

Linguistic and Social Experience During an Online Mentoring Program for Young Adults Who
Use Augmentative and Alternative Communication (AAC) Devices

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Abstract

Individuals who use speech generating communication devices (SGCDs) are described in the literature as having limited expressive linguistic competence due to limited functional practice, and limited skills in social competence due to limited social experience. Many individuals who use SGCDs in Alberta do not have access to services that provide linguistic and social intervention. Online mentoring programs have been developed for individuals who use SGCDs to address issues such as dealing with life transitions and to improve linguistic competence. These programs included training for mentors in either sociorelational and collaborative problem solving skills or language stimulation strategies such as asking open-ended questions.

The AAC Mentoring Program developed for this study was focused on creating connections between individuals who use SGCDs while also providing a supportive linguistic and social experience. This study proposed to a) design, implement and evaluate an online mentoring program according to the Fit, Focus and Functionality framework, b) determine if the program was able to provide a supportive linguistic and social experience for the participants, and c) to evaluate the implementation and social experience of the program from the participants' perspective. This exploratory study involved one mentor and one protégé. Language samples were collected from the protégé before and after the program. The pair interacted online for a total of 16 weeks. After the initial 5 weeks of baseline, the mentor completed role-plays to test her sociorelational skills and collaborative problem solving skills. Data regarding the implementation of the program, the linguistic and social competence of the protégé and the mentor, as well as information regarding their experience in the program were gathered. Results indicated that the online mentoring program 1) was able to address certain aspects of the Fit, Focus and Functionality framework, 2) provided a supportive linguistic experience by exposing

the protégé to a good model of language and by providing her with opportunities to practice writing, 3) provided a supportive social experience by engaging participants equally in conversations about a variety of topics and helping the protégé to modify her narrative writing style to a more conversational style when the context was appropriate, and 4) was a valuable experience according to the protégé. The results also indicated that although an online context reduced barriers to regular and frequent communication such as transportation and weather, delays in communication still arose due to illness. Future programs may utilize multiple modalities to increase the regularity of communication such as face-to-face meetings and instant messaging in addition to using the online forum. Additionally, focused language sessions with a speech language pathologist (SLP) in addition to the mentoring program may be a way to increase the saliency of the goals of the program and therefore facilitate greater changes in linguistic competence. Accessibility adaptations to the online forum will also be necessary. Next steps include involving more participants and evaluation of a mentor training program, which are both currently occurring as part of a larger research project.

Preface

This thesis is an original work by Jenelle MacDonald. The research project, of which this thesis is part, received research ethics approval from the Health Research Ethics Board at the University of Alberta. The online forum utilized in the study was created with the help of the Informational Technology Team at the University of Alberta based on ethical and accessibility requirements. Administrative Approval for the I CAN Centre for Assistive Technology at the Glenrose Rehabilitation Hospital in Edmonton, Alberta and the Augmentative Communication and Educational Technology Services (ACETS) centre at the Calgary Children's Hospital in Calgary, Alberta was obtained from Alberta Health Services.

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Chapter 1 Introduction

1.1 Problem

Some individuals are not able to use their voice to communicate. They instead may use augmentative and alternative communication (AAC), which can range from using gestures to using high tech devices. Many different types of AAC devices exist and learning to use AAC to communicate comes with unique challenges and barriers. One type of AAC device is a speech generating communication device (SGCD). SGCDs are high tech communication devices that express via automated speech output. SGCDs are used by individuals with disabilities who are unable to speak or have limited speech that does not meet their functional communication needs for activities of daily living (von Tetzchner & Basil, 2011; von Tetzchner & Martinsen, 2000). Learning to use such an SGCD may occur at different ages for different people. Individuals who are unable to speak due to congenital disorders are learning to communicate with an SGCD without ever experiencing being able to speak naturally (Beukelman & Mirenda, 2005). They have yet to experience the power of communication and realize what being able to independently communicate feels like (Light & McNaughton, 2014).

Learning to use an SGCD requires specific instruction, support, opportunities to practice and encouragement (Beukelman & Mirenda, 2005). There are several components of becoming a competent communicator while using an SGCD. One framework describes these components as linguistic competence, operational competence, social competence, and strategic competence (Light & McNaughton, 2014). Operational competence refers to technical skills needed to operate an AAC device (Beukelman & Mirenda, 2013). Social competence involves being able to express a variety of communication functions for social purposes, such as initiating a conversation with peers (Beukelman & Mirenda, 2013). Strategic competence can involve

understanding how to modify communication in different contexts (Beukelman & Mirenda, 2013), (e.g. during conversation or writing a narrative). Linguistic competence encompasses the knowledge and use of language through a linguistic code or organizational system (Light & McNaughton, 2014). An SGCD has its own organizational system of pages of symbols that must be learned by the individual in order to be successful.

Many individuals who use SGCDs are described as having limited expressive linguistic competence because of reduced or ungrammatical linguistic output (Lund & Light, 2003; Lund & Light, 2007). These limitations often correspond with the significance of their disability, substantial environmental barriers, and restrictions of SGCD systems (Light & McNaughton, 2014). Beukelman and Mirenda (2005) outlined the importance of rate, accuracy and independence for successful communication interactions. When communication breakdowns occur for an individual who uses SGCDs it is commonly to do with one of these areas. Kraat (1987) describes the speech production of individuals who use SGCDs as seriously limited in rate (2-25 words per minute) compared to natural speakers (150-175 words per minute). Koester and Simpson (2014) examined the rate of linguistic output of individuals using AAC, defined as the text entry rate (TER). They found that even when provided with modifications to increase TER, participants' words per minute (WPM) ranged from 1.42 – 2.72 (Koester & Simpson, 2014). Moore, Adams, Dagenais, and Caffee (2007) described listeners' preferred rate of speech ranging from 150 – 200 WPM. Lund and Light (2003) described the linguistic output of individuals who use AAC as having incomplete syntax, improper word order, lack of function words and lack of morphological markers. The speech of individuals who use SGCDs is often described as “telegraphic,” especially during face-to-face interactions (Lund & Light, 2003). Individuals who use SGCDs often rely on limited and unintelligible natural speech, facial expressions, gestures, eye gaze, and body language more than their SGCD and furthermore often use these modalities to

add precision to their utterances rather than increasing the complexity of their linguistic output through their SGCD (Kraat, 1987; Rahavendra, Olsson, Sampson, Mcinerney, & Connell, 2012). They use these alternate modalities despite the fact that they require more effort and participation on the part of the communicative partner who often misinterprets the intended message (Kraat, 1987; Lillienfeld & Alant, 2005). Other factors that contribute to the limited speech production of individuals who use aided communication have been examined such as ability to spell versus being restricted to the preset symbols on a device (Kraat, 1987). An SGCD system can be accessed in various ways depending on the physical abilities of the individual, but these access methods are not as efficient as natural speech and therefore affect the rate at which someone is able to communicate. Examples of access methods are using switches or buttons to scroll through options on a screen, touching a screen directly, using eye gaze technology to select items on a screen, etc. (Beukelman & Mirenda, 2005). These many factors limit what individuals are able to express and the complexity of their linguistic output.

These limitations in linguistic output are often at odds with the receptive knowledge of individuals who use SGCDs (Lund & Light, 2003). It is often difficult to assess the true linguistic abilities of individuals who use SGCDs as they may have adequate language and social skills but may not have the means (via their SGCD) to apply their knowledge or may choose not to in order to try to be more efficient (Kraat, 1987; Lund & Light, 2003).

Attaining linguistic competence is one aspect of communicative competence. However, in order to be able to use one's skills in linguistic competence to meet their communicative goals, they also need skills in social competence (Light & McNaughton, 2014). Light & McNaughton (2014) describe social competence in two ways: 1) sociolinguistic skills and 2) sociorelational skills. Sociolinguistic skills involve skills related to pragmatics (i.e., turn taking, initiating and terminating conversations, using various communicative functions, etc.) (Light & McNaughton,

2014). Sociorelational skills involve the ability to develop and maintain effective relationships through active listening (Light & McNaughton, 2014). Therefore, in order to attain social competence one must be able to communicate appropriately in many settings, with many different people. Individuals who use SGCDs often communicate effectively with family, close friends, and in predictable situations (Light & McNaughton, 2014; Liliensfeld & Alant, 2005). However, breakdown occurs with unfamiliar communication partners and in novel or less structured settings (Light & McNaughton, 2014; Liliensfeld & Alant, 2005). Therefore, individuals who use SGCDs need to learn when and when not to initiate conversations, what to talk about, with who, where and in what manner in order to develop skills in social competence and to communicate effectively (Light & McNaughton, 2014).

The interactions that an individual who uses an SGCD experiences most likely have an influence on their linguistic and social competence and may be largely determined by the communicative partner with whom they are interacting (Kraat, 1987; Batorowicz, Campbell, von Tetzchner, King, & Missiuna, 2014). Individuals who use SGCDs engage in fewer social interactions than individuals who use natural speech. Achieving meaningful participation in school, social situations, with family, and at work is a challenge that continues throughout the life of an individual who uses an SGCD. Limited social experience leads to decreased number of opportunities to communicate independently (Raghavendra et al., 2012). Individuals who use SGCDs may also be perceived as low achievers and therefore be provided with fewer opportunities to participate by teachers and caregivers (Light & McNaughton, 1993). Additionally, individuals who use SGCDs are less involved and engaged in the activities that they are a part of (Thirumanickman, Raghavendra, & Olsson, 2011). The lack of engagement in activities by an individual who uses an SGCD may be due to environmental barriers, decreased/lack of accessibility of activities, parental over-protectiveness or limited functional

abilities (Thirumanickman et al., 2011). Thirumanickman et al. (2011) also reported that individuals who use SGCDs often are involved in activities by the choice of someone else, most likely a caregiver and not of their own volition. These factors may contribute to the lack of engagement and diminished use of their SGCD. Furthermore, natural speakers often dominate interactions or use close-ended questions with individuals who use AAC and in turn, take away opportunities for the individual who uses AAC to communicate and practice with their device (Light, 1997). Therefore, an intervention that counteracts these factors by creating a supportive linguistic and social experience is necessary.

Individuals who use SGCDs may never know someone else who is a successful and competent speaker who also uses an SGCD (Ballin, Balandin, Stancliffe & Togher, 2012). Having a role model is important to individuals who use SGCDs (Ballin et al., 2012). A role model has the potential to increase a new learner's motivation to become competent with their device.

1.2 Possible Solutions

Children with Language Impairments (LI) have similar features of limited expressive linguistic competence as individuals who use SGCDs. Children with LI make more grammatical errors, use simplified grammatical structures and show restricted vocabulary compared to typical language learning children (Paul & Norbury, 2012). The way children with LI develop language does not occur in a different way than children with typical language, they just acquire it at a slower pace (Paul & Norbury, 2012). The same can be said for individuals who learn to use SGCDs because they are receiving access to communication later in life and therefore will need time to get a similar amount of exposure as typical language learning children receive in order to acquire language. Therefore, we can look at the ways we address the limited expressive language

problems in children with LI to determine how we can solve the same problem in individuals who use SGCDs.

Speech language pathologists (SLPs) use intervention strategies that increase the number of communicative opportunities to address the limited linguistic competence of kids with language impairments (Paul & Norbury, 2012). SLPs aim to increase the frequency of vocalizations using a variety of intervention strategies (Paul & Norbury, 2012). These strategies may be different depending on the theoretical background of the individual SLP. However, regardless of background, it is important that any intervention planned follows the operating principles related to Fit, Focus, and Functionality (FFF) as outlined by Judith Johnston (2007). There are 10 operating principles related to Fit, Focus, and Functionality that were derived to guide intervention with children but are useful for young adults as well. Fit includes five operating principles and takes into account content and style. In terms of content, the first operating principle ensures treatment goals are developmentally appropriate for the development level of the client's expressive language (Johnston, 2007). The second operating principle aims to design interventions that allow the client to accomplish their own desired purpose (Johnston, 2007). The third operating principle ensures that treatment goals are appropriate for what the client can interpret based on his/her knowledge of language and the world (Johnston, 2007). In terms of style, the fourth operating principle ensures the intervention utilizes the client's preferred strategies while the fifth operating principle embeds language intervention into another task in order to seemingly pursue some other goal (Johnston, 2007). Focus relates to two operating principles. The first focus principle ensures that interventions make what the client has to learn as salient and as clear as possible by providing concentrated practice (Johnston, 2007). The second focus principle encourages the use of a target or language goal in a variety of contexts in order to ensure the client understands the breadth of its meaning (Johnston, 2007).

Functionality relates to three operating principles. The first functionality principle aims to ensure language is taught in both natural and contrived situations. The second functionality principle ensures that language interventions are embedded into the communication of real messages (Johnston, 2007). Lastly, the final functionality principle ensures that we teach language in the client's world by focusing on what is important to them (Johnston, 2007). Using the principles of Fit, Focus, and Functionality ensures interventions are planned appropriately to affect change in the language abilities of children with language impairments.

We can apply these FFF principles to the design and implementation of intervention programs for individuals who use SGCDs. The idea of Fit can be applied for individuals who use SGCDs as interventions should be developmentally appropriate for the level in which individuals are currently able to express themselves. Interventions should also aim to decrease the gap between the individual's receptive and expressive linguistic abilities, and interactions need to be appropriate for their chronological age. Fit can also be applied to the idea that we have the most appropriate people providing the intervention. People who communicate effectively with SGCD's may be the best individuals to provide intervention. Individuals who use AAC to communicate every day and have become competent communicators know the systems better than most SLPs (Ballin et al., 2011). In addition they have direct experience with the challenges and barriers of using a SGCD. The principle of Focus can be applied by ensuring individuals who use SGCDs are practicing using their device to communicate. This can be done using online conversations to restrict them to using their linguistic abilities, as they cannot rely on their listener to co-construct their utterances. We can also increase the amount of language they produce and are exposed to by implementing a program that provides them with exposure to a good model of language and enables them to practice using their device to communicate. The principle of Functionality can be applied by ensuring the task meets the priorities of the

individual. Improving linguistic competence may not be a priority of an individual who uses an SGCD, as they may be able to get by with co-constructing utterances with familiar communication partners. However, connecting with someone who has gone through similar communication and life issues could be motivating and may provide a good model of linguistic competence. Furthermore, common topics discussed between individuals who use SGCDs who engaged in an online mentor program were of a social nature or related to family, their disability (cerebral palsy), school or work, personal care attendants, financial issues, finding resources and general communication strategies (Cohen & Light, 2000). This shows the variety of issues that individuals who use SGCDs may converse about and which may be more motivating than increasing their linguistic competence.

Engaging with someone who has actually been through similar situations and who can provide support and be a role model provides a functional reason to communicate. Therefore, online mentoring programs may provide the context for an intervention program that aims to increase the linguistic and social competence of individuals who use SGCDs. Competent and successful individuals who use SGCDs would be the best people to fill a mentor role, as they are the only ones who can truly relate to individuals who are still learning to use their device and dealing with the barriers that accompany that experience. A supportive linguistic experience would provide exposure to a good model of language as well as additional opportunities to practice using one's device in order to improve these areas of linguistic competence. A supportive social experience would introduce individuals who use SGCDs to new communication partners and new contexts for communication. Additionally, the individual would be engaged in the activity as evident by the amount of their participation.

Mentoring programs are used in many fields. Mentoring is becoming widely accepted as an effective means of achieving successful outcomes in the fields of education, psychology and

management (Jacobi, 1991). Mentoring has been used with a variety of populations such as children in foster care with traumatic stress symptoms, individuals with spinal cord injury, individuals who are legally blind, and more (Bell, 2012; Johnson & Pryce, 2013; Shem, Wright, Kolakowsky-Hayner, & Duong, 2011). Such programs have had successful outcomes in a variety of ways such as reducing traumatic stress symptoms, achieving meaningful employment, and positive self-identification (Bell, 2012; Johnson & Pryce, 2013; Shem, Wright, Kolakowsky-Hayner, & Duong, 2011).

Mentoring programs are often used to teach and learn new skills (Jacobi, 1991). The theory behind learning through mentoring is best described by Bandura's Social Learning Theory (1971). Social learning theory proposes that we can learn by our own direct experiences as well as from the experiences of others (Bandura, 1971). It also describes our ability to work through possible experiences by thinking about them rather than physically experiencing them (Bandura, 1971). The idea of learning through the experiences of others in the theory of social learning provides the theoretical basis for mentoring programs. The theory also suggests that complex behaviour such as language is best learned through modeling (Bandura, 1971). A mentoring program that exposes protégés to individuals with higher linguistic competence than they currently have may provide such modeling.

Social learning theory also describes how we integrate many cognitive processes when observing and learning new things. Examples of these are attentional processes, retention processes, motoric reproduction processes, etc. (Bandura, 1971). The theory states that we determine what processes were used by the person we are observing and then we determine what processes we will need. In order to increase the likelihood that an individual will learn something

we can reduce the load on these processes in our design of mentoring programs for learning new things.

Mentoring programs are beginning to be introduced in the field of AAC. Such programs have focused on either life transitions (Light, McNaughton, Krezman, Williams, Gulens, Galskoy, & Umpleby, 2007) or linguistic output (Ballin, Balandin, & Stancliffe, 2013) but not both. The training involved in these programs has either been in skills to ensure mentors are prepared to support their protégés as best as possible through sociorelational skills and collaborative problem solving skills (Light et al., 2007), or to ensure mentors provided protégés with optimal opportunities to communicate through the use of open ended questions and other indirect language stimulation strategies (Ballin et al., 2012). A mentoring program that both met the functional needs of receiving support from an individual who has gone through similar experiences and was able to increase their linguistic competence would fill a gap in the field in terms of both functional and effective interventions for individuals who use SGCDs. Determining whether an online mentoring program is able to provide a rich linguistic and social experience for protégés learning to use an SGCD would be a step towards this goal.

1.3 Justification

The number of individuals who use AAC in Canada is continually growing as awareness of the needs and benefits increase. In 2006, individuals with disabilities that affect speech represented approximately 386,660 members of the Canadian population (Statistics Canada, 2006). From this total, 21,450 were between the ages of 15 and 64 and were not receiving any services despite needing them (Statistics Canada, 2006). Additionally, 124,410 were receiving some services but were in need of more (Statistics Canada, 2006). These numbers are continuing to grow and the type of individuals included is becoming more heterogeneous. This growth is

evident in the increase from 302,560 to 386,660 of individuals with disabilities affecting speech, an increase of over 80,000 individuals from 2001 to 2006 (Statistics Canada, 2006).

Canada's population is quite dispersed throughout the large country, especially in the provinces of Saskatchewan and Alberta. Because of this dispersion, individuals who use SGCDs are often isolated in their communities. Those living in remote areas without access to adequate services may never have met someone that also uses an SGCD to communicate, thus they may not know if linguistic competence is even possible or should be something to strive for. An online mentoring program between individuals who use SGCDs could address the issues of connecting people from dispersed locations.

Intervention services available for AAC support are limited and may not meet social and functional needs of these individuals (Ballin, Balandin, Stancliffe, & Togher, 2011). SLPs report not having the time or appropriate resources to support the functional use of SGCDs (Ballin et al., 2011). In Alberta, there are a total of 10 sites that serve children and young adults up to the age of 20 with complex communication needs and only 3 of these serve both children and adults. The clinicians at these sites provide initial support for individuals who receive their SGCD. Once the clients are able to use their device they are discharged and the clinicians assume that the clients will be monitored by community or school SLPs. Unfortunately, barriers in transportation often prevent individuals who use SGCDs from accessing local SLPs and community services (Ballin, Balandin, Togher & Stancliffe, 2012). Access to services that are not dependent on traveling would be beneficial for individuals who use SGCDs in Alberta as weather, road conditions, and limited transportation often make getting to services difficult or even impossible.

1.4 Purpose of this study

The current study is part of a larger project that involves an AAC Mentoring Program that pairs experienced users of SGCDs (mentors) with less experienced users (protégés) and a mentor training course. The larger project involves: a) pairing of mentor-protégé pairs, b) several weeks when the pairs interact in a baseline phase, c) several weeks interacting while the mentor takes the mentor training course, and d) several more weeks of interacting after the mentor training course is completed. The larger project is still underway; a mentor training program was developed and one mentor-protégé pair was matched. This thesis focused on the baseline phase where the pair interacted online as part of the AAC Mentoring Program. The purpose of this study was three fold: 1) to pilot the implementation of an online mentoring program; 2) to examine whether an online mentoring program that focuses on functional life issues can provide a suitable environment for also addressing issues such as linguistic and social competence; 3) to evaluate the experience of the participants going through an online mentoring program in terms of its implementation and their social experience.

1.5 Research Questions

- 1. Describe the experience of participants in a mentoring program as a possible avenue for linguistic and social intervention, prior to the mentor receiving training.**
- 2. Does a mentoring program conducted online allow for a supportive linguistic and social experience?**

Chapter 2 Literature Review

2.1 Aspects of mentoring programs

The prevalence of mentoring programs is increasing and the populations utilizing mentoring as an intervention are becoming increasingly heterogeneous. Mentoring has been defined in numerous ways. For the purposes of this study a mentoring program is defined as a program or intervention that is intended to promote positive outcomes via relationships between one person who is less experienced and another who is more experienced and trusted (DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011). Mentor programs are effective for improving outcomes in several domains of development such as behavioural, social, emotional and academic (DuBois et al., 2011). Mentoring programs have been created for youth and adults, students and employees, as well as in a variety of other contexts (Allen, Finkelstein, & Poteet, 2009; DuBois et al., 2011; Schwartz, Rhodes, Liang, Sanchez, Spencer, Kremer, & Kachewa, 2014).

Mentor training has been recognized as an important aspect of mentor programs; however, the type of training appears to be quite individual based on the goals of the mentoring program, the protégé population, and any prior training of the mentors (DuBois et al., 2011; Schem et al., 2011; Johnson & Pryce, 2013; Cohen & Light, 2000; Ballin, Balandin & Stancliffe, 2012). A strong and meaningful connection between mentor and protégé has also been described as an essential part of a successful mentor-protégé relationship (Rhodes & DuBois, 2008; DuBois et al., 2011). Unsuccessful mentoring relationships have been noted when the roles of mentors were not well defined which resulted in either an overly prescriptive style of interaction, inconsistent follow up, or modeling of unhealthy behaviours (Black et al., 2010; DuBois et al., 2011; Shpigelman & Gill, 2013).

Mentors have reported that taking part in a mentoring program led to the development of interpersonal skills for both mentors and protégés, an increase in their confidence in their leadership skills, an increase in their self-awareness and gave them a sense of purpose (Haddock, Weiler, Krafchick, Zimmerman, McLure, & Rudisill, 2013).

2.2 Mentoring in non-AAC fields

Mentoring programs are widely used in many fields to connect more experienced individuals (mentors) with individuals who are less experienced (protégés) (Jacobi, 1991; Allen et al., 2009). Mentoring is becoming widely accepted as an effective means of achieving successful outcomes especially in education, psychology and management (Jacobi, 1991).

A therapeutic mentoring program showed significant results in reducing the impact of trauma for youth in foster care (Johnson & Pryce, 2013). Youth between the ages of 6 and 15 were enrolled in a therapeutic mentoring program for 18 months. Mentors in this program were given extensive training in supporting youth who have suffered trauma. Training also included how to best engage youth in conversation with the use of open-ended questions.

Shem et al. (2011) created a mentoring program for youth and young adults with spinal cord injury (SCI). This program was focused on having participants return to school or work or prepare for a transition to beginning post-secondary education or employment for the first time. Youth with SCIs were matched with mentors with or without a disability all of whom took part in peer support training. There was no mention of whether there were differences on any of the measures between pairs including mentors with a disability versus pairs including mentors without a disability. Significant effects were noted for increases in participation in the community and decreases in amount of supervision needed. Limitations of the study were that there were no control groups and because of the length of the study many of the participants were not able to

complete the full two-year program. However, 90% of participants who completed the program had a positive experience in the mentor program and indicated that they would continue to communicate with their mentor.

Bell (2012) created a mentoring program for transitioning youth who were legally blind. The author found that after being in the two year long mentoring program youth experienced an increased confidence to make career and life decisions. Additionally, Bell (2012) found that youth experienced increased positive attitudes about blindness.

2.3 Mentoring in AAC

The field of AAC is beginning to use mentoring to bring together individuals who communicate, often using SGCDs, and provide them a means to share their experiences with people who understand the challenges they face.

Individuals who use AAC and their parents have expressed interest in mentoring programs that will connect them with other people who also use AAC (McNaughton, Rackensperger, Benedek-Wood, Krezman, Williams, & Light, 2008). Individuals who use AAC emphasize the importance of having a role-model when learning to use an SGCD (Ballin, Balandin, Stancliffe, & Togher, 2012). Ballin et al. (2012) interviewed individuals who use AAC about their views on implementing a mentoring program where individuals who use SGCDs would be the mentors. All participants in this study supported the implementation of such a program (Ballin et al., 2012). Common themes found from the interviews were 1) the benefit of knowing someone who is successful in communicating with an SGCD would be motivating to new learners, 2) individuals who use an SGCD are best suited to be role models for individuals learning to use an SGCD, 3) motivation and encouragement for new learners would be beneficial for the new learner and their family, 4) individuals who use an SGCD competently have the

firsthand experience which puts them in a position to improve the new learners' use of their device, 5) individuals who use an SGCD competently can provide technical and operational support for families, and 6) individuals who use an SGCD competently may be able to enhance life and advocacy skills of new learners as well (Ballin et al., 2012). Additionally, mentors agreed that individuals who are competent with an SGCD still need training in working with people, so there are potential benefits for mentors. Finally, mentors mentioned that programs including face-to-face meetings would encounter significant barriers including access to transportation (Ballin et al., 2012).

Speech language pathologist's (SLP's) have also expressed the possible benefits of mentoring programs for individuals who use SGCDs. Ballin, Balandin, Stancliffe, and Togher (2011) used focus groups including SLPs in Sydney, Australia to reflect on the unique challenges of learning to use an SGCD, along with the limited resources and services SLPs are able to provide due to caseload demands and restrictions in service delivery models. There was consensus that mentoring programs to improve SGCD use, which included individuals who are competent with SGCDs, were needed (Ballin et al., 2011). A successful mentoring program would include functional device use, an aspect of intervention the SLPs were not always able to provide (Ballin et al., 2011). A prevailing aspect of this kind of mentoring program was that it would include individuals who shared similar experiences and thus would be able to provide a type of support out of the range of services provided by the SLP (Ballin et al., 2011). SLPs in the focus group admitted to not being as proficient in using SGCDs as an individual who uses an SGCD for everyday interactions (Ballin et al., 2011). Additionally, SLPs reported not having enough time to provide adequate services and support for new learners of SGCDs due to funding and service restrictions (Ballin et al., 2011). Overall Ballin et al. (2011) concluded that there was

a need for mentoring as an addition to the services currently provided.

Mentoring executed via the Internet has had the most success because of the physical barriers and other challenges that limit regular attendance in person for this population (Light et al., 2007; Ballin, Balandin, & Stancliffe, 2012). An online mentoring program was conducted by Cohen and Light (2000) for individuals who use SGCDs. For this program, mentors included individuals who use SGCDs and were identified as role models due to previous endeavors. Mentors were over the age of 25, and were paired with younger individuals who used SGCDs. The younger individuals (protégés) were in the midst of a life transition and were expected to engage in an online mentoring program with the older individuals (mentors) for at least six months. Eight participants were recruited, four mentors and four protégés, to take part in the study. The pairs were connected via email and allowed to freely get to know each other. If there was no communication between the mentor and protégé for more than two weeks the researcher would remind the participants about the importance of regular communication. Mentors and protégés were given directions to forward emails to the researcher for monitoring and analysis. This study found the mentor-protégé pairs communicated quite frequently (range of 1.3- 3.7 messages per week) and that both the mentors and mentees had positive experiences with the program. They examined the types of messages and the topics discussed but did not investigate the communicative competence of the protégés before or after engaging in the program. However, they did find that the mentors lacked certain skills to support their protégés and that a training program would be beneficial (Cohen & Light, 2000).

In a follow up study by Light et al. (2007) the mentors took part in a training program that taught sociorelational and collaborative problem solving skills through strategy-based learning. The strategies taught skills such as ensuring mentors listened to the protégés and communicated

respect, asked questions to find out more about the protégés interests or concerns as well as how to scaffold the problem-solving process and help someone set goals without taking over the process (Light et al., 2007). The participants in this study were successful at learning the strategies and validating the training's usefulness. After training, these participants were paired with protégés for a year long mentoring program, after which the mentors reported satisfaction with the support they were able to give their protégés because of the training. The protégés also indicated their satisfaction with the support that they were given by their mentors. The study was focused on the success of learning the skills necessary to be a mentor and did not address any effects of the interaction on the protégés communicative competence.

There have been two studies that focused on the effect of face-to-face mentoring on the linguistic competence of individuals who are new to using their SGCD. In the first study by Ballin et al. (2012) the researchers attempted to create a mentor training program that taught mentors how to support the improvement of linguistic competence of new SGCD users (protégés) by using language modeling strategies such as recasts and expansions as well as ensuring mentors asked open-ended questions to increase the number of communicative opportunities for the protégés. Recasts are when a listener rephrases the utterance of the speaker by changing its syntactic structure. Expansions occur when a listener repeats the utterance of the speaker but adds appropriate syntactic and semantic information. Open-ended questions demand a response longer than yes/no or a single lexical item. These strategies are widely used in the SLP field as they have been shown to be effective in improving the language abilities of individuals with language impairments (Paul & Norbury, 2012). This mentoring program was executed in a face-to-face format to allow mentors and protégés to actually see how they each used their device to communicate. The three mentor- protégé pairs were expected to meet six times for one hour each.

During these meetings there was a short break when mentors were given feedback and support regarding their use of the above strategies. For example, mentors received support to use expansions in the form of advice on how long their expansions should be and by pointing out opportunities where expansions could be used. Additionally, mentors could choose to respond to communication attempts through the protégé's device as well as other modes, such as gestures. When the protégés used gestures, mentors could model how that would be expressed via their device.

This training program was found to be moderately effective for teaching the above strategies (Ballin et al., 2012). Two of the three mentors used open-ended questions both before and after training but did not use recast sentences even after training. In terms of expansions, the mentors were able to use this strategy after training and support given by the authors. However, only one mentor showed a significant increase in their use of this strategy. Whether the minimal increase in expansions resulted in any changes in the linguistic competence of the protégés is unknown.

Unfortunately, only two of the three mentor-protégé pairs were able to complete the program. One of the pairs had gaps between meetings of up to 6 weeks and the protégé in this pair reported feelings of anxiety and frustration because of an inability to use his SGCD to communicate, as well as finding the program too difficult (Ballin et al., 2012). This protégé ended up discontinuing his participation in the study. The participants in this study encountered several challenges to attending the meetings due to holidays, inability to access transport, unavailable care support for the excursion, and mechanical breakdowns. These limitations may have been less of a barrier had the meetings been conducted online. This study did not report the effects of this program on the protégés. There is nothing mentioned about the enjoyment or

satisfaction the protégés felt after engaging in the mentoring program. Additionally, this study does not report the types of linguistic exchanges that occurred between the mentors and protégés. The participants were monitored by an SLP who would support the flow of conversation and provide a list of conversation topics if there were times where conversation stopped (Ballin et al., 2012). Having the SLP visibly present may have negatively impacted the degree of connection and rapport the mentors were able to build with their protégé.

In Ballin, Balandin and Stancliffe (2013) the effects of the mentoring interaction on protégé's SGCD usage was examined through measuring the linguistic competence of the protégés before and after a mentoring training program. The linguistic competence was measured using Number of Total Words (NTW), which measures the amount of linguistic output, Number of Different Words (NDW) which measures lexical diversity, and Number of Bound Morphemes (NBM), which they defined as grammatical accuracy (Ballin et al, 2013). The protégés in this study showed variable results in their improvement in linguistic competence. Two of the three participants showed that the program was highly effective to increase their NTW but not for their NDW and NBM. In fact, the changes in NBM did not show that the mentoring program was effective at all. The lack of effect for grammatical accuracy exemplifies the importance of SLP services and support in working with individuals who use SGCDs to become grammatically competent. However, this also shows that such a mentor program may be effective for increasing the amount of device use in general, although not grammatical use. The lack of effect for the NBMs may also be an indication of an inappropriately defined measure. If only the NBMs that are used are counted than you do not know whether the individual is using them in obligatory contexts or not. Therefore, an indication of errors in the use of morphemes, including both omissions and incorrect use, may have been a more precise measure. The authors reported that

there was an increase in discourse skills for the two participants who completed the mentoring program as well as increases in social, operational and strategic competence. It is important to consider the participant in this study for whom this program did not work. The difficulties this participant faced show the importance of having access to different types of programs and support.

Furthermore, this study used language stimulation strategies to improve the protégés linguistic competence (Ballin et al., 2013). The focus of the study was only on the linguistic competence of the individual learning to use an SGCD. The strategies used were more explicitly pointing out grammatical errors in the protégés. These strategies are largely used in language intervention with children, however, adults are more aware when they are being corrected and when they have made an error. This may have had an impact on both the development of a relationship between the mentors and protégés in this study as well as the increased anxiety and frustration by one of the participants. Such a direct interaction style where the mentor is actively correcting the protégés utterance may hinder the relationship emerging between the mentor and protégé as well as take away the natural and functional aspect of the mentoring interaction. A more indirect approach where the main focus is not just the linguistic competence, may render a more natural conversation as well as foster more meaningful relationships between mentors and protégés.

By integrating aspects of each of the AAC mentoring studies that have already been done (Cohen & Light, 2000; Light et al., 2007; Ballin et al., 2013) it is hypothesized that such a program may be an effective addition to regular communicative intervention for individuals who are learning to use their SGCD or struggling to become competent communicators. Such a program would allow individuals to practice using their devices to create longer messages due to

eliminating the time constraints of a face-to-face or instant messaging interaction. In addition, these longer messages may increase the connection and social relationship that develops between the participants.

Chapter 3 Methods

Ethics approval was obtained from the Health Research Ethics Board at the University of Alberta. The online forum utilized in the study was created with the help of the Informational Technology Team at the University of Alberta based on ethical and accessibility requirements. Administrative Approval for the I CAN Centre for Assistive Technology at the Glenrose Rehabilitation Hospital in Edmonton, Alberta and the Augmentative Communication and Educational Technology Services (ACETS) centre at the Calgary Children's Hospital in Calgary, Alberta was obtained from Alberta Health Services.

3.1 Design

A qualitative case study design was used to examine the implementation of the online mentoring program and the experience of the participants going through the program. Few mentoring programs for individuals who use SGCDs have been implemented and studied (Cohen & Light, 2000; Light et al., 2007; Ballin, Balandin, & Stancliffe, 2013). Therefore, limited information on the benefits and experience of individuals going through such a program is currently available. A single observational case study was utilized in order to understand a) how to best implement an online mentoring program and b) the experiences of both a mentor and a protégé with complex communication needs going through an online mentoring program.

3.2 Participants

3.2.1 Recruitment

Information posters were distributed at the I CAN Centre for Assistive Technology (see Appendix I) and at ACETS (see Appendix II). SLP's at the I CAN Centre created a list of potential and recommended participants who fit the criteria: protégés who had room for

linguistic growth and were going through a transition and mentors who could provide a good model of linguistic competence and were mature enough to be a mentor. Information and consent forms were sent to potential participants (available in Appendix III). Research posters were also sent to assistive technology vendor representatives (e.g., Tobii Dynavox, Aroga, etc.) and various disability service sites. Interested participants completed information and consent forms and contacted me via e-mail or phone.

3.2.2 Participants

Two participants were recruited at the beginning of the study, one mentor and one protégé. Recruitment efforts continued as this initial pair began the study. However, no other pairs were recruited within the timeline of this study. Information gathered about the participants through the demographic form (See Appendix IV) were used to determine whether the participants would be a good match for the program. The mentor that was recruited was younger than the protégé. However, it was decided that they would make a good match because the protégé had less life experience based on the information in their demographic forms.

The protégé was a 19-year-old female with Athetoid Cerebral Palsy who had already finished high school. She was living at home in a small town outside of Edmonton and had been using an AAC device for 15 years. She had been using a PRC Accent with 144-symbol display using the Minspeak language system, a symbol based system, for approximately one year before the study began. Her language system also allowed for her to spell novel words on a keyboard page and allowed for word prediction features to be turned on. However, this feature may have only been available to her when she was on a keyboard page and not when she used her symbol pages. Her word prediction feature could also be described as more of a ‘spelling completion’ because it would only guess which word she was trying to spell rather than true word prediction

which would provide her with options for the grammatically best next word. The protégé used head switches to access her device and was looking to connect with a mentor that had information on living independently, improving her writing and spelling, taking public transit, and going to college. The protégé was also very interested in becoming a writer, was part of a writing group and was taking an online writing class at the time of the study. She was chosen to be a protégé based on her eagerness to gain information about the topics above.

The mentor was an 18-year-old female with Rett Syndrome and was in the midst of completing high school. She was living at home and had been using a Tobii I15 Eye Gaze device for approximately three months before the study began and a Surface Pro tablet and Dell Laptop with PC Eye Go bar for approximately one and a half years before the study began. She used a software program called SonoScribe, which is a text-based program that allowed her to save the messages and phrases she constructed. Her text-based system included rate enhancement features such as word prediction. Her word prediction was always available to her and would predict the grammatically best next word based on the pronoun or noun she began her sentence with. The mentor was fluent in both English and French and planned to study Political Sciences after she graduated. She was a member of a youth council for two years and helped advocate for equality policies in Alberta schools. In addition, she was the co-chair of a committee and started a group that provided safe, judgment-free peer support. She was also on a committee for empowering people. She also helps other people use and learn to program Eye Gaze devices through the Internet.

3.3 Materials and Settings

3.3.1 Online Forum Platform.

The mentoring program was conducted online via a University of Alberta (U of A) forum.

The forum was set up based on the following initial criteria:

- Each post by a user must have moderator approval (e.g., posts containing offensive, hurtful, or safety concerns would not be approved and a change in topic would be advised);
- The moderator can turn off the ability for users to delete posts;
- Messages are only visible to defined group members

Modifications were made to the initial site in order to make it as accessible as possible for individuals who use AAC. These changes included:

- Remove “extra” features:
 - text modifications;
 - emoticons;
 - links to different pages;
 - notification of date, time, and length of time logged on, etc.
- Reduction of number of “hits” to get to log in and messages
- Simplification of length of URL to www.aac.ualberta.ca.

The protégé and mentor were given a University of Alberta email address to use in the study along with a link to the online AAC Mentor Program Website. Both were added to private forums within the site that only they and the moderator had access to.

3.4 Procedures

The components of the procedures are described in more detail in sections 3.4.1 – 3.4.4. The participants completed pre-assessments before being introduced online. Once completed, the participants were introduced via the AAC Mentoring Project forum where they communicated for the duration of the program. After 5 weeks of interacting, the mentor completed role plays based on skills she would learn in the mentor training course. After the study was over, post-assessments were completed by the protégé.

3.4.1 Pre Assessments

The pre-testing measures were administered via email before engaging in the mentoring interaction to obtain a baseline language sample. Written language samples from the protégé were collected using the stimulus pictures from the Edmonton Narrative Norms Instrument (ENNI) and the Test of Narrative Language (TNL). The stimuli from these tests were used as they include multiple sets of pictures that could be used before and after the program. The ENNI is a narrative assessment with norms for children up to age nine (Schneider, Dubé, & Hayward, 2004). It consists of a series of pictures from which the examinee tells a story (Schneider et al., 2004). In order to make the story telling task age appropriate, the protégé was asked to write the story as if telling it to a young child. However, this instruction may have influenced the utterance length and word choice of the protégé. The TNL is also a narrative assessment with norms for children up to age 12 (Gillam & Pearson, 2004). The TNL consists of two-picture sequence story generation tasks like the ENNI and two single picture story generation tasks (Gillam & Pearson, 2004). Similar to the ENNI, the protégé was asked to write the story as if telling it to a young child and only the stimuli from this test were used, i.e., not the norms. One story from the ENNI, and one single picture story from the TNL were used during pre-testing. The pictures and

instructions were emailed to the protégé, who emailed the story she had written back to me. In these emails, I pointed out the importance of writing these stories independently without any help from a caregiver, friend, sibling, etc.

This study used narratives to assess the language abilities of the protégés as narratives present an ‘ecologically valid’ representation of one’s language abilities, compared to standardized tests (Feagans & Appelbaum, 1986; Owens, 2014). It also provided me with information on the linguistic abilities in an online context rather than face-to-face, thus giving participants ample time to represent their full linguistic capabilities. Using an online context was important because the mentoring interaction was conducted online, which also allowed the protégé more time to construct her utterances.

The Quality of Communication Life Scale (QCLS) was also sent to the participants over email. This measure was used to determine the participants’ current perception of the effect of their communication difficulty on their quality of life (Paul, Frattali, Holland, Thompson, Caperton, & Slater, 2004). This measure is used with individuals who use AAC as their difficulties with communication in particular may not be captured in other quality of life scales. The QCLS was developed by the American Speech and Hearing Association (ASHA) and specifically takes into account activities that would be affected by having problems with communication (Paul et al., 2004). The QCLS is usually administered in person but I adapted it for use online. This was done by copying the text and creating a replica of the rating scale in a Microsoft Word document. The document was sent to the participants and they entered values for each question based on the rating scale in the document. Other quality of life scales have also been adapted for use online without change to their validity and reliability (Duracinsky, Lalanne, Goujard, Herrmann, Cheung-Lung, Brosseau, Schwartz, & Chassany, 2014; van Bragt, van den

Bemt, Thoonen, Jacobs, Merkus, & Schermer, 2014). A list of the questions included in this assessment is located in Appendix V.

3.4.2 Mentoring Program

The mentoring program consisted of the interaction between the protégé and the mentor via the online forum. The participants were told the program was focused on creating connections between individuals through the online forum and discovering the possible benefits of such a program. They were not told that the program was specifically focused on their linguistic and social experience in the program. The protégé's own goal of improving her writing may have influenced the way she utilized the program. An introductory email was sent to welcome the protégé and the mentor to the program. I also gave instructions and rules of the program, and gave them some possible 'get to know your partner' topics to start their conversation.

Additionally, I reminded participants to check the forum and send a message to their partner at least once a week to ensure they were communicating regularly and to reply to messages sent by their partner as soon as possible. See Appendix VI for screenshots of the forum and Appendix VII for intro email, topics and rules.

The interactions between the protégé and mentor were monitored to ensure regular and appropriate communication. If there was no communication between the pair in the one week period, I sent an email with a reminder to send their partner a message and reminded them about the importance of regular communication.

3.4.3 Mentor Training

After 5 weeks of the protégé and the mentor interacting in the baseline phase of the mentoring program, the mentor was given role play scenarios to answer in order to determine whether she was already using mentoring skills. The mentor was not given any feedback on her

answers to these role plays. The next step, in the larger project, will be for the mentor to do a mentor training course. The development and evaluation of the AAC Mentor Training Course is part of the larger research project. The training course was designed to teach mentors sociorelational, collaborative problem solving, and information gathering skills. The training was based on work created at Penn State University (Light, et al., 2007) and was modified by myself and the SLPs at the I CAN Centre for Assistive Technology for use in the larger project. In particular, the training included encouraging mentors to ask open-ended questions when interacting with their protégé as well as to help their protégé learn how to solve their own problems rather than the mentors telling them what to do by giving advice. The training also taught mentors how to access resources to better help their protégés and know when to direct their protégé to someone who is more qualified to answer their questions.

3.4.4 Post Assessments

After the mentoring program was completed, the participants were emailed post testing assessments. The protégé was sent a second set of pictures from both the ENNI and the TNL to write another story for each. Both the mentor and the protégé were sent interview questions regarding their satisfaction with various aspects of the program (See Appendix VIII). When the protégé sent back her answers to the interview questions, follow-up questions were sent as necessary. For example, because the protégé's answers to the interview questions were quite short, I asked the protégé to write a short paragraph about her overall feeling about the program. Once the follow-up interview questions were complete, I sent the protégé the QCLS to complete again.

3.5 Data Collection

3.5.1 Implementation

As this was the first attempt at conducting the AAC Mentoring Project in Alberta, data in terms of implementation was recorded. This included the length of the program and the training and any technical difficulties that were reported throughout the program. In addition, the number of messages sent per week and the longest duration between messages were recorded. This information allowed us to determine how long the program might take for future participants and what changes need to be made to the program to reduce difficulties and increase regular participation. This information, when integrated with the rest of the data, provided evidence to determine whether the program fit the framework of Fit, Focus, and Functionality for designing language interventions.

3.5.2 Language Samples

Data collected using the ENNI and TNL before and after the mentoring program were coded for Number of Total Words (NTW), Number of Different Words (NDW), Mean Length of Communication Unit (MLCU), Complexity Index (CI) and number of errors. The data were segmented into communication units (CUs). A communication unit is defined as an independent clause and all of its modifiers. Therefore, a sentence sent by the protégé as follows, ‘My black communication device is called a accent and I use it with two black as the night cap switches on the sides of my head’ would be divided into two CUs because it included two independent clauses connected by a coordinating conjunction. Definitions of NTW, NDW, MLCU, CI, and Number of errors are available in Appendix IX. How these variables were coded within the transcripts can be found in Appendix X. One external rater was trained in the coding procedures and coded 25% of the data from these stories. The amount of data to have coded by a second rater

was chosen because several other similar studies have coded 25% (Ballin et al., 2013; Cohen & Light, 2000; Light et al., 2007). The initial agreement for these codes was 70%. However, after resolution of disagreements, 100% agreement was achieved. The initial disagreements were mostly due to accidentally missing a code such as a morpheme ending or a comma by the second rater rather than the need for more clearly defined codes. Resolution was achieved by going through the data at the same time and adding the missed codes to both my data sheet and the external rater's. After the resolutions were completed I coded the rest of the data and checked it over twice to ensure nothing had been missed.

3.5.3 Linguistic Experience

In order to determine the amount of linguistic output created by the protégé during the mentoring program the transcripts were coded for the same linguistic variables as the language samples. These measures were chosen based on previous mentoring studies that focused on linguistic competence (Ballin et al., 2013). However, additional measures were added as I felt the need for a more thorough description of the transcripts than previous studies provided. Previous studies looked at the NTW, NDW, and Number of Bound Morphemes (NBM) of protégés only (Ballin et al., 2013). Therefore, the mentor's messages were also coded for these variables to serve as a comparison as well as to examine the type of linguistic exposure the protégé was receiving in the program. Data points were normalized by looking at 50 CUs from the transcripts at a time. The same external rater as above also coded 25% of the data from the online forum for both the mentor and the protégé. For the protégé's data 83% reliability was achieved. After resolution of disagreements, 100% reliability was achieved. For the mentor's data, 93% reliability was achieved. After resolution of disagreements, 100% reliability was achieved. The

reasons for disagreements and procedures for resolution were the same as for the language sample stories.

The linguistic experience of the participants was also described by looking at the number of communication units per message and Number of Total Words (NTW) per message. These measures provide information on the length and breadth of the messages sent. These features were chosen based on the Cohen and Light (2000) study and were used to show how much the program was used by the participants and whether the mentoring program was a conducive environment to elicit conversation between the participants.

3.5.4 Social Experience

The social experience of the participants was described in several ways. First, an aspect of social experience is related to pragmatics and relates more to the content of the messages such as the number of questions asked and answered and the use of words and symbols to capture emotions and intonation, referred to here as 'written suprasegmentals'. Written suprasegmentals were defined as the use of symbols and text to add emotion or intonation to text (e.g., !, ?, !?, !!!, haha, lol, OMG, ☺). These social linguistic variables were counted as totals throughout the entire program rather than per message.

The social experience of the participants was also described by looking at the topics that the protégé and the mentor talked about most frequently. This data was examined as it enabled me to determine the type of relationship that developed between the participants as well as the suitability of the mentor for her role. This was also examined by Cohen and Light (2000) and therefore a comparison could be made between the topics brought up by participants in that study and those in the present study. The same external rater also coded 25% of the transcripts by assigning one of the identified topics to each sentence and 89% agreement was achieved.

3.5.5 Mentoring skills

The mentoring skills of using open-ended questions and collaborative problem solving were examined in this study as these were the skills that would be taught in the AAC Mentor Training course. The number of open-ended questions and the number of times the mentor provided advice before getting more information from the protégé were examined through inspection of the transcripts collected from the mentoring website. The occurrence of an open-ended question was coded with an (O) and the occurrence of a closed-ended question was coded with a (C). The occurrence of immediate advice was coded as [ADVICE]. The occurrences of each code were then counted and tallied in each message.

3.5.6 Participant's Perspective

Data regarding the protégé's view of her overall experience in the program was collected via email interviews. The interview questions are available in Appendix VIII. These interviews included the protégés perspective on the achievement of the goals she set at the beginning of the program, things she would like to change about the program, and ratings in regards to several aspects of the program. The mentor was also asked to rate several aspects of the program as well as the training for the parts that she completed and any changes she would make to the training and the program overall. However, she was unable to complete the post assessments. The protégé's scores on the Quality of Communication Life Scale (QCLS) before and after the program were also recorded and compared.

3.6 Data Analysis

The Systematic Analysis of Language Transcripts (SALT) software was used to count the linguistic variables such as NTW, NDW, MLCU, CI, and Number of errors for both the language samples and the transcripts from the online forum. This software can be used to analyze language

samples as well as count unique codes. Non-linguistic codes were counted manually. For the ‘topics’ identified in the transcripts a “topic analysis” similar to that done by Cohen and Light (2000) was conducted in order to determine the percentage of sentences on each of the defined topics.

3.6.1 Triangulation

According to Robert (2016), triangulation is the collection of converging evidence from different sources and is one of the eight strategies described to combat threats to validity in qualitative research. This also relates to the trustworthiness of the data presented. Aspects of triangulation and trustworthiness were implemented in this study. This study used multiple methods of data collection. The quantitative information from linguistic output included both the conversations that took place in the online interaction as well as language samples collected from narratives. This study also used interviews, standardized questionnaires and the conversations from the online mentoring program to collect more information about the experience of the participants. By having these multiple sources for the participant pair, it allowed more confidence in our interpretations of how the participants were affected by the program. In addition, the findings from the interviews were reviewed by the protégé to ensure accurate interpretations were made. In terms of trustworthiness, a second rater was utilized for various measures in data collection and analysis. By ensuring another individual coded the data as I did, the reliability or trustworthiness of my data is increased.

Chapter 4 Results

4.1 Implementation

Data regarding the length of the program are available in Table 4.1.1. The last messages sent by the protégé and the mentor were in week 16. The baseline phase of the program lasted 5 weeks at which time role plays were sent to the mentor. The role plays took 11 weeks to complete. It was expected to take only a maximum of five weeks with one role play being completed each week. However, there were long gaps between when the mentor received the role play and when she replied to it.

Despite this being the first time implementing an online mentoring program in Alberta, few technical difficulties were reported. Participants reported minor problems by email a total of three times. This included the protégé reporting that the website would not save her password even when she clicked ‘remember me’ on the log in page, the mentor asking whether her posts went through because her internet cut out, and the website timing out and deleting the message she was working on. The mentor also indicated that she needed to modify the page on her device so that she could access it using eye gaze. She indicated that she had to make the icons bigger and more spaced out. The participants also discussed aspects of the website they would like to change over the online forum a total of six times. This was coded as ‘Forum Difficulties’ in the topic analysis, in Section 4.4. The main change both participants brought up was the desire to be able to send pictures to each other.

Table 4.1 .1: Length of study components for AAC Mentoring Project

Variable	Expected	Actual
Total length of study	10 weeks	16 weeks
Length of baseline interaction	5 weeks	5 weeks
Length of role plays	Max. 5 weeks	11 weeks

Data regarding the frequency of correspondence between the participants is available in Table 4.1.2 and Table 4.1.3. The average was between one and two message every week. According to the protocol, at the beginning of the study I sent the participants a message when they had not yet sent a message to their partner by the Wednesday of each week. I did this twice for the protégé and four times for the mentor. However, when this was necessary both the protégé and the mentor often replied to these emails saying that they were too sick to be able to send a message to their partner at that time but would as soon as they felt better. Sometimes the participants had a caregiver send an email to me on their behalf if they were too sick. In order to not put added pressure on the participants, it was decided to no longer send these messages as they only did not send messages because they were too ill.

Table 4.1.2: Frequency of Correspondence during the AAC Mentoring Program

Coded Variable	Protégé	Mentor	Combined
Total number of weeks until their last message	16	16	Not Applicable
Mean messages per week	1.06	0.88	1.94
Longest duration between messages (weeks)	1	2	Not Applicable

Table 4.1.3: Number of messages sent each week by the protégé and the mentor.

Week	Number of messages sent by the protégé	Number of messages sent by the mentor	Role plays for the mentor
1	3	2	
2	1	1	
3	2	2	
4	1	1	
5	1	1	
6	0	0	# 1 sent and completed #2 sent
7	1	1	
8	1	0	
9	1	1	#2 completed

			# 3 sent
10	1	1	
11	0	1	
12	3	0	
13	0	2	
14	1	0	
15	0	0	
16	1	1	# 3 completed #4 sent and completed #5 sent and completed
Total Messages Sent	17	14	

4.2 Language Samples

The linguistic data for the language sample stories written by the protégé including the number of communication units (CUs), Number of Total Words (NTW), Mean Length of Communication Unit (MLCU), Number of Different Words (NDW), Complexity Index (CI) and number of errors are available in Figure 4.2.1. The length of the stories ranged from 35 CUs to 52 CUs. The post story for the ENNI, was longer than the pre-story. However, the pre-story for the TNL was longer than the post story. There were more words and more complex utterances for the ENNI pre-story than for the post story. The TNL post story had more words and more complex utterances than the pre-story. In terms of errors, there were fewer in the second story for both the ENNI and the TNL. The pre story for the TNL had many more errors than the other stories. It is unclear as to why this came to be as this story had fewer total words than the other stories but similar number of communication units, number of different words, complexity index, and the mean length of communication unit.

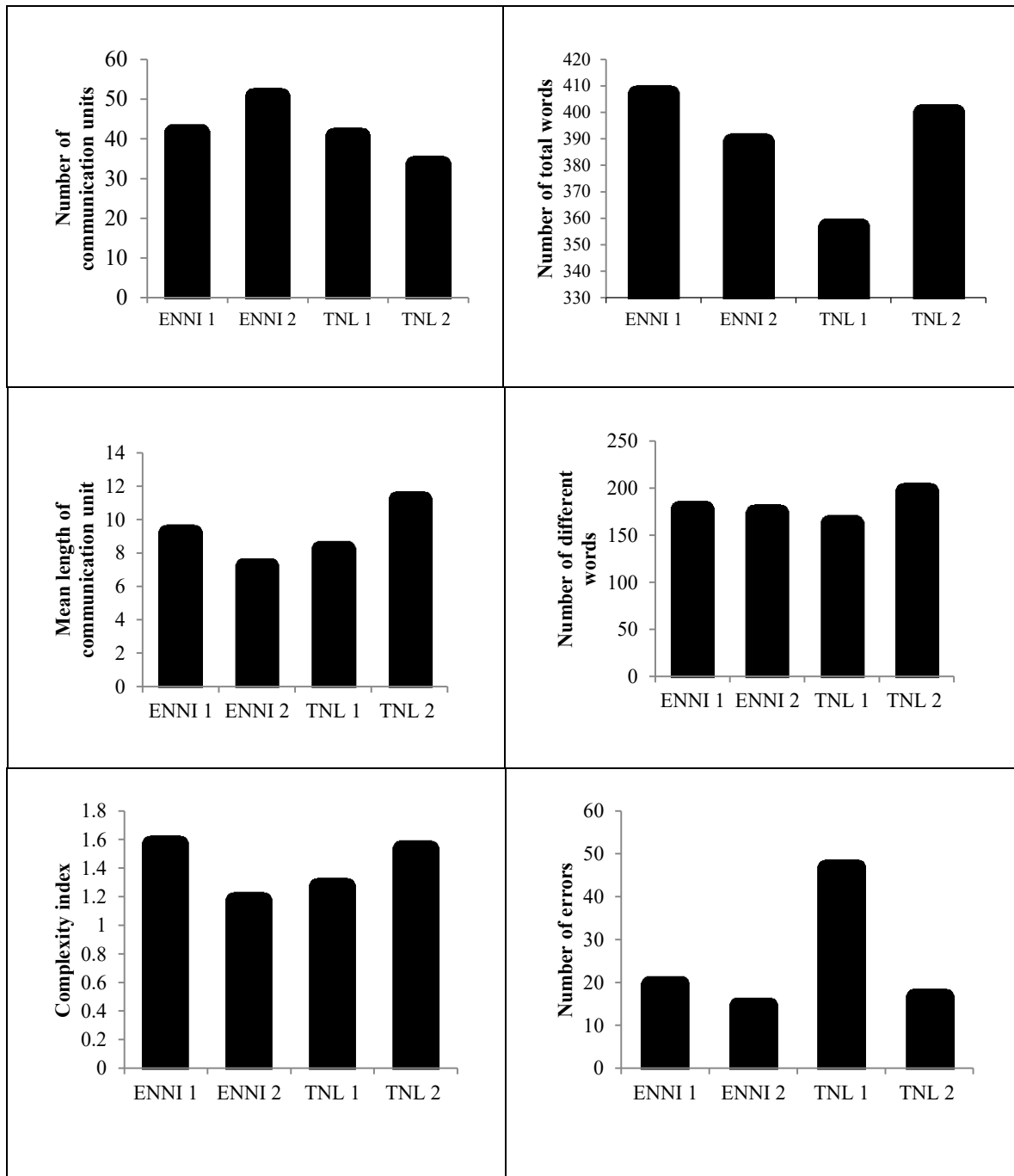


Figure 4.2.1: Linguistic data for the protégé from pre (1) and post (2) language samples elicited from the Edmonton Narrative Norms Instrument (ENNI) and the Test of Narrative Language (TNL).

4.3 Linguistic Experience

The mean number of CUs per message and mean number of total words per message by the protégé and the mentor are shown in Table 4.3.1. The total number of messages sent is shown in Table 4.1.3 above. These measures inform us about the amount of language the protégé was exposed to receptively as well as the amount of language she produced expressively. The mentor sent fewer messages due to medical issues preventing her from participating regularly in the program. However, within these messages she had more communication units (37.64 Mean CUs) and total words (333 Mean NTW) on average than the protégé (26.11 Mean CUs and 203 Mean NTW).

Table 4.3.1: Occurrences of codes for linguistic experience during AAC Mentoring Program

Coded Variable	Protégé	Mentor
Mean CUs per message	26.11	37.64
Mean NTW per message	203	333

The protégé's and mentor's mean length of communication unit (CU), number of total words used, number of different words used and complexity index of their utterances are shown in Figure 4.3.1. Each data point in the graphs represents 50 CUs, thus weeks where there are no messages are ignored. The values for each variable appear stable for both the protégé and the mentor. Based on visual inspection it appears that the mentor has higher values for all variables. It should be noted that sets seven and eight contain a poem that the protégé pasted in the forum twice, the second time by accident, to share with the mentor. The poem was possibly written before and edited by someone else. The poem was kept because she took the time to log into the forum, create her message, and send it each time. Additionally, the poem does represent the full extent of the protégé's language abilities if she takes the time to edit her work.

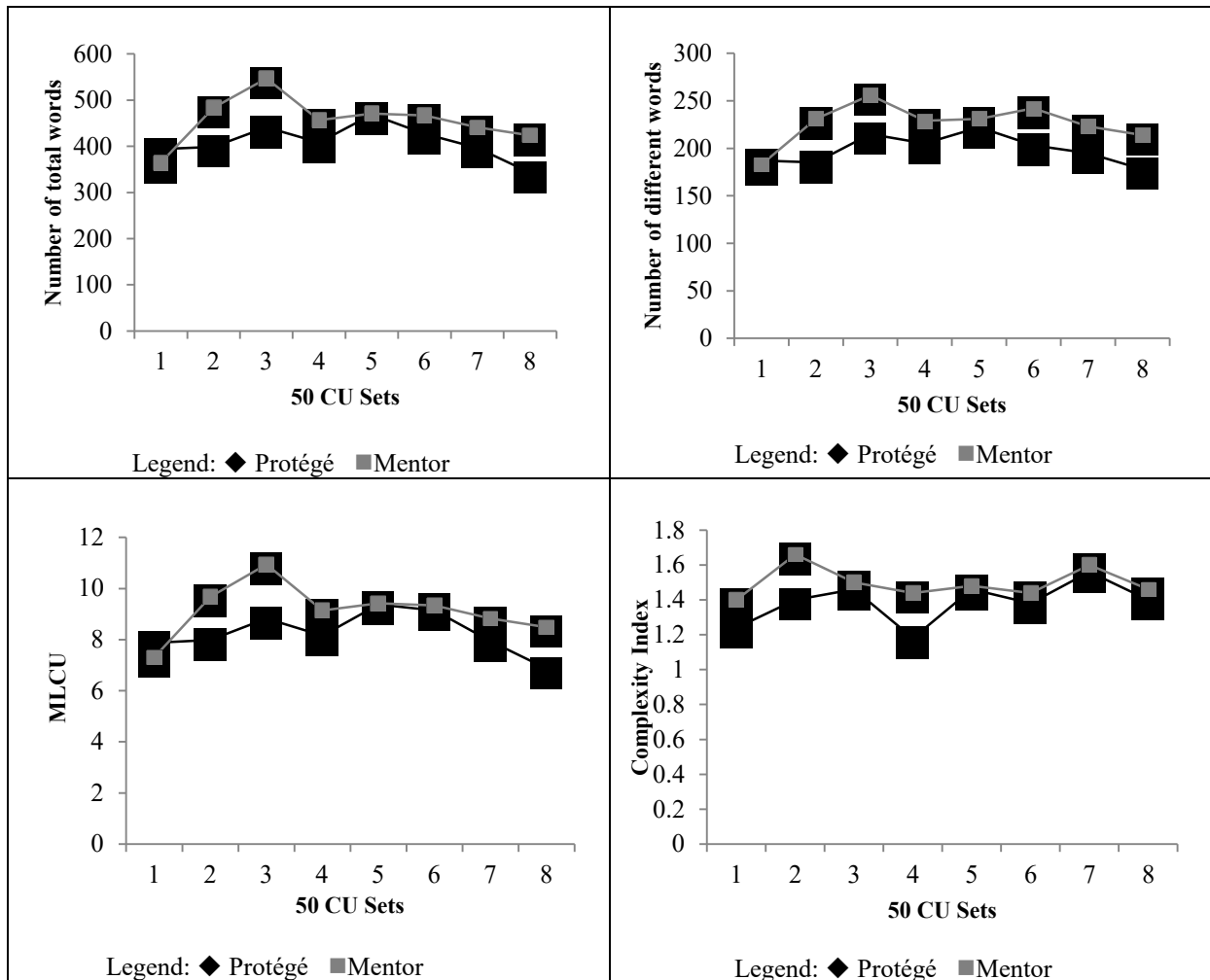


Figure 4.3.1: Linguistic data for the protégé and the mentor during online conversations

There was also a difference between the protégé and the mentor in terms of the number of errors they made during their messages. The protégé made an average of 24.13 errors every 50 CUs during the online interactions. However, the mentor made an average of 6.38 errors every 50 CUs during the online interactions. The number of total errors for both participants per 50 CUs is shown in Figure 4.3.2. Errors included incorrect word usage, spelling errors, punctuation errors, and syntax errors (i.e., utterance errors). The frequency of the types of errors the protégé made are shown in Figure 4.3.3. The protégé mostly made utterance errors, punctuation errors and word errors, with fewer spelling errors throughout her messages. There was an aspect of the

protégé’s writing that was difficult to define. Many of her sentences needed to be read several times in order to understand them due to awkward wording and extra detail. These instances were coded as utterance errors. For example the sentence, ‘So many times we got after her to not jump on my black as bitter coffee flat screen TV’ was coded as an utterance error as the extra detail makes the sentence confusing to read.

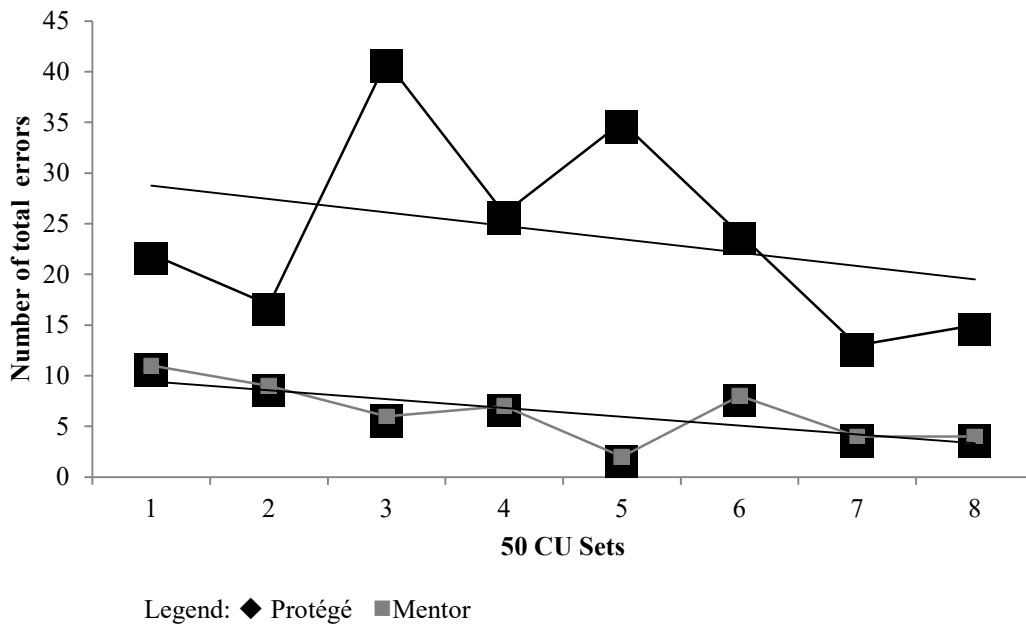


Figure 4.3.2: Number of errors made every 50 CUs by the protégé and the mentor.

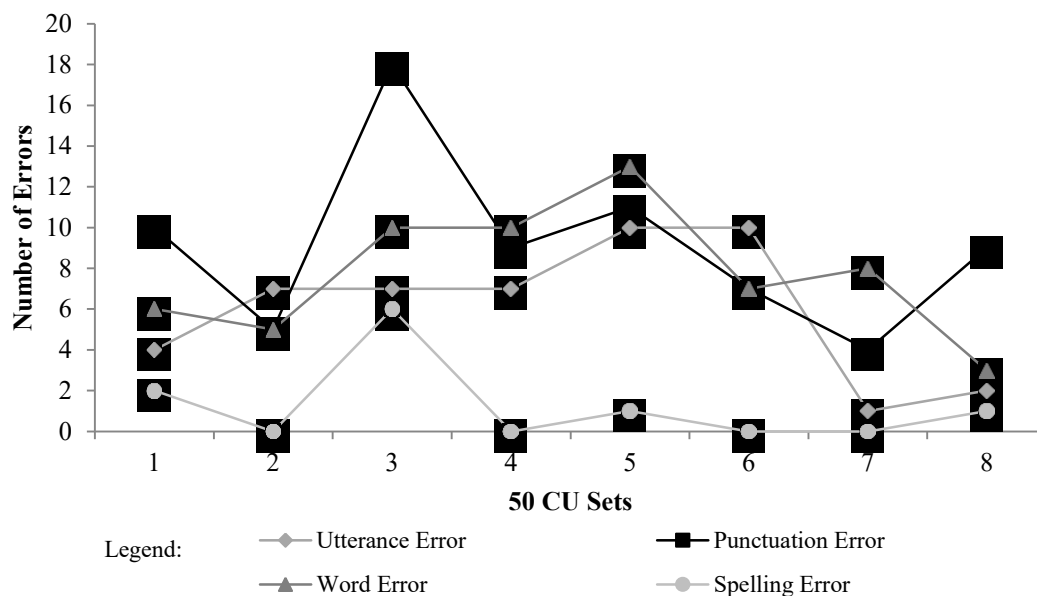


Figure 4.3.3: Frequency of the types of errors made every 50 CUs by the protégé.

4.4 Social Experience

Several aspects of social experience are recorded in Table 4.3.2 below. The mentor asked more questions than the protégé. This shows her skills in utilizing a conversational style of writing. The mentor would frequently ask the protégé questions to find out about her life experiences and interests rather than just talk about herself. She used questions to encourage the protégé to elaborate on things she had mentioned. For example, ‘Where did you get your painting from? Did you get to meet the artist?’. Furthermore, it was noted that the mentor asked many rhetorical questions for social purposes rather than topic changing. The protégé did utilize questions to find out more information about the mentor, however, not as often or in the same way as the mentor did. The protégé used questions to bring up new topics that she wanted to talk about in her messages. Below is a short sample of one of the protégé’s messages where she used questions to change topics quickly.

What did you do on your beautiful snowy May long weekend? I had a Waltons weekend LOL. Did you try cherry coke cola? I love it but I couldn't find it then in the bigger grocery store they sell all kinds of coke cola including cherry. Did you read the book Me before you? I am reading it now before the movie comes out.

Another difference between the participants was in the number of written suprasegmentals. The mentor used more written suprasegmentals in her messages than the protégé. The protégé may have learned to use these elements, such as 'lol', from the mentor as she did not start using them until after the mentor used them in seven messages, by the seventh week, or they may be elements that were used in less formal writing contexts that she began applying to communication with the mentor when she saw the mentor using them.

Table 4.3.2: Occurrences of codes for social language experience during AAC Mentoring Program

Coded Variable	Protégé	Mentor
Total number of questions asked	52	68
Number of close-ended questions	Not applicable	43
Number of open-ended questions	Not applicable	25
Number of questions answered	35	35
Use of written suprasegmentals (e.g., !, ? lol, haha, omg, ☺, etc.)	80	108

Topic analysis was completed on the data from the transcripts on the forum to describe the range of topics discussed between the pair during the AAC Mentoring Project. A total of 14 topics were identified. A frequency graph of the topics found and the percentage of sentences on each topic is shown in Figure 4.4.1. Definitions and examples of each category are available in Appendix XI. Discussion of the interests of each participant comprised the largest portion of their conversations at 35%. Social (11%), School (11%), and Medical (9%) also comprised a large amount of the conversation.

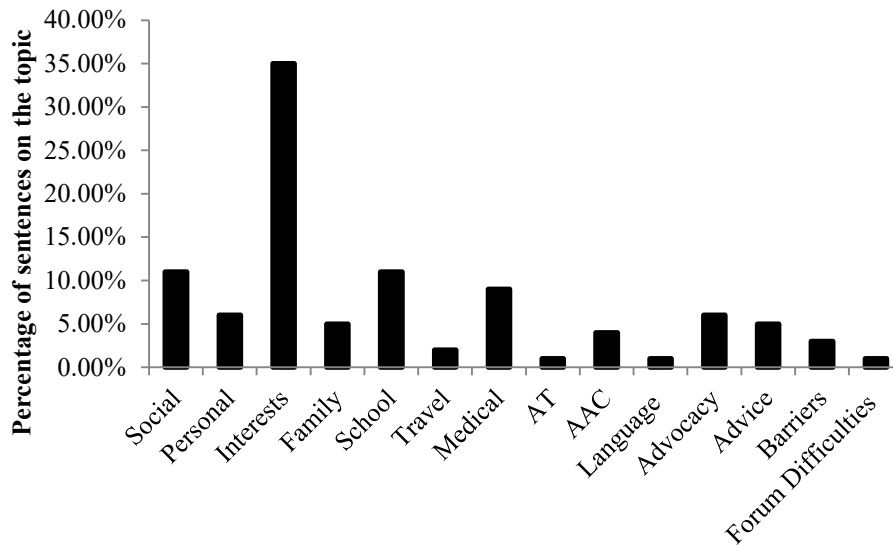
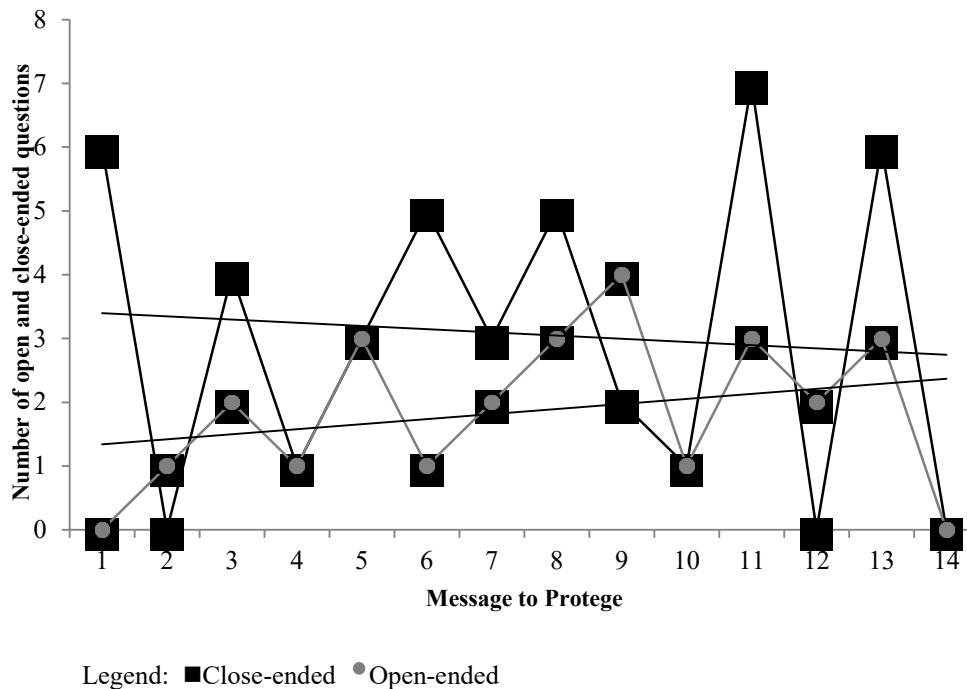


Figure 4.4.1: Percentage of sentences on each topic from online interactions.

4.5 Mentoring skills

The mentors' use of open versus closed ended questions per message is shown in Figure 4.5.1. The weeks where no messages were sent are not accounted for in this figure. The trend line for closed ended questions shows that there were more close-ended questions than open-ended questions, though the data is quite variable. The other mentoring skill examined was using 'Collaborative Problem Solving'. During conversations with the protégé, the mentor gave advice 12 times. This occurred every time the protégé asked for advice. This shows that the mentor was not using the collaborative problem solving skill in the baseline phase. Had she been using the collaborative problem solving skill, she would have been asking the protégé more questions about the problem that she needs advice for rather than giving her advice right away.



Legend: ■ Close-ended ● Open-ended
 Figure 4.5.1: Open versus close-ended questions asked by the mentor to the protégé per messageH

4.6 Participant Perspectives

In the protégé’s initial demographic form, she indicated that she wanted to learn about how to improve her writing and spelling, living on her own and how to manage when she does not have her device. She also listed goals of taking public transit and going to university. She felt that she achieved her goals “a little bit” as well as received “a little bit” of resources from her mentor. She indicated that she may have gotten more answers from an older mentor. However, she did claim to learn other things from her mentor. She listed topics such as G-tube feeding, shopping tips, books to read, politics and some grammar tips.

Both participants were asked to provide a rating for several aspects of the AAC Mentoring Program and their experience participating in research. Data are only available from the protégé. These ratings are shown in Table 4.6.1. Ratings were on a 5-point scale, with 1 indicating very unsatisfied and 5 indicating very satisfied (See Appendix VIII).

Table 4.6.1: Participant ratings on aspects of the AAC Mentoring Program. 1 = very unsatisfied, 5 = very satisfied.

Area being rated	Protégé	Mentor
Quality of AAC Mentor Program overall	4	*
Accessibility of the website	4	*
Relationship with partner	5	*
Contact with researcher	5	*
Your partner's advice/ability to answer your questions	4	Not applicable
Your partner's ability to provide resources/information regarding your questions	4	Not applicable

** Scores are not available at this time as the mentor was unable to respond before the completion of the study.*

Participants were asked to provide feedback on things they would like to change about the program after the study was completed as well. The protégé reported wanting to be able to meet her partner in person or become friends on Facebook and that she would like to connect to someone internationally. The mentor reported early on in the study that she needed to adapt the site herself by making the icons larger in order to be able to access it using her eye gaze device.

The protégé's scores for the Quality of Communication Life Scale didn't change from before the program to after the program (Pre: 4.23/5, Post: 4.25/5). The mentor's scores for the QCLS was 4.47/5, her scores after the program could not be attained during the timeline of the study. Both participants' scores were very high to start and therefore less likely to show any changes following the program.

Chapter 5 Discussion

The following discussion will summarize the results of this study. The first section, section 5.1, will summarize the answer to the first research question posed regarding whether the implementation of the online mentoring program provided an acceptable context for language intervention by addressing the areas of the Fit, Focus and Functionality framework. Sections 5.2 and 5.3 address the second question regarding whether the mentoring program allowed for a supportive linguistic and social experience. These sections are followed by discussion comparing to previous mentoring programs, participant perspectives, and future recommendations.

5.1 Fit, Focused, and Functional

In many ways the results of this study show that the implementation of the AAC Mentoring Project addressed aspects of the operating principles related to fit, focus and functionality (Johnston, 2007). One operating principle in the area of ‘fit’ was achieved by meeting the skill level of the participant. The protégé was able to independently create her own messages and was able to express her thoughts and ideas in a way that could be understood by the mentor. Therefore, the program was not too difficult for her. In the face-to-face mentoring program conducted by Ballin et al. (2013), one of the participants dropped out because he felt that the program was too difficult and he was unable to communicate with his device. Had his program been conducted online he may have had more success. However, the online context requires an individual to be able to communicate without the use of external cues such as gestures. This participant may have also had difficulties with the online context. Therefore, mentoring programs may be best suited to individuals with higher linguistic competence. Had the protégé in the current study been only able to produce telegraphic utterances, the mentor may

have misunderstood her messages, impacting their social relationship, and the protégé may have been more limited in the ideas and topics she was able to converse about. Their ability to share their ideas and relate to each other was evident in their conversations and may have been the key ingredient to the protégé's high satisfaction with this program. The protégé's enjoyment of the program overall is evident in the following quote, 'The program was nice because I got to talk to someone who understands what I am going through and face the same challenges.'

The idea of fit also relates to the appropriateness of an intervention to the participant's age and their disability. The mentoring interaction was largely directed by the participants, as they chose what they wanted to talk to their partner about. Based on the topics, it is clear that this pair who face the same challenges of having a severe disability and are similar in age are able to relate to each other. The topics they discussed ranged from boys, hair, grad dresses, and decorating their rooms to medical issues such as needing a G-tube for nutrition and medication. By allowing the mentoring interaction to be led by the participants we were able to ensure it was appropriate for their interests according to their age and the fact that they have a disability.

Fit is also related to choosing the best person to serve as a mentor, which is largely dependent on the goals of the protégé. Firstly, based on the topics described above, it is clear that the mentor needed to be someone with a disability. Second, the protégé in this study indicated that she was not able to completely reach the goals she set at the beginning of the program because her mentor was not old enough to have experienced the things that she had questions about. However, she did indicate that she learned about other areas from her mentor and she indicated that she was very satisfied with her relationship with her mentor. Therefore, a mentor should be someone who can relate to the individual, in this case by having a severe disability rendering the need for an SGCD, but also must be old enough to be able to provide guidance and resources for the protégé dependent on the protégé's goals.

Frequency of sessions is important for language intervention in terms of the operating principles related to ‘focus’ and is also an important aspect of mentoring programs (Paul & Norbury, 2012; Cohen & Light, 2000). The current study chose an online context to increase the number of opportunities to communicate with each other, as well as decrease the barriers associated with face-to-face communication and travel. This context may have allowed participants to communicate more frequently than the participants in the Ballin et al. (2013) study. The participants in the current study were free to communicate at any time and sent a total of 31 messages to each other, with 1.94 messages sent per week, over a period of 16 weeks. This is comparable to other online mentoring programs lasting from 10 – 21 weeks with 1.3 – 3.7 messages sent per week (Cohen & Light, 2000). However, previous face-to-face studies involved only six meetings with two structured 15-minute blocks for the pair to talk within each meeting (Ballin et al., 2013). Simply by the nature of the design of the Ballin et al., (2013) study, the participants communicated less often than in online mentoring programs. The online context allows for the participants to take as much time as necessary to construct their messages and they are able to talk about whatever they want, perhaps leading to longer messages and more messages overall. In terms of how we can increase the frequency of sessions even more, we need to look at how we can further reduce the barriers that may interrupt the frequency of communication in order to be considered a ‘focused’ intervention. The current mentoring study aimed to reduce barriers such as transportation and weather by implementing the program online. However, gaps in communication still occurred for periods of up to two weeks. These gaps were often due to illness. Previous mentoring studies have also reported difficulties with gaps in communication due to various challenges and barriers faced by individuals who use SGCDs (Cohen & Light, 2000; Ballin et al., 2012). This is a problem for both online and face-to-face mentoring programs. However, online programs are able to reduce difficulties such as transportation and weather that

could lead to such gaps. Previous face-to-face mentoring studies have reported gaps of up to 6 weeks due to cancellations due to illness, difficulties accessing transportation, unavailability of care support, wheelchair or SGCD breakdown, and scheduling difficulties (Ballin et al., 2012). Previous online mentoring studies reported problems with gaps in communication being due to unreliable Internet service providers. Overall, both online and face-to-face mentoring programs continue to have difficulties ensuring regular communication. Possible solutions may be to have multiple modes of communication between the participants. Participants in online mentoring programs reported that they wanted to meet their partner face-to-face or at least given a picture of them (Cohen & Light, 2000). The protégé in the current study also reported this and that she would have liked to be able to connect with her mentor via Facebook. Having multiple ways to contact someone could lead to a decrease in the length of the gaps between meetings and/or messages.

The operating principles related to ‘focus’ also included aspects of saliency and concentrated practice. We were not able to achieve these aspects because we did not inform the participants of our ‘focus’ on linguistic competence and did not include any concentrated practice on specific language goals. Because we focused on creating a social connection, we sacrificed these important aspects of language intervention. Future programs may include sessions with an SLP or SLP student in order to focus the participants on aspects of their linguistic competence that they would like to improve. Participants would then be able to take what they learn in this concentrated teaching time and apply it to a meaningful activity such as the social conversations with their mentor. Furthermore, when mentors take the training where they use the language stimulation strategy of asking open-ended questions to both increase communication opportunities as well as foster a social relationship, that may increase the ‘focus’ of this program further.

The operating principles related to functionality indicate the need to communicate real message in activities that meet the child's needs in their everyday world. The AAC Mentoring Program created an environment where the protégé was able to write about her life and what was important to her. The program also introduced her to a peer that could relate to her and therefore fulfilled these requirements. Some evidence of this is in the number of messages sent back and forth, totaling 31 messages, the length of the messages sent and the content of the messages. The mentor and the protégé were sending between one and two messages per week. Therefore, showing their commitment to keeping in touch as often as they could. The protégé's messages were 203 NTW on average and the mentor's messages were 333 NTW on average. The mentor and the protégé discussed a wide range of topics such as their interests, family, and medical issues. Within these messages the protégé was given many opportunities to share her own ideas and address issues that were important to her such as euthanasia. The protégé used many of those opportunities and wrote long and frequent messages. Further evidence of the functionality of the program can be shown in a quote from the protégé regarding her experience in the program,

I enjoyed writing to someone who is like me. Sometimes it feels like I'm the only one trying to overcome my disabilities and regular people don't understand. This program was nice because I got to talk to someone who understands what I am going through and face the same challenges.

5.2 Linguistic Experience

The following section, section 5.2.1, describes the protégé's linguistic skills before and after the mentoring program in a narrative context. Furthermore, section 5.2.2 discusses the answers found to the first part of the second research question involving whether the online mentoring program allowed for a supportive linguistic experience.

5.2.1 Language Samples

The protégé in this study was affected by many of the barriers to linguistic competency discussed in the literature. The protégé had cerebral palsy and used switches mounted beside her head to access her device. This type of indirect access method is known to significantly slow down someone's rate of communication (Koester & Simpson, 2014). Other barriers she faced were decreased independence with online communication because she needed to have someone assist her in turning on a computer. Additionally, her language system had a word prediction feature, however, it only worked with her keyboard page. Therefore, she needed to know what verb form or tense would be appropriate for the sentence she was trying to write, which was an area of difficulty for her. For example, the protégé wrote, 'the online classes is for two years'. When composing this message on her device, she had to decide whether to put a singular form of the verb 'is' or the plural 'are'. Despite the challenges she faced, before the study began she was able to produce interesting stories with vivid detail. The ENNI and TNL stories she created before entering the program had a large total number of words (ranging from 360 to 410 NTW) a large variety of words (around 200 NDW), and included long and grammatically complex sentences (between 8 and 10 MLCUs and ranging from 1.2 to 1.6 CIs). However, there are no norms to compare these values to say that these are lower or higher values than expected.

The protégé's accuracy, as defined by Beukelman and Mirenda (2013), indicated a need for improvement. The number of errors that occurred in her stories sometimes made it difficult to understand her sentences, requiring them to be reread several times. The protégé's writing was very detailed with a lot of sensational imagery. This alone, without added utterance errors and other various grammatical errors may have not affected the 'readability' of her stories as such detail is important when story telling. McCoy, Bedrosian, Hoag, and Johnson (2007) noted that extra detail in messages is preferred by listeners over too little detail or extended duration before

a message is delivered. The language samples that the protégé produced before the program also showed the inconsistency of her writing at times, with the story written from the TNL having more errors than the story written from the ENNI, with the TNL having 48 errors and the ENNI having 21 errors.

The protégé recruited for this study did not fit the description of typical individuals who use SGCD's in the literature (e.g., Lund & Light, 2003). The protégé's writing before entering the program did have syntax errors, punctuation errors, and word errors. However, her writing would not be described as telegraphic or lacking function words and many morphological markers. Based on this information, the protégé was judged to have higher linguistic competence going into the study than what the program was originally designed for. This points out the need for more studies looking at various linguistic levels of individuals who use SGCDs so that we can be sure to adequately support their needs as they progress. However, the protégé's success in the program suggests that the program may be better suited to individuals with higher linguistic competence.

There were no changes in the linguistic measures for the language samples completed before or after the mentoring program. The linguistic measures from the language samples completed before the mentoring program already had high values and therefore change was unlikely to be seen. Additionally, the program did not directly focus the protégé on improving her language in specific ways and this may have affected whether changes would be seen. When comparing the linguistic measures across the language samples it does show the inconsistency in the protégé's writing. Some of the measures showed higher values before the program than after the program and others the opposite. This could be due to various factors in the protégé's life such as writing at times of increased fatigue or attempting to write some stories in a shorter

period of time. This inconsistency may indicate the need for alternative stimuli that produce more stable measures.

5.2.2 Linguistic Experience during the Online Mentoring Program

Overall, the mentor appeared to have higher linguistic competence in terms of NTW, NDW, MLCU, CI, and number of errors. The biggest differences between the protégé and the mentor was in the number of communication units per message (26.11 CUs per message for the protégé and 37.64 CUs per message) and the number of errors (24.13 mean number of errors for the protégé and 6.38 mean number of errors for the mentor). The errors in the protégé's writing often led to her messages needing to be re-read several times to be understood, like in her language samples. In the context of conversation, her writing could be described as elaborative and including sensational imagery. Features that may be considered assets when writing a story to someone who cannot see the pictures, as in the ENNI and TNL, may be considered a barrier when trying to have a conversation with a peer. Furthermore, these overelaborations often lead to misinterpretation of the message that the protégé was writing. For example the protégé wrote, 'I live on a farm without any farm animals but I have two tortis cats, one charcoal as the night cat and a black and tan dachshund.' Originally, it appeared that there were two cats and she forgot to describe the second and then she also has a dog or maybe there are three cats and then one dog. Either way, due to the added descriptors, this sentence was very confusing to read. In another example the protégé uses sensational imagery. She writes, 'So many times we got after her [one of her cats] to not jump on my black as bitter coffee flat screen TV'. In the example, the sensational imagery does not add to understanding of the sentence and may confuse the reader.

The high number of errors that the protégé made may have had to do with limitations of the device she used to communicate. The protégé used a symbol based communication system

and although it did allow for the use of punctuation and correct verb tenses, they may have required increased time to access the required icons. In a simulation of how the protégé would use her device, it took more than five hits of a switch in order to select the icon that would make the next word she selected capitalized. The protégé may choose to conserve her energy for getting her thoughts and ideas out rather than using correct punctuation and grammar.

Additionally, it was noted that the protégé may have chosen a word that was a ‘near homophone’ to the word she actually wanted because she was unable to find the actual word or it would take too long to find it. The protégé showed this when she wrote, ‘I didn’t mine the movie The Life of Pi.’ She may have used the word ‘mine’ instead of ‘mind’ because it was quicker to get to and sounded ‘close enough’. It seemed that at times she wanted to be very specific in how she wrote something and at other times she may not have cared if she used the word she intended. This choice seems to be dependent on whether the word is part of a description such as the colour of something or if it is just a regular noun or verb. Overall, the protégé may be making the content and descriptiveness of her messages a priority over the grammatical aspects such as punctuation, verb form and tense and specific word choice. She may prioritize this way because of her interest in being a writer. This may have influenced what she was focused on in the study, such as improving her narrative writing rather than learning how to appropriately converse with a peer linguistically and socially. However, the grammatical errors in her writing will need to be an area of focus eventually if she hopes to pursue a post-secondary education. This may be an area that would require more direct services such as with an SLP or an English teacher. When compared to the mentor’s messages, the protégé made many more errors. However, the mentor also used eye gaze technology, which is considered a direct selection method, and therefore is faster, rather than the indirect selection method that the protégé used with her switches. The mentor also used a text-based system that utilized rate enhancement features such as providing the grammatically

best next word. This may have assisted the mentor in creating more grammatically accurate phrases. Without being able to control for these features it is difficult to determine the protégé's and mentor's true grammatical skills.

Based on the trend line in Figure 4.3.2, it appears that the protégé's errors may have been decreasing as the program progressed, but there is large variability in the data. A decrease may be due to increased practice with editing her own messages, increased exposure to written language that was grammatically correct and socially appropriate, and increased motivation to improve her writing because of meeting someone else who uses an SGCD who has good writing skills. The protégé noticed she was observing a good model of language because she mentioned how good the mentor was at grammar and spelling and asked for advice on how she could improve her own. Additionally, the protégé may have become more comfortable with the program and her mentor which could have led to her taking more time to construct her messages carefully. However, because of the variability in her writing overall, and the many other factors that may have influenced this finding it should be interpreted with caution. The utterance errors seemed to improve over the course of the study, as seen in the following examples, but again, this should be interpreted with caution. An example of a message sent by the protégé in week seven is as follows, 'I love buying clothes but my mother said that I have enough clothes but girls need more clothes than boys LOL. She doesn't know about nothing.' An example of a message sent by the protégé in week 14 had fewer utterance errors:

Did you read the book Me before you? I am reading it now before the movie comes out. It is about a man who was in a bike accident and he wants to die. I am really not sure that people who have a disability like us from birth, or like the man in the book should be able to choose

death or if we can't make that decision someone else can. What do you want to do if you had the choice?

This study may provide a means of comparison for future studies as to what individuals aged 18-19 who use AAC are capable of in terms of linguistic competence since, as of now, no data on this could be found. The need to show the variations and differences in linguistic skill between individuals who use SGCDs is important in order to provide adequate services to individuals of varying levels. If we assume all individuals who use SGCDs have low linguistic competence we are limiting the services available for those individuals who have higher linguistic competence but still have areas where they need support in order to become successful and fully competent communicators.

To determine whether the AAC Mentoring Program was able to provide a supportive linguistic experience we can look at whether the program provided the protégé with a good model of language as well as additional opportunities to practice using her device independently. The data indicate that the mentor was able to provide a good model of language in terms of both quantity and quality as she sent long messages with very few errors in her writing. On average, the protégé was exposed to around 300 words per message and received a total of 14 messages and had an average of only 6.38 errors per 50 CUs. Future programs may look at ways to increase this exposure and the overall focus on language even further by including elements of concentrated practice on specific language areas. The AAC Mentoring Project was also able to provide the protégé a means to practice writing and editing her own work, without the help of others. This helped her focus on the medium of writing, an area of interest for her. Evidence that she was writing independently is apparent in the fact that she makes frequent errors in her messages. Had she been co-constructing these messages with a partner, they would have likely been correcting these mistakes. Furthermore, the protégé showed evidence of possibly learning

from the mentor's good model of language by mimicking the way the mentor wrote. After the mentor described how she was going to get her hair dyed she exclaimed, 'Whoa that was a lot about my hair, lol'. Later, when the protégé described her cat that had passed away she wrote, 'Wow that is a lot about my cat'. The protégé may have liked how the mentor worded what she said and then figured out how she could say something similar with her own device. This is an example of how someone may be able to learn new things simply by observing someone else as in Bandura's Social Learning Theory (1971).

5.3 Social Experience

The following section discusses the findings in regards to the second part of the second research question. That is, whether the online mentoring program allowed for a supportive social experience for the protégé.

5.3.1 Questions

The number of questions asked and answered by the participants along with the length of their messages showed fairly equal participation in the online conversations by both individuals. This shows that the mentoring program eliminated barriers that often lead to lack of engagement in activities such as conversations that are dominated by naturally speaking communication partners (Thirumanickman et al., 2011). This context allowed these participants to take the time to say what they wanted to say and how they wanted to say it.

Asking questions during a conversation is an aspect of social competence and is considered a sociorelational skill that an individual who uses an SGCD must learn in order to communicate effectively. Based on the data, both participants were asking questions of each other throughout the program, therefore, demonstrating some level of use of this skill. There was a difference in the types of questions that the protégé asked the mentor. The protégé's questions

were often self-referential, meaning that they often were related to something she had shared about herself rather than showing interest in something the mentor had said. For example the protégé said the following,

I have a dentist appointment at the UofA. I hate going. I always have to be put to sleep and then stay and be monitored for 24hrs. I'm always scared I won't wake up. Are you like that too? Have you had to be sedated?

In contrast the mentor's questions often reflected subjects that the protégé brought up to show her that she is listening to her. After the protégé shared that she had a spoon collection in one of her messages the mentor asked, 'Where do you have spoons from? What does your favorite spoon look like?'

Although the mentor did often ask questions that related to the protégé it was expected that as a mentor she would take this skill a step further by ensuring the questions she asked were mostly open ended questions. The mentor did not show evidence of using more open ended questions than closed ended question and may have benefited from completing the training to learn this.

5.3.2 Style

A difference that is notable in terms of the protégé's and the mentor's social competence is the difference in their style of communication. The mentor uses an informal conversational style of writing, as you would expect when writing to a peer. This is also captured in her use of 'written suprasegmentals' to add a level of emotion to her writing. However, the protégé's writing appears to be a more narrative style of writing as uses overelaborations and sensational imagery in their conversations like she did in her initial language samples. She also used fewer written suprasegmentals than the mentor which may have also made her style of writing seem

more narrative rather than conversational. Knowing what style of writing to use in certain context could also be described as a strategic competency skill. The protégé began to use more written suprasegmentals such as ‘lol’ after week seven in the program and by the end her writing appeared more natural and less like a narrative.

As mentioned, the protégé was very interested in writing. The initial language samples may have set her up to think this program was intended to be about writing stories to a new friend. She even described the program as a ‘letter writing’ program and mentioned how it was different than talking to someone on Facebook or Messenger. The mentor even reinforced the protégé’s style of writing by praising her ‘mad writing skills’.

5.3.3 Topics

The topics discussed by the protégé and the mentor provide evidence of the type of mentoring relationship that was formed between them. Although, the program was initially intended to be a mentoring program where a mentor is older and more experienced than a younger participant, this study transformed into a peer mentoring program due to the participants’ similarity in age. The topics discussed, especially ‘social’ and ‘interests’, provide evidence of this peer relationship. These two participants talked to each other as friends and equal participants in the conversations they had. The protégé even described the mentor as a new friend that was similar to her, something she hadn’t experienced before. The topic of ‘interest’ was the most popular topic and the two discussed a range of topics within this such as shopping, beauty, writing, art, ‘eye candy’ (i.e., boys,) and more. The range in ‘interest’ topics showed that although these two young women have severe disabilities, they are also just two young women.

The previous study by Cohen and Light (2000) also conducted topic analysis from the emails sent by their protégé-mentor pairs. There was some overlap between the current study and

the findings from Cohen and Light (2000). Their topics, ‘social’, ‘family’ ‘school or work’ and ‘general communication strategies’ would be considered parallel to the topics in this study of ‘social’, ‘family’, ‘school’ and ‘AAC’. However, the differences between the topics also note the difference in the types of mentoring programs. The Cohen and Light (2000) study involved individuals with more varied ages such as a 14-year-old protégé with a 33-year-old mentor, which may have been more conducive for topics such as financial issues, resources and personal care attendants. The current study, as mentioned, became more of a peer mentoring program. This served the purpose of connecting two individuals who have many similarities. However, it may not have provided the means for the protégé to access resources and receive answers to questions, as she also wanted. The protégé indicated that although she was very satisfied with her relationship with her mentor, she felt that someone older might have been able to provide her with more resources in order to achieve the goals she set out at the beginning of the program.

5.4 Mentoring in AAC

The following section discusses aspects of previous AAC mentoring programs that led to the decisions made when designing the program described in the current study. This section also describes the areas that need to be considered for modifications for future programs. In addition, this section largely reflects the protege’s perspective on her experience and the implementation of the program.

5.4.1 Goals of the program

When designing a mentoring program several aspects need to be taken into account such as what the goal of the program will be, what type of training the mentors will take, and the context in which the program will take place. For the AAC Mentoring Project the goal was to create connections between individuals who use SGCDs while supporting them through life

transitions and indirectly provide increased opportunities to communicate using their device. This was chosen in order to fill a gap in the types of mentoring programs previously studied. Previous programs have focused on either life transitions or improving linguistic competence, but not both. This study proposed to use online mentoring, where participants were focused on creating a connection with another individual who uses an SGCD, to increase the number of communication opportunities and to provide exposure to a good model of language in order improve an individual's linguistic competence. Previous studies have shown that functional practice is an area that is lacking in SLP services for individuals who use AAC (Ballin et al., 2011). In addition, using strategies such as open-ended questions and modeling have been used by SLPs and in previous AAC mentoring studies to improve linguistic competence (Ballin et al., 2013). In the current study, though variable, the protégé's number of errors made in her messages appear to decrease and her narrative writing style began to change to be more contextually appropriate as the study progressed. Therefore, possibly providing evidence that this context may be conducive to improving certain aspects of linguistic and social competence. However, increasing the saliency of the goals of the program as well as increasing the frequency of practice may lead to greater improvements in these areas.

Previous AAC mentoring studies have also focused on life transitions (Light et al., 2007). The current study aimed to address this by having the protégé choose goals and seek resources from the mentor in order to achieve these goals. Unfortunately, the protégé did not feel that she was able to completely reach her goals. This may be due to the fact that the mentor was similar in age to the protégé and had not experienced the things she was asking about yet. In terms of the goal of making connections, this is an area where the program, even cut short due to illness, succeeded. Simply looking at the protégé's rating of her relationship with the mentor as 'very satisfied' as well as in her own words, 'I made a really good friend who is like me. I definitely

want to stay friends' shows the success of the program at building a positive connection between two people through online mentoring.

5.4.2 Mentor Training

The current study showed that the training completed prior to mentoring in previous AAC mentoring studies was warranted, i.e., language stimulation strategies in the case of Ballin et al. (2012) and sociorelational and collaborative problem solving skills in the case of Light et al., (2007). The results indicate that the mentor was not using more open-ended questions than closed ended questions and was not utilizing any collaborative problem solving strategies. This indicates that training in these areas was necessary for this mentor. The training program in the larger project, based on the Light et al. (2007) study, teaches mentors to use open-ended questions in order to foster a positive social relationship with the protégé and the Ballin et al. (2013) study taught open-ended questions as a way to increase the linguistic output expected of the protégé. Therefore, the current study aimed to determine if the Light et al. (2007) training was also able to achieve Ballin et al. (2013)'s goal. When the mentor continues in the larger project, the effectiveness of this program to teach the use of open-ended questions and collaborative problem solving will be determined.

5.4.3 Program Success

Overall, the success of any mentoring program is largely determined by the strength of the relationship fostered between the participants (Rhodes & DuBois, 2008; DuBois et al., 2011). In this case, a friendship was created that is likely to continue even with barriers such as illness that led to gaps in the participants' communication. The current program avoided features of unsuccessful mentoring programs identified by Black et al. (2010) by not asking mentors to correct the protégé's linguistic errors as was done in the Ballin et al. (2013) study. The protégé

stated that she really enjoyed the program, was satisfied with her relationship with the mentor and wanted to continue to communicate with the mentor by connecting with her over Facebook. She was also interested in participating again in the future. When the mentor made the decision to postpone her involvement in the study she stated that it was a really hard decision to make. Based on the conversations between her and the protégé it appears that she enjoyed her time in the program and the connection she made with the protégé.

5.5 Recommendations for an AAC Mentoring Program

The information gathered from the current study will lead to changes for the larger project and for future AAC mentoring programs. In terms of recruitment, more participants are needed in order to provide protégés with the opportunity to decide whether they want to connect with a peer and create a social relationship, with an older mentor who can provide them with resources and information in relation to their goals, or both.

Future programs will likely utilize an online context again as the amount of linguistic exposure and practice was likely higher than a face-to-face context. Evidence that there is something special about the online context and the forum for the participants in this study can be found in a quote from the protégé, ‘I wish we could have wrote more often. I miss writing to her. I can talk on Facebook or messenger but it’s not letter writing.’ Furthermore, having multiple modalities for conversation, such as instant messaging or video conferencing, may be an aspect of future programs as it may decrease the likeliness for long gaps in communication and increase the overall amount of communication. The platform that is utilized will also need to be adapted according to the participants' feedback such as using larger icons in order for the website to be more accessible for individuals who use eye gaze technologies and allowing participants to add images as attachments to their messages.

In order to increase the saliency of the expectations of the program additional elements such as focused teaching on specific language goals prior to or throughout the program may be necessary. If the program's goal is to increase an individual's linguistic competence, salient goals and focused teaching are important principles of the Fit, Focus and Functionality framework.

5.6 Research Limitations

There are several limitations to this study. Firstly, the limited number of participants led to a design that did not allow for generalizable interpretations or analysis. Therefore, the results of this study apply only to the two participants. More participants would have allowed for the comparison of the topics discussed, the various levels of linguistic competence, and the effectiveness of the mentor training and program overall. Multiple mentor-protégé pairs would be necessary for the validation of these results to the larger population of individuals who use SGCDs. Secondly, the participants completed only the baseline phase of the intended larger study because the mentor was unable to complete the training and the post-training phase. This led to there being no 'post-training' phase to serve as a comparison to the data collected in the baseline phase. In terms of data collection and analysis, this study utilized manual counting of many of the codes, which may involve human error. To counteract this problem, a second rater also coded the data and the codes were recounted several times.

Another limitation is that the participants in this study used different language systems. This limits the comparison of the linguistic data that they produced because the means with which they produced it are quite different. The mentor's software may have features that help make grammatically correct sentences more easily than the protégé's software allows.

The stimuli used for the language samples may also have impacted the linguistic output generated by the protégé. The instruction of 'telling a story to a child' may have limited the types

of words she used and the length of her phrases in order to make her writing ‘child friendly’. Therefore, a more age appropriate task should be devised for future studies. One possibility would be to find short You Tube clips may generate a more accurate language sample.

There also were several confounding variables affecting the interpretation of the results. For example, the protégé was receiving help with her writing from a tutor in her home. Additionally, she was taking an online writing class. Because these are so closely related to the goals of this study it is difficult to determine if it was the study causing any changes or if she was learning from her tutor or the online class. She may have used the program to practice what she was learning in her online class, which may have led to her narrative style of writing early on in the study. Furthermore, because this study was conducted over a long period of time and the design did not allow for the differentiation of maturation effects versus the effects of the program, we are unable to establish cause and effect. Overall, the current study revealed the challenges of conducting research with a fragile, low-incidence population and attempting to implement a functional intervention program.

5.7 Conclusion

The results of this study are a reflection of the experience of one protégé and one mentor taking part in the first steps in implementation of an online mentoring program for individuals who use AAC in Alberta. The implementation of the program attempted to incorporate the areas of Fit, Focus, and Functionality, as outlined by Johnston (2007) as a framework for language interventions. We learned that adaptations to the program are needed in order to clarify the participant’s focus and our focus on aspects of linguistic competence. Additionally, the online mentoring program was able to provide a supportive linguistic experience by exposing the protégé to a good model of language and by providing her with many opportunities to practice

writing independently. The program provided a supportive social experience by engaging participants equally in conversations about a variety of topics and helping the protégé learn to modify her narrative writing style to a more conversational style. Furthermore, the protégé was satisfied with the program and the relationship formed, however, she had specific feedback in terms of the implementation of the program and the types of partners needed to achieve her goals.

This study provided further evidence of how important mentoring programs are for individuals who use SGCDs as they are a unique population who require unique interventions and supports. With limited services available, alternative means for support are needed and online mentoring programs can fit this role. Overall, the results indicate a need for specific changes and considerations for future implementation of mentoring programs for individuals who use SGCDs, but most importantly that there is a need for such programs and further investigation of their benefits.

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Appendices

Appendix I: The I CAN Centre for Assistive Technology

The I CAN Centre is located at the Glenrose Rehabilitation Hospital in Edmonton, Alberta. It is a state-of-the-art centre that utilizes a multidisciplinary team to provide services for individuals who require assistive technology. Clients located north of Red Deer are referred to the I CAN Centre when community services are unable to meet their specialized needs.

Mission Statement:

The mission of the I CAN Centre for Assistive Technology is to positively affect, through the use of assistive technology, the lives of people who have disabilities.

Website:

<http://www.albertahealthservices.ca/Facilities/GRH/page79.asp>

Location:

I CAN Centre for Assistive Technology

Glenrose Rehabilitation Hospital

Room 38, Level 0 GlenEast

10230 111 Avenue NW, Edmonton, Alberta T5G 0B7; 780-735-6070

Appendix II: Augmentative Communication and Educational Technology Service (ACETS)

ACETS is located in the Alberta Children's Hospital in Calgary, Alberta. ACETS provides assessment and consultation services to children and adults across Southern Alberta who are unable to meet their daily communication interaction needs (face to face communication, digital communication, telecommunications) due to developmental, degenerative, physical and/or sensory limitations.

Email:

acets@albertahealthservices.ca

Location:

Alberta Children's Hospital

Lower Level, Rehabilitation Services

2888 Shaganappi Trail NW, Calgary, Alberta T3B 6A8; 403-955-7912

Appendix III: Information and Consent Forms

The first form was for the Protégé. The second and the third forms were for the mentor and her mother. She needed a form signed by a parent as she was under the age of 18 at the time of recruitment. Her reading level was judged to be high enough to not need a modified form.

Participant Consent Form

Title of Study: A mentoring program for individuals who use Augmentative and Alternative Communication (AAC) devices.

Principal Investigator: Kimberley Adams, Ph.D., Joint Assistive Technology (AT) Position: Assistant Professor Faculty of Rehabilitation Medicine, and Researcher, Glenrose Hospital (GRH)

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[Karen Pollock, Ph.D R.SLP, Professor and Chair Department of Communication Sciences and Disorders,](#)

[Phone:](#) (780) 492-5980 Email: Karen.pollock@ualbert.ca

Why are you being asked to take part in this research study? You are being asked to be in this study because you use Augmentative and Alternative Communication (AAC). We believe you may benefit from being a part of our AAC mentoring program. We want to know how a mentoring program could help people who use AAC.

Before you make a decision one of the researchers will go over this form with you. You are encouraged to ask questions if you feel anything needs to be made clearer. You will be given a copy of this form for your records.

What is the reason for doing this study? The purpose of this study is to determine how a mentoring program can help people who use AAC.

What will I be asked to do? The study will begin by having you complete a questionnaire about yourself. This will include questions about your interests, the type of AAC device you have and other things like that. Then you will tell two stories based on a series of pictures. The stories will be done via e-mail. This will show us how you are able to communicate using your AAC device. The stories should each take about 30 minutes but will depend on the time you take to tell the story. You will also complete a questionnaire about how your life is affected by having a communication problem. After this is complete you will be paired with a mentor.

You will talk with the mentor via email, which will be monitored by the investigator to ensure all participants' safety. You will be required to e-mail the mentor at least once a week and respond to e-mails from the investigator and the mentor within one week. You will talk with the

mentor for approximately 6 months. After the 6 months is complete you will repeat the same measures from the beginning of the study. This includes the questionnaire about life and the online stories. You will also be sent a series of questions about your experience in the mentoring program. The time that these questions will take will depend on the length of responses and the time it takes to make them.

Throughout the study you will also be asked to keep a record of what is going on in your life. This could be in the form of weekly journal entries about learning activities you are part of. This information will allow us to separate the benefits of this program from what would have naturally happened in your life.

What are the risks and discomforts? There are very few, if any, risks to participating in this study. If you ever become tired during the work at the computer you are free to stop and take a break. It is not possible to know all of the risks that may happen in a study, but the researchers have taken all reasonable safeguards to minimize any known risks to a study participant.

What are the benefits? Participating in this mentoring program may have many benefits to you. You will have a chance to talk and share thoughts with someone who has gone through similar life experiences and maybe shares similar interests. Talking with someone using the AAC device may make using your device easier. However, you may not get any benefit from being in this research study. This study may also help other people who use AAC in the future.

Do I have to take part in the study? Being in this study is your choice. If you decide to be in the study, you can change your mind and stop being in the study at any time. This will in no way affect the services you are entitled to.

You do not have to answer any questions from the researchers or mentor that you are not comfortable with.

If you wish to stop being in the study please let the researchers know immediately. We will discuss with you how much of the data already collected can be used.

Will I be paid to be in the research? No you will not be paid to be in this study.

Will my information be kept private? During the study we will be collecting data about you. We will do everything we can to make sure that this data is kept private. No data relating to this study that includes your name will be released outside of the researcher's office or published by the investigators. Sometimes, by law, we may have to release information with names, so we cannot guarantee absolute privacy. However, we will make every legal effort to make sure that your information is kept private.

What if I have questions? If you have any questions about the research now or later, please contact Jenelle MacDonald (780) 492-5422 or Kimberley Adams (780) 492-0309.

If you have any questions regarding your rights as a research participant, you may contact the Health Research Ethics Boards at 780-492-2615. This office has no affiliation with the study investigators.

There are no actual or potential conflicts of interest with respect to remuneration received from the funding agency. There is no conflict of interest for conducting or being involved with any part of the study. Also, there is no conflict of interest for the possibility of commercialization of research findings. The study is being conducted by investigators and a Master of Science Thesis student. The student has received funding from the Social Sciences and Humanities Research Council to conduct this research. You are entitled to request any details concerning this funding from the Principal Investigator. The student will be using this study to complete her program requirements for a Masters degree.

CONSENT

Title of Study: A mentoring program for individuals who use Augmentative and Alternative Communication (AAC) devices.

Principal Investigator: Kimberley Adams **Phone Number:**
(780) 492-0309

Co-Investigator: Jenelle MacDonald **Phone Number:**
(780) 492-5422

	<u>Yes</u>	<u>No</u>
Do you understand that you have been asked to be in a research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you read and received a copy of the attached Information Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand the benefits and risks involved in taking part in this research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that you are free to leave the study at any time, without having to give a reason, and without affecting services at the I CAN Centre?	<input type="checkbox"/>	<input type="checkbox"/>
Has the issue of confidentiality been explained to you?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand who will have access to your study records?	<input type="checkbox"/>	<input type="checkbox"/>
Are you able to commit to emailing the mentor at least once per week?	<input type="checkbox"/>	<input type="checkbox"/>
Are you able to respond to e-mails within at least a week from either the	<input type="checkbox"/>	<input type="checkbox"/>

investigator or the mentor?

Who explained this study to you?

I agree to take part in this study:

Signature of Research Participant

(Printed Name)

Date: _____

Signature of Witness

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator or Designee _____ Date _____

**THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM
AND A COPY GIVEN TO THE RESEARCH PARTICIPANT**

Participant Consent Form

Title of Study: A mentoring program for adolescents who use Augmentative and Alternative Communication (AAC) devices.

Principle Investigator: Kimberly Adams, Ph.D., Joint Assistive Technology (AT) Position: Assistant Professor Faculty of Rehabilitation Medicine, and Researcher, Glenrose Hospital (GRH)

Phone: 780.492.0309. Fax: 780.492.1626. Email: kdadams@ualberta.ca

Address: 3-48 Corbett Hall. T6G 2G4. Edmonton, Alberta, Canada

Co-Investigators: Jenelle MacDonald, MSc. Student Department of Communication Sciences and Disorders

Phone: (780) 492-5422 Email: jenelle3@ualberta.ca;

[Karen Pollock, Ph.D R.SLP, Professor and Chair Department of Communication Sciences and Disorders.](#)

[Phone:](#) (780) 492-5980 Email: Karen.pollock@ualbert.ca

Why am I being asked to take part in this research study? You are being asked to be in this study because you use Augmentative and Alternative Communication (AAC). We feel you have the potential to become a mentor to another AAC user. We want to see how training mentors can improve the mentoring experience for both the mentors and the individuals being mentored.

Before you make a decision one of the researchers will go over this form with you. You are encouraged to ask questions if you feel anything needs to be made clearer. You will be given a copy of this form for your records.

What is the reason for doing this study? The purpose of doing this study is to determine how a mentoring program can help people who use AAC.

What will I be asked to do? The study will begin with two questionnaires about you and your life. One questionnaire will be questions about your interests, the type of AAC device you have, and other things about yourself. The other is about how your life is affected by having a communication problem. Then you will be paired with a younger person who also uses an AAC device (your AAC mentoring partner). You will be paired based on the information in the form about yourself.

You will talk with this person in an email at least once a week for 6 months. The email will be monitored by the investigator to ensure all participants' safety.

After at least 6 weeks you will complete a mentor training course at your own pace where ever you have access to the Internet and can concentrate. The training course is estimated to take 20-25 hours in total (over 6 to 8 weeks). During the training you will learn specific mentoring strategies and have time to practice them. You will also get feedback on your use of the strategies during practice. While you are taking this online course you will continue to talk with your AAC mentoring partner online.

At the end of the study, you will be asked some questions about your experience. The questions will be sent via e-mail and the time it will take will be based on how much you wish to write. You will also complete the questionnaire about your life and this will also be sent by email.

What are the risks and discomforts? There are very few, if any, risks to participating in this study. If you ever become tired during the training or while completing the quality of life measure you are free to stop and take a break. While completing tasks for the study at home, you can go at your own pace to avoid discomfort. It is not possible to know all of the risks that may happen in a study, but the researchers have taken all reasonable safeguards to minimize any known risks to a study participant.

What are the benefits to me? By participating in this research you will be receiving a mentor training course for free. This training course can be included in your resume. Also, the skills you will learn from this course can be used in your daily life. You will also get the chance to share your knowledge and skills with another individual who uses AAC. You will also have the opportunity to engage with someone who may be going through similar life experiences as you have. However, you may not get any benefit from being in this research study. This study may also help other people who use AAC in the future.

Do I have to take part in the study? Being in this study is your choice. If you decide to be in the study, you can change your mind and stop being in the study at any time. This will in no way affect the services you are entitled to.

During any interview or questionnaire you do not have to answer any questions that you are not comfortable with.

If you wish to stop being in the study please let the researchers know immediately. If you decide to stop being part of the study, you will be asked if you wish to have your data removed from the study or not.

Will I be paid to be in the research? No you will not be paid to be in this study.

Will my information be kept private? During the study we will be collecting data about you. We will do everything we can to make sure that this data is kept private. No data relating to this study that includes your name will be released outside of the researcher's office or published by the researchers. Sometimes, by law, we may have to release your information with your name so we cannot guarantee absolute privacy. However, we will make every legal effort to make sure that your information is kept private.

What if I have questions? If you have any questions about the research now or later, please contact Jenelle MacDonald (780) 492-5422 or Kimberly Adams (780) 492-0309.

If you have any questions regarding your rights as a research participant, you may contact the Health Research Ethics Boards at 780-492-2615. This office has no affiliation with the study investigators.

Declaration of any actual or potential conflicts of interest with respect to remuneration received from the funding agency for conducting or being involved with any part of the study and/or the possibility of commercialization of research findings: The study is being conducted by researchers at the University of Alberta and a Master of Science Thesis student in the Communication Sciences and Disorders Department of the Faculty of Rehabilitation Medicine. The student has received funding from the Social Sciences and Humanities Research

Council to conduct this research. You are entitled to request any details concerning this compensation from the Principal Investigator. The student will also be using this study to complete their program requirements for a Master of Science Thesis in Communication Sciences and Disorders.

CONSENT

Title of Study: A mentoring program for adolescents who use Augmentative and Alternative Communication (AAC) devices.

Principal Investigator: Kimberley Adams **Phone Number:**
(780) 492-0309

Co-Investigator: Jenelle MacDonald **Phone Number:**
(780) 492-5422

	<u>Yes</u>	<u>No</u>
Do you understand that you have been asked to be in a research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you read and received a copy of the attached Information Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand the benefits and risks involved in taking part in this research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that you are free to leave the study at any time, without having to give a reason, and without affecting your services at the I CAN Centre?	<input type="checkbox"/>	<input type="checkbox"/>
Has the issue of confidentiality been explained to you?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand who will have access to your study records? <input type="checkbox"/>	<input type="checkbox"/>	
Are you able to commit to messaging your AAC mentoring partner at least once per week?	<input type="checkbox"/>	<input type="checkbox"/>
Are you able to respond to e-mails within at least a week from either the investigator or your AAC mentoring partner?	<input type="checkbox"/>	<input type="checkbox"/>
Who explained this study to you? _____		

I agree to take part in this study:

Signature of Research Participant

(Printed Name)

Date: _____

Signature of Witness

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator or Designee

Date

**THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM
AND A COPY GIVEN TO THE RESEARCH PARTICIPANT**

Information and Consent Form for Parents

Title of Study: A mentoring program for individuals who use Augmentative and Alternative Communication (AAC) devices.

Principle Investigator: Kimberly Adams, Ph.D., Joint Assistive Technology (AT) Position: Assistant Professor Faculty of Rehabilitation Medicine, and Researcher, Glenrose Hospital (GRH)

Phone: 780.492.0309. Fax: 780.492.1626. Email: kdadams@ualberta.ca

Address: 3-48 Corbett Hall. T6G 2G4. Edmonton, Alberta, Canada

Co-Investigators: Jenelle MacDonald, MSc. Student Department of Communication Sciences and Disorders

Phone: (780) 492-5422 Email: jenelle3@ualberta.ca;

[Karen Pollock, Ph.D R.SLP, Professor and Chair Department of Communication Sciences and Disorders.](#)

[Phone:](#) (780) 492-5980 Email: Karen.pollock@ualbert.ca

Why is your child being asked to take part in this research study? Your child is being asked to be in this study because he/she uses Augmentative and Alternative Communication (AAC). We feel your child has the potential to become a mentor to another AAC user. We want to see how training mentors can improve the mentoring experience for both the mentors and the individuals being mentored.

Before you make a decision one of the researchers will go over this form with you and your child. You are encouraged to ask questions if you feel anything needs to be made clearer. You will be given a copy of this form for your records.

What is the reason for doing this study? The purpose of this study is to determine how a mentoring program can help people who use AAC.

What will my child be asked to do? The study will begin with two questionnaires about your child's life. One questionnaire will be questions about interests, the type of AAC device, and other things about your child. The other is about how your child's life is affected by having a communication problem. Then your child will be paired with a younger person who also uses an AAC device (a mentoring partner). Your child will be paired based on the information in the form about him/her.

Your child will talk with this person in an email at least once a week for 6 months. The email will be monitored by the investigator to ensure all participants' safety.

After at least 6 weeks your child will complete a mentor training course at his/her own pace where ever he/she has access to the Internet and can concentrate. The training course is estimated to take 20-25 hours in total (over 6 to 8 weeks). During the training your child will learn specific mentoring strategies and have time to practice them. Your child will also get feedback on use of the strategies during practice. While your child is taking this online course he/she will continue to talk with the AAC mentoring partner online.

At the end of the study, your child will be asked some questions about the experience. The questions will be sent via e-mail and the time it will take will be based on how much he/she wishes to write. Your child will also complete the questionnaire about his/her life and this will also be sent by email.

What are the risks and discomforts? There are very few, if any, risks to participating in this study. If your child ever becomes tired during the training or questionnaires he/she is free to stop and take a break. While completing tasks for the study at home, he/she can go at his/her own pace to avoid discomfort. It is not possible to know all of the risks that may happen in a study, but the researchers have taken all reasonable safeguards to minimize any known risks to a study participant.

What are the benefits? By participating in this research your child will be receiving a mentor training course for free. This training course can be included in a resume. Also, the skills learned from this course can be used in daily life. Your child will also get the chance to share his/her knowledge and skills with another individual who uses AAC. Your child will have the opportunity to engage with someone who may be going through similar life experiences. However, your child may not get any benefit from being in this research study. This study may help other people who use AAC in the future.

Does my child have to take part in the study? Being in this study is you and your child's choice. If you decide to be in the study, you can change your mind and stop being in the study at any time. This will in no way affect the services your child is entitled to. During any questionnaires your child does not have to answer any questions that he/she is not comfortable with.

If you or your child wish to stop being in the study please let the researchers know immediately. We will have a conversation with you to discuss how much of the data already collected can be used.

Will my child be paid to be in the research? No he/she will not be paid to be in this study.

Will my child's information be kept private? During the study we will be collecting data about your child. We will do everything we can to make sure that this data is kept private. No data that includes your child's name will be released outside of the researcher's office or published by the researchers. Sometimes, by law, we may have to release information with names so we cannot guarantee absolute privacy. However, we will make every legal effort to make sure that your child's information is kept private.

What if I have questions? If you have any questions about the research now or later, please contact Jenelle MacDonald (780) 492-5422 or Kimberly Adams (780) 492-0309.

If you have any questions regarding your rights as a research participant, you may contact the Health Research Ethics Boards at 780-492-2615. This office has no affiliation with the study investigators.

There are no actual or potential conflicts of interest with respect to money received from a funding agency for conducting or being involved with any part of the study. There are no conflicts of interest in the possibility of commercialization of research findings. The student on this project has received funding from the Social Sciences and Humanities Research Council for this research. You are entitled to request any details concerning this compensation from the

Principal Investigator. The student will be using this study to complete their program requirements for a Master of Science Thesis.

CONSENT

Title of Study: A mentoring program for individuals who use Augmentative and Alternative Communication (AAC) devices.

Principal Investigator: Kimberley Adams **Phone Number:** (780) 492-0309

Co-Investigator: Jenelle MacDonald **Phone Number:** (780) 492-5422

	<u>No</u>	<u>Yes</u>
Do you understand that your child has been asked to be in a research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you read and received a copy of the attached Information Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand the benefits and risks involved in taking part in this research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that your child is free to leave the study at any time, without having to give a reason, and without affecting services at the I CAN Centre?	<input type="checkbox"/>	<input type="checkbox"/>
Has the issue of confidentiality been explained to you?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand who will have access to your child's study records?	<input type="checkbox"/>	<input type="checkbox"/>
Is your child able to commit to emailing the mentoring partner at least once per week?	<input type="checkbox"/>	<input type="checkbox"/>
Is your child able to respond to e-mails within at least a week from either the Investigator or the mentoring partner?	<input type="checkbox"/>	<input type="checkbox"/>
Who explained this study to you? _____		
I agree for my child to take part in this study: Signature of Parent _____		

<p>(Printed Name)</p> <hr/>
Date: _____
Signature of Witness

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.
Signature of Investigator or Designee _____ Date _____

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND

A COPY GIVEN TO THE RESEARCH PARTICIPANT

Appendix IV: Pre-Assessment Questionnaire/Demographics Form

Protégés

Name:

Age:

Grade:

Gender:

Diagnosis:

Type of AAC Device:

Date that you received this AAC device:

What are your interests/hobbies?

What areas would you like support from a mentor for?

Are you able to read independently?

Are you able to spell words out on your device if they are not pre-programmed?

Do you have regular access to a computer with the Internet?

Are you able to independently access this computer and send/receive e-mails?

Mentors:

Name:

Age:

Occupation:

Gender:

Diagnosis:

Type of AAC Device:

Date that you received this AAC device:

What are your interests/hobbies?

What are your areas of strength/knowledge that you would be able to help a younger individual who uses an AAC device with?

Are you able to read independently?

Are you able to spell words out on your device if they are not pre-programmed?

Do you have regular access to a computer with the Internet?

Are you able to independently access this computer and send/receive e-mails?

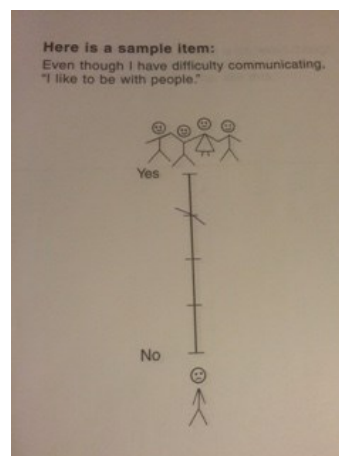
Appendix V: Quality of Communication Life Scale Questions

Examinee will place a mark on a scaled line (bottom of line being disagree/always, middle of the line is sometimes, top of line being strongly agree/never). They are asked to think about this phrase before every item: “Even though I have difficulty communication...”

Items:

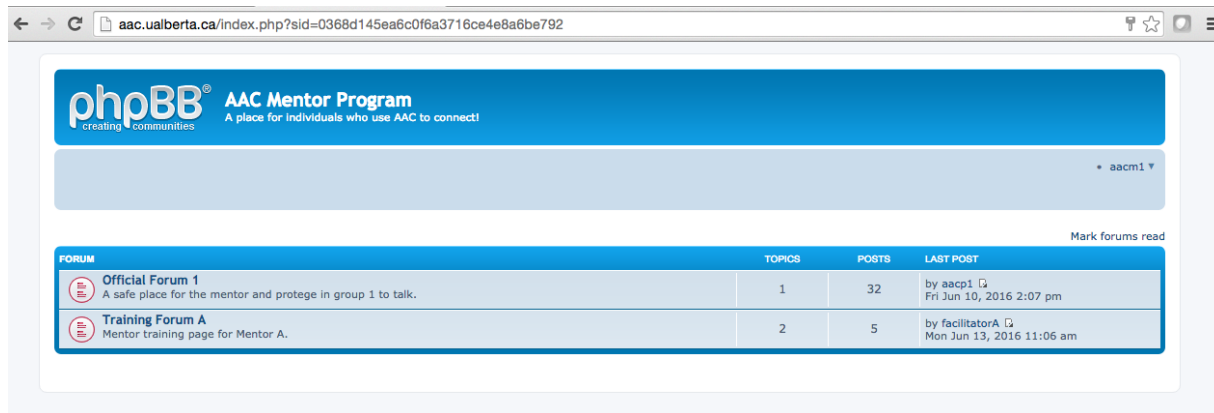
1. I like to talk with people.
2. It’s easy for me to communicate.
3. My role in the family is the same.
4. I like myself.
5. I meet the communication needs of my job or school (such as: typing, give and following directions, reading).
 - a. (This item has a “does not apply” box they can check to skip the item)
6. I stay in touch with family and friends.
7. I follow news, sports, and stories on TV/movies.
8. People include me in conversations.
9. I use the telephone.
10. I see the funny things in life.
11. People understand me when I talk.
12. I keep trying when people don’t understand me.
13. I make my own decisions.
14. I am confident that I can communicate.
15. I have household responsibilities (such as: shopping, cooking, home repairs).
 - a. (This item has a “does not apply” box they can check to skip the item)
16. I get out of the house and do things (such as: sports, dinner, shows, parties).
17. I speak for myself.
18. In general, my quality of life is good.

Example of sample item with scale:







Appendix VI: AAC Mentoring Project online forum and training

Below is a screenshot for the main page as would be seen by the mentor. The forum where she would communicate with the protégé is labeled ‘Official Forum 1’. The forum where she would take her training course in the larger project is labeled ‘Training Forum A’.



The screenshot displays a web browser window with the URL `aac.ualberta.ca/index.php?sid=0368d145ea6c0f6a3716ce4e8a6be792`. The page header includes the phpBB logo and the text "AAC Mentor Program" with the tagline "A place for individuals who use AAC to connect!". Below the header is a navigation bar with a dropdown menu set to "aacm1". The main content area features a table with two forum entries:

FORUM	TOPICS	POSTS	LAST POST
 Official Forum 1 A safe place for the mentor and protege in group 1 to talk.	1	32	by aacp1  Fri Jun 10, 2016 2:07 pm
 Training Forum A Mentor training page for Mentor A.	2	5	by facilitatorA  Mon Jun 13, 2016 11:06 am

Appendix VII: Introduction message and rules for forum

Below is a screenshot directly from the forum showing the welcome message and rules for the forum. The rules remained at the top of each page of the forum as a reminder for participants.

AAC Mentoring Program

Forum rules

- 1) Please do not share any personal identification information during this program (home phone, street address, alternate e-mail, etc.). It is okay to share your first name with your partner.
 - 2) Use appropriate language (no swearing or foul language)
 - 3) Please be polite and considerate of your partner's feelings.
 - 4) Do not send rude or mean comments to your partner.
 - 5) Do not send inappropriate pictures (e.g. nudity).
- If a message that is sent contains any of these elements, it will be immediately deleted by the administrator and you will receive a warning message. If you continue to send inappropriate messages you will be removed from the program.

AAC Mentoring Program

by Moderator » Wed Jul 29, 2015 12:53 pm



Moderator

Posts: 31
Joined: Tue Jun 23, 2015
8:25 pm
Contact:

Welcome to the SGCD Mentoring Program!! We are very excited to start this program and to help connect individuals who communicate with AAC devices. We are so glad to have you as part of our program. We hope you enjoy your time in the AAC Mentoring Program. Please remember that in order to have a successful program we need you to communicate regularly with your partner. It would be best to check for messages everyday! We require you to send a message and reply to a message at least once a week but encourage you to send many more! The more you talk with you partner the closer you will become! If you have not sent or replied to a message by Wednesday of each week you will receive a message from the administrator reminding you to communicate with your partner along with some conversation topics. Remember that by agreeing to be a part of this study you agreed to these commitments.

Reply to this topic to start a conversation with your partner! You can start with a simple hello and a few things about yourself (e.g., favourite colour, favourite sport, type of AAC device you use, reason for participating in the program, etc.)

Here are some other conversation topics you can use to start conversations with your partner.

- Interests, hobbies (e.g. favourite TV show, favourite movie; singing karaoke, reading, etc.)
- Plans for the weekend
- Plans for the summer
- Plans for your life (careers, family, etc.)
- What you did today/this week
- What do you do during the day? (e.g. go to school, work from home, work on personal projects/hobbies, etc.)
- Things that make you happy, sad, excited, angry
- Problems or areas you may want advice or guidance in.
- Stories about yourself and your life

Remember to only reply to this topic page. Don't start new topic pages as it will make accessing the conversations confusing.

Appendix VIII: Post-Assessment Interview Questions

Protégé:

*Please answer as many questions as you can. You don't, however, need to complete them all in one sitting – you have the option of sending us your responses as you finish them. We are only asking these questions to learn about your experience with the program. With this in mind, point form answers are okay; don't worry about using complete sentences or correct grammar in your responses. Before answering the questions, look back at your conversations with your partner on the website: aac.ualberta.ca.

- If you had to describe your experience in the AAC Mentoring program using just 3 words, what would they be?

- What did you like best about the AAC Mentoring program? Would you participate in the program again?

- If you were able to make any changes to the program what would they be?

- You picked: “1) to use a bus in the city 2) how it is moving out and going to college”, as your goals at the beginning of the program.
 - o Do you feel like you achieved these goals?
 - o Were you provided with resources to achieve these goals in the future?
 - o Did you create new goals while working through the program?

- Tell us about the relationship you developed with your mentor. Are you interested in maintaining this relationship?

- Did you feel like you learned anything from your mentor?
 - o If YES, what did you learn?.
 - o If NO, why?

- Were there any events/circumstances that affected your participation in the program?

- Did you take part in courses, conferences, training events, etc. during the course of the program?
- Do you think others would benefit from this program? Why or why not?
- Do you have any other comments about your experience with the AAC Mentoring Program?

Examine the rating scale below:

1 = Very unsatisfied

2 = Somewhat unsatisfied

3 = Neutral

4 = Somewhat Satisfied

5= Very Satisfied

Provide a rating of 1 – 5 (see above) for the follow areas:

1. Quality of AAC Mentor Program overall
2. Accessibility of the website
3. Relationship with partner
4. Contact with researcher
5. Your partner's advice/ ability to answer your questions
6. Your partner's ability to provide resources / information regarding your questions/ goals
7. Overall experience with your partner

Mentor:

Post Program Interview Questions

*Please answer as many questions as you can. You don't, however, need to complete them all in one sitting – you have the option of sending us your responses as you finish them. We are only asking these questions to learn about your experience with the program. With this in mind, point form answers are okay; don't worry about using complete sentences or correct grammar in your responses. Before answering the questions, look back at your conversations with your partner on the website: aac.ualberta.ca.

- If you had to describe your experience in the AAC Mentoring program using just 3 words, what would they be?
- What did you like best about the AAC Mentoring program? Would you participate in the program again?
- Were there any events/circumstances that affected your participation in the program?
- Did you take part in courses, conferences, training events, etc. during the course of the program?
- If you were able to make any changes to the program what would they be?
- Do you think others would benefit from this program? Why or Why not?
- Did you feel prepared to be a mentor when the program first started?
- What did you learn from the training you completed so far? Did it change how you interacted with your partner?
- Are you interested in maintaining a relationship with your partner?

Examine the rating scale below:

1 = Very unsatisfied

2 = Somewhat unsatisfied

3 = Neutral

4 = Somewhat Satisfied

5= Very Satisfied

Provide a rating of 1 – 5 (see above) for the follow areas:

1. Quality of AAC Mentor Program overall

2. Accessibility of the website

3. Relationship with partner

4. Contact with researcher

Appendix IX: Linguistic Competence Measures

Language Sample Analysis:

Transcribe Sample

Using either the stories generated in pre-/post-assessments or the e-mail conversations, I orthographically transcribed samples.

Segment transcripts by C-Units

E-mail messages will be coded according to SALT procedures and therefore using C-Units. C-Units are used to distinguish utterances. A C-Unit is “an independent clause with its modifiers,” i.e. a main clause with all the of subordinating classes attached or dependent on it.

<http://www.saltsoftware.com/resources/tran aids/CunitSummary.pdf>

How to calculate Linguistic Competence Measures:

Number of Total Words (NTW)

The NTW will be calculated by counting the total number of words used over two-weeks of e-mail transcripts or in a story transcripts generated during pre-/post-assessment. This number will be divided by the total number of utterances that occur in that two-week period or story.

Compound words and proper names will be counted as single words and errors (incomplete/non-words) will be removed.

Number of Different Words (NDW)

The NDW will be calculated by counting the number of words with different roots produced over two-weeks of e-mail transcripts or story transcripts. This total will be divided by the total number of words used in that two-week period or story. Words will be considered to have the same root if the word is the same once prefixes or suffixes are removed or if they are derivatives of the same root word. Example: “plays”, “playing”, “played” share the root “play”.

Mean Length of Communication Unit

See description of C-unit above. MLCU involves finding the average number of words per C-unit. Example: 'I want to be free and see the beautiful world'. This is an example of 1 C-unit involving an independent and dependent clause. This C-unit has 10 words.

Complexity Index

Complexity index is calculated by counting the number of dependent and independent clauses, every 50 CUs, adding them together and then dividing by the number of independent clauses.

$$CI = (\text{Independent} + \text{dependent}) / \text{Independent}$$

This determines the number of dependent clauses per independent clauses in the sample. For the purposes of this study, a sample that uses a high ratio (higher than 1) of dependent to independent clauses would be considered syntactically complex.

Errors

Errors were counted as anything coded in the transcripts as missing or incorrect. These were often coded with a (*) or a code in square brackets (e.g., *the – for missing the word “the”; [PE] - for punctuation error). Punctuation errors, spelling errors, word errors, and utterance errors were coded and counted. Punctuation errors were defined as missing or incorrect periods, commas, and other forms of punctuation (e.g., ‘What are you doing today’ [PE:?]). Spelling errors were defined as misspelled words (e.g., ‘the stars looked majical[SE] last night’). Word errors were defined as incorrect use of a word (e.g., “there” instead of “their”). Utterance errors were defined as sentences with incorrect or odd syntax that led to misinterpretation of a sentence as well as run-on sentences (e.g., Sam was feeling a little bit scared as she crept along on her silvery tentacles bouncing up and down as she came down the ramp, the yellow ball of fire hit on her pail face, this made her smile [EU].). This category also included incomplete sentences (e.g., ‘No sooner did she finish [EU].’). Other errors that were coded were morphological errors, i.e., word

endings. These errors included missing the plural marker 's' when it was necessary (e.g., 'The dog were running after me' → 'The dog*s were running after me').

Appendix X: Coding Legend

Below is the document used by me and second rater to code the linguistic data. It is included as supplementary information to the previous appendix.

AAC Mentoring Project Writing Analysis Codes

This document was developed based on class notes from CSD 518: Child Language II and Narrative Analysis Handbook written by Dr. Phyllis Schneider.

Coding Legend				
Morphemes				
General	3 rd person singular	Possessive	Be verbs (auxiliary + copula 'be')	
/+morpheme	/3s	/z	/'s	
Sentence Level				
Dependent clause [DC]				
Errors				
Omitted morphemes	Word Level errors (no space b/w word and code)	Sentence Level errors (space b/w word and code)	Spelling Error	
/*+morpheme (walk/*ed)	[EW: correct word]	[EU]	[SE]	
Punctuation				
Omitted Period	Omitted Coma	Omitted Capital	Omitted Apostrophe	Punctuation Error
[.]	[,]	[C]**	[']	[PE]

Note: Do not mark words such as “lol” “omg” “haha” as errors. Do not mark multiple punctuation marks as errors. Do not mark using capitals to show emphasis as errors.

*****not placed at beginning of quotations when quotations do not appear at the beginning of the sentence.***

Steps for Coding:

- 1) Make each line into a C-unit (see notes below) with a period at the end. If a signature/ name is at the end of a message, move it up to be included with the previous line.
- 2) Look through and code each line according to chart above (see notes below for more info).

General Notes About Coding:

Morphemes:

- General Examples:
 - o Balloon/s
 - o Walk/ed
 - o Call/ing
 - o Can/'t
 - o Does/n't
- 3'd person singular:
 - o She eat/3s pizza.
- Possessive:
 - o Her pant/z are expensive.
- Be verbs:
 - o It's so nice out!
- But leave these as is:
 - o Glasses (never singular)
 - o Don't
 - o Won't
 - o Hers
 - o Bored
- Always transcribe the root of the word BEFORE the morpheme is added
 - o Ex: cried → cry/ed
- Irregular verbs ARE NOT broken down and are left as they are.

Sentence Level:

Rules for dividing sentences into C-Units:

- A T-Unit consists of an independent clause plus dependent clauses. A C-unit can include incomplete phrases.
- An independent clause must have a subject and a predicate (subject and a verb) and can stand by itself.
- The following would be one independent clause: Someone broke into her house and stole all her money.
- The following would be two independent clauses: Someone broke into her house and he stole all her money. (Because the second part has its own subject, it is actually a second independent clause and would be transcribed on a separate line in a transcript.)
- *And* and *but* conjoin sentences and therefore (if followed by a complete sentence) normally indicate that there are two independent clauses.
e.g.: She wanted a balloon / but she had no money [these would be transcribed on separate lines with periods at the ends of each.]

e.g.: She wanted a balloon but had no money. [Because there is not a complete sentence after but, it is one independent clause with a conjoined verb phrase.

Coordinating Conjunctions		
and	accordingly	instead
but	again	likewise
for	also	moreover
nor	besides	namely
or	consequently	nevertheless
so	finally	otherwise
yet	for example	still
	hence	that is
	however	then
	indeed	therefore
	in fact	thus

Identifying dependent clauses

Clause versus phrase: Clauses have verbs; phrases generally do not (other than verb phrases, which *are* verbs).

The presence of more than one verb can be used as a cue when looking for clauses.

e.g.: *Having eaten* dinner, he *took* a nap. [*having eaten* is one verb, *took* is a second verb]

Exception: coordinated phrases may contain more than one verb, but they are not clauses.

e.g.: He *ate* bread and *drank* water. [co-ordinated verb phrases, no dependent clause]

Coordinated phrases are not counted because they are not considered complex syntax, and they develop earlier than complex sentences.

Watch out for verb phrases with modals – they count as only one verb, and thus do not indicate a complex sentence.

e.g., *Could have been watching* = one verb.

Even if other words intervene, they are still only one verb: *could possibly have been secretly watching*.

Watch out for contracted verbs – they are easy to miss.

e.g., *he's* = *he is*; *they're* = *they are*

Subordinating conjunctions such as *although* and *because* indicate that there is a single independent clause with a dependent clause.

e.g.: She wanted a balloon although she had no money.

e.g.: She wanted a balloon because they were so much fun.

Subordinate Conjunctions		
after	even though	until
although	how	when
as	if	whenever
as if	in order that	where
as long as	now that	whereas
as much as	once	whenever
as soon as	provided that	whether
as though	rather than	while
because	since	why
before	so that	that
even if	than	though
		unless

Types of dependent clauses:

Relative: Describes the subject or object and is often introduced with a relative pronoun (who, which, where)

- “and then his broken is the one *who gets shipwrecked on the island*”

Nominal: Completes a thought introduced by the main clause and often follows a metacognitive verb (e.g. know, believe, think) or metalinguistic verb (e.g. say, tell, ask) also called the complement of a verb.

- “We didn’t know *it was eight miles.*”

Adverbial: Expresses conditionally, reason, manner, time, contrast, comparison, place or purpose.

- “And we biked over to a boat launch while *someone else drove the boat there.*”

Infinitive: Not marked for person, tense, and number; the word *to* is sometimes omitted.

- “He likes *to play in the woods.*”

Participial: Describes nouns and functions like a truncated relative clause; ends in –ing, –en, or –ed.

- “Well I have a dog *named Pogo*”.

Gerund: Functions like a noun or a truncated nominal clause; often ends in –ing.

- “I love *learning new stuff*”

Direct quotations: Mark something spoken in a narrative. Must be followed by atleast a clause.

- She said “Don’t do that”
- NOT: She said, “Hello” OR She said, “Not that”.

Reported statement: Marks content of a quote as it relates to the speaker in time, person, place, and direction, at the moment of speaking (marked by *that*)

- She said *that it was raining there*.
- She declared *that the umbrella was hers*.

Units that are NOT counted as dependent clauses:

- Conjoined phrases, either nouns or verbs (also called coordinated phrases)
 - o She had coffee, toast and cereal for breakfast. (1 main clause only)
 - o She sat down and ate her breakfast. (Second subject was deleted--thus 1 main clause. This can be confusing because there are two verb phrases, but no dependent clause)
- Prepositional phrases, however long or numerous they may be
 - o She was tired from the top of her head to the tips of her toes. (1 main clause only)
- *-ing* , *-ed*, or *-en* forms serving as nouns or adjectives
 - o She ran to the *swimming* pool.
 - o There is no *running* in the pool area.
 - o She ate a *cooked* lunch.
 - o He had a half-*eaten* sandwich.
- Phrases that would have been clauses but the verb was deleted
 - o He didn't want *to*. (if the verb had not been deleted, e.g., He didn't want *to run*, there would have been an infinitive clause)

Errors:

Omitted words and morphemes: *

- Yesterday, I walk/*ed to the store (yesterday I walk to the store)
- Yesterday, I walk/ed *to the store (yesterday I walk the store)
- I (wa*) am happy.

Word-level errors: [EW]

- They was[EW:were] happy
- Her[EW:she] went there

Sentence-level errors: [EU]

1) In correct word order and run-on sentences

- I am to going school
- I have a trick for colds, that is putting some oregano oil on your feet and you will feel better also you have to eat it but, only a couple drops in food.

2) When a sentence needs to be read several times in order to understand it.

- I don't sit in my wheelchair while in my white and light gray RV instead my raspberry pink insert with colorful butterflies goes into the upper part in the RV.

3) When a sentence does not relate to the context before or after it.

- My TA and my friend pick a boy to go with me to my grad. He was nice and not in my class but he was in my cousins class. *I was held back a year in grade five.*

Appendix X1: Definitions of topics identified

1. **Social** - conversational language, e.g., “How is it going?” “How are you today?” “Talk soon!”
2. **Personal**- anything about themselves, body/feelings. Also included when they describe things like their house or room. E.g., “I was nervous” “I have a painting in my room”
3. **Interests**- anything about stuff they like to do or see or are just interested in, such as writing, going to movies, music, friends, shopping (e.g., ‘Do you go shopping at WEM?’ ‘Did you see the poem I wrote?’) (includes talk about grad dresses/photos)
4. **Family**- anything about their family, pets included (e.g., ‘my sister is annoyingly younger than me and we don’t agree on much’ ‘I have a dog named ___’)
5. **School**- anything about school, graduation, post secondary, or taking classes of some kind (e.g., ‘Did you guys do any cool activities at your school?’ ‘Are you interested in taking an online class?’) (includes academic aspects of graduation)
6. **Travel**- anything about taking public transit or travelling for family vacations, etc. (e.g., ‘I’m shocked the taxi company made you wait 3 hours in the rain!’ ‘I’m going to Toronto to see my film’)
7. **Medical**- anything about being sick, medical conditions, procedures, feeding tubes, etc. (e.g., ‘Good luck with your surgery!’ ‘The last procedure I had done was my PIC line’)
8. **Assistive Technology (AT)**- Anything about wheelchairs, wheelchair attachments, apps or programs on device NOT communication related, etc. (e.g., ‘did you ever use your device to play music or play an instrument?’ ‘I found an arm for my wheelchair that I just love!’)
9. **Augmentative and Alternative Communication (AAC)** - anything to do with the way their communicate with their device or about their device, alternative methods of accessing their communication device such as eye gaze technology (e.g., ‘I like to say my device is like my speaker’, ‘I use a program called ‘SonoScribe’’))
10. **Language** - anything about what and how they write/ talk with their device, mostly about grammar/spelling (e.g., ‘Truthfully writing is a lot of work for me’ ‘I learned to read and write in school when everyone else did’)
11. **Advocacy**- anything about disability rights, minority rights, government, etc. (e.g., ‘I volunteer with a youth council’ ‘I strongly believe in the inclusion of all students in our school system’)
12. **Advice**- giving or asking for advice (e.g., how did you learn vocabulary, spelling and grammar?’ ‘My advice is to make sure people alter your dress.’)
13. **Barriers**- anything about things that are challenges or barriers in their lives (e.g., ‘I was one of those kids who was only taught by my TA’ ‘I haven’t been there, my mom doesn’t drive in the city very well’)
14. **Forum Difficulties**- anything about difficulties with the forum, not being able to do something on it they would like to or something not working properly for them (e.g., ‘You have to log out and in to receive new messages’ ‘I wish we could send pictures on here’).