’s ability to be independent:

For somebody who might not have an opportunity to have a conversation, or to know where to even start a conversation it was right there and that gave independence because it was nothing to do with me, it was their thing that they were doing.

_Julie and Jeff_. Because Julie and Jeff are siblings, their information is presented together based on the prelesson meeting and postlesson conversation. According to their mother, Julie, Jeff, and their caregivers made a significant effort to increase the collection of digital artifacts during recreation and build a more consistent infrastructure for sharing.

Based on information from the prelesson meeting, Julie had never taken or shared photos or videos from recreational activities. Julie’s mother reported that she would like to take more photos; however, this task typically gets put on the “back burner” as there are so many other things to do to prepare for adaptive recreation. Furthermore, Julie’s mother reported that Julie did not have an iPad or other types of capture technology. She was not satisfied with the limited number of photos that had been taken during recreation and would like to have more media. She would like to share media with friends and family but also use it to preview and review recreational activities.
According to his mother, Jeff has had more opportunities than his sister to collect and share photos. Jeff’s mother reported that even though he has his own iPad, caregivers still need reminders to use it to capture photos when they are out in the community. Furthermore, Jeff’s mother shared that some caregivers may take photos or video with their phones and send them to her so that Jeff can look at them. Prior to the research project, Jeff was not on social media and any photos used for sharing were sent to family members via email. Jeff’s mother reported that she would like to have Jeff take more photos during recreational activities but it is difficult for him to hold and direct the camera.

Since the completion of the research project, Julie, Jeff, and their caregivers made an increased effort to capture and disseminate digital artifacts. Their mother reported that they were planning to purchase a GoPro® camera and a second iPad with the goal to collect more photos and share more with family and friends. Using media from the CAPTURE & Share program, both Julie and Jeff shared photos with immediate and extended family in addition to a new following on social media. It was determined that Facebook would be good option for sharing, so both Julie and Jeff with the support from caregivers and family started Facebook accounts. Julie and Jeff’s mother shared, “since getting email addresses from everyone was tough, it was easier for people to just accept a friendship and then they could share and comment on the pictures and the videos that they saw.”

Overall, the entire family has made a commitment to collect and share photos and videos. In addition to buying cameras and starting Facebook accounts, Julie and Jeff’s
mother shared, “we plan to continue capturing whatever they do in all aspects of their lives. They’re swimming, they’re biking, they’re doing everything.” Lastly, Julie and Jeff’s mother talked about being realistic as they move towards increasing these types of activities in their lives:

It’s a process and we’re learning it and I figure in a couple years we will be spectacular. I wish we had started years ago. I am happy that we had this opportunity to just be pushed in the right direction.

**Sam.** Prelesson data was gathered from Sam’s sister and one of Sam’s primary caregivers. Sam’s sister who lives on the West Coast reported that she has taken some photos and videos when she comes to visit Sam on the East Coast. She stated that in the past she used her iPhone to take photos and would share these with other family members by engaging in face-to-face sharing or using her personal Facebook account. Despite Sam owning a small camera, his sister indicated that it is difficult for Sam to push the buttons due to poor motor control and incoordination. Sam’s sister would like to receive more photos of Sam participating in recreation; however, she realizes that capturing photos may not be the highest priority during community or recreational outings.

Sam’s primary caregiver also provided preactivity data about capturing media. He stated that although he is interested in taking more photos, currently photos and videos are not collected during recreational activities. Furthermore, he shared that if more photos were taken he would help Sam to create photo books, talk about activities using the photos, and use photos as a visual prompt for painting. Lastly, Sam’s caregiver talked about sharing photos and expressed that Facebook may not be an appropriate option for Sam as it can be very distracting with the excessive amount of visual and text content that can exist.
Upon completion of the research project, Sam’s caregiver talked about the various ways they have attempted to share media artifacts. He stated:

We have gone back and forth with, trying to put pictures on Facebook, because Sam doesn’t actively use his face book page himself, it’s just like giving photos to the people who are on his face book friend’s list. He doesn’t actually use it himself, so, I don’t know about that as the best method for sharing.

Sam’s caregiver revealed that they have not done a lot of sharing with outside people but are open to doing more when they have time. According to Sam’s caregiver, Sam has spent most time viewing the photos and videos independently; however, Sam’s sister reported that she was happy to receive photos of Sam kayaking and looks forward to receiving additional photos that were collected during the recreational experience.

Mike. Prelesson data were gathered from Mike’s primary caregiver. She reported that Mike does not have a camera and that he has not previously taken photos or videos during recreational activities. Instead, she reported that various staff at the adaptive sport programs have taken photos, but Mike has not seen these and does not currently have these photos. Mike’s caregiver expressed an interest in taking more photos and printing them out so that Mike could enjoy them and send them along to his brothers. Due to motor and physical limitations with Mike’s upper extremities, his caregiver was concerned about how he would hold a camera at the same time he is holding a kayak paddle.

Postlesson data provided by Mike’s primary caregiver revealed that they have had challenges with sharing digital media. They have made some attempts to share via social media as Mike’s caregiver said, “I put up the pictures on Facebook, because people look at them more.” Mike’s caregiver also talked about other plans for using the photos,
saying, “we are planning on printing them out, and hanging them up around the apartment.” Both Mike and his caregiver talked about plans to share the photos including an effort to purchase photo paper as well as frames for the printed photos.

**Benefits of the CAPTURE & Share program.** In addition to providing general comments about the CAPTURE & Share program, parents and caregivers shared specific perspectives about the benefits of the collection and dissemination of media artifacts. All the parents and caregivers discussed benefits of the program and some provided personal accounts relative to the impact they observed.

Julie and Jeff’s mother enjoyed the program and wished she had started collecting artifacts earlier: “I wish we had started years ago. I am happy that we had this opportunity to just get pushed in the right direction.” Furthermore, she was thankful for the volunteers and appreciated their effort in trying something new while also facilitating the adaptive sport experience: “I think everybody did an amazing job. Like you said, you go through it and learn, I mean you didn’t do it before so you learn what works and what doesn’t work and that’s what we all did.”

Carol’s mother was happy to have photos of Carol displaying a genuine smile: “I like the ones of Carol smiling with her friend. They were all real smiles. Carol doesn’t normally smile nicely, so those are very special, the smiling pictures.” Carol’s mother also discussed how the CAPTURE & Share program supported increased opportunities for conversation:
Carol was comfortable enough to start a conversation with the volunteers. I did notice in the video that there was a lot of conversation going on. I think that was good because it was something that they were doing that they could do together that had conversation involved. For somebody who might not have opportunity to have a conversation, or to know where to even start a conversation it was right there.

In addition to increasing opportunities for conversation, Carol’s mother shared that the program also facilitated Carol’s ability to be more independent:

It was a good experience for Carol because it was something she does not always have the chance to do. In addition to the conversation and photography part of it, she had an opportunity to be a little more independent and that was nice because it was nothing to do with me, it was their thing that they were doing.

Julie and Jeff’s mother was thankful for participating in the research, she shared benefits that she observed during the activities and indicated that sharing photos can impact the perspectives of others:

For Jeff and Julie, I noticed the benefit that they felt very proud sharing the different events that they’re doing. Because a lot of times people think, oh it’s so tough, and when they see that it’s just very normal for us, and normal for Julie and Jeff, and that we have fun, then they feel better, which in turn, makes me feel better. It’s our normal and it’s good.

Sam’s caregiver talked about how the photos and videos have been most beneficial for Sam for previewing and preparing for upcoming recreational activities:

“We’re going kayaking tomorrow and it’s nice to look at how fun that was, and being able to utilize the photos as a tool for communication.” Additionally, Sam’s caregiver stressed that Sam has enjoyed independently reviewing the photos on his personal tablet and benefits from having context in the photos:
He always likes seeing pictures of himself but he also really seemed to be more interested in the pictures that you can tell what type of activity that was taking place. It’s kind of nice when the pictures are related to his actual life, rather than just photographs of landscapes. Those pictures are pretty, but if you can tell what the activity is and can see the kayak in the picture, then that was positive for him, because he was able to make a connection about where the picture was from.

Mike’s caregiver indicated that he enjoyed looking at the photos. Despite reporting difficulty in sharing photos, Mike’s caregiver said that he is happy to review the media independently and prefers to focus on printing out a few special photos that he will hang up around his apartment. Mike’s caregiver also stressed the importance of supporting autobiographical memories as she recognized, “It will be nice for Mike to have a record of what he has done in the past for him to review and enjoy.”

**Discussion**

The results of study 2 revealed a process through which people with CCN who engage in active recreation can be successful in capturing and sharing their experiences. Also demonstrated, were the needed levels of support from volunteers and caregivers. According to the perspectives of different stakeholders, collecting digital media during active recreation has value and can be beneficial for people with CCN and their caregivers. Overall, the study was successful due to the collaborative nature of the community of people in active recreation that included volunteers, participants with CCN, caregivers, recreational therapists, and program administrators. All stakeholders were dedicated to the process of ensuring a safe and enjoyable recreational experience while also supporting participants to document and disseminate their personalized media artifacts.
Implementation of the CAPTURE & Share program depended upon many factors. Critical supports were provided by volunteers and caregivers as they assisted participants with CCN to effectively collect artifacts and create opportunities to share. Volunteers were successful as participation facilitators as they assisted people with CCN in the process of collecting and capturing digital media. During implementation, volunteers applied creative problem solving skills to support independence to capture a range of media artifacts from various perspectives.

Volunteers’ supported the collection of media during the recreational experience while family and caregivers took on the primary responsibility for sharing photos and videos. The extent of media sharing was impacted by motivation, time, and interest of the caregivers. Some caregivers shared extensively and developed new methods for dissemination (i.e., use of social media), while others enjoyed more independent review and did not share with individuals outside of their family. Despite challenges, stakeholders remained motivated during the process and achieved individual success due to the support and collaboration of the adaptive program community. Many opportunities for communication were created through the entire program as participants, volunteers, and caregivers engaged in the process of collection and dissemination.

**Previous Research in AAC**

**Participation.** Previous research has investigated participation; however, challenges exist with how to define and effectively measure outcomes in this area. The participation model (Beukelman & Mirenda, 2013) and the World Health Organization’s International Classification of Functioning, Disability, and Health (ICF) (WHO, 2013)
provide the AAC community with a starting point when considering barriers and supports to participation for people with CCN.

Beukelman and Mirenda (2013) developed the Participation Model as a framework for assessment and intervention for individuals who use AAC. The Participation Model stresses the need to identify participation patterns, barriers, and specific communication needs for individuals with CCN. The model highlights both opportunity and access barriers which may be common factors for individuals who participate in community based recreational programs (Datillo et al., 2010). Opportunity barriers may include the skills and knowledge of AAC facilitators which in the case of recreation, may relate to a volunteers’ attitude or their ability to safely adapt activities to support full participation. On the other hand, access barriers relate to limitations imposed by AAC systems or the individual skills and characteristics of people who use AAC. Access barriers may be influenced by an individuals’ physical and motor limitations, capacity for decision making, or sensory/perceptual skills. Beukelman and Mirenda (2013) encourage AAC stakeholders to recognize opportunity and access barriers as they plan current and future assessment and intervention tasks.

In addition to the Participation Model, the ICF (WHO, 2013) offers a broad perspective relative to individuals with disabilities and their participation in society. Raghavendra et al. (2007) applied the ICF to the field of AAC and discussed the interaction between environmental factors (e.g., communication partners, available AAC systems) and personal factors (e.g., age, background, family support, motivation) for individuals with CCN. This framework is important to consider as it broadens the definition of participation and recognizes individual psychosocial factors (e.g., self-
determination) and their impact on the level and type of participation that occurs for people with CCN.

In the current study, participation was a key component when considering the role of volunteers and individuals with CCN. During the kayaking lessons, volunteers facilitated participation and supported individuals with CCN to collect and capture their recreational experiences. As outlined in the CAPTURE & Share program, volunteers were asked to consider environmental and personal barriers and supports for themselves and individuals with CCN. Both the Participation Model and the ICF (WHO, 2013) recognize the importance of examining barriers and supports for stakeholders.

Although some volunteers found it challenging to consider personal and environmental barriers, it facilitated planning and provided structure for the volunteers as they reflected on their role as participation facilitators. Since each model considers physical environments, the current study helps to address and inform barriers present in outdoor settings of community based recreation. Since the CAPTURE & Share program created opportunities for autonomy and choice making, the volunteers maximized participation and more effectively recognized potential opportunities for communication and interaction during the experience.

**Communication partners.** Previous research has demonstrated the critical role of communication partners in supporting people who use AAC to be successful in their development across linguistic and social domains of language (Kent-Walsh et al., 2015). Research has investigated how teachers and parents in educational and residential settings support individuals who use AAC to achieve these types of language goals (Binger et al., 2008, 2010; Kent-Walsh et al., 2010; Light & Kelford-Smith, 1993). The focus of partner
research in AAC has therefore been on family and paid staff with traditional outcomes related to language domains.

In contrast, the current study focused on training communication partners (i.e., volunteers) to facilitate participation across a series of community based recreational activities. The trained volunteers were expected to support participants with CCN to access recreational activities and capture their experiences. It is not unusual for communication partners to have multiple roles when supporting people with CCN. In this study, volunteers were responsible for ensuring a safe environment, supporting the collection of digital media and facilitating full participation and enjoyment across the entire experience. Volunteers were not only communication partners, but also participation facilitators.

Throughout the experience, volunteers engaged in an active process that allowed them to apply skills, share feedback, reflect, and consider modifications for future lessons. They relied on support from each other and caregivers as they shared their perspectives and worked towards making modifications and adjustments to increase independence and support full participation.

An important benefit of PAR was the self-reflection process that was instilled in the volunteers. The PAR framework empowered the volunteers and demonstrated how their active participation can positively influence their approach as they support individuals with CCN to collect and share. One volunteer Danielle, talked about a specific strategy that she was going to apply, while also considering future iterations of the program in different recreational settings:
I think I’m going to slow down the process to make all the pieces work. Repetition is helpful; it was helpful that we all supported the same individual during the three lessons. It would be nice to do this with other activities so that the individuals would see the same routine, using the cameras again in different settings.

As collaborators in the PAR process, the volunteers in the current study had multiple opportunities to reflect and share their experiences relative to the application of the CAPTURE & Share program. The PAR framework supported a process of feedback, revision, and planning which could be applied to AAC research that focuses on partners and teams of individuals that support people with CCN. Conducting research using the PAR framework ensured an inclusive approach from all stakeholders when considering interventions that may be beneficial for partners or people with CCN.

Recreation and community inclusion. Light and McNaughton (2015) encouraged researchers to apply a more holistic approach to AAC by focusing on participation patterns of individuals with CCN across real world contexts. They suggested that future AAC research should support positive social change and improve the quality of life of people with CCN not only at the level of interaction with family and friends, but also across broad societal contexts as well. Previous research has focused on the role of leisure, recreation, and community inclusion for individuals with significant disabilities who use AAC (Datillo et al., 2008; King et al., 2014; McNaughton & Bryen, 2007; McNaughton, Bryen, Blackstone, Williams, & Kenney, 2012). King et al. (2014) recommends that future research should investigate how youth with severe disabilities access and participate in recreation and leisure in their community.

Recreational experiences are meaningful and have a positive impact on improving quality of life for all stakeholders (Zabriskie et al., 2005). The current study was designed
to include a community of stakeholders who are passionate about making recreation accessible and available to individuals with significant disabilities. The results revealed that the group of volunteers not only supported people with CCN to participate in active recreation; but, also to successfully collect and share their experiences.

The group of volunteers were successful in implementing the program for a variety of reasons. Since they all had previous experience in supporting people with disabilities in recreation, they were familiar with the setting and could focus on the additional task of capturing digital media. Also, the training they received in study 1 prepared the volunteers to participate and provided them with an opportunity to thoroughly consider intrinsic and extrinsic barriers and supports. Because of the training, the volunteers were confident in their ability to embed the CAPTURE & Share program within the recreational activity. Finally, since the volunteers demonstrated a genuine passion for accessible recreation, this common factor contributed to their collaboration and willingness to share ideas and support each other to eliminate common barriers.

Recreational programs provide a meaningful source of activity and social engagement for people with CCN across the lifespan. Youth, young adults, and even older adults with developmental or acquired conditions can find extensive benefits from participating in community-based recreation. McNaughton et al. (2012) recommend that for adults with CCN to make successful transitions to society they need to: (a) have a safe and supportive place to live; (b) participate in meaningful activities; (c) access services and support; and, (d) develop friendships and relationships. Active recreational programs can assist people with CCN to accomplish these goals as the activities are rich with
opportunities for socialization, engagement, and participation in community-based settings.

Through participation in recreation, the participants from the current study have accomplished goals b-d outlined by McNaughton et al. (2012). Recreational activities have defined the lives of these individuals, offering them rich opportunities for meaningful interactions and social closeness. Active recreational settings provide the infrastructure for individuals with CCN to access, engage, and participate. Volunteers are an important part of making the experience successful and providing key support to participants with CCN.

With the support of volunteers, the CAPTURE & Share program can be an important factor in assisting participants to share their recreational experiences. By sharing personalized media, participants with CCN can initiate and sustain social networks. The digital artifacts gathered from the CAPTURE & Share program could also assist in educating the public about what participants with CCN can do in recreational settings. Furthermore, the photos and videos could serve to motivate others to participate and provide a way for people to make connections through shared activities of interest. Digital artifacts could be a starting point for interactions with new partners while also providing familiar partners with a method to reminisce and remember good times. These types of interactions build social closeness and generate opportunities for participants with CCN to share what is meaningful to them.

**Participatory Action Research (PAR) and Contributions to Future Programs**

The process for studies 1 and 2 is depicted in Figure 3 and could serve as a model for community-based programs with goals to improve engagement, expand social
networks, and support full and active participation for people with disabilities. The PAR approach supports collaboration between the investigator and the participants in the study, referred to as coresearchers. The coresearchers (e.g., volunteers, participants with CCN, and caregivers) were involved across all levels of the study and strongly influenced the direction of the study outcomes. Across the different components of study 2, the coresearchers had several opportunities to provide feedback and share their experiences. Three important factors which aligned with the principles of PAR positively impacted the outcomes from the study: (a) input from all stakeholders, (b) applied feedback, modifications and outcomes, and (c) research in a natural context.

**Input from all stakeholders.** It is common for people with CCN to have a team of individuals who support them across educational, vocational, and/or community settings across their lifespan. Support teams may change based on significant transitions or life events; however, each member of the team has a unique perspective and contribution that should be considered. In this study, input was gathered from team members that included caregivers, program directors, volunteers, and participants with CCN. Over the course of the study, these individuals had opportunities to provide their unique perspectives.

The process of gathering feedback provided rich data from multiple perspectives and had a significant impact on the direction of the research outcomes. Volunteers had three consistent opportunities to provide input about the application of the program as they met with the principal investigator during scheduled sessions after each kayaking lesson. Most input gathered from the volunteers focused on the completed lesson, as the experience was fresh on their mind.
It may have also been beneficial to have input sessions with volunteers prior to the lesson to review plans and consider the current conditions of the natural environment and how they may impact photo and video capture. This would have allowed the volunteers to discuss their plans while also informing other volunteers about the types of equipment and accessories they were planning to use. Lastly, volunteers provided input during the lessons as they encountered issues or found specific methods to be successful. Since the volunteers were all mobile in tandem or solo kayaks, they could easily approach other volunteers to share a quick idea or suggestion.

One of the challenges in gathering input from caregivers and participants was having time to connect before and after the recreational lessons. This was due to a range of logistical and personal issues that were individual to each caregiver and participant. For example, on some occasions, caregivers may have been late to the lessons due to the remote recreational settings which required additional travel time. Furthermore, once participants arrived on site, there were many tasks to complete to prepare for the lesson. After the lesson, caregivers and participants had limited time to provide input as participants were hungry, needed the bathroom, or had other appointments and activities to attend.

The volunteers proposed a solution to this issue by ending the kayaking lesson 10 minutes early to leave time to review photos and get ideas about capturing different types of artifacts in the next lesson. Also, since it was challenging to gather in-person feedback, the principal investigator engaged with caregivers via email or on the phone. Most feedback from caregivers and participants was gathered during phone conversations after the completion of all three lessons.
Applied feedback, modifications and outcomes. Innovation, creativity, and a willingness to collaborate are important qualities for professionals in the field of AAC. The process of PAR supports the application of these types of skills which may impact intervention programs for partners and people with CCN. The concept of immediate feedback is a component of PAR that can be useful in making informed decisions relative to AAC as stakeholders consider methods to improve and expand opportunities to support communicative competence.

The cycle of application, feedback, reflection, and planning contributed to the wealth of ideas that volunteers shared as they worked towards facilitating participation, communication, and independence. In the present study, the volunteers valued the fluid process of problem solving while supporting participants with CCN to further engage and participate. Because volunteers had previous experience in adaptive recreation, they could more effectively focus on applying the capture process while also recognizing the participant’s strengths and limitations. During study 2, the volunteers actively worked towards making modifications that supported independence and the individual preferences of each participant.

During the lessons, volunteers needed to make quick decisions about necessary modifications to support effective outcomes. For example, during one session, Allison assisted Mike as he was having difficulty managing his camera equipment since he was uncomfortable in his kayak and needed a positional adjustment. Allison communicated with the program director to adjust Mike’s position so he could participate in collecting artifacts. While Mike was receiving the positional support, Allison managed the collection of photos on her tablet until Mike was ready to use his action camera again.
This example showed how the volunteer applied a quick modification to the plan to support Mike.

**Research in a natural context.** Moving from a training program delivered online to implementation in real world contexts revealed unanticipated challenges relative to the weather and natural elements, time required to set up and complete the components of the program, and issues related to technology and access.

Study 2 occurred in the context of a community based recreational activity across three different outdoor settings (e.g., public lakes and boat launches). The natural environment was an important component to consider during implementation of the program. Even though the camera equipment was protected in waterproof casing, issues related to sun glare, wind, and choppy water provided additional challenges. During one lesson, it was difficult for volunteers to manage their cameras due to the rough open water which forced them to focus only on paddling. Once they had moved to a section of the lake that was calmer, they were then able to set up Bluetooth connectivity and facilitate capture.

Next, the process for setting up accessories and capture equipment was time intensive. During the prelesson period, there were additional activity specific tasks that needed to be completed to ensure safety and comfort for a kayaking lesson. These tasks along with setting up the accessories and equipment for capture, extended the prelesson period and resulted in volunteers having less time to follow each component of the program. For example, volunteers reported having limited time after the lesson to review and edit digital artifacts.
Lastly, volunteers experienced some difficulty with pairing tablets and cameras using Bluetooth technology. These issues occurred during the kayaking lessons and seemed to be caused by interference with other devices and Bluetooth signals from other volunteer/participant dyads. Also, when the volunteers were kayaking, some of them found it difficult to maintain an appropriate distance to ensure a consistent connection. Volunteers would frequently drift on the water or struggle to keep up with their participant who was in a different kayak.

Volunteers were expected to balance issues related to kayaking, photo and video capture, and the elements such as weather or other environmental considerations. This type of real world application was critical to assist the volunteers and research team to understand how to most effectively support participants in the capture process and realize any issues that may occur in the natural context. Due to the nature of PAR, the volunteers had frequent opportunities to modify the process and consider alternative methods to support independence and effective capture.

**Key Factors That Influenced Outcomes**

Based on the perspectives gathered from all stakeholders, the results of this study indicated that volunteers were successful in supporting individuals with CCN to capture digital media, while caregivers and participants shared the media. Despite the overall success of the program, challenges remain relative to time, technology, and the individual skills and characteristics of all stakeholders. Factors associated with the setting and program, volunteers, caregivers, and participants with CCN impacted the outcomes of this research.
Factors related to the setting and program. Previous research has indicated that recreation is an area that improves quality of life by facilitating enjoyment and enhancing social connections for individuals with disabilities who use AAC (Datillo et al., 2008, 2010; Zabriskie et al., 2005). Recreational activities provide multiple opportunities for communication and socialization in community settings for people with significant disabilities. A challenge for some individuals with severe disabilities can be a lack of opportunity to access and participate in these settings.

In the present study, the nature of the recreational setting was an important factor that contributed to the collection of photos and videos. For some participants with CCN, it was their first time kayaking and typically people like to record novel events and experiences that occur in their lives. The setting and overall activity, provided an enjoyable and motivating experience with many opportunities for photo and video capture. Both the scenic features of the natural environment and the design of the program were factors that positively influenced the implementation of the CAPTURE & Share program.

The infrastructure of adaptive recreation provided consistent opportunities for collecting photos and videos at different time periods across the activity. These time periods were prelesson, during the lesson, and postlesson. In the prelesson period, volunteers and participants set up equipment and practiced photo and video capture; during the lesson, participants and volunteers actively took photos and videos; and in the postlesson period, volunteers reviewed, reflected and planned modifications for next time.
The *CAPTURE & Share* program was developed to be applicable to recreational activities across multiple settings. Even though kayaking was selected as the activity in this study, there are several other recreational activities and settings that may be appropriate for applying the *CAPTURE & Share* program (e.g., skiing, hiking, cycling). Each activity has its own unique natural setting (e.g., lake, nature trail, mountain), which also creates meaningful and diverse opportunities for photo and video capture.

As seen in study 1, the volunteers were successful in applying their knowledge to a wide range of recreational activities that were included in the hypothetical probes. They demonstrated flexibility and problem solving as they applied program components to make plans for participants with CCN across different types of activities. The volunteers’ successful application of the training program in study 1 influenced their ability to be flexible and implement the program across the natural context.

**Factors related to volunteers.** Recreational activities rely on support from volunteers who have been recognized as important supports for people with CCN who engage in active recreation (Hajjar et al., 2016). These individuals are motivated communication partners who share common interests and are willing to do more to enhance the experience. The volunteers in the present study had a minimum of 2 years of experience and were motivated to provide support for access and full participation. One individual reported that she had been volunteering with adaptive sport programs for over 30 years. This level of commitment is common among community based volunteers as they share a passion for the benefits of recreation and want to ensure that sports and other activities are accessible to others. Volunteers have an important role to assist individuals with disabilities to access sport and leisure by demonstrating an interest in the
activity and sharing their unique skills and talents to support recreational inclusion. They assist to foster an inclusive recreational community which involves caregivers, participants with disabilities, program staff, and the public.

Volunteers come to the experience with a range of skills, talents, and recreational interests. Even though some volunteers were not comfortable with managing the capture technology, they were willing to learn and collaborate with others to make the experience successful. It is important to note that the CAPTURE & Share program was done in addition to other responsibilities that volunteers had during the lesson. Despite this, the volunteers worked hard to integrate the program into the existing infrastructure of the kayaking lesson.

**Factors related to caregivers.** Caregivers facilitate participation and create opportunities for meaningful recreational experiences to happen for individuals with CCN. They are critical supports across the entire experience. Caregivers are often responsible for finding recreational programs that are safe, affordable, and accessible. The caregivers in this study were dedicated to ensuring consistent participation in recreation and leisure activities for individuals with CCN.

Caregivers recognize the benefits of recreational activities as they increase community engagement, physical activity, and socialization. Sometimes, paid caregivers are solely responsible to make active recreation happen and in other situations parents or other family members support participation in the activity. In the present study, 3 of the participants with CCN had a parent as the primary caregiver while the other 2 participants had paid primary caregivers. The 2 participants with paid caregivers were both over 50 years old, and one individual had family out of state. In either case, family
or paid caregivers were responsible for coordinating weekly schedules for participants that may involve working and/or volunteering, attending medical or therapy appointments, or supporting independence in activities of daily living. Despite competing demands, the caregivers in this study were committed to consistently making the recreational experience happen.

In the present study, caregivers were not only responsible for transporting participants to the recreational setting; but, they were also key supports in sharing digital media. Caregivers were asked to support participants with CCN to share their media artifacts with individuals in their social networks. This task depended upon factors related to time, interest, motivation, experience, and opportunity. For example, some caregivers reported not having enough time to organize and facilitate sharing. In contrast, other caregivers developed or updated social media profiles and purchased additional equipment (e.g., action camera) to support future collection and sharing. Not every caregiver was “tech-savvy” so it was important to support the type of sharing that was comfortable for each family.

The caregivers’ experiences with sharing varied over the course of the 45-day period of dissemination. Some caregivers reported that lack of time was a barrier to sharing. Caregivers also indicated it was difficult to initiate sharing during daily face-to-face interactions with friends or acquaintances. Those caregivers who did report using social media in addition to face-to-face interactions, also discussed the idea of limiting sharing as not to overwhelm people with CCN or their followers. Overall, some caregivers shared more frequently and extensively, while others were more content to independently review their photos and videos and not use social media.
The caregivers had the choice to share the digital artifacts in a manner that aligned with their personal preferences. Giving the caregivers this type of control was important as they look for opportunities to share information about their loved ones with friends and family members. Caregivers typically encounter many types of stressors in their lives as they advocate for services or educate others. The CAPTURE and Share program provided caregivers and participants with CCN a sense of control as they made decisions about who to share with and which artifacts to share.

**Factors related to participants.** Participants with CCN were successful in capturing and sharing media artifacts for a variety of reasons. The participants in this study had extensive caregiver support, previous experience in active recreation, access to cameras and technology and motivation to participate.

During feedback sessions, the volunteers mentioned that many of the participants engaged in multiple adaptive sports throughout the year. This indicated that individuals with CCN and their caregivers found great value in participating and seeking out opportunities for leisure across different seasons and activities. Previous experience in recreation was beneficial for participants as capture technology and other accessories were introduced and integrated into the lesson. Participants with CCN were more familiar with not only the physical demands of the activity, but also the routine, procedures, and expectations of the lesson.

Also, participants with CCN were successful in capturing experiences because they had an opportunity to try multiple methods for collection. If one type of camera or wearable accessory did not work, there were other ways for individuals to capture their experience. Despite the physical demands of the recreational activity, the participants and
volunteers were committed to capturing media and were actively engaged in all aspects across the experience.

With assistance from volunteers, the participants wore different cameras and various accessories throughout the experience. Since the capture devices and wearable accessories were new pieces of equipment for the participants, it was sometimes difficult to adjust the gear and make it fit comfortably for the duration of the lesson. For example, on one occasion, Julie was unable to tolerate a head strap for her camera, so she switched to using a boat mount. During another lesson, Mike required a break from wearing his camera as it was too tight around his lifejacket. When setting up participants for capture, they should have time to practice, so they can try wearing the different accessories and equipment. It is important for the equipment to fit comfortably so that participants are not distracted or uncomfortable during the lesson.

Intrinsic factors mediate communication success and failure for people with CCN (Light & McNaughton, 2015). Participants in this study had high levels of motivation to participate, confidence in themselves to take on new challenges, and resiliency to deal with unexpected events. It seems likely that active recreation has a role in facilitating intrinsic factors for people with CCN. Based on observation and caregiver report, all participants were motivated to participate in the kayaking activity as they all sustained a high level of interest and involvement for the duration of the activity. Even with extensive physical and motor tasks, the people with CCN in this study, showed resiliency when faced with various challenges. Like the volunteers, these individuals were dedicated to the recreational activity and received extensive benefits through participation and engagement.
Since employment and education were not primary activities for most of the individuals in this study; recreation was paramount and provided a critical outlet for these individuals. For some people with significant disabilities, recreation can define one’s life like work or school. The work/life/play balance is different for all individuals with CCN and depends upon many factors related to location, opportunity, skills and characteristics of the individual, and caregiver advocacy and support.

**Implications of Findings**

The recreational setting has many benefits to offer individuals with disabilities and CCN. Leisure and recreational activities facilitate a high level of enjoyment and provide multiple opportunities for social interactions in public settings (Datillo et al., 2008).

For participants with CCN and their primary caregivers, it is important to consider how they can effectively collect and share experiences in a manner that is accessible and comfortable for both the participant with CCN and their primary caregivers. Photos and videos should be collected and disseminated to provide individuals with CCN increased opportunities for enjoyment, communication, and social interactions. To reduce barriers, maximize benefits, and realize the full potential of the CAPTURE & Share program, implications are presented across four different areas: (a) practice settings, (b) SLPs & related professionals, (c) caregivers, and (d) participants with CCN.

**Impact for practice settings.** Increasing awareness and educating key stakeholders about the CAPTURE & Share program could be an effective strategy to support sharing and may increase opportunities for communication across clinical, educational, and community settings.
Traditionally in the recreational setting, volunteers are responsible for reducing physical barriers and supporting participants with disabilities to access a range of adaptive sport activities. In this study, volunteers were responsible for additional tasks as they also integrated photo and video capture across the activity. In feedback sessions, volunteers revealed some challenges with photo and video capture; however, they also shared positive feedback about the benefits and opportunities that emerged after implementation. Changes in future iterations of the program may include providing more time for the review and edit phase, finding additional accessories to facilitate independent capture in other sports, and having additional practice time for volunteers and participants to try the capture equipment.

Results of the study indicated that the CAPTURE & Share program should also be considered in additional community, educational, or clinical practice settings where people with CCN live, work, play, and access services. For example, in healthcare settings, it would be beneficial for patients with CCN to capture aspects of their therapy sessions to share with family and friends. Patients, in collaboration with therapists or therapy assistants, could share photos or videos of their intervention plans to educate caregivers and make them aware of therapy activities. In educational settings, the CAPTURE & Share program could be used across a range of activities with teachers and/or therapists. Daily activities could also be captured and then reviewed later. These photos or videos could be used to assist students to review key concepts or share assignments and activities with family and friends. Also, teachers or therapists could integrate photos and videos into the academic curriculum. These personalized artifacts
could be used to further engage students and enhance motivation for learning in areas such as literacy, vocabulary, or comprehension skills.

All individuals with CCN should be encouraged to visit new places and try new activities in their local and regional communities. Even a simple walk around the neighborhood could be filled with opportunities for photo capture that could be shared later with professionals or individuals within ones’ social network. These everyday experiences could be a starting point for building a photo library that includes familiar places, people, and activities. For some individuals and caregivers, they may want to move beyond these daily experiences and expand their opportunities for different types of recreation. Active recreation may not be for everyone; however, these environments tend to be rich with opportunities to engage with others and share life-changing experiences.

In many recreational settings, the structure of planning before, capturing during, and sharing after is a framework that works for many activities and can help to ensure settings and experiences create new opportunities in the future, regardless of any existing barriers. The digital media artifacts may be the final product; however, the process of planning photo capture, participating in capture, and sharing the results of capture are the most important components. The entire process of collecting and sharing digital media is filled with opportunities for communication, interaction, and making connections with familiar and unfamiliar partners.

**Impact for speech-language pathologists and related professionals.** SLPs and related professionals may not be aware that their clients, patients, or students participate in active recreation and may want to share their personal experiences. The *CAPTURE & Share* program could be integrated into the professional work of SLPs and other related
professionals. The integration of personalized media artifacts from recreation may support communicative competence for children, youth, and adults with CCN. With greater access and use of personalized media, motivation for learning may increase as meaningful visual content is used to improve social, communication, and language skills.

SLPs may decide to incorporate media collection and sharing during their individual or group therapy sessions. For example, as seen in the recreational setting, the process of capturing photos and videos can increase opportunities for communication and provide motivation for participation. The fact that cameras can be adapted with different types of accessories and wearable products promotes independence and allows individuals to capture media from their unique perspective. In school and community settings, SLPs could implement these types of activities with their students and clients with CCN. Activities could support competencies across the linguistic, social, operational, and/or strategic domains.

SLPs should also consider using the CAPTURE & Share program with adults. Personalized media could be integrated into AAC systems for interactions with communication partners. For example, SLPs could work collaboratively with adults to create visual scene displays (Beukelman et al., 2015) with digital photos taken from personal experiences. Also, SLPs could use personalized photos to support the process of coconstructing messages with adults and their caregivers. Finally, SLPs and related professionals could assist in the development of creating photo books or video diaries that support autobiographical memories for people with CCN and individuals in their social networks.
As reported in the present study, people with CCN were involved with many steps in the process of capturing and sharing digital media. SLPs are in a good position to support this type of activity and to realize the potential benefits relative to communication and learning for their clients, patients, or students with CCN. SLPs should consider extending their assessment and intervention services to include community-based recreational settings. It is possible for SLPs to work more closely with certified therapeutic recreational specialists to enhance communication and participation in recreation. Furthermore, SLPs could be important stakeholders in the continuing education of AAC facilitators that exist in recreational settings.

**Impact for caregivers.** Despite the influx of photos and videos from the kayaking lessons, there was variation in the frequency and type of sharing that occurred. For example, one caregiver shared photos via newly created pages on social media, while others created more personalized opportunities for independent review and reflection in the home setting. Julie and Jeff’s mother, shared that she was planning to buy a new action camera that could be used by her children specifically during recreational experiences. Since she participated in the kayaking lessons along with her adult children, she recognized the value of capturing photos and videos in recreation and expressed a desire to continue this type of activity.

Limited access or unavailability of camera equipment can make it challenging for caregivers to collect and capture moments during recreational activities. Unless the adaptive sport program owns cameras and accessories, the equipment must be provided by the caregivers or guardians. Even if the equipment is available for capture, sharing photos or videos involves an extensive process. Media artifacts need to be reviewed,
edited, transferred from devices, labeled, organized, and stored. This process takes time and can be burdensome for caregivers who have many other priorities and responsibilities. Making a commitment to the process of collecting and sharing media will require additional resources for caregivers as they may need specialized training or other equipment.

Each caregiver had a different approach to facilitate sharing based on their personal experience, knowledge and skills relative to technology, time, and schedules. Even though the principal investigator collected information about caregivers sharing patterns, it is difficult to predict how family members or paid caregivers may follow through in the dissemination of media artifacts. Sharing patterns may ultimately depend upon the quality and type of artifacts collected, the type and availability of resources for sharing (e.g., technology, devices), or past experiences with sharing personalized media.

Despite their previous sharing patterns, some caregivers preferred sharing via digital methods and others attempted more face-to-face interactions. For example, Carol’s mother was not comfortable teaching her daughter about how to access and upload photos and videos on social media. She was concerned that Carol may “get into trouble online” or “navigate to unfamiliar or inappropriate pages.” However, Julie and Jeff’s mother focused primarily on digital sharing by developing pages on social networking sites and uploading photos and videos from their kayaking lessons. Lastly, Sam’s caregiver discussed that he did not think that sharing via social media was meaningful for Sam as he was often distracted by the amount of visual information located on social media platforms.
In all these situations, it is likely that caregivers would benefit from assistance to facilitate sharing. Depending upon the individual, help may come from skilled professionals, family members, or community volunteers. The goal for educating caregivers would be to empower them to create more opportunities for sharing and communication in a manner that is sustainable and accessible.

**Impact for participants with CCN.** Stakeholders’ perceived benefits and barriers were reported in addition to perspectives from 2 participants with CCN. Input from stakeholders in this study indicated that participants with CCN enjoyed the opportunity to collect and share their media from active recreation. During caregiver phone conversations, Mike and Carol both indicated that they liked the program and would participate again. Julie, Jeff, and Sam did not participate in phone conversations due to the extent of their communication disorders which severely impacted their ability to generate novel language. For these individuals, benefits and barriers were perceived by primary caregivers.

As discussed earlier, intrinsic factors may support participation in active recreation for people with significant communication disabilities who may use AAC. On the other hand, it is also likely that these experiences build and support the development of psychosocial factors such as motivation, confidence, and resiliency. Datillo et al. (2008) revealed that leisure experiences allowed adults with cerebral palsy who use AAC to build competence and confidence as well as increasing their visibility in their communities. Furthermore, Hajjar and McCarthy (2016) reported that adults with acquired conditions who use AAC, participated in active recreation due to social and
intrinsic benefits, enjoyment, and opportunities to interact with people who share common interests.

By collecting and sharing photos and videos from active recreation, people with CCN had opportunities to engage with others and educate partners about their experiences. Communication partners who see people with disabilities participating across a range of activities experience heightened awareness and understanding about adaptive sport and the capabilities and skills of people with CCN. These types of interactions have the potential to empower participants with CCN and their caregivers as they receive positive feedback and increased attention from partners. Disseminating personalized digital media from recreation may allow caregivers and participants to feel more confident and make connections that enhance social closeness and reciprocity.

In the past decade, there has been an influx of action cameras and wearable technology that can be used in outdoor recreational settings. People with CCN have increased options for capture technology; however, some challenges remain relative to expense, access, integration with current devices and consistent use across settings.

Aided communication systems have improved in their ability to take photos and videos; however, they are not frequently seen across community-based recreational settings. Also, since these systems are expensive and may be difficult to acquire and use, it may be easier for people with CCN to try mainstream action cameras, tablets, or cell phones to capture active recreational experiences. There are several companies that manufacture good quality action cameras with a wide range of accessories and protective equipment for any type of sport or activity. This technology is reasonably priced and more accessible to individuals with CCN and stakeholders in recreation. Also, companies
that make action cameras have developed software applications that can assist users with capturing media, as well as basic editing, storage, and quick options for sharing.

Limitations of the Study

Some important limitations to this study should be considered when interpreting the results. Only 5 volunteers and 5 individuals with CCN participated in study 2. Since purposive sampling was used in the study, the volunteers and participants were all individuals from the same adaptive sport program who had previously participated in adaptive recreational activities. Only volunteers with a minimum of 2 years of experience participated in the study. This means that the volunteers all had some prior experience with recreation and the results may be different with volunteers with limited to no experience.

Furthermore, due to the research timeline and close integration with study 1, the options for the types of recreation were restricted to activities that occur in the summer (e.g., paddling or cycling). It is reasonable to assume that the perspectives of stakeholders from different programs and sports may be different than the volunteers, caregivers, or participants who were in the current study. Also for each stakeholder group, it is important to consider how previous experience and the nature and type of participants’ disabilities may alter the outcomes and provide different views and information. Results of this study may not be generalizable to other groups of volunteers, caregivers, and participants who engage in active recreation.

Finally, limitations of the study may be due to the short timeframe of the lessons and the location of the activity. In this study, participants engaged in three consecutive recreational lessons. Even though 3-5 lessons are typical for participants who engage in
active recreation, this is not a lot of time to consider the integration of the CAPTURE & Share program. Depending upon the season and sport, some participants may engage in more sessions. For example, in adaptive skiing, participants may attend a series of 6-9 lessons in one season. With more lessons, volunteers would have had more time and been able to implement their plans by also using the pre- and postlesson periods more effectively. Also, with more lessons, volunteers would be able to try different modifications for capture technology and focus more on the purposes of sharing different types of media.

Depending upon the location of the activity, logistical features of the setting may have had an impact on the implementation of the program. In this study, the activity was located at public boat launches on lakes. This setting did not have a comfortable area to sit so that volunteers and participants could focus on sharing and other program components. For example, some recreational settings have dedicated spaces to facilitate sharing and postlesson interactions (e.g., ski lodge). In these types of settings, volunteers may have had more time and opportunity to engage in the review and edit components while also focusing more on face-to-face interactions.

**Directions for Future Research**

Future research is required to determine how the CAPTURE & Share program could be integrated into other activities and used by volunteers or stakeholders from different types of environments and community-based programs. Although the CAPTURE & Share program was not created for one specific activity or sport, it would be helpful to determine the generalizability of using the program with different
stakeholders across educational or clinical settings. Gathering perspectives from stakeholders in education or related therapy services would be important to maximize outcomes, modify procedures, and expand the extent and type of sharing. It would also be beneficial to investigate how the program could be integrated with individual academic or therapy goals and objectives relative to participation, communication, and expressive or receptive language skills.

Research should also consider how the evolution of device and tablet technology may impact how individuals with CCN and partners collaborate to capture and integrate digital media for sharing. Many AAC systems have built in cameras or can access the Internet to share digital media. The elements and conditions of the setting in the present study required that capture technology be portable, durable, and protected in waterproof casing. However, not all activities will require this level of durability and protection. Some activities may require additional specialized capture equipment and modifications, while other activities may allow capture by aided AAC systems. It would be beneficial to determine which types of new or existing technology may be most efficient for photo and video capture across a range of activities.

Additional research should also investigate how individuals with CCN share digital media and which factors impact the frequency and type of sharing that occurs. In the present study, caregivers were provided with 45-days to share without any assistance or support from professionals or other related stakeholders. An extension of the current study may involve providing more structured and systematic support for sharing with consideration of the type (e.g., digital vs. face-to-face) and purpose (e.g., exchange
information, social closeness) of sharing. Furthermore, given the extensive options available for digital sharing, it would be important to determine which type of caregiver and participant characteristics may predict or influence a specific method. Sharing digital media across new or existing social networks has benefits for people with CCN; however, the process should be reviewed on an individual basis with considerations for safety, access, privacy, and purpose.

**Conclusion**

Results of the present study suggest that volunteers were successful in implementing the program; however, had the most difficulty with the review and edit phase. Furthermore, volunteers had limited time for sharing. Overall, the volunteers were successful in employing active problem solving as they provided feedback and reflected upon the unique skills and characteristics of each participant in the context of a series of kayaking lessons.

In addition to volunteers, the present study also reported the perspectives of caregivers about their experiences with sharing photos and videos with others. Sharing memories serves basic social functions of communication, interaction, and bonding, while making connections between partners and supporting reciprocity in conversational exchange (Bluck et al., 2005). Based on the interpretations of conversations with caregivers, the extent and type of sharing depended upon four areas: (a) previous experience with sharing, (b) access to resources and equipment, (c) types of activities and recreation, and (d) existing social networks.

Recreation is an important activity for many children, youth, and older individuals with acquired and developmental disabilities. These types of activities are shared with
others and are typically outdoors with scenic views and natural surroundings with diverse landscapes. The perspectives of the volunteers, participants with CCN, and caregivers will inform and educate stakeholders in communication, disability studies, education, and recreation. The views and ideas gathered in this study will shape the conversation about full participation and its impact on communication and interaction during recreational activities.

There is a lot to collect and share from recreational activities and the CAPTURE & Share program provides the infrastructure for people with CCN and their facilitators to participate and engage in these tasks. It is important to share photos and videos of our experiences to create opportunities for communication, maintain and expand our social networks, support storytelling, and share our autobiographical memories.
Chapter 5: Conclusion

This research validated a distance training called the CAPTURE & Share program by combining experimental and observational methods. In study 1, volunteers from an adaptive recreation program in the Northeast, USA completed a series of distant training modules and learned how to support people with CCN to collect and share photos and videos. All the volunteers successfully learned the training program. These same volunteers then applied their newly learned skills during a series of recreational activities. In study 2, the volunteers applied the steps of the program, provided feedback, and determined modifications in the natural context of the activity. PAR provided an important framework in study 2 as volunteers, caregivers, and participants with CCN shared their perspectives during feedback sessions and interviews.

The current research revealed that volunteers were committed and reliable communication partners who were willing to do more to enhance recreational experiences for people with CCN. The volunteers in this research actively engaged in the process of facilitating the CAPTURE and Share program. They supported participants with CCN to collect media from multiple perspectives which resulted in the collection of personalized digital artifacts. Before, during, and after the 3 kayaking lessons, the volunteers provided feedback and ideas for modifications and improvements to the program. The process was open and iterative, as volunteers shared their perspectives in a supportive environment with the principal investigator, caregivers, and other volunteers.

The distance training program taught volunteers to make a plan and consider the various steps in collecting and sharing photos and videos. During the training, volunteers reflected on their personal strengths and barriers as well as considering the characteristics
and skills of the participants they would be supporting. Before and after each kayaking lesson, volunteers were asked to consider their plans and make modifications as necessary. Volunteers employed flexibility based on the natural conditions of the environment, equipment and accessories available, and amount of caregiver support.

Communication partners should be recognized as an important part of the intervention plan for people with CCN as they can have a positive impact on creating opportunities for communication and interaction with others. Based on the results from this research, it was evident that using a combination of digital and face-to-face approaches was beneficial for communication partners. Learning the CAPTURE & Share program served as an important preliminary step for the volunteers prior to applying the program in the field. Combining online training with contextual application was effective for this group of volunteers and should be considered as a training approach across educational and healthcare settings in the field of AAC. It is important for partners to feel empowered as they are key supports to increase socialization, communication, and participation across different settings.

Stakeholders in education, healthcare, and community integration should invest in training communication partners who support people with CCN. Previous research has investigated partner interventions; however, this has not resulted in a significant clinical impact. It is evident that partner training can positively impact the pragmatic and linguistic skills of people who use AAC; however, more work needs to be done to educate partners as they support full participation. Using a combined training approach (i.e., distance and application) ensured that all learning styles were recognized and provided partners with an opportunity to engage and interact in a meaningful way.
The ICF/WHO (2013), broadened the definition of participation and considers important contextual and personal factors while recognizing that each person has unique knowledge and skills they bring to the experience. By understanding the critical role of partners (e.g., volunteers) in recreation, it is possible to enhance the overall experience and create more opportunities for communication and social exchange. As partners gain more skills and knowledge, they become more empowered to facilitate interactions and advocate for people with CCN.

In this research, communication partners helped to support people with CCN to take photos and videos of their experience. For people with CCN, it was important to collect digital media as photos and videos can be used to recall past events and memories, construct messages for the purposes of communication, and share stories with others. Furthermore, personalized digital artifacts can be used to support individual AAC systems in the form of visual scene displays and video visual scene displays. In addition to the photos and videos that were collected, the entire process of capturing media artifacts provided many opportunities for communication and socialization.

Future directions in AAC research should continue to focus on the natural contexts of recreation and family leisure activities. These types of activities are meaningful, motivating, and rich with multiple opportunities for communication and participation. Also, continued focus on training communication partners and related stakeholders supports people with CCN to achieve communicative competence and expand their social networks. Greater collaboration with professionals in recreation and leisure would be beneficial to ensure generalization of skills while also, improving quality of life, decreasing loneliness, and increasing psychosocial skills such as
motivation and confidence. Research should also focus on how individuals with CCN share personalized media across digital and face-to-face interactions with a range of stakeholders across different settings.

In summary, the research findings showed that partners who support people with CCN benefit from having a plan to capture media; however, they also need flexibility to manage and support transitions and unexpected events. The current research supports training communication partners and demonstrates that partners can learn instructional strategies via distance training. By teaching partners the CAPTURE & Share program, people with CCN had more opportunities for communication, interaction, and engagement with others. Furthermore, caregivers and participants used the digital artifacts for a range of purposes as they controlled the extent and type of sharing. Some caregivers uploaded photos and videos to social media in addition to supporting face-to-face interactions, while others reviewed pictures on an individual and more private basis. As a result of having a collection of personalized media artifacts, people with CCN and their caregivers can use these photos and videos to share stories, create opportunities for social closeness, and support the transfer and exchange of daily information.
References


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Appendix A: Example of a Complete Plan of the CAPTURE & Share Program

Mary is a 16-year-old girl with cerebral palsy who attends a regular high school and has a large support network of peers and acquaintances. Mary is non-speaking and because she is unable to use her hands for typing, she uses eye-gaze to access and select messages, pictures, letters and words on her communication device. Using her device, she can make all her needs and wants known and independently composes emails to her family and friends across the country. She is consistently frustrated with the slow pace of her communication system and has difficulty using her device in most recreational and outside settings. Her communication device is typically mounted to her power wheelchair, which she can independently drive and control. She wears glasses and reports no issues with hearing. Mary enjoys staying active by participating in adaptive sports 2-3 times each month in addition to completing her schoolwork. Mary is planning to participate in adaptive cycling next month and is excited to share media from this experience with her online and in-person social networks.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Action Items Say or Do</th>
<th>Example Barriers / Supports Participant (Mary)</th>
<th>Example Barriers / Supports Volunteer</th>
</tr>
</thead>
<tbody>
<tr>
<td>C- Cameras</td>
<td>Show &amp; label camera</td>
<td>B: Mary’s communication device not available</td>
<td>B: No camera available for capture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S: Mary uses unaided methods (e.g. eye gaze, pointing) for communication</td>
<td>S: Volunteer able to get a camera to use from program or caregiver</td>
</tr>
<tr>
<td>A - Adapt</td>
<td>Show &amp; label options for wear vs. mount</td>
<td>B: Mary is unable to hold a selfie stick or access camera on mount</td>
<td>B: Unfamiliar with accessory options</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S: Harness and mounts are available for Mary to use</td>
<td>S: Has had personal experience with wearing a camera</td>
</tr>
<tr>
<td>P - Practice</td>
<td>Take a practice photo &amp; video</td>
<td>B: Mary is unable to signal quick enough to ensure capture of intended target</td>
<td>B: Does not think there is enough time during lesson for photo capture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S: Mary is willing to wear camera and have partner assist with control</td>
<td>S: Able to access camera more easily</td>
</tr>
<tr>
<td>T - Take Photos And Videos</td>
<td>Take photos &amp; videos, before, during &amp; after</td>
<td>B: Physical/motor skills (e.g. Mary is unable to push the button to take the picture)</td>
<td>B: Too many other tasks to do during lesson</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>U - Use Context</td>
<td>Suggest and direct photo &amp; video capture</td>
<td>B: Physical/ motor skills (e.g. Mary has difficulty moving around during lesson)</td>
<td>B: Not aware of this concept</td>
</tr>
<tr>
<td>R - Review Photos &amp; Video</td>
<td>Compare photos &amp; video, identify favorite</td>
<td>B: Physical/motor for selecting media (e.g. Mary may have difficulty pointing to select a picture or video)</td>
<td>B: Distracted by other tasks</td>
</tr>
<tr>
<td>E - Edit</td>
<td>Edit photos by adding a caption and videos by trimming</td>
<td>B: Limited access to communication device (e.g. Mary is unable to type an idea for a caption)</td>
<td>B: Unfamiliar with technology</td>
</tr>
</tbody>
</table>
Appendix B: Training Module Videos

If you are interested in viewing the 5 training module videos, please email the principal investigator, David Hajjar Ph.D., CCC-SLP and he will share a link to the videos.

Email: dhajjar23@gmail.com
Appendix C: Content for Audio Voiceovers Training Modules 1-5

Training Module #1

Title Slide: Welcome to the first training module that will introduce how to make a plan to support individuals to share their recreational experiences. Your plan will be based on the steps of the CAPTURE & Share program. Your objective will be to learn the steps of the plan and think about what you may say or do during each step as you support an individual with a disability.

Slide 2 (CAPTURE): The acronym CAPTURE will help you remember the steps to make a plan for sharing. The steps are meant to be completed in a sequential order.

Slide 3: (Camera): The first step in your plan is to identify a camera. At this step you should always label and show the camera to the participant so they are aware of the device. In this study we will be using GoPros, Polaroid Cubes, and iPod touches.

*Comprehension check: Please type the first step and what you would say or do.

Slide 4: (Adapt): The second step in your plan is to adapt the camera to support more independent capture. Accessories for wearing and mounting the camera will be introduced at this step in the plan. For this study, volunteers will provide a choice to the participant to wear the camera using a head strap or mount the camera using a stick or clamp.

*Comprehension check: Please type the second step and what you would say or do.

Slide 5: (Practice): The third step of your plan is to practice. During this step the volunteer and participant will determine who will control the camera. The volunteer and participant will practice taking photos and videos. Volunteers who are controlling the camera will need to consider how participants will signal when they want to capture something during the activity.

*Comprehension Check: Please type the third step and what you would say or do.

Slide 6: (Take Photos & Videos): The fourth step of the plan is to take a series of photos and videos before, during and after the experience.

*Comprehension Check: Please type the fourth step and what you would say or do.

Slide 7: (Use Context): The fifth step of the plan is to use context. This will be important to create more opportunities for sharing and communication exchange. If context exists in the photos and videos, it will assist in supporting a shared dialogue. Volunteers may need to suggest and direct photo and video capture during this part of the plan.

*Comprehension Check: Please type the fifth step and what you would say or do.

Slide 8: (Review Photos & Videos): The sixth step of the plan is to review photos and videos. During this step volunteers and participants will compare, review and select a favorite photo or video to edit.
*Comp. Check: Please type the sixth step and what you would say or do.

Slide 9: (Edit) The seventh step of the plan is to edit photos and videos. During this step volunteers and participants will add captions to photos and trim videos to a manageable size for sharing.

*Comp. Check: Please type the seventh step and what you would say or do.

Slide 10: (CAPTURE) At this point in the training you have been introduced to the primary steps that will support sharing. The acronym CAPTURE will help you remember the key words at each step.

*Please type all the steps in CAPTURE

Slide 11: (Share) The eighth and final step of the plan is to share a photo and/or video. Volunteers will ask participants who they would like to share with and give them an option to share face-to-face or via digital methods using text, email or social media. The participants’ parent or guardian will assist with providing options and permissions related to digital sharing.

*Comp. Check: Please type the last step and what you would say or do.

Slide 12: (Assessment) Now it is time for a quick assessment. During the assessment you will complete multiple choice and open ended questions related to the steps of the CAPTURE & Share program including the ‘action items’ at each step. The action items are what you can say or do at each step to assist the participant to move through the plan. The steps of CAPTURE & Share will assist you in developing a plan for sharing. In the next training module you will learn how to organize information that should be included in your plan.

**Training Module #2**

Introductory Slide: “Welcome to module 2 of the CAPTURE & Share training program. In this training module, I will introduce how to write a complete plan to assist someone to share their recreational experience. We will use a table with 4 different components to help keep you organized. In this training module, we will introduce the four components and focus on the first two components: program steps and Action items associated with each step. You will have periodic comprehension checks in order to give you an opportunity to type the program steps and action items. During the presentation, some slides will have a sidebar containing questions relevant to each step.

Slide 1: Table slide: “In order to assist you in making your plan, it will be important for you to think about including the 4 primary components. The table will assist you to ensure you include all the steps and keep information organized. When making your plan, first, you should label the program step, then write an action item including what you may say or do with the participant, next, consider barriers and supports for the participant, and finally consider barriers and supports for yourself as a volunteer.”

Slide 2: The four components of the plan include:

- Program steps
- Action items (what you would say or do)
In this presentation we will focus on learning the first two components; program steps and action items.

*This slide includes a comprehension check: Please type the 4 primary components in the plan.

Slide 3:
“During this training module, you will learn about different action items associated with each program step. These action items are examples of what a volunteer may say or do at each step of the plan. In this training, you will be asked to type action items that are appropriate for each step of the plan.

“In order to give you an opportunity to practice writing a plan, I will use a hypothetical person named Mary. The structure of this hypothetical probe is similar to the other probes that you have already completed. Using the Mary example will assist you to think about which components you should include the next time you are asked to write a plan to support individuals to share their recreational experience.

Slide 5:(the sample probe for Mary)

Slide 6: Placeholder with photo of Mary
In the next series of slides I will review the individual steps that you should include in your plan and the corresponding action items.

“As you listen to the voiceovers with each slide, you will also hear a female voice. This voice is meant to be a simulation of a volunteer interacting with Mary. This simulation will give you an idea of what a volunteer may say or do during each step of the plan.

To assist you in learning how to make the plan, you will have an opportunity to type each individual step and the action items for each step. Periodically, questions will appear on the side panel. Read the question and type a response.

Slide 7: Cameras:
David: “The first step in your plan is to identify a camera. At this step you should label and show the camera to the participant so they are aware of the device.”

Mock Volunteer: Hey Mary have you ever seen one of these before? This is a GoPro camera. We can use it for taking photos and video while we bike. Are you up for trying it today?

Slide 8: On this slide first review the table, next, a sidebar will appear and you will be asked to type the first step of the program along with one action item related to what you may say or do at this step.
Slide: 9
2. Adapt:
David: “The second step in your plan is to adapt the camera to support more independent capture. Accessories for wearing and mounting the camera will be introduced at this step in the plan. Volunteers will provide a choice to the participant to wear the camera or mount the camera.”

Mock Volunteer: “So Mary, we have a few options for taking pictures and videos while we bike. You can either wear the camera using a head strap or we can mount the camera on the handlebars. Which one do you want to try?”

Slide 10: On this slide review the table, the first step has been filled out, next, a sidebar will appear and you will be asked to type the second step of the program along with one action item related to what you may say or do.

3. Slide 11: Practice:
David: “The third step of your plan is to practice. During this step the volunteer and participant will determine who will control the camera. You will also practice taking photos and videos. Volunteers who are controlling the camera will need to check in with participants during the activity and make sure they understand how a participant will indicate yes/no.

Mock Volunteer: “All right Mary lets practice taking a photo and a video. Since I will be helping to take the photos and video from a distance, we need to make sure we have a plan. Let’s come up with a signal, take a few practice shots and make sure we are good to go.

Slide 12: On this slide review the table, the first two steps have been filled in. Next, a sidebar will appear and you will be asked to type the THIRD step of the program along with one action item related to what you may say or do.

4. Slide 13: Take a photo and video:
David: “The fourth step of your plan is to take a photo and video before during and after the lesson.”

Mock Volunteer: Hey Mary, before we get into our boat, do you want to take a picture? and then we can take a few when we are out on the water and after we finish.

Slide 14: On this slide review the table, the first three steps have been filled in. Next, a sidebar will appear and you will be asked to type the fourth step of the program along with one action item related to what you may say or do.

Slide 15: Use Context:
David: “The fifth step of the plan is to use context when taking photos and video. This means to include the setting and background as much as possible including scenery, other people, equipment and gear.”

Mock Volunteer: “Mary, let’s take a photo here with you in the kayak holding your paddle in front of the dock.”
Slide 16: On this slide review the table, next, a sidebar will appear and you will be asked to type the fifth step of the program along with one action item related to what you may say or do at this step.

6. Slide 17 Review:
David: ‘The next step of the plan is to review footage and compare different photos and videos. The goal here is to select one photo or video to edit and then share. Photos and videos will be reviewed on iPods or iPads’.

Mock Volunteer: “Mary, let’s look at the photos and video that we took today. I like this photo, do you like this one? Let’s find a few other good ones.

Slide 18: On this slide review the table, next, a sidebar will appear and you will be asked to type step number six of the program along with one action item related to what you may say or do at this step.

7. Slide 19: Edit:
David: “The next step of the plan is to edit the photo or video that you selected. Depending on which type of media is selected, volunteers will assist participants to include a caption or trim a video.”

Mock Volunteer: “You chose a nice photo Mary, Let’s add a caption to label it.”

Slide 20: On this slide review the table, next, a sidebar will appear and you will be asked to type step number seven of the program along with one action item related to what you may say or do at this step.

8. Slide 21: Share
David: “The last step of the plan is to share the photo or video. Volunteers will support participants to share in person and using email, text or social media.

Mock Volunteer: Now that we have some great photos, lets’ decide who you want to share them with. Do you want to print out a photo or share it on Facebook?

Slide 22: On this slide review the table, next, a sidebar will appear and you will be asked to type step number eight of the program along with one action item related to what you may say or do at this step.

Slide 23: On this slide is a study guide to help you complete the assessments. You can also use this guide to assist you in writing your responses to the hypothetical scenarios. Please go to the link in the sidebar to access the study guide. Download and Print out the study guide for future reference.

*Assessment slide: Now it is time for a quick assessment. During the assessment you will complete multiple choice and open-ended questions related to the steps and actions items in the CAPTURE & Share program. Your goal is to score 80% or better on this assessment. Please use the study guide to assist you as needed.
Training Module #3

Introductory Slide/slide 1: “Welcome to module 3 of the CAPTURE & Share training program. In this module, you will learn more about writing a complete plan to assist someone to share their recreational experience. The focus here is to learn about barriers and supports for yourself as a volunteer and barriers and supports for participants who engage in recreational activities. As seen in previous modules, some slides will have sidebars containing questions relevant to each step. These questions will serve as a comprehension check to give you practice in generating content for your plan.”

Slide 2: “In order to assist you in making your plan, we will use the table to keep content organized across the 4 primary components. The table will serve as a guide to make sure you include all the necessary information when making your plan.

Slide 3: The four components you should include in your plan are:

- The 8 Program steps
- Corresponding Action items for each step
- Barriers/Supports for the Participant
- Barriers/supports for the volunteer

Slide 4: In this module we will focus on learning about barriers and supports related to individuals with disabilities. Barriers would be considered things that get in the way or prevent a person from participating in an activity; Supports would be considered things that assist an individual to participate and fully engage in activities.

Slide 5: For the purpose of this training, we will consider barriers and supports that impact an individuals’ participation across two primary categories: Body structure & function and contextual/environmental.

Body structure and function is related to individuals’ characteristics and impacts their skills and abilities. These individual characteristics may limit or assist a person to participate. Characteristics will be considered across areas of communication, physical and motor ability, sensory and perceptual skills and psychosocial skills like motivation and confidence.

Contextual or Environmental relates to those things that are imposed by people other than the individual with the disability. For example,

- Communication partners may or may not have the appropriate skills or knowledge to support a participant with a disability,
- Communication partners may or may not encourage consistent access to an individuals’ communication device or system
- Families or caregivers may or may not have adequate resources to support participation in recreational activities.

Slide 6: We will again use Mary as our participant example. This example will assist you to identify barriers and supports related to each step of the CAPTURE & Share program.
Slide 7: In the next series of slides you will have an opportunity to think about barriers and supports related to each step of the CAPTURE & Share program. For each step I have highlighted one sentence that may provide useful information that will assist you to identify barriers and supports for Mary. Your task will be to generate a barrier or a support related to each program step. During this task, you should consider the important point that is included on the slide or look back at the entire paragraph that describes Mary in order to get more information. Remember, the barrier or support that you generate will need to be related to each specific step of the CAPTURE & Share program.

Slide 8: The first step to consider is “cameras”, based on the important point provided, please consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 9: For this step, an example of a barrier may be related to Mary’s communication disorder and the fact that her device may not be available to assist her in choosing a camera. A support for Mary would be that she could use unaided methods to communicate such as pointing or looking at her preferred camera. Unaided methods for communication do not involve using a communication device.

Slide 10: The next step to consider is ‘adapt’, based on the important point provided, please consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 11: For this step, a barrier may be Mary’s physical & motor skills, which could prevent her from holding the camera. A support for Mary would be that she might be willing to wear a head strap or harness so she can be more independent with capturing photos or video.

Slide 12: The next step to consider is ‘practice’, based on the important point provided, please consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 13: For this step, a barrier may be that Mary cannot signal quickly enough to ensure that her preferred target is captured. A support may be that Mary has the ability to understand and follow directions and may be willing to have a partner assist with camera control.

Slide 14: The next step to consider is ‘take photos and videos’. Based on the important point provided, consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 15: For this step a barrier may be that Mary is unable to access the camera. A support may be that Mary has experience with technology and may be willing to use an alternative method to support more independent capture.

Slide 16: The next step to consider is “use context”. Based on the important point provided, consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 17: For this step a barrier may be related to Mary’s physical and motor skills. Due to her physical disability, it may be difficult for her to move into different positions to support varied
context in photos or video. A support for Mary is that she is able to understand directions and is motivated to have different types of photos and videos to share with her family and friends.

Slide 18: The next step to consider is ‘review’. Based on the important point provided, consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 19: For this step a barrier may be related to Mary’s difficulty with communication and comparing photos or video on an iPad. On the other hand, a support for Mary is that she understands directions and may be able to use an unaided method for communication like pointing or looking towards her preferred target.

Slide 20: The next step to consider is ‘edit’. Based on the important point provided, consider a barrier or support for Mary related to this step. You can type your response when the sidebar appears.

Slide 21: For this step a barrier may be related to Mary’s physical and motor abilities as she may not be able to add captions to a photo on an iPad. On the other hand, a support for Mary is that she is familiar with technology and may be able to use her communication device to inform her partner about an idea for a caption.

Slide 22: The next step to consider is ‘share’. Based on the important point provided, consider a barrier OR a support for Mary related to this step. You can type your response when the sidebar appears.

Slide 23: For this step a barrier may be related to Mary’s slow rate of communication as she engages in face-to-face sharing. On the other hand, Mary has several supports; she has a large network of friends, she is familiar with technology and social media and she is motivated to share her experiences.

Slide 24: Assessment: Now it is time for a quick assessment. During the assessment you will complete multiple choice questions related to barriers and supports for the participant. Your goal is to score 80% or better on this assessment. Please use the study guide to assist you as needed.

Training Module #4: Voice over

Slide 1: Welcome to module 4 of the CAPTURE & Share training program. In this module, you will continue to learn about writing a complete plan to assist someone to share their recreational experience. The purpose of this training module is to learn about and consider barriers and supports for yourself as a volunteer. As seen in previous modules, some slides will have sidebars containing questions relevant to each step. These questions will serve as a comprehension check to give you practice in generating content for your plan.”

Slide 2: “In order to assist you in making your plan, we will again use the table to keep content organized across the 4 primary components. The table will serve as a guide to make sure you include all the necessary information when making your plan.

Slide 3: The four components you should include in your plan are:
• The 8 Program steps
• Corresponding Action items for each step
• Barriers/Supports for the Participant
• Barriers/supports for the volunteer

Slide 4: In this module we will learn about barriers and supports related to you as a volunteer. In order to create your plan it is important to consider what barriers you experience and what supports you bring to the experience. For example, when supporting people with disabilities in recreation, are there things you could learn to do better? Are there things you already do well?

Slide 5: For the purpose of this training, I want you to consider your personal barriers and supports and how they impact your effectiveness as a volunteer. Volunteer barriers and supports will be considered across three categories:

• Knowledge and skills
• Practice (equipment, time, logistics, routine)
• Personal experience

Slide 6: For the next series of slides you will consider your own personal barriers and supports related to each step of CAPTURE & Share. As you review each step, Try to think about things that you are good at or things that you may need more assistance with. When considering personal barriers or supports, think about your own knowledge and skills related to each step. Also, consider PRACTICE type barriers and supports which relate to equipment, time and support from others. Lastly, consider your own personal experiences and how these may impact your ability to implement the steps of CAPTURE & Share.

As we move through the 8 steps of the program, we have developed a series of barrier and support examples related to each individual step. After each set of examples, you will have an opportunity to consider a barrier or support for yourself related to each step of the program.

Slide 7: For step number one, Cameras; EXAMPLES of barriers may be related to not having access to or knowing how to work a camera. On the other hand an Example of a support would be having a camera and knowing how to use it.

Slide 8: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Slide 9: For step number two, adapt; barriers may be related to volunteers having limited access to equipment or limited knowledge related to how to use the equipment and accessories. An example of a support would be if volunteers have access or prior experience with equipment and also understand how to use it.

Slide 10: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.
Step 11: For step number three, Practice, barriers may relate to how volunteers provide instruction and communicate with participants. An example of a support would be if the volunteer practices effective communication strategies, like providing adequate wait time after asking questions.

Step 12: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Step 13: For step number four, Take photos and videos, barriers may be related to volunteers not understanding how to operate a camera or perhaps a volunteer may have too many other tasks to complete during the lesson. A support may be related to volunteers having past experience with cameras or having assistance from other volunteers during a lesson.

Step 14: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Step 15: For step number five, Use context, barriers may be related to volunteers not having a good idea of the structure and setting of the lesson or perhaps not understanding the importance of context. An example of a support would be if volunteers are familiar with the setting and procedures of the lesson while also understanding the importance of capturing photos and video with context.

Slide 16: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Slide 17: For step number six, Review photos and videos, barriers may be related to volunteers not allowing enough time for participants to review digital media. Also, volunteers may be unfamiliar with technology used for reviewing photos and video. Supports include a volunteers’ use of appropriate communication strategies (i.e. wait time, repeat questions) with participants as they review their photos and video.

Slide 18: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Slide 19: For step number seven, Edit, barriers may be related to volunteers being unfamiliar with technology such as adding captions or trimming videos. Another barrier would be if a volunteer does not allow enough time to for participants to edit selected photos or video. Supports include being familiar with technology and leaving enough time at the end of the lesson for editing.

Slide 20: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Slide 21: For step number eight, Share, barriers may be related to volunteers being unfamiliar with technology and social media. It is also possible that volunteers may run out of time at the end of a lesson; this would be considered a policy type barrier. Supports include volunteers being
familiar with technology and social media while also making time for face-to-face sharing after the lesson.

Slide 22: In the sidebar, please type one personal barrier or support for you at this specific step. Please label it as a barrier or support.

Assessment: Now it is time for a quick assessment. Do your best to achieve 80% accuracy, so you can complete another hypothetical probe and move on to the last training module!

**Audio for Training #5:**

Slide 1: Introduction: Welcome to the last training module. In this module we will review the key points. At the end of this module you will have an opportunity to write a complete plan for Mary. After you submit your plan you will receive feedback prior to completing your next hypothetical case.

Slide 2: Table slide: “Make sure to include the 4 primary components. The table will assist you to ensure you include all the steps and keep information organized. When making your plan, first, you should label the program step, then write an action item including what you may say or do with the participant. Next, consider barriers and supports for the participant, and finally consider barriers and supports for yourself as a volunteer.”

Slide 3: The four components of the plan include:
- Program steps
- Action items (what you would say or do)
- Barriers/Supports Participant
- Barriers/supports volunteer

Barriers & Supports

*Participants:*
Slide 4: Participant barriers and supports are in two categories:

Body structure and function will cover four areas: communication, physical and motor ability, sensory and perceptual skills, and psychosocial skills such as motivation or confidence.

Contextual or Environmental relates to those things that are imposed by people other than the individual with the disability. For example:
- communication partners may or may not support consistent access to an individuals’ communication device or system
- Families or caregivers may or may not have adequate resources to support participation in recreational activities.

*Volunteers:*
Slide 5: The last thing to consider when making your plan are barriers and supports that you bring to the experience. For example, when supporting people with disabilities in recreation, are there things you could learn to do better? Are there things you already do well?
When making your plan, Please consider your personal barriers and supports and how they impact your effectiveness as a volunteer. Volunteer barriers and supports will be considered across three categories:

- Knowledge and skills
- Practice
- Personal experience

Slide 6: Assessment: For this assessment you will read the Mary case study and consider how you would assist her in sharing her experience. When you are writing your response, make sure to include all four components across all 8 steps of CAPTURE & Share.
Appendix D: Instructions for Accessing Training Modules

- Follow the link for each module
- You will be prompted to enter your name. Please type your initials here.
- Press the “start” button:

![Image of training module]

- **Helpful Tips:**

  - Training modules have audio, so be sure that your volume is turned up! You can pause and play the videos using the red button at the bottom.
  - When you have a sidebar question, and you are unsure of the answer, you can use the orange slider to go back to review information in the module. You can also use your study guide.
  - You must enter responses for all questions and hit “submit” after typing your response.
  - You will always have an assessment at the end of each module.
Appendix E: Examples of Questions for Comprehension Checks

Open Response Question: Module #1

Type the eight steps of the CAPTURE & Share program in the correct order below.

- Capture
- Adapt
- Practice
- Use
- Camera
- Share
- Context
- Pictures
- Video
- Photos
- Utilize
- During
- Capture

Last Response Submitted: July 10th 2016, 1:17 pm

<table>
<thead>
<tr>
<th>Viewer Name</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cameras adapt practice take pictures and videos use context review photos and videos edit share</td>
</tr>
<tr>
<td></td>
<td>camera adapt practice take pictures and video use context review edit share</td>
</tr>
<tr>
<td></td>
<td>cameras adapt practice take photos and videos use context review photos and videos edit</td>
</tr>
<tr>
<td></td>
<td>Camera Adapt Practice Take Pictures (before, during, after) Use Context Review Edit Share</td>
</tr>
<tr>
<td></td>
<td>Capture, adapt, practice, take pictures or videos, utilize, review, edit and share</td>
</tr>
<tr>
<td></td>
<td>camera, adapt, take, use context, review, edit, share</td>
</tr>
</tbody>
</table>
Multiple Choice Question: Module #1

Multiple Choice
Select the action item that corresponds with the third step: “P- Practice” of the CAPTURE & Share program.

Video Context

Choices

A. Take photos & videos, before during & after
B. Take a practice photo & video
C. Decide who to share with
D. Show & label content

Distribution of Answers

<table>
<thead>
<tr>
<th>USER NAME</th>
<th>CORRECT</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Take a practice photo &amp; video</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Take a practice photo &amp; video</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td>Take a practice photo &amp; video</td>
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<tr>
<td></td>
<td></td>
<td>Take a practice photo &amp; video</td>
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</tbody>
</table>
Open Response Question: Module #2

Open Response

Open step 37 and provide an example of something you may say or do at this step.

6 Responses

Last Response Submitted: July 19th, 2016, 1:37 pm

<table>
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<tr>
<th>Viewer Name</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Edit: &quot;What you like to trim the lap of this picture? What would you like to write as a caption?&quot;</td>
</tr>
<tr>
<td></td>
<td>edit i like the photo you chose what do you want to say about it</td>
</tr>
<tr>
<td></td>
<td>edit- lets put a caption with this video</td>
</tr>
<tr>
<td></td>
<td>Edit: add text or cut video so it is more easily viewed Mary I love the photo you picked. What do you want others to know about what we did?</td>
</tr>
<tr>
<td></td>
<td>Edit: When the best photos have been selected the participant might want help captioning or cropping the photo.</td>
</tr>
<tr>
<td></td>
<td>Edit: This is a great photo lets add a caption to it.</td>
</tr>
</tbody>
</table>
**Open Response Question: Module #3**

**Video Context**

**Important Points:**
*Title: Taking Photos and Videos*

**Skills**

**Responses**

*Last Response Submitted: July 20th 2016, 10:31 am*

<table>
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<tr>
<th>Viewer Name</th>
<th>Response</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>not able to communicate, fast understands directions and follow them with a partner assistance</td>
</tr>
<tr>
<td></td>
<td>she can signal when she wants a photo by using her eyes and/or communication device</td>
</tr>
<tr>
<td></td>
<td>may not fully understand role in taking pictures</td>
</tr>
<tr>
<td></td>
<td>Mary will continue to have difficulty establishing and using a reliable signal for when to take a picture or video due to not using her device in the kayak</td>
</tr>
<tr>
<td></td>
<td>Mary may find the process of taking pictures and pictures in a timely fashion a bit frustrating. Working with her to plan to take more than what might be used later may help.</td>
</tr>
<tr>
<td></td>
<td>Support: I might hold Mary's camera and have her use an eye gaze to indicate to me when she would like to take a particular picture.</td>
</tr>
</tbody>
</table>
Multiple Choice Question: Module #4

**Multiple Choice**
Volunteer has a good understanding of the most effective way to communicate with the participant. What type of support is this?

<table>
<thead>
<tr>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Knowledge and skills</td>
</tr>
<tr>
<td>B Practice (equipment, time, logistics, routine)</td>
</tr>
<tr>
<td>C Personal experience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Viewer Name</th>
<th>Correct</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✔️</td>
<td>A Knowledge and skills</td>
</tr>
<tr>
<td></td>
<td>✔️</td>
<td>A Knowledge and skills</td>
</tr>
<tr>
<td></td>
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<td>A Knowledge and skills</td>
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<tr>
<td></td>
<td>✔️</td>
<td>A Knowledge and skills</td>
</tr>
<tr>
<td></td>
<td>✗</td>
<td>C Personal experience</td>
</tr>
<tr>
<td></td>
<td>✔️</td>
<td>A Knowledge and skills</td>
</tr>
<tr>
<td></td>
<td>✔️</td>
<td>A Knowledge and skills</td>
</tr>
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</table>
Multiple Choice Question: Module #4

**Multiple Choice**
Mary's communication partner is unfamiliar with the technology used for sharing. What type of barrier is this?

<table>
<thead>
<tr>
<th>Video Context</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A Body Structure and Function</td>
</tr>
<tr>
<td></td>
<td>B Contextual/Environmental</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VIEWER NAME</th>
<th>CORRECT</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✓</td>
<td>B Contextual/Environmental</td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>B Contextual/Environmental</td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>B Contextual/Environmental</td>
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<tr>
<td></td>
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<td>B Contextual/Environmental</td>
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<tr>
<td></td>
<td>✓</td>
<td>B Contextual/Environmental</td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>B Contextual/Environmental</td>
</tr>
</tbody>
</table>
Appendix F: Introductory Email to Volunteers

Dear Volunteer,

Thanks so much for agreeing to be part of my dissertation research. I think you will enjoy the experience. During the study you will have an opportunity to learn and apply new information related to supporting people with disabilities in recreation and sport.

The first order of business is to have you read the attached consent form, which explains part one of the study along with some other information related to details like time commitment and compensation. After you read the document, please contact me if you have any questions. If you have no questions, sign the form and either scan, email, or snail mail just the signed page back to me. Use the address on the form if you need to use snail mail.

As you participate in the study, your tasks will be spread out over the next several weeks; some weeks will be busier than others. Do your best to complete written probes and training modules in a timely manner. It will be important for you all to be completed with the distance training before starting part two of the study on July 8, 2016.

You will be working independently during phase one of the study, but sometimes the tasks you are given are dependent upon the completion of tasks by other volunteers in your group. Each task you are given should take you approximately 15-30 minutes to complete. Over the course of the first phase of the research study, you will need to complete between 12-15 responses. Phase 2 of the study will require 3 hours of your time, on three consecutive occasions during the regularly scheduled kayaking lessons with the program. Please note you will need to stay after the kayaking program for approximately 1 hour in order to participate in a focus group.

Please consider your commitment to participating in the study and do not hesitate to contact me at any time if you have any questions or concerns. I am currently in Athens, OH and will be traveling to New England in mid-June. I check this email quite often and have also included my phone number in the consent form if you prefer to communicate by phone or text.

Thank-you and I look forward to meeting you in July.

Sincerely,

David J. Hajjar, M.S., CCC-SLP
Doctoral Candidate
Ohio University
## Appendix G: Scoring Rubric

<table>
<thead>
<tr>
<th>Step</th>
<th>Point</th>
<th>Action Item: Say or Do</th>
<th>Point</th>
</tr>
</thead>
</table>
| Cameras               | Cameras | • Show & label camera to participant.  
• “Here is the camera we are going to use.” |       |
| Adapt                 | Adapt | • Show & label options for wear vs. mount.  
• “Wear it or mount it?” |       |
| Practice              | Plan & Practice | • Take a practice photo & video.  
• Practice communication  
• “Push here to turn on, change mode…OR  
What’s your signal?” |       |
| Take Photos & Video   | Take Photos & Video | • Take photos & videos, before, during & after  
• “Let’s take photos &/or video here” |       |
| Use Context           | Use Context | • Suggest and direct photo & video capture  
• “Get this/that in the background.” |       |
| Review Photos & Video | Review Photos & Video | • Compare photos & video, identify favorite.  
• Which one do you like? |       |
| Edit                  | Edit | • Edit by caption or trim  
• “Do you want to add a note or trim video?” |       |
| & Share               | & Share | • Print or digital share  
• “Do you want to print photo or send?  
photo/video?”  
• “Who should we show/send?” |       |
<table>
<thead>
<tr>
<th>Program Steps</th>
<th>Barriers-Participants</th>
<th>Supports-Participants</th>
<th>Barriers-Volunteers</th>
<th>Supports-Volunteers</th>
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</thead>
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<tr>
<td>Cameras</td>
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<td></td>
</tr>
<tr>
<td>Adapt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take photo/video</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Edit</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Share</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Total points earned for each step is 2 points; A response must have at least one barrier and/or support for the participant to earn a point. Also, a response must have at least one barrier & support for the volunteer to earn a point. IF a response has both a barrier and a support for the participant or the volunteer it is still only 1 point.)

Initials of Rater:

Date:

Code for Probe(initials & Probe#):

Points:
- 16 (1 point for including the correct name of the step & 1 point for including say or do item)
- 8 (1 point for generating barrier or support relative to volunteer at each step)
- 8 (1 point for generating barrier or support relative to participant at each step)

Total Amount of Points Assigned: points

(need 26/32 for 80%)
Appendix H: Probes

Stimuli question for all probes:
Read the case study. Consider how you would support the individual to share their recreational experience. Make a plan to assist the person in sharing his or her experience. Type your plan below.

Probe #1: Jim is a 50-year-old man who had a stroke 6 months ago and is currently residing at home with his wife who works full-time and 2 children who will be heading off to college in two years. His speech is difficult to understand so he uses gestures and points to objects and pictures to communicate his message. He is able to understand speech at a conversational level; however has been unable to find a part-time job and is currently receiving federal assistance due to his disability. He maintains a positive attitude when interacting with other people, but his wife think he may be depressed. He experiences tremors in his arms and is not walking independently requiring full assistance to stand and transfer. He has normal hearing ability; however is unable to use his peripheral vision and is not allowed to drive. Jim will be participating in a **wheeled hike on an accessible nature trail** with his recreational therapist, and a volunteer. He would like to share this experience with his family.
Flesch-Kincaid Grade Level Score (FKGLS): 11.3

Probe #2: Sara is a 25-year-old woman with cerebral palsy who lives in a group home with 2 other women with disabilities and various support staff. Sara is non-speaking; however, uses vocalizations, facial expressions and a speech-generating device in order to communicate. She is able to understand speech at a conversational level and uses her device to communicate her daily needs, and initiate conversations. Sara is unable to use her arms and hands in a functional manner, so she uses a head switch to select symbols and words on her device. She is unable to walk; but, uses a power wheelchair. Her hearing ability is within normal limits, but she requires visual information to be enlarged. Sara will be participating in an **adaptive paddling** program with the assistance of her direct care staff and volunteers at the adaptive program. Since she does not have a job and a limited network of friends, she would like to share her experience with her roommates.
FKGLS: 11.3

Probe #3: Peter is a 16-year-old young man with autism who lives at home with his parents and younger brother. He does not use natural speech to communicate and has difficulty consistently following directions. Peter has an iPad with a communication app, but he most often communicates by pointing and using modified sign language. His parents’ do not encourage him to use his iPad for communication and it is often left behind or forgotten when he goes out. Peter enjoys being around other people; but has difficulty making his needs and wants known especially with unfamiliar individuals. He can walk independently but requires maximum support and supervision to ensure he is safe, especially in community settings. Peter’s hearing ability is within normal limits; however, he responds more consistently when presented with visual information (e.g. sign language, pictures). Peter will participate in a series of **adaptive skiing** lessons and his parents would like for him to share his experience with his classroom peers and teachers in school.
FKGLS: 11.4

Probe #4: Jen is a 22-year-old woman who suffered a traumatic brain injury 2 years ago and currently lives with her parents. She communicates using natural speech; but, has severe word-
finding difficulties and poor short-term memory, which negatively impacts her ability to understand questions. Jen is able to make her daily needs known, but she needs support to participate in conversations and express complex ideas. She feels socially isolated living with her parents and misses seeing and talking with her friends who are in college and graduate school across the country. She walks with the assistance of a cane, experiences weakness in her left leg, and has reduced strength in her left arm and hand. She has a visual impairment, is unable to drive, and her parents are nervous about giving her more freedom to engage with activities and people in her community. She does not have a job and has limited opportunities to meet new people. Jen will participate in an adaptive hand cycling program.
FKGLS: 11.1

Probe #5: Paul is a 55-year-old man with amyotrophic lateral sclerosis (ALS) who lives with his wife and two dogs. He does not communicate verbally and uses eye-gaze with a speech-generating device in order to engage with others and make his daily needs known. He understands directions and questions; however, his rate of communication is slow and it can be difficult for him to use his device when he becomes tired or is outside his home setting. Paul has a positive outlook on life despite his challenges and has a large network of friends and supporters through social media. He travels in a power wheelchair and requires maximum assistance for all daily care needs. He wears glasses and his hearing is considered normal. Paul wants to participate in an adaptive shooting activity; however his wife does not like guns and refuses to attend the activity with him. Paul does not drive and relies on a small network of neighbors to access local activities and programs.
FKGLS: 10.3

Probe #6: Tess is a 10-year-old girl with cerebral palsy who lives in a rural area with her parents and three sisters. She is non-verbal and inconsistently uses a speech-generating device in order to communicate with others and make her needs known. She understands language, but requires extra time in order to generate a message and respond to others. Tess is a happy child who goes to school with her same aged peers in an inclusive classroom. She is able to travel independently at home and school in a power wheelchair. She has limited use of her arms and hands so she uses consistent head movements to select communication symbols on a speech-generating device that is on loan from the school district. Tess wears glasses due to a visual deficit and requires words and symbols to be enlarged. She would like to participate in an adaptive surfing program, which is located four hours from her house in California.
FKGLS: 9.8

Probe #7: John is a 23-year-old man with autism who lives in a residential group home setting with two other men and a group of paid caregivers who are constantly changing. John’s mother and brother live approximately 2 hours away and see John two times a month. John communicates by pointing and making verbal utterances that are difficult to understand. He seems to follow simple and familiar directions, but his ability to respond consistently to questions is not accurate. John spends 10 hours each week in a sheltered workshop setting and his social network consists of his two roommates, paid caregivers and his family. John is able to walk independently; but, requires supervision to ensure safety in his home and in the community. His vision and hearing skills are considered within normal limits. John enjoys participating in therapeutic horseback riding lessons, which occur two times each month.
FKGLS: 11.1

Probe #8: Mike is a 51-year-old man with a diagnosis of multiple sclerosis who lives with his wife and son; his daughter is living away at college. Mike is a verbal communicator with a slow
rate of speech that can be difficult to understand when he is tired. His thinking skills continue to be sharp and he has a witty sense of humor. He has a large network of friends in his community and his wife is a teacher in the local school district. In the past, Mike worked as a classroom teacher but is currently unemployed and unable to find a part-time job. Mike uses a cane to assist him with walking around the house. He wears glasses but is not allowed to drive; his hearing is normal. Mike is planning to participate in 6 adaptive ski lessons.

FKGLS: 7.6

Probe #9: Kevin is a 14-year-old boy with Spina bifida and development delay who is currently living in his third foster home this year. His speech is difficult to understand and he follows simple directions. He attends a regular high school, but spends most of the day in a self-contained classroom with support from a licensed nursing assistant who provides personal care. He uses a computer to play below grade level literacy and math games and he does not have access to Email. He consistently seeks out people to greet and talk to, as he does not have a lot of school-age friends. He is in a wheelchair and is able to move himself around independently. He wears glasses and his hearing is within normal limits. Kevin is planning to participate in an adaptive waterskiing program this summer.

FKGLS: 8.9

Probe #10: Steve is a 35-year-old man who suffered a traumatic brain injury and is living at home with his wife and newborn son. He uses natural speech to communicate and he benefits from having questions repeated since he has a mild hearing loss and refuses to wear hearing aids. Steve has difficulty dividing his attention, initiating communication and short-term memory. He and his wife are unemployed, do not have a reliable vehicle and rely on accessing the Internet through their public library. Steve has been unable to keep a job outside of the house and shows signs of depression for which he is currently taking medication. He is able to walk, but experiences chronic neck pain. His vision is within normal limits. Steve is planning to participate in a series of adaptive rock-climbing lessons at a new gym in his town.

FKGLS: 9.8

Probe #11: Ken is a 65-year-old man who suffered a stroke and is now living at home with his wife. His adult children and grandchildren live in another state and he has a small group of friends that he still plays cards with once a week. He has difficulty expressing himself and uses a small notebook with common phrases and questions; he refuses to use any type of electronic device or tablet for communication. He is able to understand questions and multi-step directions. He experiences weakness on his left side and has difficulty holding items and balancing. He does walk with the assistance of a cane and has more difficulty on uneven surfaces. He experiences some visual deficits and his hearing seems to be within normal limits. He will be participating in an adaptive golf program for the first time this summer.

FKGLS: 9.0

Probe #12: Matthew is a 45-year-old man who was recently diagnosed with Huntington disease (HD). He has a family history of this disease and understands that his life expectancy is approximately 15 years. He is married, the father of three children and enjoys staying active in the outdoors. He is experiencing a decline in his ability to speak and is having increased difficulty focusing and following directions. Matthew is able to walk with assistance, gets tired easily, and requires support from paid caregivers to drive him to medical appointments and meetings. His hands and arms are strong, he is able to hold items, push and pull items, and use his arms and hands for support. His visual ability is within normal limits, but, his wife suspects that
he has difficulty hearing. Matthew will be trying adaptive surfing this summer, but will require support for transportation and self-care as his wife works and cannot drive him four hours to the beach from their home.

FKGLS: 10.8

Probe #13: Violet is a 12-year-old typically developing girl who experienced a fall and suffered a traumatic brain injury. She inconsistently uses natural speech to communicate but also points to enlarged pictures and words using a communication app on an iPad. She is able to follow simple directions, but requires more support for complex tasks. As a result of her injury, she is not attending school but instead has a tutor come to her house so she can access her curriculum to the best of her ability. Violet enjoys being around other people, but her peer group is limited because she has difficulty focusing her attention and staying alert. She is unable to walk but can stand with the assistance of one other person. She inconsistently reports episodes of double vision and her hearing is within normal limits. Mary is planning to participate in adaptive snowboarding with her older brother.

FKGLS: 12

Probe #14: Ann is an 18-year-old woman with global developmental delay who lives with her parents. She is able to walk independently but requires supervision in public settings to ensure her safety. She uses natural speech to communicate but unfamiliar listeners have difficulty understanding her. In the past, Ann has used a speech-generating device, but currently her device is not working and her parents have not been able to get it fixed. She goes to school in a separate classroom for students with special education needs and she no longer receives active therapy services due to lack of progress. Her social network consists of her parents, paid caregivers and one friend from her class. She does not have consistent access to a computer with Internet and spends a lot of time watching television and Disney movies. Ann has agreed to participate in a bocce tournament organized by the teachers at her school.

FKGLS: 10.6

Probe #15: Michael is a 12-year-old boy with autism who attends a residential special education school located 4 hours from his family. He is a verbal communicator who repeats words, but generally does not say words spontaneously. He wears glasses and is learning to read sight words in school. Michael does not engage with his peers and does not like being in noisy and crowded environments as he easily becomes over stimulated, shuts down and repeatedly asks to leave. He is able to understand directions and responds well when communication partners use visuals like pictures or words to help him accomplish daily tasks. He is interested in technology and has the motor ability to type and use a mouse with the computer. He is able to walk independently but requires supervision to ensure safety and appropriate behaviors in public settings. His recreational therapist has organized a time for Michael to try cross-country skiing with two other peers in his class.

FKGLS: 12

Probe #16: Bill is a 30-year-old man with a developmental disability who lives in a community residence with two other adults and rotating caretakers. He uses limited speech to make his needs known and is able to follow familiar directions. He works 4 hours each week at the local grocery store and enjoys playing cards and board games with his housemates and caregivers. With assistance from his caregivers he will use a computer to search for pictures of animals and he occasionally receives emails from his brother who lives in another state. He mostly spends time
with his roommates and caregivers. He is able to walk and take care of all personal daily need with occasional reminders from his caregivers. He wears glasses and his hearing ability is within normal limits. Bill likes the snow and is going to try adaptive skiing this winter.

FKGLS: 10.4

Probe #17: Sandra is a 55-year-old woman who had a stroke 2 years ago and lives with her husband. She has great difficulty speaking and understanding language. She spends most days at home as she is not able to work anymore due to her communication difficulties. She spends time watching television and looking at family pictures on her computer. Sandra has many friends in the community who will come by her house to visit and assist her in preparing meals. She is able to walk with a cane and has some difficulty using her right leg and arm. She wears glasses and has no difficulty with hearing. In her stroke support group, she learned about an adaptive sport program and would like to try adaptive cycling.

FKGLS: 7.8

Generalization Probes:

M.M. is a 60-year-old male who suffered a traumatic brain injury in 1999. He is a verbal communicator but has difficulty with speech intelligibility and unfamiliar listeners are challenged to understand him. He has good attention skills and is able to follow 1-2 step directions. He lives alone but has support staff to assist him with daily activities and to access his community. M.M. has been involved with CMARS for many years and he has also participated in activities such as skydiving, whitewater rafting and hang-gliding with other organizations in the New England region. He is unable to walk and uses a wheelchair to get around. He has weakness in his left hand and arm but can use his right hand and arm in a functional manner. M.M. has three brothers and friends in his local community. He is able to use a computer with support from his caregiver.

FKGLS: 6.8

S.A. is a friendly 50-year-old man with a traumatic brain injury that occurred over 20 years ago. He is non-speaking, but does produce vocalizations and uses facial expressions to supplement his expressive communication. He is able to indicate yes and no and is able to follow simple directions. He is primarily in a wheelchair but is able to stand with maximum support from a caregiver and he can hold items in his right hand. He lives in his own apartment with the support of constant caregivers. He does not currently have a job, but participants frequently with CMARS in skiing, kayaking and cycling. S.A. does own an iPad but does not use it for communication. He has a sister on the west coast who is very supportive and would like to see more photos and videos of S.A. participating in adaptive sports.

FKGLS: 6.6

J.V. is a 27-year-old man with a severe global developmental delay with hearing and vision skills within normal limits. He is an active participant with CMARS and will be participating in the kayaking program for a fourth consecutive summer season. He is non-speaking but does produce some vocalizations and uses modified sign language to indicate basic wants and needs. He is able to indicate yes and no by using signs and head nods or a head shake. He is able to walk independently but does experience some issues with balance on uneven surfaces. He lives with another young man with a disability and shared caregivers. He owns an iPad and enjoys looking at pictures, videos and playing games on his tablet. His family is very supportive and he sees his mother several times each week, at this time he currently does not work or go to school.
FKGLS: 8.2

C.A. is a 30-year-old woman who presents with limited speech and delayed cognitive skills such as initiation, memory and verbal processing. She is a verbal communicator and is able to make her needs and wants known as well as participate in conversations. C.A. is able to follow simple directions and focus her attention to a group conversation for 45-60 minutes. She does not typically initiate language and responds inconsistently to reminders and cues to participate in conversational exchanges. She is able to walk and has use of her hands and arms to hold items and perform activities of daily living. C.A. has a very supportive family and is involved in several different recreational activities as well as working part-time assisting with gardening tasks in her local community. She has two sisters and nieces and nephews, but would like to make more consistent connections with friends in her area. C.A. lives at home with her parents and is saving her money to visit Harry Potter World in Orlando, FL.

FKGLS: 7.7

JV is a 29-year-old girl with profound global developmental delays. She is an active participant with CMARS and will be participating again in the kayaking program. Her mom reports that during the lessons, she does not interact consistently or express pleasure; however, after lessons she is quite happy and cheerful. She is non-speaking and has an inconsistent ability to follow simple directions and respond to yes and no questions. She is in a wheelchair and requires maximum assistance for all activities of daily living. She has a supportive family and caregivers and she enjoys looking at pictures that are enlarged. Her mother is considering getting her an iPad in order to review photos and videos. She currently lives with a full time caregiver and does not have a job or go to school.

FKGLS: 10
### Appendix I: Components of the CAPTURE & Share Program

<table>
<thead>
<tr>
<th>Strategy Component</th>
<th>Points</th>
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<tr>
<td><strong>Cameras</strong></td>
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<tr>
<td>Type a barrier or support for volunteer</td>
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</tr>
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<td>Type a barrier or support for volunteer</td>
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<tr>
<td><strong>Practice</strong></td>
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<td>Type a barrier or support for participant</td>
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<tr>
<td>Type a barrier or support for volunteer</td>
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</tr>
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<td><strong>Take Photos and Videos</strong></td>
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<tr>
<td>Type a barrier or support for volunteer</td>
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<tr>
<td><strong>Use Context</strong></td>
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<tr>
<td>Type a barrier or support for volunteer</td>
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<tr>
<td><strong>Review</strong></td>
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<td><strong>Edit</strong></td>
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<tr>
<td>Type a barrier or support for volunteer</td>
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</tbody>
</table>
Appendix J: Operational Definitions for Reliability Tasks

1. **Steps**: Actual word needs to be included in order to give a point
   Camera, adapt, practice, take photo or video, use context, review, edit and share.

2. **Action Items**: should be a statement/s that are related to the specific step of capture & share.
   Statements should be about something that the volunteer is suggesting that the participant or support person do at this specific step. One exception; for the step of **plan & practice**; it is okay to give a point here if the volunteer mentions communication and practicing communication. Communication is an important part of this step as it relates to cameras and how to support the participant to take photos and videos.

3. **Barriers/supports participant**: Should be some statement about skills and characteristics of the person with the disability. Statements may describe motor skills, visual skills, cognitive skills or communication skills of the participant. The barrier or support statement needs to be connected to one of the steps of **CAPTURE & Share** in order to be counted for a point.

4. **Barriers/support volunteers**: Statement about the volunteer skills and their personal capabilities related to each step. Sometimes in baseline probes these statements may be more scattered as the volunteer has not learned how to organize the information in a table. Statements may start: “I am not familiar with…. ” Or “ I don’t know about…. ” Again, the barrier or support statement needs to be connected to one of the steps of **CAPTURE & Share** in order to be counted for a point.
Appendix K: Social Validation Scale-Volunteers

Directions: Please complete the following questions related to the CAPTURE & Share training using the 5 point scale: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; and 5 = strongly agree.

1. Usefulness of training:
   a. The online distance training increased my ability to understand the CAPTURE & Share program.

2. Support for Sharing:
The distance training increased my ability to support individuals with disabilities to share their recreational experiences.

3. Recommendation:
   I would recommend the training to other volunteers who support people with disabilities in recreational activities.

4. Other General Comments or Suggestions about the training program:

Initials: ______________
Appendix L: Social Validation Tasks-Parents and Preprofessionals

1. In which response do you think the volunteer generated a more complete & comprehensive plan to support the participant to share their recreational experience?

2. In which response do you think the volunteer more thoroughly considered personal and environmental barriers and/or supports related to the participants’ ability to share their recreational experience?

3. In which response do you think the volunteer more comprehensively considered personal and environmental barriers and/or supports for themselves as they facilitate the sharing of recreational experiences.
Appendix M: Photos of Volunteers and Participants

Carol & Melanie

Carol paddling, the smiley face on the paddle assists her to keep the paddle in the correct position. Notice the caption on the 2nd photo.
Jeff & Danielle

Jeff is in a tandem kayak with his mother. He is signing ‘broken’ to refer to a problem the volunteer is having with the camera. Jeff’s volunteer is in another kayak and not visible in this photo.
This is Julie with her mother. They are filming using a camera attached to a boat mount. This was lesson #3, which was a very windy day on the lake.
This is Mike with the director of the adaptive sports program. Mike is wearing a camera with a chest strap. Mike had some difficulty wearing this camera due to the size of his life jacket. This is one of Mike’s favorite photos.
In this photo, Sam and the principal investigator, David are caught in a photo taken by Amy. The principal investigator had the opportunity to support Sam in the kayak during all three lessons in a tandem kayak. Sam’s volunteer, Amy was providing support for capture form a solo kayak. Sam is wearing a camera with a chest
Appendix N: List of Equipment and Accessories

- Two HERO 3 GoPro® cameras
- Two Polaroid Cube cameras
- Two adult chest harnesses for GoPro® cameras
- One child harness for GoPro® camera
- Two chest harnesses for Polaroid Cube Cameras
- One head strap for GoPro® camera
- One head strap for Polaroid cube
- 2 iPods, 32GB and protective waterproof cases
- 6 iPad mini 2s
- 2 gooseneck mounts & flex clamps for kayaks
- 2 shutter stick selfie sticks
- 1 Canon Selphy CP910 Printer
- 1 combined package of Canon postcard color ink cartridge and 4x6inch photo paper
- 6 USB 16GB encrypted flash drives
- 1 Extra micro SD card and micro SD adapter
- 1 video camera (Sony Handy Cam)
- 1 audio recorder (Philips Voice Tracer)
- Password-protected MacBook Air for managing storage of media artifacts
Appendix O: Prelesson Status

(Caregiver or Guardian)

Name/Code of Participant:
Name of Caregiver or Guardian:
If Caregiver, how long have you been supporting the individual?
If Guardian, how long have you been guardian?

Date completing questionnaire:

1. Do you know if anyone currently takes photos during recreational activities?
   - Participant with a disability takes artifacts independently
   - Participant with a disability takes artifacts with assistance
   - Volunteer takes artifacts
   - Caregiver or family takes artifacts
   - No one currently takes photos ***(If no one takes artifacts, skip to question 6)
   - Other (please explain)

2. If someone does take photos or video, Approximately how many digital artifacts are taken during one recreational activity/session(include pre activity and post activity periods)?
   - 0
   - 1-10
   - 11-20
   - 21-30
   - 30+

3. If artifacts are taken, Which type of digital artifacts have been taken during the recreational activity?
   - Photos
   - Video
   - Both
   - Other

4. If artifacts have been taken, Have you edited artifacts taken during recreational activities? Yes or No; If yes, how?
   - Change size
   - Trim videos
   - Add caption
   - Add border
   - Use collage
   - Other(please indicate)

5. If artifacts(photos or videos)have been taken do the artifacts get shared with others? If No, skip to question #6.

   If yes:
a. How do you share digital media? (circle all that apply)
   • Face-to-face
   • Social media
   • Text
   • E-mail
   • Snail mail
   • Other (please indicate)

b. Who do you share with? (circle all that apply)
   • Family members
   • Friends
   • Teachers
   • Co-workers
   • Social media network (i.e., followers on Facebook, Twitter, Instagram)
   • People at CMARS
   • Other (please indicate)

6. If you currently DO NOT take photos or videos, do you wish you could take more/get more?

7. If you currently DO NOT take photos or videos, what do you think are the primary barriers?
   a. lack of equipment
   b. unable to attend activities
   c. unable to get good shots (photo or video)
   d. other (please indicate)

8. Are you satisfied with the amount of photos and videos that are taken during the recreational activity?

9. If you had more digital artifacts from your family member’s recreational experiences, how do you think you would use these?

Information for Sharing:

10. Please provide names and numbers of individuals that you approve for sharing photos and videos: (for guardians only)

11. Any other recommendations or thoughts about this topic that may be important for me to know about? (i.e. past experiences with capture or use of cameras in other activities or settings etc.)
Appendix P: Postlesson Feedback

(Caregivers and/or participants with CCN)

Name/Code of Participant:  
Name of Caregiver/Guardian:  
Date:  

PART 1:

1. What have you done with the artifacts (e.g. photos & videos) since the flash drive arrived in the mail?

2. If you have shared the artifacts with others, please tell me how? (we will talk about all that apply)
   
   Face-to-face  
   Social media  
   Text  
   E-mail  
   Snail mail  
   Other (indicate)  

3. Who have you shared the artifacts with?
   
   Family  
   Friends  
   Teachers  
   Co-workers  
   Social media network  
   People at CMARS  
   Other (indicate)  

4. Have you (caregiver) done any editing to artifacts; videos or photos? (e.g. add caption, trim or crop, slow down or speed up, add music)  

5. Any other thoughts in this area?
PART TWO:
1. Benefits: What types of benefits did you observe or perceive as a result of the digital media intervention/CAPTURE & Share program?
   - Benefits for participants with CCN
   - Benefits for yourself, family members or caregivers

2. Barriers: What were the primary challenges with sharing digital media?
   - Challenges for participants with CCN
   - Challenges for caregivers or guardians

3. Supports: Where were the primary supports to assist in sharing the digital media artifacts? What could be improved here? What else is needed to support more sharing?

4. Solutions and Moving Forward: Do you think you would be more likely to capture or share media from other activities?
   If you will not use the program again, why?

5. Operational & Technical Issues: How could the technology and/or overall process for sharing be improved? Did we have all the equipment needed for sharing? What other aspects do we need to consider in regard to collecting and sharing digital artifacts?

6. General Feedback & Recommendations: Do you have any ideas or suggestions for improvements?
   - Procedures for capture
   - Process for sharing
   - Types & quality of artifacts collected
   Advantages and disadvantages
Appendix Q: Potential Topics for Feedback Sessions

(Volunteers)

Feedback Session One: (primary questions and follow-up)

Benefits/Successful outcomes that you observed:
• Describe something successful that occurred during the application of the CAPTURE & Share program. What are the benefits that you observed?

Challenges/Barriers:
• Describe a problem/s that you experienced during application of the CAPTURE & Share program.
  (if you did not have any problems, state a goal for next time of a photo you would like to capture but did not get on the first session)

Communication & Interaction:
• How did the participants’ communication ability/skill impact application of the CAPTURE & Share program?
• What strategies did you use to ensure clear communication?
• Challenges specific to communication?
• Methods to support the CAPTURE & Share program?

Key Supports:
• What are the things/people etc. that were important to make the program work?
• What were the key supports for you the volunteers?
• What were the key supports for the participants?
• What was missing, what other supports would you need to be successful with the CAPTURE & Share program?
• What could be done better next time?
• Do you think it is important for participants to collection photos and videos?

Plan for Next time: Methods/ideas to solve problems:
• Outline ways to solve the problem or meet the goal for next time, what is your plan for next time?
• What would you hope to change? What are the potential consequences/results of solving the problem? What will be different, what is your goal?

Feedback session two & three (primary questions and follow-up)

1. Modifications from last time/changes:
• Anything you tried differently or found something that worked well or not
• Anything else need to be changed?
• How will you implement a change?
• What were the outcomes based on your attempt to solve the problem?

2. Existing barriers/things that are still difficult:
3. **Good things that happened (benefits):**
   - Supports during the activity?
   - What are you finding that is most helpful to make capture happen?

4. **Communication:**
   - Do you think you were effective in communicating with your participant?
   - Why or Why not?
   - Did you have a signal for photo/video capture?
   - Do you need more support around communication?

5. **General Recommendations for applying the CAPTURE & Share program: (i.e. personnel, resources, equipment, training, what was missing?)**
   - For adaptive programs that would like to support photo/video capture?
   - For volunteers who support participants in adaptive programs?
   - What would a recreational program need to make this program work?
   - For participants and caregivers/guardians or parents?
   - Barriers/Supports for yourself as a volunteer: What would you do differently based on your own barriers and supports?
   - Barriers/supports for participants: Thinking about the participants in adaptive sport, What would you like to know more about in order to make a plan?

6. **Feedback about distance training & application:**
   - How to assist in training communication partners to support participants with disabilities
   - What were you able to transfer from the program and what was more difficult to try and apply?
   - Recommendations for improving or using the program again?
   - Comments about the specific modules.
   - What could be improved with the specific modules?
   - What did you like about the training module?
Appendix R: Operational Definitions for Primary Themes and Subthemes

1. Steps: (Cameras, Adapt, Practice, Take, Use; Review & Edit; Share)
   - Note if the actual steps of the program are mentioned
   - Sometimes steps are mentioned but look at the meaning behind the statement, it may go better in a different category based on the intent

2. Challenges: (2 subthemes: Stakeholders & Technology/gear)
   - When something is described as hard or difficult, “it’s really hard to do”
   - If something in the moment that was hard for a volunteer or participant
   - Missed opportunities, things breaking, people being uncomfortable

3. Supports:
   - These could be skills, strategies or things in the environment to support participation
   - This theme can overlap a bit with adapt in the steps theme, but there are only a few occasions of this
   - When volunteers talk about cueing, prompting or assisting
   - Volunteers may use a specific strategy or skill to help the person participate in the program

4. Benefits:
   - Statements fun or enjoyment
   - When something is great or good
   - Someone says they like something.
   - Example: “Well he loved looking at himself when we took the selfie.”

5. Feedback: (Immediate, Future direction & program)
   - Generally, Statements will likely start with “I……”
   - Immediate: statements about changes or modifications or observations that volunteers would like to make during the program lessons.
   - Future: statements about changes or modifications or ideas that may be applied after the program lessons, maybe in another iteration of the training program; recommendations for other settings or for other activities
   - Program: statements specific to modifications for the CAPTURE & Share program, recommendations for changes or aspects that volunteers liked

6. Interaction:
   - Communication that occurs between participants, volunteers, or caregivers across the experience
   - Interpreting signals or behaviors of the participant; responding to the participant

7. Not-codable:
   - Any unit that does fit in one of the categories above or seems irrelevant to the topic