

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

New Zealand Speech-Language Therapists'
Perceptions and Experiences of Supporting Preschool
Children with Complex Communication Needs.

A thesis presented in partial fulfilment of the requirements for the degree of
Masters of Speech-Language Therapy
at Massey University, Albany, New Zealand.

Claire-Ellen Roberts

2017

Contents

List of figures and tables	1
Acknowledgements	2
Abstract	3
CHAPTER ONE Introduction	
1.1 Background	4
1.2 Rationale	8
1.3 Research Aims/Questions	9
1.4 The Structure of the Thesis	9
CHAPTER TWO Literature Review	
2.1 Impact of Complex Communication Needs on Language Development	11
<i>2.1.1 Language learning process</i>	11
<i>2.1.2 Language characteristics</i>	13
<i>2.1.3 AAC system and modality characteristics</i>	14
<i>2.1.4 Communication opportunities</i>	16
2.2 Impact on Participation	17
2.3 Impact on Learning	19
2.4 Child's Right to Have a Voice	20
2.5 Early Intervention and Children with Complex Communication Needs	21
2.6 Early Intervention	21
<i>2.6.1 Importance</i>	21
<i>2.6.2 Principles</i>	22

2.6.2.1 <i>Family centred practice</i>	22
2.6.2.2 <i>Enhancing participation in natural environments</i>	23
2.6.2.3 <i>Culturally responsive</i>	23
2.6.2.4 <i>Providing integrated services</i>	24
2.7 Early AAC Provision	25
2.7.1 <i>Barriers to access to AAC</i>	28
2.7.1.1 <i>Belief that it will slow speech development</i>	28
2.7.1.2 <i>Belief that the child has some words so doesn't need it</i>	30
2.7.1.3 <i>Belief that the child is too young</i>	34
2.7.1.4 <i>Belief that the child does not have the pre-requisite</i>	
<i>cognitive abilities.</i>	34
2.7.2 <i>Barriers to access to robust AAC</i>	34
2.7.2.1 <i>Belief that the child needs to be able to recognise objects</i>	
<i>and photos before symbols can be introduced</i>	35
2.7.2.2 <i>Belief that we introduce a few symbols initially and then add</i>	
<i>a few more when the child shows us that s/he can use them</i>	36
2.8 Early AAC Intervention	37
2.8.1 <i>Intervention goals</i>	37
2.8.1.1 <i>Building communicative competence</i>	37
2.8.1.2 <i>Developing communicative autonomy</i>	38
2.8.1.3 <i>Ensuring communicative accessibility</i>	38
2.8.2 <i>Optimising Interactions</i>	38
2.8.3 <i>Barriers/Facilitators to AAC implementation</i>	40

2.8.3.1	<i>Support</i>	41
2.8.3.2	<i>Attitudes</i>	41
2.8.3.3	<i>Lack of training for teams</i>	41
2.8.3.4	<i>Speech-language therapist AAC competency</i>	42
2.9	Conclusion	45
CHAPTER THREE Methodology		
3.1	Introduction	46
3.2	Research Questions	46
3.3	Participant Recruitment	46
3.4	Methodological Approach	47
3.4.1	<i>Online survey methodology</i>	47
3.4.2	<i>Survey design</i>	47
3.5	Procedures	50
3.5.1	<i>Data analysis procedures</i>	50
3.6	Ethical Considerations	51
3.6.1	<i>Informed consent</i>	51
3.6.2	<i>Confidentiality</i>	51
3.7	Conclusion	52
CHAPTER FOUR Results		
4.1	Introduction	53
4.2	Survey Results	53
4.3	Participants	53
4.4	Caseload Characteristics	55

4.4.1 <i>Reasons for not providing AAC intervention</i>	55
4.4.1.1 <i>Service delivery</i>	55
4.4.1.2 <i>Family factors</i>	56
4.4.1.3 <i>Use of other methods</i>	56
4.4.1.4 <i>Child factors</i>	57
4.4.1.5 <i>Education</i>	58
4.4.2 <i>AAC systems used</i>	59
4.5 Competence	59
4.5.1 <i>Perceived competence</i>	60
4.6 Myths in AAC	63
4.7 Factors Influencing Implementation of AAC	65
4.8 Barriers to AAC Implementation	66
4.9 Facilitators	68
4.10 Conclusion	70
CHAPTER FIVE Discussion	
5.1 Introduction	71
5.2 Research Questions	71
5.3 Participants	72
5.4 Caseload characteristics	73
5.4.1 <i>Caseloads</i>	74
5.4.2 <i>Types of AAC systems used</i>	75
5.5 Early Intervention Speech-Language Therapists' Knowledge and Beliefs about AAC	76

5.5.1 <i>New Zealand speech-language therapists' education</i>	77
5.5.2 <i>New Zealand speech-language therapists' competence</i>	77
5.5.3 <i>Myths</i>	78
5.5.3.1 Factors affecting AAC use	79
5.6 Barriers and Facilitators	80
5.6.1 Attitudes	80
5.6.2 Specialist Support	81
5.7 Conclusion	83
CHAPTER SIX Conclusion	
6.1 Introduction	84
6.2 Purpose and Design	84
6.3 Limitations	84
6.4 Implications for Practice	86
6.5 Implications for Future Research	87
6.6 Final Thoughts	88
REFERENCES	
References	89
APPENDICES	
Appendix A: Recruitment Email	98
Appendix B: Information Sheet	99
Appendix C: Copy of Online Survey	101
Appendix D: Ethics Approval Letter	110

List of Figures and tables

List of Figures

Figure 1:	Competence in AAC	61
-----------	-------------------	----

List of Tables

Table 1:	Participant demographic information	54
Table 2:	Service delivery reasons for no AAC intervention	56
Table 3:	Family reasons for no AAC intervention	56
Table 4:	Other methods used instead of AAC	57
Table 5:	Child reasons for no AAC intervention	58
Table 6:	Education reasons for no AAC intervention	58
Table 7:	Speech-Language Therapists' Competence with AAC systems	62
Table 8:	Agreement ratings in relation to myths in AAC	64
Table 9:	Level of importance given to factors when deciding whether or not to implement AAC	65
Table 10:	Barriers to AAC implementation	67
Table 11:	Facilitators to AAC implementation	69

Acknowledgements

I would like to start by thanking TalkLink Trust, The Ministry of Education and the early intervention centres that helped to distribute my survey to speech-language therapists across New Zealand. This study would not have been completed without the 61 speech-language therapists who took the time out to complete the online survey. Your time and honesty have helped to build a picture of current AAC practice for preschool children with complex communication needs in New Zealand.

To my supervisor Dr. Sally Clendon, I could not have completed this without your encouragement, support and amazing feedback that helped me to build this thesis into what it is. I would also like to thank my second supervisor Dr. Elizabeth Doell for your guidance and time.

To my fiancé Shane, thank you for your unfailing support over the past 2 years. I am grateful for the cups of tea, hugs and pep talks when I was having doubts or working throughout the day and night. To my parents, thank you for your encouragement and for coming down to Wellington to help with wedding organisation or housework, so I had one less thing to worry about.

A final acknowledgement for the financial support received from Massey University via the Institute of Education Pathway Scholarship for Masterate Students.

Abstract

Communication allows a person to express their thoughts and feelings and participate fully in life. It is a basic human right. Children with complex communication needs (CCN) also have this right and require early access to augmentative and alternative communication (AAC) to support their development of language and communication skills. This study employed a descriptive cross-sectional survey design to gather insight into the perceptions and experiences of speech-language therapists supporting preschool children with CCN in New Zealand.

The survey was completed by 61 speech-language therapists working in early intervention. There were a number of key findings. Only 37% of the participants reported that they used AAC with all of the children with CCN on their caseloads. In terms of their education and competence in AAC, 74% of participants said that their qualification did not include a paper on AAC and 57% rated their competence in AAC as being at the novice level. Team attitudes, lack of specialist support and inconsistent use of the system were the most frequently reported barriers. Whereas, team members' willingness to try, supportive teams and education of those involved were the most frequently reported facilitators to AAC implementation.

This study revealed the need for more education and support for speech-language therapists working in early intervention with children with CCN. This support is essential to help these children to develop the language and communication skills needed to participate fully in society, education and work.

Chapter One: Introduction

1.1 Background

The ability to communicate is critically important as it allows individuals to express their thoughts and feelings, identify and define who they are, connect with others meaningfully and participate fully in society, education and work (Light, 2003; Light, Beukelman, & Reichle, 2003). The United Nations has recognised the importance of communication as a basic human right (United Nations, 1948). Article 19 is the “right to freedom of opinion and expression” (United Nations, 1948). Speech-language therapists are employed to work with individuals who have difficulty communicating.

Some children and adults with developmental and acquired disabilities have complex communication needs. Complex communication needs (CCN) is a term used in the literature to describe individuals who are unable to meet all of their communication needs using speech alone. Children with CCN are a very diverse group with a range of skills and abilities. In addition to difficulties with receptive and expressive language, these children may also have a combination of physical, sensory and/or cognitive difficulties (New South Wales Government Australia, 2015). As well as using non-verbal communication such as body language and facial expression, these children can learn to communicate using augmentative and alternative communication (AAC) (Franklin & Osborne, 2015; New South Wales Government Australia, 2015).

The American Speech-Language-Hearing Association (2004) refers to AAC as the “set of procedures and processes through which the receptive and expressive communication skills of individuals with CCN can be maximized for functional and effective communication” (American Speech-Language-Hearing Association, 2004, p.

2). AAC incorporates all of an individual's communication abilities. Therefore, it may include their existing speech, as well as unaided and aided symbols. Unaided symbols are those that rely on the communicator's body to convey a message for example gestures, sign language and body language. Aided symbols require the use of external tools, for example, paper and pen, or symbols in communication books or devices (National Joint Committee for the Communication Needs of Persons with Severe Disabilities, n.d.).

Aided symbols can be:

- a) Tangible: real objects or tactile symbols
- b) Pictorial: photos or graphic symbols (e.g., Picture Communication Symbols, SymbolStix)
- c) Orthographic: traditional orthography (printed word) or Braille (Beukelman & Mirenda, 2005)

AAC systems can be no-tech, low-tech, mid-tech, or high-tech. No-tech systems require no power and include sign language, paper-based communication books and boards and tactile/tangible symbols. Low, mid and high tech systems require power. They differ from one another in the quantity of vocabulary that can be stored and the amount of training required. High-tech systems can store large amounts of vocabulary and allow for complex messages to be generated. No-tech systems can also allow for complex message production (American Speech-Language-Hearing Association, 2008, 2016; National Joint Committee for the Communication Needs of Persons with Severe Disabilities, n.d.).

Children with CCN require early access to AAC services to support their

development of language and communication skills. As with any language system, a person requires time and people in their environment providing language input in order to learn the rules (American Speech-Language-Hearing Association, 2004, 2008, 2016; Zangari & Van Tatenhove, 2009).

Early intervention is the provision of services to children under five years of age who either have a disability or are at risk of one (Ronski, Sevcik, Barton-Hulsey, & Whitmore, 2015). Providing services as early as possible maximises the child's inclusion and productivity in society over time; it also reduces the stress on the family (Guralnick, 2000, 2001). High quality early intervention services reduce the risk of further problems and are less costly and more effective than services provided later in life (American Speech-Language-Hearing Association, 2008; National Early Childhood Technical Assistance Centre, 2011).

The American Speech-Language-Hearing Association (2008) outlines four guiding principles to support best practice for speech-language therapists working in early intervention:

1. Services should be family centred and culturally responsive
2. Services should be developmentally supportive and promote children's participation in their natural environments
3. Services should be comprehensive, coordinated, and team-based
4. Services should be based on the highest quality internal and external evidence that is available. (paragraph 3)

Within New Zealand, children under the age of 5 and their families receive support from speech-language therapists who work for a range of early intervention

providers. The two main providers are the Ministry of Health and the Ministry of Education. The Ministry of Health provides services to children under the age of 3 at which point services transfer to the Ministry of Education. There are a few additional providers such as CCS Disability Action (Auckland, Christchurch, Dunedin), Ohomairangi Trust (Auckland), Conductive Education (Hamilton, Christchurch) and early intervention centres such as the Champion Centre (Christchurch), the McKenzie Centre (Hamilton), and the Wellington Early Intervention Trust (Ministry of Education, 2017a).

Speech-language therapists are typically the lead professional in AAC assessment, obtainment and use (National Joint Committee for the Communication Needs of Persons with Severe Disabilities, n.d.). For pre-schoolers in New Zealand, early intervention speech-language therapists have primary responsibility for AAC introduction and support. They may refer to TalkLink Trust if they require support or access to funding for high-tech AAC. TalkLink Trust is New Zealand's AAC and assistive technology assessment service. They work with the team involved to find AAC solutions that are the best fit for the individual. TalkLink Trust employs a range of professionals including speech-language therapists, occupational therapists, and resource teachers with specialist expertise in AAC (TalkLink Trust, 2012).

Early intervention services in New Zealand share similar principles to those outlined by the American Speech-Language-Hearing Association (2008) above. For example, the Ministry of Education speech-language therapists work as part of a multidisciplinary team. Family-centred practice is important with children's communication goals developed through discussions with families around their

concerns and priorities. An important part of the speech-language therapist role is providing support to the adults who spend the most time with children, improving their communication in natural settings, usually at home or in early childhood centres (Ministry of Education, 2017a).

1.2 Rationale

Historically, the introduction of AAC to young children was limited with many children with CCN not receiving their first AAC system until they were school-aged or beyond. A major reason for this was the existence of various myths and misconceptions held by parents and professionals about AAC (Ronski & Sevcik, 2005). One myth was a belief that the introduction of AAC would hinder speech development. Other myths were that certain pre-requisite skills were required prior to the introduction of AAC. These myths emerged from early thinking about how to best introduce and implement AAC (Ronski & Sevcik, 2005). None of these myths are supported by the literature (Ronski & Sevcik, 2005). Despite being dismissed by experts in the field, some of these myths may still exist and have an impact on AAC services for young children. There is limited literature on current practice in early intervention and AAC. In Australia, Iacono and Cameron (2009) conducted a study to examine the knowledge and perceptions of speech-language therapists working in early intervention with children with CCN. No similar research has been carried out in the New Zealand context.

1.3 Research Aims/Questions

This research aimed to provide insight into the perceptions and experiences of speech-language therapists working in early intervention in New Zealand by addressing the following research questions:

1. What are the caseload characteristics of speech-language therapists working in early intervention with children with complex communication needs?
2. What knowledge and beliefs do speech-language therapists working in early intervention have about AAC?
3. What factors do speech-language therapists working in early intervention perceive as barriers and facilitators to AAC implementation?

Information about the study was distributed by the New Zealand Speech-Language Therapists' Association (NZSTA), TalkLink Trust and the Ministry of Education. Eligible speech-language therapists were invited to complete an online survey.

1.4 Structure of the Thesis

Chapter one has provided an overview of the research completed for this thesis. Chapter two begins with a discussion of the impact of CCN on language development, learning and participation. This is followed by a review of the literature regarding early intervention; its importance as well as best and current practice in early intervention and AAC. Barriers and facilitators affecting AAC access and implementation in early intervention are also discussed. Chapter three outlines the survey methodology used in the research. It describes participation recruitment, the procedures for collecting and analysing the survey data, and the ethical considerations. The findings of the study are

presented in chapter four. These findings are then discussed in relation to best practice in chapter five. Chapter six discusses the limitations of the study along with final conclusions and possible directions for future study.

Chapter Two: Literature Review

This chapter reviews literature related to early intervention and AAC. Firstly, it examines the impact of CCN on language development, learning, and participation. After this, it outlines the importance and principles of early intervention, the rationale underpinning early access to AAC, and finally best practice in early AAC intervention. Barriers and facilitators affecting AAC access and implementation are also discussed.

2.1 Impact of Complex Communication Needs on Language Development

In this section, the impact of CCN on language development is reviewed. This starts with an examination of the language learning process. This is followed by a description of the language characteristics of children with CCN, and a discussion of how language development for these children can be influenced by AAC system and modality characteristics, and the quantity and quality of communication opportunities received. Finally, the impact of language difficulties on learning and participation is examined and every child's right to a voice is discussed.

2.1.1 Language learning process. Language development is the process by which children come to share in their cultures' means of communication (Hetzroni & Harris, 1996; Light, 1997; von Tetzchner & Stadskleiv, 2016). Although children are active language investigators, they may have difficulty independently creating language without a supportive language environment (von Tetzchner & Stadskleiv, 2016). Children learn language by observing native competent speakers; both adults and older children (Sutton, Soto, & Blockberger, 2002; von Tetzchner & Stadskleiv, 2016). Both comprehension and production are paths to the acquisition of language. For children with CCN, their production of spoken language is limited. Therefore, language

comprehension may play a more prominent role in language acquisition (Sutton et al., 2002).

Children with CCN who are learning to use AAC are often faced with a disparity between their primary mode of language input (spoken language) and their primary mode of language output (aided language). This is unlike their typically developing peers, for whom both modes are the same (Sutton et al., 2002). Children who use AAC are often in language learning environments where they rarely see AAC being used outside of structured sessions (Sutton et al., 2002).

Children learning spoken language need to learn the links between a spoken word and its referents. Children with CCN must learn the spoken word, its referents, its graphic representation and how to 'translate' between the two (von Tetzchner & Stadskeiv, 2016). When learning to communicate using AAC, a child requires a smart partner to translate and assist them in formulating their message output. This co-construction may blur the distinction between input and output (Sutton et al., 2002).

Light (1989) discussed that AAC communicative competence includes four main parts:

- Linguistic competence: The ability to understand spoken language and express oneself using aided language
- Operational competence: The technical skills needed to use the AAC system. This includes accessing and navigating the system and using any operational buttons e.g., on/off and volume controls
- Social competence: The ability to understand the social rules surrounding communication

- Strategic competence: The ability to employ compensatory strategies to communicate despite system restrictions e.g., using key words to communicate more efficiently.

2.1.2 Language characteristics. Individuals who use AAC experience significant difficulty in developing mature syntax and morphology (Binger & Light, 2008). Children often communicate in single-unit turns consisting of single symbols, or simple clauses with a lack of questions, commands, negatives, and auxiliary verbs (Sutton et al., 2002). In addition, the structure of these children's utterances does not always parallel spoken language order (Sutton et al., 2002; von Tetzchner & Stadskleiv, 2016). Grammatical morpheme markers such as regular past tense "-ed," possessive "-'s," and third-person subject-verb agreement "-s are often omitted (Blockberger & Johnston, 2003; Sutton et al., 2002). These patterns often continue into adulthood where many individuals who use AAC continue to communicate in brief, single-symbol utterances (Binger & Light, 2008).

Children with CCN are often passive communicators; tending to initiate few interactions (Kent-Walsh & Binger, 2009; Kent-Walsh & McNaughton, 2005). Communication between a person who uses AAC and a person who is naturally speaking is usually asymmetrical (Muller & Soto, 2002) with naturally speaking communication partners dominating conversations (Muller & Soto, 2002; Pennington & McConachie, 1999, 2001). Communication partners tend to take the lead role, asking a lot of yes/no questions and individuals who use AAC may end up in the responder role, answering all of these questions (Kent-Walsh & Binger, 2009; Muller & Soto, 2002; Pennington & McConachie, 1999, 2001).

Some people with CCN may have communicative competence that varies across environments or with different communication partners. They may be competent when communicating with familiar people (e.g., their parents) but struggle when communicating with less familiar partners (Binger & Light, 2008; Lund & Light, 2007).

Some of the language difficulties described above may be caused by difficulties intrinsic to the individual with CCN, i.e., linked to their disabilities. However, others may be extrinsic and relate to AAC system characteristics or the quantity and quality of communication opportunities received.

2.1.3 AAC system and modality characteristics. Children who use AAC must learn the location of each symbol within their AAC system and how to navigate to find it. Until they learn to spell independently, the content of their AAC system is not under their control and is instead set up by caregivers and/or clinicians. What they can express at any time is determined by whether the system is accessible and by what vocabulary is available (Sutton et al., 2002).

Unfortunately, some AAC systems may have limited vocabulary with nouns prioritised over functional language resulting in the need for children to use strategic utterance constructions to get their meaning across (von Tetzchner & Stadsleiv, 2016). The most efficient order of constructing a sentence on an AAC system may not correspond to the order of spoken language. It is not yet possible to automatize the construction of an aided utterance, thus aided language may be a more cognitively demanding task than spoken language (von Tetzchner & Stadsleiv, 2016).

The system may also lack morphologic or syntactic forms and structures (Sutton et al., 2002). When these are available, they may be difficult to access. To add

morphological markers, for example, a child may need to navigate through several levels of their system or select a graphic symbol that is almost identical to another one on the same page or pop-up window. Children who use AAC therefore, may choose to use a different and easier way to mark past tense e.g., using the word “yesterday” rather than using the past tense -ed morpheme (Sutton et al., 2002).

Individual graphic symbols may not visually represent an individual spoken word. For example, the Picture Communication Symbol (PCS) for throw (a line drawing of a person throwing a ball) represents the agent and the object. This may influence sentence construction due to the blurred grammatical category boundaries (Sutton et al., 2002).

An additional challenge may be the relevance and cultural appropriateness of the vocabulary and symbols. AAC systems may reflect the norms and language of the school context and not those of the family, which may potentially isolate the child from their family and community (Lund & Light, 2007).

Communication using AAC is typically much slower than natural speech and takes more effort (Light, 2003). Individuals with motor impairments who use switch scanning to control their device experience even greater limitations in the rate of their communication. As a result, many individuals require strategies to improve their efficiency (Light, 2003). Some individuals may rely on their communication partners to predict messages to speed up communication (Light, 2003). Alternatively, they may use keywords to get their message across or pre-programmed phrases. When these pre-programmed phrases are used for a different purpose, the meaning must be inferred (Sutton et al., 2002). A partner may say “What did you do in the weekend?” the child

may push the button for McDonalds with the computerised system outputting “I want to go to McDonalds.” The partner then may translate saying “Oh, did you go to McDonalds in the weekend?” and the child says “Yes”.

2.1.4 Communication opportunities. The language development of children is facilitated by the expectations and interaction behaviours of their communication partners. Maternal responsivity is a mother’s ability to perceive their infant’s signals and respond to these. Maternal responsivity is strongly associated with a variety of cognitive and linguistic outcomes, such as vocabulary and syntax development, for children with and without disabilities (Bornstein, Tamis-LeMonda, & Haynes, 1999; McDuffie & Yoder, 2010; Warren, Brady, Sterling, K., & Marquis, 2010).

Parents’ communication interactions with children are less responsive and often characterised by requests, directions and minimal pauses allowing for child responses (Light, Binger, & Kelford-Smith, 1994; Light, Collier, & Parnes, 1985; Pennington & McConachie, 2001). This may be due to the difficulties a child with CCN experiences when attempting to gain and direct attention and show their interest, leading parents to unintentionally miss communication initiations from their child (McCollum & Hemmeter, 1997). This may in turn affect the amount of language models a child receives (McCollum & Hemmeter, 1997).

For children who are developing spoken language, adults in their environment are naturally speaking communicators and can act as models. For children who are learning to use AAC, their teachers and parents do not typically use graphic symbols for everyday communication. Often, they are learning to use the child’s AAC system at the same time as the child. This lack of interaction with competent users of their language is

likely to have a negative effect on language development (von Tetzchner & Stadskleiv, 2016)

Children who use AAC may also lack exposure to unfamiliar communication partners. Brown (1973) discussed that when children communicate with familiar communication partners in their home environment they may make their intentions clear easily, but when communicating with those unfamiliar to them, they are forced to attempt more complex language to get their message across. These are important opportunities for language problem solving. Children with CCN may not experience these situations as frequently, putting them at a disadvantage (Clendon & Anderson, 2016). Therefore, the simple language structures used by children with CCN may be at least partly related to their communication environment.

2.2 Impact on Participation

The World Health Organisation's International Classification of Functioning, Disability and Health framework identifies participation as a crucial health outcome (World Health Organisation, 2002, 2007). Participation in activities both at home and in the community for children with disabilities is essential for development (King et al., 2003; Raghavendra, Virgo, Olsson, Connell, & Lane, 2011). Participation increases quality of life and future outcomes while also providing a sense of meaning (Batorowicz, Mcdougall, & Shepherd, 2006; King et al., 2003; Raghavendra, Olsson, Sampson, Mcinerney, & Connell, 2012; Raghavendra et al., 2011; Thirumanickam, Raghavendra, & Olsson, 2011).

Children with physical disabilities and CCN engage in a reduced variety of activities in comparison to their peers (Thirumanickam et al., 2011). They also have

fewer partners and go to less venues (Thirumanickam et al., 2011). Children with CCN are more likely to participate in activities that are closer to home rather than in their community (Raghavendra et al., 2011). They are also more likely to complete activities alone or with family, rather than friends and peers (Raghavendra et al., 2011). Children with CCN also have fewer same-aged friends with a large number of paid workers in their social circles (Thirumanickam et al., 2011). In addition these children seek out emotional support from friends and peers less than typically developing peers and peers with physical disabilities (Ostvik, Ytterhus, & Balandin, 2016; Raghavendra et al., 2012).

In a recent study, AAC intervention was found to make a real world difference to children with CCN and their communicative participation skills (Thomas-Stonell, Robertson, Oddson, & Rosenbaum, 2016) as measured on the Focus on the Outcomes of Communication Under Six (Washington et al., 2013) and The Ages and stages Questionnaire-Social/Emotional (ASQ-SE) (Squires & Bricker, 2009). Change for eight children was measured over a one-year period at the start, mid-point and end of intervention. Both the FOCUS scores and the communication related items on the ASQ-SE improved, however, the non-communication related items on the ASQ-SE did not improve (Thomas-Stonell et al., 2016). The authors stated that the fact that the improvements were specific to communication indicated that the introduction of AAC systems and the intervention provided were likely responsible for the changes in the children's communicative participation as opposed to general developmental change (Thomas-Stonell et al., 2016).

2.3 Impact on Learning

When a child starts school, it is assumed that they can talk already and are therefore able to talk to learn. For children with complex needs, this is often not the case (Zangari & Van Tatenhove, 2009). Although these children may have started to acquire language, they are usually not using it to the same level as their peers (Zangari & Van Tatenhove, 2009). These language issues affect their access to the curriculum including literacy development (Koppenhaver, Foley, & Williams, 2009).

Literacy underpins the general curriculum (Erickson, Hanser, Hatch, & Sanders, 2009). Beyond the obvious literacy demands within English, other subjects such as science, social studies and maths include literacy (Erickson et al., 2009). Students who are unable to read and write can learn skills and information across the curriculum, but are unable to learn important life-long skills that will allow them to independently revisit and build upon this information (Erickson et al., 2009).

Children with CCN often face multiple barriers to literacy learning (Erickson et al., 2009). In the preschool years, when other children are engaged in emergent literacy experiences, the parents of children with CCN may be focussed on other priorities such as communication, self-help and medical needs (Light & McNaughton, 1993). On top of this, information given to parents by medical and educational professionals regarding the literacy expectations of their children may be discouraging (Kliwer, Biklen, & Kasa-Hendrickson, 2006) and parents may view literacy as an unrealistic goal (Erickson et al., 2009).

A large proportion of individuals who use AAC have limited movement which can limit early learning opportunities such as independently exploring reading and writing

materials (Koppenhaver et al., 2009; Von Tetzchner & Martinsen, 2000). Many individuals who use AAC also have visual impairments (Koppenhaver et al., 2009). This can result in a degrading of print information and inconsistent performance in visual processing which can cause difficulty in reading (Koppenhaver et al., 2009).

Despite these challenges, with access to comprehensive instruction, appropriate accommodations and time, children can achieve literacy competence (Koppenhaver et al., 2009). Conventional spelling ability is crucial for children with CCN as it allows them to construct novel messages (Blischak & Schlosser, 2003). It also supports memory and reflection leading to improved school achievement (Bangert-Drowns, Hurley, & Wilkinson, 2004).

2.4 Child's Right to have a Voice.

All children have a right to have a voice. In the past, children were often seen as unable to express their views. When they were able to express their views, their views were often overlooked or under-valued as children were perceived as being unable to understand the adult world (Roulstone & Lindsay, 2012). In 1989, the Convention on the Rights of the child was established. Article 13 states that all children “have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice” (UN General Assembly, 1989). Article 12 provides children with the right to be heard in decisions that affect them (UN General Assembly, 1989). Listening to the perspectives of children with CCN can be difficult due to their challenges in expressing themselves (Roulstone & Lindsay, 2012). It is critical to understand the intrinsic and extrinsic barriers that

influence language development for children with CCN and the significant impact these can have on learning and participation. In the next section, the importance of early intervention will be discussed. Early intervention is critical for maximising children's language outcomes, so that their perspectives can also be heard (American Speech-Language-Hearing Association, 2008).

2.5 Early Intervention and Children with Complex Communication Needs

In this section, early intervention for children with CCN is examined. Firstly, the importance of early intervention is discussed including an overview of key principles. The early provision of AAC is then explored, including consideration of key barriers that may impact on young children's access to AAC. Finally, early AAC intervention is discussed. The goals of AAC intervention are examined, finishing with an examination of key barriers and facilitators to AAC implementation.

2.6 Early Intervention

Early language interventions aim to maximise communication skills and encourage children with receptive and/or expressive language learning needs to take more of an active role in communicating with others. Early language interventions may work on improving intelligibility, increasing receptive and expressive language skills, and/or modifying communication partner behaviours.

2.6.1 Importance. Early intervention has been found to improve outcomes for children, families and their communities (American Speech-Language-Hearing Association, 2008; Bailey et al., 2005; Guralnick, 1998; National Early Childhood Technical Assistance Centre, 2011). High quality early intervention programs reduce the risk of further problems and are more effective and less costly than when they are

completed later in life (American Speech-Language-Hearing Association, 2008; National Early Childhood Technical Assistance Centre, 2011).

2.6.2 Principles. The American Speech-Language-Hearing Association (2008) outlines some important principles that a speech-language therapist should follow when working with children and their families. These include providing family centred practice, enhancing participation in natural environments, being culturally responsive and engaging in transdisciplinary teaming. These are discussed below.

2.6.2.1 Family centred practice. In order to assist a family in helping their child to learn to communicate, the American Speech-Language-Hearing Association (2008) states that “services should be family centred”. Paul (2007) suggests that early intervention services should be responsive to the family’s concerns related to the needs, strengths and learning styles of the child. Family centred practices promote positive and successful child communication interactions through a set of values and beliefs supporting family involvement (American Speech-Language-Hearing Association, 2008; Boone & Crais, 1999; D. Paul & Roth, 2011; R. Paul, 2007; Polmanteer & Turbiville, 2000). As the family provides a lifelong context for the child’s development and growth, the family is the primary recipient of services rather than the child (D. Paul & Roth, 2011; R. Paul, 2007). The family is therefore able to choose whether they would like the services to focus on the family or the child, and be actively involved in intervention planning and implementation (American Speech-Language-Hearing Association, 2008).

Brady, Thiemann-Bourque, Fleming, and Matthews (2013) investigated a model of language development (Intrinsic Symbolic Factor, ISF) to explore whether there were factors that could predict the number of different words a child would produce in the

future (using speech, sign, or a speech generating device). The ISF was drawn from past research into predictors of early communication in preschool children. It included non-verbal cognitive development, language comprehension, communication complexity and play levels. A total of 93 preschool children with intellectual disabilities were assessed. Of these, 82 children were assessed a year later with the same model. Children who had higher initial levels of the ISF and more adult input at home produced more words one year later (Brady et al., 2013). A family centred practice approach that fosters increased adult input at home is therefore a vital part of preschool intervention to maximise language gains.

2.6.2.2 *Enhancing participation in natural environments.* The American Speech-Language-Hearing Association (2008) states that early intervention should promote social communication so as to maximise participation in natural environments. Services for children with disabilities should extend beyond the home environment, to other areas that the family identifies such as day-care, preschool, grocery store or recreational facilities. Routines or activities in natural environments enable a speech-language therapist to highlight learning opportunities that are embedded and available on a frequent and ongoing basis.

2.6.2.3 *Culturally responsive.* The American Speech-Language-Hearing Association (2008) calls for speech-language therapists to be aware of their own cultural beliefs, values and behaviour as well as those of the families they support, and how these could affect interactions and perceptions. Wing et al. (2007) suggest that recommendations that conflict with families' values and beliefs could result in an

unnatural environment for the child. When such conflicts exist, alternate strategies need to be considered.

2.6.2.4 Providing integrated services. A child who requires communication intervention is likely to present with needs in other areas, such as, motor or sensory. Speech-language therapists are therefore encouraged to work with other disciplines to achieve the best result for the child. The term comprehensive is used by American Speech-Language-Hearing Association (2008) to describe the wrap-around service required for children in early intervention.

Speech-language therapists are called to coordinate their services with other professionals leading to a service free from fragmentation. The recommended service model for early intervention is a transdisciplinary one. This is where team members work together across the traditional disciplinary and professional boundaries. Team members benefit through the joint professional development and the enhancement of intervention for the child, and through the shared knowledge and skills enabled from a transdisciplinary approach (American Speech-Language-Hearing Association, 2008).

In New Zealand, speech-language therapists are required to operate under the same guiding principles for practice (Ministry of Education, 2015). The main service provider for children with CCN is Learning Support (previously Special Education) from the Ministry of Education. These services are provided in the child's natural environments (home and early intervention centre) (Ministry of Education, 2017a).

The Ministry of Education (2016) is working to improve the education system for students requiring learning support. They have recently updated their service with aims to continue to improve and build on inclusivity to achieve more for children with

additional learning needs (Ministry of Education, 2015). The action points from this update are:

1. Better guidance and training for teachers – from early childhood education onwards
2. Greater involvement of parents and whānau and better information for them.
3. Much simpler and more transparent access to support
4. Better interagency coordination
5. Better transparency and more joined up services across the education system
6. Streamlined support when a child moves – to primary or high school or to another school. (pg. 2)

In New Zealand, speech-language therapists are expected to follow the principals of The Treaty of Waitangi (Ministry for Culture and Heritage, 2017) in their work with families. The Treaty's three principles of participation, protection and partnership need to be acknowledged and integrated into all aspects of service delivery. There are several government documents to assist therapists in their use of these in practice. Te Pikinga ki Runga: Raising Possibilities (MacFarlane, 2009), Te Whariki (Ministry of Education, 2017b) and Te Whare Tapa Wha (Durie, 2017).

2.7 Early AAC Provision

For children with CCN, early access to AAC is critical (Cress & Marvin, 2003; Ronski & Sevcik, 2005). It is essential for facilitating the prelinguistic and cognitive skills

needed for language development (Brady, 2000; Cress & Marvin, 2003; Ronski & Sevcik, 1996).

AAC can play at least three different roles for children with CCN in early intervention and depends on the individual child's needs. These roles include: augmenting the child's existing speech, providing a primary mode for communication output, or providing a mode for both communication input and output (Branson & Demchak, 2009; Von Tetzchner & Martinsen, 2000). No matter the role that the AAC system is playing for a child, the AAC system itself must be robust.

A robust AAC system includes several features that make it highly supportive of language development. This includes having multiple modalities, being linguistically based, featuring core vocabulary, providing morphological variations and having the potential for growth (Zangari & Van Tatenhove, 2009).

To communicate effectively across multiple environments and contexts, a child must have access to a full range of multimodal strategies. For example, a child might use a sophisticated piece of AAC technology, low-tech communication aids and unaided strategies such as natural speech and sign (Zangari & Van Tatenhove, 2009).

A linguistically based AAC system provides structure for growth and language development as it can be systematically expanded to include more linguistic forms and structures. This is important for vocabulary acquisition as well as the development of more advanced language forms (Zangari & Van Tatenhove, 2009). In contrast, a topic or activity based communication board only includes words that relate to a topic or activity. These boards are primarily set up and used so that children can make requests and comment on materials. They are typically used to meet a short-term communication

need, and are generally put away after an activity. These systems do not allow children to manipulate word forms and express novel messages (Zangari & Van Tatenhove, 2009).

Core vocabulary words are high frequency words that represent a large proportion of what adults and children say. These words are used consistently across populations, activities, places, topics and demographic groups (Zangari & Van Tatenhove, 2009). Core vocabulary is the central element of a linguistically based AAC system (Zangari & Van Tatenhove, 2009). These core words are from all word classes: pronouns, verbs, adjectives, adverbs, prepositions, determiners, conjunctions, interjections, question words and nouns. Becoming fluent in the use of core vocabulary is a top priority for individuals who use AAC (Zangari & Van Tatenhove, 2009). As core words are used so frequently, they need to be placed within the AAC system in locations that ensure quick and easy access (Zangari & Van Tatenhove, 2009).

To enable children to become literate language users, they must have early and consistent access to morphological variations that enable them to produce grammatically correct forms (Zangari & Van Tatenhove, 2009). Having access to correct forms is particularly important as without these, it could limit their development of more precise communication (Zangari & Van Tatenhove, 2009). For example, some children may have access to an -ed symbol that they can use to change a word into past tense. However, as the most frequently used past tense verbs are irregular, not having the ability to also create irregular verbs could be frustrating. Experimenting with morphological forms is a normal part of development. However, children should “not be

forced to communicate telegraphically, imprecisely or incorrectly” (Zangari & Van Tatenhove, 2009, p. 177).

2.7.1 Barriers to access to AAC. Despite advances in both AAC technology and services, the introduction of AAC to young children has been significantly impeded due to myths about AAC. These myths include the concern that introducing AAC will slow or prevent speech development; the belief that some children don’t need AAC because they already have some spoken words; and the belief that some children are too young or don’t meet the cognitive pre-requisites needed to introduce AAC. Ronski and Sevcik (2005) stated that these myths grew out of information in the clinical literature in the absence of any research-based evidence to support them. These myths are discussed and refuted below.

2.7.1.1 Belief that it will slow speech development. Although it is well documented (Cress & Marvin, 2003; Johnston, McDonnell, Nelson, & Magnavito, 2003; Ronski et al., 2010; Stahmer & Ingersoll, 2004) that concerns are unwarranted, one of the most common myths within the field of AAC is that the introduction of AAC will prevent or hinder speech development. Children tend, however, to use the quickest, most effective and most accessible means available to communicate their wants and needs (Mirenda, 1998 as cited by Cress and Marvin (2003). The most portable, individualised means to communicate with a wide variety of listeners is speech (Cress & Marvin, 2003). It is the most preferred method by both users of AAC and their communication partners. It will therefore always be an element of multimodal AAC systems (Cress & Ball, 1998; Light, Roberts, DiMarco, & Greiner, 1998; Mar & Sall, 1999 as cited in Cress and Marvin (2003). The introduction of AAC has not been

associated with loss or inhibition of speech development. Instead research indicates that AAC facilitates verbal communication by increasing interaction, language skills and providing a continuous model for speech (Cress & Marvin, 2003).

Romski et al. (2010) compared the language performance of 68 children with developmental delays, ranging in age from 21-40 months. The children were randomly assigned to one of three parent-coached language interventions: augmented communication input (AC-I), augmented communication output (AC-O) or spoken communication (SC). Within the AC-I group, the interventionists and parents modelled both augmented and spoken word use on the child's AAC system, as well as symbols in the environment. At no point, was a response demanded from the child. The focus within the AC-O group was for the child to produce augmented and spoken words. The parents and interventionists prompted the child (visually, verbally and physically) to produce targeted augmented words. In contrast, in the SC condition, the parents and interventionists visually and verbally prompted spoken words; no AAC was used. All intervention conditions consisted of 24 sessions. The results showed that the children in both augmented groups (AC-I and AC-O) produced more expressive language including spoken words than those in the SC group, with those in the AC-O group producing the most (Romski et al., 2010).

Millar, Light, and Schlosser (2006) carried out a meta-analysis to ascertain the effect of AAC on speech development for individuals with developmental disabilities. There were 23 studies that met the inclusion criteria. Eight of these were descriptive case studies, 14 were single subject designs, and one was a group pre-test-post-test design. Collectively there were 67 participants. Increases in speech production were

observed in 89% of these participants, with the remaining 11% showing no change. None of the cases showed a decrease in speech production because of AAC intervention (Millar et al., 2006).

Schlosser and Wendt's (2008) systematic review showed similar results with nine single-subject design studies and two group studies. The findings from these studies indicated that AAC does not impede speech production. Instead, most studies reported a modest increase in speech production (Schlosser & Wendt, 2008).

2.7.1.2 Belief that child has some words so doesn't need it. Another common myth that can impact and delay AAC implementation with children in early intervention settings is the belief that they already have some words so therefore they do not need AAC. Behnami and Clendon (2015) commented that this usually occurs because children can get most of their wants and needs met by their caregivers. This approach can be risky, however, as children may become dependent on familiar listeners.

Children with CCN have fewer social partners and interactions than their typically developing peers (Raghavendra et al., 2012). As discussed above, communicating with unfamiliar partners forces a child to use more complex language to communicate their message leading to the development of language and problem-solving skills (Clendon & Anderson, 2016). Children with CCN are therefore at a disadvantage when trying to develop these skills (Clendon & Anderson, 2016).

Hustad and Miles (2010) investigated the alignment between young children with cerebral palsy who required AAC, and the goals featured in their individual education plans (IEP). Their study included 22 children from the upper-Midwest region of the

United States who were taking part in a 4-year communication development longitudinal study. Their study addressed three research questions:

1. How many children with cerebral palsy who have a need for speech-language services also have a need for AAC intervention? For those who could benefit from AAC, what is the nature of the need?
2. How many children with cerebral palsy who have a need for AAC intervention have speech-language goals/objectives in the IEP that target AAC? What are the other speech-language goals/objectives being targeted for children who do and do not need AAC?
3. Are children with particular types of AAC needs more or less likely to receive AAC-focussed speech-language services? (p.131)

To answer these questions Hustad and Miles (2010) categorised the children into four groups.

- Category A: Children who did not require AAC as all communication needs were met across all settings to developmental norms.
- Category B: Children who could meet most communication needs through speech alone. These children had mildly reduced intelligibility or difficulty in adverse communication environments resulting in the need for AAC as a back-up.
- Category C: Children who needed AAC and speech as primary modes of communication as they could only meet some communication needs across partners and situations. These children had moderately reduced

intelligibility and although they would be able to communicate with familiar partners, they would struggle with unfamiliar ones.

- Category D: Children who potentially could produce some words or vocalisations, but heavily relied on partner interpretation. They met few or no communication needs across partners and settings. Comprehensive AAC systems were required in all settings.

Ninety-five percent of the children who required AAC met the criteria for Categories B, C, and D (One child in category A, four children in category B, nine category C and eight category D). Those children with less words had more AAC goals as part of their IEP. Seventy-five percent of children in category D had AAC goals compared with 44% of category C and 50% of category B. These results suggested that some children were receiving inadequate AAC services. There also appeared to be a bias against providing AAC-focused intervention to children with any speaking ability (Hustad & Miles, 2010).

Smith and Hustad (2015) researched parent perceptions of communication, the focus of early intervention goals and strategies, and the factors that affected AAC implementation for 26, two-year-old children with cerebral palsy. This study was part of a larger longitudinal study focussed on the communication development of children with cerebral palsy. As part of the study, the children participated in a data collection session between the ages of 24 and 29 months.

At this session, the children's language scores were collected as well as information from a questionnaire that was mailed to parents. The questionnaire asked about the child's communication, therapies, feeding and gross and fine motor skills.

Parents also provided information on the intervention that their child received including the goals focussed on in sessions.

The children were classified into three groups: not yet talking (n = 12), emerging talkers (n = 10) and established talkers (n = 4). The children in all three groups showed significant differences in expressive language, differing in number of words produced, percentage of intelligibility and numbers of different words. However, both the emerging and established talker groups did not differ significantly in mean length of utterance or number of vocal utterances. Receptive language measures were variable and did not show significant differences between the groups.

The results revealed that 33% (n = 6) of the children were not receiving any speech and language therapy. Two of these children were in the not yet talking group, two in the emerging talkers group, and two in the established talker group. Of these children, three had lower than expected receptive and expressive language for their age and were recommended for speech-language therapy assessment and intervention by the researchers.

The researchers found that fewer children in the emerging talker group had goals that included AAC. They also found that children with a lower mean length of utterance, controlling for receptive language were 14 times more likely to have goals related to AAC. Despite this, most goals at this age were related to reducing impairment, through working on feeding and oral-motor skills rather than functional communication. This was particularly the case when the child was in the not talking group.

2.7.1.3 Belief that child is too young. Many children with complex needs may not receive AAC intervention as they are considered to be too young. Cress and Marvin (2003) state that there is no evidence that a person must be a certain age to benefit from AAC. Despite this AAC is still viewed as a 'last resort' by many people rather than a tool to be used to build a firm foundation for language and literacy growth (Ronski & Sevcik, 2005a).

2.7.1.4 Belief that child does not have the pre-requisite cognitive abilities. There is no clear link between cognitive abilities and language use (Ronski & Sevcik, 2005). It is a dangerous to make an assumption that a child does not have the pre-requisite cognitive abilities to benefit from AAC. Cress and Marvin (2003) stated that the natural actions and behaviours of a child are the only pre-requisites for AAC intervention.

Kangas and Lloyd (1988) reviewed the literature related to the development of cognition and language in young children. Six models were used to describe the relationship between the two constructs. The authors concluded that none of the models were sufficient to explain it. Kangas and Lloyd (1988) suggested that the relationship is correlational, not causative. For children with communication, sensory and motor impairments, demonstration of early cognitive processes is limited and therefore cannot be used as a measure of AAC eligibility (Kangas & Lloyd, 1988; Porter & Burkhart, 2015; Ronski & Sevcik, 2005).

2.7.2 Barriers to access to robust AAC. There are also myths that have impacted on the provision of robust AAC to young children. These include the belief that a child must be able to recognise objects and photos before a graphic symbol-based

AAC system can be introduced. Another belief is that only a few graphic symbols should be introduced initially and then more added when the child shows that they can use them. These myths are discussed and contested below.

2.7.2.1 Belief that child needs to be able to recognise objects and photos before graphic symbols can be introduced. In the past, there was a belief that there was a hierarchy of visual representation. This hierarchy placed visual representations on a continuum from concrete to abstract. More concrete representations included objects, remnants and miniatures with the most abstract being the written word. Using this hierarchy, photos and objects were considered more concrete than graphic symbols. This misconception led therapists to require a child to prove that they could recognise these before they were introduced to graphic symbols. Ronski and Sevcik (2005) however, argued that no such hierarchy exists.

DaFonte and Taber-Doughty (2010) considered the use of graphic symbols in infancy. They studied infants at three ages 6 months, 9 months and 12 months to see if they showed any preference for the use of photos versus graphic symbols. All of the children were typically developing and were enrolled in a day care. The photos and graphic symbols were used in a choice making task where the infant was asked to choose between three favoured items by intentionally looking, gesturing or grabbing a photo or graphic symbol of the item. The results showed that infants could be taught to use graphic symbols to communicate. There was no preference for photos over graphic symbols at any age.

A major limitation with introducing object or photo-based systems is that these systems are only useful for representing nouns. It is challenging to represent other more

abstract vocabulary such as words like “more” or “like” (Porter & Burkhart, 2010). As a result, children with these systems usually do not have access to the core vocabulary needed to combine words and build their language skills (Porter & Burkhart, 2010).

2.7.2.2 Belief that we introduce a few symbols initially and then add a few more when the child shows us that s/he can use them. Historically, it was common practice to introduce a child to a few symbols initially and then to gradually add more as the child demonstrated mastery. This approach was inconsistent with what is known about language development in typically developing children. With typically developing children, it is expected that they will utter their first word after being exposed to at least 12 months of language input from adults. They are then given more time to learn to combine words and understand the complexities of the language. For all people learning language, the language must be absorbed first before it is expressed. This is also the case for children who require AAC and can be replicated through providing access to a robust AAC system and modelling language on the system (Behnami & Clendon, 2015).

In order to close the current gap between what is known about AAC interventions and current practice, Light and McNaughton (2012) discussed the need for an increase in public awareness, reduction of attitudinal barriers, improvement of in-service training for education professionals and more effective collaborations between families and professionals. There is growing evidence to refute the myths outlined in this section. However, due to a lack of a strong evidence base, attempts to dispel myths in early intervention have been based largely on expert opinion and researcher authority (Iacono & Cameron, 2009).

2.8 Early AAC Intervention

Best practice in AAC intervention suggests that AAC systems are introduced early to support language development and prevent long-term negative outcomes (Behnami & Clendon, 2015; Cress & Marvin, 2003; Ronski & Sevcik, 2005; Van Tatenhove, 1987). In this section goals for children with CCN using AAC are outlined, followed by a discussion of some common barriers and facilitators to AAC implementation.

2.8.1 Intervention goals. Despite the variety of AAC systems, the goals for children with CCN using AAC remains the same. Intervention aims to build communicative competence, develop communicative autonomy and ensure communication accessibility. These goals are discussed below.

2.8.1.1 Building communicative competence. Early AAC interventions aim to increase communicative competence (Light, Binger, Agate, & Ramsay, 1999) and develop language skills. Light (1989) defined communicative competence as “the ability to functionally communicate within the natural environment and to adequately meet daily communication needs.” (Light, 1989, p. 143). Communicative competence is an interpersonal construct that relies on both members of the conversation. It is also context dependent and can be different for every person, in every context. AAC intervention therefore needs to include significant others and facilitators. To achieve communicative competence, individuals must integrate knowledge, judgement and skills from all four areas of competence (linguistic, operational, social and strategic). It is not sufficient to develop skills in only one or two areas.

2.8.1.2 Developing communicative autonomy. Communicative autonomy is defined as being “able to say what I want to say, to whoever I want to say it to, whenever and wherever I want to say it and able to understand other people” (Porter & Burkhart, 2015, p. 2). When a child has communicative autonomy, they can express their own thoughts and feelings according to their own intentions (Porter & Burkhart, 2015). They are responsible for their own language productions with limited restrictions on what they can say (Porter & Burkhart, 2015).

2.8.1.3 Ensuring communication accessibility. Communication accessibility is reliant on people in the environment. These people need to understand the AAC system, help to scaffold it and communicate in a way that helps the child to achieve communicative autonomy (Porter & Burkhart, 2015). Intervention therefore needs to include the child’s close friends and family, extended social networks, and school community (Porter & Burkhart, 2015).

One aspect to intervention that is critical to success across these goals is the optimisation of language interactions. Language input is critical for language development in both typically developing children and children with communication needs (Hart & Risley, 1995; Ronski & Sevcik, 2003; Yoder & Warren, 1998, 2001, 2002).

2.8.2 Optimising interactions. The main approach used in the literature for optimising communicative interactions are communication partner interventions. These involve teaching and/or coaching communication partners to use a range of strategies such as observing the child, following the child’s lead, structuring conversations and the environment, and prompting production (Pennington, Thomson, James, Martin, &

McNally, 2009). There are several parent training interventions used by speech-language therapists working in early intervention; examples include: Hanen's It Takes Two to Talk (Pepper & Weitzman, 2004), Milieu Teaching (U.S. Department of Education & Institute of Education Science, 2012) and Responsivity Education/Milieu Teaching (Yoder & Warren, 2002).

Roberts and Kaiser (2011) conducted a meta-analysis to systematically evaluate the effectiveness of parent-implemented language interventions on the language skills of children with and without intellectual disabilities between 18 and 60 months of age. The 18 studies were analysed for the effect on seven child language outcome variables (overall language, expressive language, receptive language, expressive vocabulary, receptive vocabulary, expressive morphosyntax and rate of communication). The 18 studies compared parent-implemented language interventions with either a control or therapist-implemented language interventions. Results revealed that parent-implemented language interventions had a significant, positive impact on the language skills of children when compared to a control group (Roberts & Kaiser, 2011).

Kent-Walsh, Murza, Malani, and Binger (2015) completed a meta-analysis of AAC partner instruction studies. There were 17 single-case experimental design studies included in the meta-analysis. Across these studies, there were 53 people with CCN. They found that communication partners could modify their behaviour to support functional communication and expressive language for children with CCN. The language outcomes from these studies were pragmatic (increased social interaction. Increased proportion of communicative turns, increased initiation and increased frequency of communication acts), morpho-syntactic (increased multi-syllable

messages) and semantic (increased understanding of semantic concepts). The authors suggested that partner instruction is a vital part of both AAC assessment and intervention that has positive effects on the communication skills of children with CCN (Kent-Walsh et al., 2015).

One strategy that has a particularly strong evidence base is aided language input. Aided language input involves a communication partner modelling AAC when they speak. There are several aided-language input approaches that have been developed for AAC intervention over the years. Examples include aided language stimulation (Goossens, 1989), the System for Augmenting Language (SAL) (Romski & Sevcik, 1996) and natural aided language (Cafiero, 1998, 2001). These approaches all use AAC to augment spoken language and provide a model to expand children's aided language development. They are based on the premise that if a child is able to observe symbols being used by others in their environment, they will start to understand how they can be used for communication (Beukelman & Mirenda, 2005; Goossens, 1989). These approaches are reviewed in detail in Beukelman and Mirenda (2005).

Sennott, Light, and McNaughton (2016) systematically reviewed nine single case studies and one quasi-experimental randomised group design study to examine the effect that aided language input had on language acquisition. The results showed that AAC intervention which included communication partners modelling the use of AAC systems lead to meaningful gains in pragmatics, syntax, semantics and morphology.

2.8.3 Barriers/facilitators to AAC implementation. There are various facilitators and barriers that have been identified in the literature as affecting the long-term success of AAC implementation. Johnson, Inglebret, Jones, and Ray (2006) found

that speech-language therapists believed that there are a complex network of factors that relate to the success or inappropriate abandonment of AAC. These factors include support, attitude and speech-language therapist AAC competency.

2.8.3.1 Support. The level of support given to a child with CCN regarding their communication system was a factor relating to success or abandonment of AAC (Bush & Scott, 2009); Johnson et al. (2006) found that support from a child's family, team members, assistive technology specialists and diagnosticians was found in cases of AAC success. Where the support from family and team members was lacking, this led to AAC abandonment (Johnson et al., 2006).

2.8.3.2 Attitudes. Johnson et al. (2006) investigated the factors related to the long-term success of inappropriate abandonment of AAC as perceived by speech-language therapists in America. More than 90% of speech-language therapists reported that individuals experienced success with their AAC system when it was highly valued by both them and their communication partners (Johnson et al., 2006). It was suggested that a system's value can be improved by it being used in naturalistic settings throughout the day for both communication and education (Johnson et al., 2006). Speech-language therapists also reported that the attitudes of the individual and their communication partners significantly impacted success or abandonment of the system. A sense of ownership and being realistic lead to success. Whereas, a lack of motivation, a fear of technology or seeing the system as socially unacceptable lead to the abandonment of the system (Johnson et al., 2006).

2.8.3.3 Lack of training for teams. The speech-language therapists in Johnson et al. (2006) study reported that AAC systems were abandoned when training was not

prioritized. Training needs to address how to operate the system. It also need to provide support around ongoing programming and communication partner interaction techniques (Johnson et al., 2006).

2.8.3.4 Speech-language-therapist AAC competency. For a child with CCN to develop skills in AAC use, they rely on support, knowledge and expertise from speech-language therapists. In Johnston et al. (2006), 67% of the speech-language therapists reported that a lack of professional knowledge resulted in the abandonment of AAC devices and techniques (Johnson et al., 2006).

In the United Kingdom, a survey was completed of speech-language therapists supporting people with disabilities using AAC (Bush & Scott, 2009). Of the speech-language therapists surveyed, only 19% considered themselves to have specialist knowledge in AAC (Bush & Scott, 2009). Furthermore 69% reported that their qualifications did not include a core AAC component resulting in learning on the job (Bush & Scott, 2009). Speech-language therapists relied on other speech-language therapists with specialist expertise to provide AAC intervention within the United Kingdom. A lack of an accredited qualification or standardised competencies led to professionals only specialising in AAC if it became an area of interest (Bush & Scott, 2009). Professionals that participated in their study proposed the need for national competencies for both training and practice stating that it should be woven into continued professional development (Bush & Scott, 2009). This is further supported by Article 24 of the United Nations (2006) Convention on the rights of persons with disabilities which states:

Parties shall take appropriate measures including facilitating the learning of... augmentative and alternative modes, means and formats of communication and ... train professionals and staff who work at all levels of education [incorporating] the use of appropriate augmentative and alternative modes, means and formats of communication. (p.17)

A similar survey was completed with Australian speech-language therapists (Balandin & Iacono, 1998). Speech-language therapists who worked in paediatric services tended to report either no knowledge of AAC (39%) or extensive knowledge of AAC (38%) (Balandin & Iacono, 1998).

Costigan and Light (2010) reviewed 11 studies to discover the adequacy and effectiveness of preservice AAC training for speech-language therapists, occupational therapists and special education teachers. They discovered that speech-language pathology courses offered in the United States of America, Australia, New Zealand, The United Kingdom and Egypt between 1990 and 2008 did not include a paper on AAC. Those that did were run by people without expertise in AAC and were not mandatory. Lack of preservice AAC training was also mentioned in both the United Kingdom (Bush & Scott, 2009) and Australian studies (Balandin & Iacono, 1998; Iacono & Cameron, 2009) where AAC knowledge was reportedly gained 'on the job' (Balandin & Iacono, 1998; Bush & Scott, 2009; Iacono & Cameron, 2009).

In 2011, Speech Pathology Australia added multimodal communication to their Competency Based Occupational Standards (Speech Pathology Australia, 2011), stating that "an entry-level speech pathologist in Australia must be able to demonstrate competence in any unit of CBOS in paediatric and adult speech pathology practice with

both developmental and acquired disorders in the areas of...multimodal communication” (p.7). New Zealand follows these same standards with their speech-language therapy students. This shows a shift in how AAC is viewed. It has moved from being considered a specialist area to one in which all speech-language therapists need to have competency due to the prevalence of people with CCN on caseloads.

Sutherland, Gillon, and Yoder (2005) surveyed speech-language therapists in New Zealand who worked in both education and health settings regarding their competence in providing AAC services. Over half (54%) perceived themselves to have poor or inadequate skills; only 14% of all respondents rated themselves as competent. It was suggested that professional development was required in this area.

Binger et al. (2012); Dietz, Quach, Lund, and McKelvey (2012) discussed the roles of both general practice speech-language therapists and AAC specialist speech-language therapists within the AAC assessment process. They outlined the need for clarity in the roles to reduce gaps in service. They also outlined how the varying levels of expertise can effect AAC assessment procedures highlighting the need for professional development in these areas (Dietz et al., 2012).

In summary, New Zealand speech-language therapists' competence levels appear similar to those reported in other countries. As the previous survey (Sutherland et al., 2005) was conducted before the 2011 Competency Based Occupational Standards changes, it would be useful to discover if perceptions of competence have changed.

2.9 Conclusion

The literature suggests that the use of AAC with children with CCN facilitates language development which in turn can lead to increased participation, improved quality of life and future educational and occupational outcomes (Batorowicz et al., 2006; King et al., 2003; Raghavendra et al., 2012; Raghavendra et al., 2011; Thirumanickam et al., 2011). AAC intervention can be used with all children with CCN and the early provision and implementation of AAC is critical. Despite this, there may be myths and barriers preventing the use of AAC with some children. This study explored the perceptions and experiences of speech-language therapists working with pre-schoolers with CCN in New Zealand.

Chapter Three: Methodology

3.1 Introduction

This chapter describes the methodology of the study. It outlines the research questions and explains the rationale behind the research method chosen. It continues with a description of the construction of the survey and the data collection methods used. Finally, the ethical considerations are explored.

3.2 Research Questions

Speech-language therapists who work in early intervention were surveyed to answer the following research questions:

1. What are the caseload characteristics of speech-language therapists working in early intervention with children with complex communication needs?
2. What knowledge and beliefs do speech-language therapists who work in early intervention have about AAC?
3. What factors do speech-language therapists who work in early intervention perceive as barriers and facilitators to AAC implementation?

3.3 Participant Recruitment

The participants were recruited through the New Zealand Speech-Language Therapists' Association (NZSTA), TalkLink Trust and the Ministry of Education. An email containing a brief introduction to the study, an invitation to read the Information Sheet (Refer to Appendix B) and link to the survey was sent to these organisations for them to distribute to their members and employees (see Appendix A for a copy of the email sent). All speech-language therapists working with preschool children with CCN were

eligible to participate in the study. People who wanted to participate in the study followed the link and completed the survey.

3.4 Methodological Approach

A descriptive cross-sectional survey was used. This design allows a researcher to examine current attitudes, beliefs and opinions as well as demographic characteristics at a singular point in time (Creswell, 2008). Surveys are low cost and easy to distribute and access. Participants can complete the survey at their own pace, in a place that they feel comfortable (Dillman, Smyth, & Christian, 2014). An additional benefit is that a survey can guarantee complete anonymity (Nardi, 2014). If focus groups or interviews had been used instead, the participants may not have felt comfortable sharing their honest opinions because they could be more readily identified by others in the focus group (Dillman et al., 2014).

3.4.1 Online survey methodology. Many people now have constant access to the Internet through smartphones and tablets, resulting in many of the population completing daily tasks online. Thus, online surveys have become the fastest growing form of surveying (Dillman et al., 2014). Online surveys are also appealing to researchers due to the speed of set up and low cost (Dillman et al., 2014). Survey Monkey (<http://www.surveymonkey.com>) was used for the current research because it is one of the many online survey platforms that enables researchers to quickly construct and administer surveys. It is also easy to access on both desktop and mobile devices, making it more convenient for participants.

3.4.2 Survey design. The survey instrument included 17 questions with a mix of quantitative and open-ended questions. The format of the questions varied and included

Likert scale ratings (n=4), multiple-choice responses (n=8), demographic quantity responses (n=2) and open-ended responses (n=3) (see Appendix C for a copy of the survey).

Likert scales were used as they are useful for obtaining a rating of participants' perceptions of levels of competence or levels of agreement with statements or beliefs. Multiple-choice questions provide options to assist participants to reflect on which choice(s) best represents their context/work. Open-ended questions avoid the bias that exists with pre-determined categories; instead, they elicit what is top of mind for participants (Maxwell & Satake, 2006).

Creswell's (2008) strategies for good question construction were followed when creating questions. These strategies include not using jargon; using positive wording; asking only one question at a time; ensuring clarity of questions; having a balanced response rate where all the responses are on the same scale; and for multi-choice questions, making sure that the answers match the questions.

The survey was divided into five sections: (1) background information; (2) caseload information; (3) professional learning and development; (4) beliefs around AAC implementation with young children; and (5) facilitators and barriers to AAC implementation with young children. The questions for the survey were drawn from a variety of sources including the content of previous surveys focused on AAC (Barker, Akaba, Brady, & Thiemann-Bourque, 2013; Finke, McNaughton, & Drager, 2009; Finke & Quinn, 2012; Johnson et al., 2006; Simpson, Beukelman, & Bird, 1998; Siu et al., 2010; Sutherland et al., 2005; Wormnaes & Malek, 2004).

Section (1) contained questions relating to the number of years the participant had practiced as a speech-language therapist as well as his/her current service setting. Section (2) contained questions relating to the number of children on the participant's caseload that had CCN, the diagnoses of the children, whether these children were receiving AAC intervention, and if so which forms of AAC were being offered. Section (3) included questions relating to AAC professional development and learning. The participants were also asked to rate their competence in implementing AAC systems using a four-point scale (no experience, novice, competent, highly competent). The questions in section (4) captured information relating to the participant's beliefs around the use of AAC with young children. The participants were asked to rate on a five-point scale of importance (not important, slightly important, moderately important, important, and very important) the factors of age, cognition, type of diagnosis, family attitudes, family support and physical capabilities when deciding whether to implement AAC. They were also asked to use a five-point scale (strongly disagree, disagree, undecided, agree, strongly agree) to rate their agreement with a series of statements (e.g., the introduction of AAC will hinder speech development, individuals with significant cognitive delays can be very successful with AAC and a child under the age of 2 is not ready for AAC). In the last section (5), participants were asked to list three barriers and three facilitators to AAC implementation with young children.

It is recommended best practice to pilot a survey first (Creswell, 2008; Punch, 2014) to determine if the sample group will be capable of completing the study and understanding the questions (Creswell, 2008), and to check for any obvious flaws (Ary, Cheser Jacobs, Sorensen, & Walker, 2014). Piloting the survey can also help in

measuring the content validity; determining whether the survey's content adequately measures what was intended (Ary et al., 2014).

To check the content validity of this survey, a draft copy was sent to two experts in the field of AAC. These experts were encouraged to consider the overall appropriateness of the survey content and asked to give feedback on this in relation to the research questions. The draft survey was then sent to two speech-language therapists. These speech-language therapists had expertise in AAC but did not work with preschool children, so involving them did not decrease the participant pool. They were asked to complete the survey and give feedback on the clarity of the questions. The overall feedback for the survey was positive with only small modifications to the wording of some questions suggested. This feedback was then incorporated into the final instrument.

3.5 Procedures

The procedures outlined in the participant recruitment section above described how the participants were invited to participate in the study. The participants were informed that the survey would take them no longer than 20 minutes to complete. They were also informed that completion of the survey implied consent. Due to the anonymity of the survey, participants were unable to exit the survey or return to it later.

3.5.1 Data analysis procedures. The quantitative survey data were analysed with descriptive statistics. The qualitative data from the open-ended questions were analysed using an inductive or data-driven coding approach (Gibbs, 2015). The process involved: (1) reading the participants' responses; (2) collapsing similar responses into categories; (3) organising the categories into themes, and (4) Presenting the categories

including the number of participants who gave a response in each category into a summary table along with the themes. Any categories that did not fit within a theme were described in the table as 'other'.

Likert scales have faced controversy in terms of analysis. Traditionally this scale has been analysed using nonparametric statistics (Creswell, 2008; Punch, 2009, 2014). Sullivan and Artino (2013) discussed that although Likert scales can be ranked, the distance between each option is not necessarily equal. Therefore, in this study the findings from the Likert scales were reported using the mode.

3.6 Ethical Considerations

Ethical approval was obtained from the Massey University's Human Ethics committee (see Appendix D). Two of the key ethical issues considered were informed consent and confidentiality.

3.6.1 Informed consent. To facilitate informed consent, a detailed Information Sheet was prepared (see Appendix B). This contained information regarding the project aims, project procedures, participants' rights and project contacts. Due to the anonymous nature of the survey, consent was implied by completion and submission of the survey. This was explained on the Information Sheet and on the first page of the online survey.

3.6.2 Confidentiality. No personal or identifiable information was obtained from participants. Furthermore, Survey Monkey's anonymous survey function was used which means that the website does not track the internet protocol (IP) addresses of participants. Thus, no individual survey could be linked back to any participant.

3.7 Conclusion

The methodological considerations outlined above justify the procedures and tools used in the study. A descriptive cross-sectional survey was the best fit for the study allowing for analysis of the speech-language therapists' perceptions and experiences as related to the research questions.

Chapter Four: Results

4.1 Introduction

This study surveyed New Zealand speech-language therapists working in early intervention with children with CCN to obtain information about their caseload characteristics, and to explore speech-language therapists' knowledge and beliefs around AAC and their perspectives on the barriers and facilitators to AAC implementation. This chapter presents the results.

4.2 Survey Results

Sixty-one speech-language therapists participated in the survey. Five of the participants did not complete the last two questions (requiring them to list three barriers and three facilitators to AAC intervention). Therefore, the results for these two questions are based on responses from only 56 participants.

4.3 Participants

The number of years that the participants had been practicing as speech-language therapists was variable. One third of the participants (n=20) had been practicing for more than 10 years. The remaining participants had been practicing for less than 10 years (see Table 1 for the break down). Four had been practicing for less than one year (n=4).

The participants were employed by a range of early intervention providers. These included the Ministry of Education (n=43), early intervention centres (n=8), TalkLink Trust (n=6), hospitals (n=4), private practice (n=3), Accident Compensation Corporation (ACC) (n=1), community playcentres (n=1) and universities (n=1). Some participants were employed by more than one provider.

The number of years that the participants had been working in their current service settings ranged from less than one year (n=10) to more than 10 years (n=9) (see Table 1). Their experience in their current service settings did not necessarily match their experience in providing AAC services. One quarter of the participants had 6-10 years of experience providing AAC services (n=16), with the remainder spread across the response options (see Table 1). Seven of the participants reported that they had no experience in providing AAC services. Of these seven, two were new graduates with less than 2 years of experience. The others worked at The Ministry of Education, in an early intervention centre or in a hospital. All five had been practicing as speech-language therapists for more than 3 years, with three reporting more than 10 years of experience.

Table 1

Participant demographic information

Years practicing as a speech-language therapist	Number of participants	Years working in current position	Number of participants	Years providing AAC services	Number of participants
<1	4	<1	10	<1	11
1-2	15	1-2	14	1-2	13
3-5	10	3-5	13	3-5	7
6-10	12	6-10	15	6-10	16
>10	20	>10	9	>10	7

4.4 Caseload Characteristics

The participants reported a total of 428 children on their caseloads who were under 5 years of age and had no words or very limited functional speech. These children had a range of diagnoses including Dyspraxia, Cerebral Palsy, Autism Spectrum Disorders (ASD) or Developmental Delay. The participants had a range from 1-22 children with complex needs on their caseloads.

Most participants (n=34, 56%), stated that *some* of these children were receiving AAC intervention, 24 (37%) reported that *all* were receiving AAC intervention, and 3 (7%) reported that *none* were receiving AAC intervention.

4.4.1 Reasons for not providing AAC intervention. Those people who answered some or none to the above question were asked to explain why some children on their caseloads were not receiving AAC intervention. The reasons for not providing AAC intervention fell into five major themes: service delivery, family factors, use of other methods, child factors and education.

4.4.1.1 Service delivery. Statements related to service delivery are listed in Table 2. Six participants stated that the children were new on their caseload, three said that they were waiting for TalkLink Trust involvement, and two discussed large caseloads as factors affecting the provision of AAC intervention. Other participants stated that they only saw the children once a week, were unable to supply follow up or that the other SLT involved with the child had not suggested AAC use.

Table 2

Service delivery reasons for no AAC intervention

Reason	Responses
New to service	6
Waiting for TalkLink Trust involvement	3
Large caseload	2
Unable to supply follow up	1
Other SLT involved has not suggested AAC use	1
Only see client once a week	1

4.4.1.2 Family Factors. Family factors relating to lack of AAC intervention are displayed in Table 3. Thirteen participants stated challenges with buy-in. Four said that families had declined services or had chosen no AAC input and three stated that families had other priorities. Other participants said that parents were suffering grief and had denial over issues, parents were working full-time or had English as a second language.

Table 3

Family reasons for no AAC intervention

Reasons	Responses
Challenges with buy-in	13
Families declining AAC input, parental choice	4
Other priorities for families	3
Family grief	1
Parents working full-time	1
English as a second language	1
Parents deny there is an issue	1

4.4.1.3 Use of other methods. Statements relating to the use of other methods are displayed in Table 4. Five participants stated that they were focusing on other skills such as attention, yes/no and visual schedules first, before introducing AAC. Another

eight participants said they were using other methods such as New Zealand Sign Language (NZSL), photographs or the Hanen More than Words program. Two participants stated that children were making progress with verbal intervention.

Table 4

Other methods used instead of AAC

Methods	Responses
Use of other methods: NZSL	3
Focusing on other skills first: attention	2
Focusing on other skills first: yes/no	2
Use of other methods: Hanen More than Words program	2
Making progress with verbal intervention	2
Focusing on other skills first: visual schedules	1
Use of other methods: photographs	1
Use of other methods: visuals	1
Use of other methods: choice board	1

4.4.1.4 Child factors. Child factors that were reasons for no AAC intervention are displayed in Table 5. Four participants stated that AAC was not required or was unsuitable for the child due to them getting their needs met or having issues with anxiety. Two participants said that the child was too young and another two said that the child was not responding to AAC. Other participants said that the child was at too low a level or unable to associate objects to pictures.

Table 5

Child reasons for no AAC intervention

Reasons	Responses
AAC not required/suitable, getting needs met, issues with anxiety	4
Too young	2
Not responding to AAC	2
Cannot associate objects to pictures	1
At too low a level	1

4.4.1.5 Education. Reasons related to education are displayed in Table 6. One person said that team members had rejected professional development in AAC use. Another person said they had not been trained in the Picture Exchange Communication System (PECS) and therefore felt uncomfortable implementing it.

Table 6

Education reasons for no AAC use

Reasons	Responses
Team members rejected PD opportunities	1
Lack of PECs training so uncomfortable implementing it	1

4.4.2 AAC systems used. The children on their caseloads who were using AAC were reported to use a variety of different systems. One Hundred and one children were reported to be using Makaton sign language, 90 Core word boards, 73 Core word boards with fringe, 34 PECS, 29 Tablet devices with apps, 28 Low tech devices, 11 Pragmatically Organised Dynamic Displays (PODD) and 2 High tech devices.

Four participants responses were removed from the data due to them misinterpreting this question and answering it incorrectly. This is discussed as a limitation in Chapter 6.

4.5 Competence

The participants were asked to indicate any training in AAC that they had received as part of their basic university qualification. In terms of coursework, 16 participants indicated that they had taken a full paper on AAC, 39 indicated that they had received 1-2 lectures on AAC, and 3 selected 'other' and stated that they had received more than 2 lectures in AAC. Six participants reported that they had received no training in AAC. In terms of other training opportunities, 28 participants indicated that they had engaged in a clinical practicum experience or completed a research project (n=2) relevant to AAC. One participant had volunteered at TalkLink Trust. One had completed a critically appraised topic focused on AAC and one said that AAC had featured across multiple papers and placements.

The participants were then asked to indicate any training in AAC that they had engaged in since graduating. Fifty-four participants stated that they had participated in peer learning, 50 had undertaken self-directed learning, 46 had attended courses/workshops/conferences, 37 had attended in-service programs, 34 had

undertaken their own online learning, 25 had attended special interest groups and one person had participated in no training since graduating. Other people stated that they had worked alongside TalkLink Trust (n=2) or had completed the Ministry of Health Communication Assistive Technology (CAT) Competency framework (n=4).

4.5.1 Perceived competence. The participants were asked to rate themselves on a Likert scale according to their overall competence in providing AAC to young children. Results from this are depicted in a histogram (Figure 1). Just over half of the participants (n=35, 57%) rated themselves a Novice. The remaining participants rated themselves as Competent (n=21, 33%) or Highly Competent (n=4, 7%) with one participant stating they had No Experience.

Next, the participants were asked to rate their competence in implementing various AAC systems. Their responses are presented in Table 7. For Makaton, core word boards, and core word boards with fringe, the mode response was Competent reported by 23, 33, and 26 participants respectively. For PECS, there were two mode responses: Novice (n=21) and Competent (n=21). The mode response for PODD was Novice (n=25).

Looking at the system types more broadly, the mode response for low tech devices was Competent (n=22). In contrast, the mode responses for high tech devices, and tablet devices with apps were No Experience (n=29) and Novice (n=23) respectively.

Figure 1: Competence in AAC

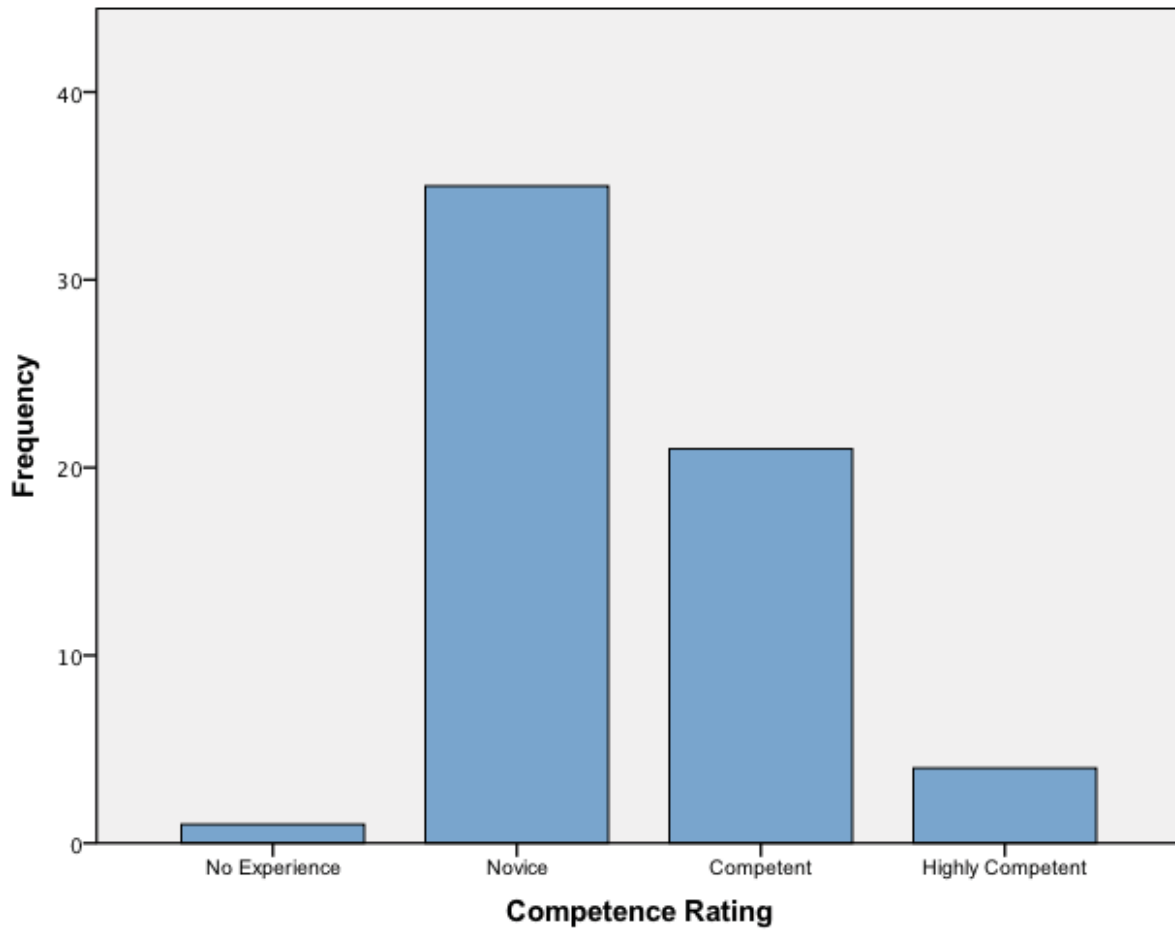


Table 7

Speech-language therapist competence with AAC systems

Competence Rating	AAC systems							
	Makaton	PECs	Core Word Board	Core Word Board with Fringe	PODD	Low tech Device	High Tech Device	Tablet Device with Apps
No experience	9	11	1	3	24	14	29	14
Novice	16	21	17	24	25	17	22	23
Competent	23	21	33	26	7	22	5	18
Highly Competent	13	8	10	8	5	8	5	6

Note: PECS = Picture Exchange Communication System, PODD = Pragmatically Organised Dynamic Display (PODD). The mode response is indicated in bold.

4.6 Myths in AAC

The participants were asked to indicate on a Likert scale whether they Agreed or Disagreed with a series of statements. Their responses are presented in Table 8.

All of the participants either Strongly Disagreed (n=53) or Disagreed (n=8) with the statement 'the introduction of AAC will hinder speech development'. This pattern was similar with the statements 'AAC is a last resort in speech-language intervention' and 'AAC is only for children who have no words'.

Most of the participants either Strongly Agreed (n=32) or Agreed (n=21) with the statement 'individuals with significant cognitive delays can be very successful with AAC'. This pattern was similar for the statement that 'AAC is the responsibility of every communication partner'.

Thirty-two participants Disagreed with the statement 'A child under the age of 2 is not ready for AAC'. Twenty-three Strongly Disagreed and 6 were Undecided.

Responses ranged across the scale for the statement 'gaining competence in AAC can take a very long time for a child'. Nine participants Strongly Agreed, 24 Agreed, 12 were Undecided, 15 Disagreed, and 1 Strongly Disagreed.

Most of the participants either Strongly Disagreed (n=24) or Disagreed (n=22) with the statement 'A child must recognise objects and photographs before symbols are introduced. Eight participants were Undecided and 7 Agreed.

Table 8

Agreement ratings in relation to myths in AAC

Myth	Level of Agreement				
	Strongly Disagree	Disagree	Undecided	Agree	Strongly agree
The introduction of AAC will hinder speech development	53	8	0	0	0
Individuals with significant cognitive delays can be very successful with AAC	1	0	7	32	21
A child under the age of 2 is not ready for AAC	23	32	6	0	0
Gaining competence in AAC can take a very long time for a child	1	15	12	24	9
AAC is the responsibility of every communication partner	0	1	2	21	37
AAC is a "last resort" in speech-language intervention	44	16	1	0	0
AAC is only for children who have no words	46	14	0	0	1
A child must recognise objects and photographs before symbols are introduced	24	22	8	7	0

Note: The mode response is indicated in bold.

4.7 Factors Influencing Implementation of AAC.

The participants were asked to indicate the level of importance that they placed on a range of factors when deciding whether or not to implement AAC. Responses are displayed in Table 9.

Half of the participants (n=34) stated that family attitudes were Very Important with a further third (n=19) indicating that they were Important. This trend was also seen for family support with 35 participants indicating that family support was Very Important, and 21 that it was Important. Twenty-five participants indicated that age was Not Important, 15 stated that it was Slightly Important and 11 that it was Moderately Important. The remaining 10 participants thought that it was Important (n=7) or Very Important (n=3). A range of responses were collected for cognition, type of disorder/communication disorder and physical disability. The mode responses for both cognition and type of disorder/communication disorder were Slightly Important. The mode response for physical capabilities was Important.

Table 9

Level of Importance given to factors when deciding whether or not to implement AAC

Factor	Level of Importance				
	Not Important	Slightly important	Moderately Important	Important	Very Important
Age	25	15	11	7	3
Cognition	10	19	15	13	4
Type of Disorder/Communication disorder	16	18	10	13	4
Family Attitudes	1	4	3	19	34
Family Support	1	2	2	21	35
Physical Capabilities	6	12	14	17	12

Note: The mode response is indicated in bold.

4.8 Barriers to AAC implementation.

Participants were asked to list three barriers to AAC implementation. Their responses were organised into eight themes: service delivery, education, family factors, AAC system factors, AAC use, team factors, child factors and myths. These are presented in Table 10.

Overall, the most frequently identified barriers were team attitudes, lack of specialist support/TalkLink Trust waiting lists, and inconsistent use of a system. Forty-eight participants stated that Team attitudes such as thinking it is too hard, giving up with a lack of immediate response, not understanding the point, buy-in and negative opinions and beliefs were a barrier. Thirteen participants stated that a lack of specialist support or TalkLink Trust waiting lists were a barrier. A further 10 participants stated that inconsistent use of the system was a barrier.

Table 10

Barriers to AAC implementation

<i>Service delivery Barriers</i>	<i>Responses</i>
Lack of specialist support or TalkLink Trust waiting lists and therefore access to funding and to high tech options	13
Time and cost required to set up AAC balanced with large caseload	8
Frequency of SLT support	5
SLT support	1
SLT resilience to address barriers	1
Finding time for teachers to develop confidence in AAC use	1
Having someone on the ground who takes responsibility for maintaining the system	1
Accredited team members overloaded with own caseload	1
Other early intervention team members not referring to SLT as child has no words so it will be of no benefit.	1
<i>Education Barriers</i>	
Lack of education for parents and early childhood educators leading to lack of motivation and understanding	9
Lack of training, knowledge and experience of SLT	3
Confidence in selecting best tool or introducing AAC	2
Communication Assistive Technology Level 1 is not helpful for learning about AAC implementation	1
Centres rejecting professional development opportunities	1
<i>Family factor barriers</i>	
Parental perceptions – AAC stigma	3
Family stages of grief and denial	3
High parental expectations	1
Rural locations	1
Complex family background	1
Family priorities	1
Parents working full time	1
Culture/background	1
<i>AAC system barriers</i>	
Practical use of being able to have it at the child's side at all times	2
Low tech is not useful	1
Suitability of AAC method and trials to find right one	1
Lack of culturally appropriate symbols	1
<i>AAC use barriers</i>	
Inconsistent use of the system	10
Pressure for the child to use it	2
Lack of access to AAC – kept in the cupboard	1
<i>Team factor barriers</i>	

Team attitudes: thinking it is too hard, giving up with a lack of immediate response, not understanding the point, buy-in and negative opinions and beliefs	48
Team too busy	2
Frequent changes in teams surrounding the child	1
Others understanding the difference between comprehension and expression for a child	1
Team member confidence	1
Team disagreement	1
<i>Child Barriers</i>	
Complex health issues	3
Attention and listening skills	4
Physical capabilities	1
Child's environment	1
<i>Myths stated to be barriers</i>	
Too much focus on cognitive abilities even though we can't test for these	1
Time spent reassuring parents and teachers that AAC does not hinder speech development	1
Very low cognitive level	1
Parents and centre often tell SLT that the child is not at that level and can't recognise symbols.	1
Waiting for speech to develop	1
<i>Other</i>	
Resource	6

4.9 Facilitators

The final question asked the participants to list three facilitators to AAC use. The facilitators fell under seven themes: education, team dynamics, AAC use, child factors, service delivery, AAC systems and beliefs. These are presented in Table 11.

Overall, the most frequently reported facilitators were a willingness to try from the team, a supportive team, and the education of those involved. Forty-three participants stated that a willingness to try from the team, buy-in, confidence, engagement, support and readiness is a facilitator for AAC use. Twelve said that a supportive team was a facilitator.

Table 11

Facilitators to AAC implementation

<i>Education facilitators</i>	<i>Number of participants who said this.</i>
Education of those involved around implementation and their roles in that	7
Access to information online and in person	6
Education about why you use AAC	2
SLT competence and knowledge	2
Knowledge of myths	1
Frequent courses	1
Knowledge on specific AAC equipment	1
<i>Team Dynamic Facilitators</i>	
Willingness to try from the team; buy-in, confidence, engagement, support, readiness	43
Team being on the same page – collaborative team work	6
Previous team success and experience with other children	4
Personal enthusiasm and confidence	3
Another SLT to brainstorm with, peer review, information sharing	3
Positive attitudes to AAC	3
Accredited people within the Ministry of Education	2
SLT/parent/centre commitment	2
SLTs from various workplaces	1
Good parent/SLT relationships	1
Someone to maintain/problem solve issues/update AAC	1
Many teams are using some form but are unaware e.g. gestures, knowing the importance of using more than that	1
Being able to talk to other teams who use AAC	1
Teacher planning/organization and ability to see how AAC can fit into language/learning activities	1
<i>Facilitators related to AAC Use</i>	
Extensive modelling but team members creating meaningful opportunities to practise	5
Consistent use	1
<i>Child Factors</i>	
Child interest in AAC, evidence of success, enjoying it being theirs	9

A good ability to shift attention between the activity, AAC system and adult modelling	1
Preschool children are less self-conscious about using different modes of communication	1
<hr/> <i>Service Delivery Facilitators</i> <hr/>	
Agency e.g. TalkLink Trust that can give advice, passion and support	5
Good SLT follow-up and support	4
Enough time and funds to create/buy system	2
Shorter waiting lists	1
Sold as beneficial for more than one child	1
Inclusive practice	1
Other language intervention (More than Words)	1
Reduced caseload	1
Providing family and teachers with both anecdotal and empirical evidence on its efficacy	1
<hr/> <i>AAC System Facilitators</i> <hr/>	
An AAC system that suits the child, ease of use or access	4
Resources ready-made	3
Including vocabulary that is meaningful/personalisation of system	2
Having lots of options	3
Appropriate equipment for the level of the child	1
Good access to AAC choices	1
<hr/> <i>Beliefs that are Facilitators to AAC use</i> <hr/>	
Increased acceptance of tech and AAC	2
A belief that all humans have the right to communicate	1

4.10 Conclusion

In summary, this chapter presents the findings of this study in relation to the perceptions and experiences of speech-language therapists working in early intervention in New Zealand. These results were produced from analysis of the participants responses to the online survey. These findings will be discussed in the next chapter as they relate to the research questions and will be linked to relevant literature reviewed in Chapter 2.

Chapter Five: Discussion

5.1 Introduction

The literature reviewed in Chapter 2 identified that early access to AAC is essential for children with CCN, (Cress & Marvin, 2003; Ronski & Sevcik, 2005) to optimise language development and maximise participation and learning across the lifespan (Binger & Light, 2008; Thirumanickam et al., 2011; Zangari & Van Tatenhove, 2009). Early AAC intervention aims to build these children's communicative competence, autonomy and accessibility. Speech-language therapists play an important role by working alongside families and teams to optimise communicative interactions by increasing responsivity, employing strategies such as wait time and following a child's lead and providing aided language input and modelling. Historically, the introduction of AAC to young children has been limited with many children with CCN not receiving their first AAC system until they were school-aged or beyond. A major reason for this has been the existence of various myths and misconceptions held by parents and professionals about AAC (Ronski & Sevcik, 2005). None of these myths are supported by the literature (Ronski & Sevcik, 2005).

5.2 Research Questions

Given the key role that speech-language therapists play in early AAC intervention, this study was developed to investigate the perceptions and experiences of speech-language therapists working with pre-schoolers with CCN in New Zealand. This research addressed the following research questions:

1. What are the caseload characteristics of speech-language therapists working in early intervention with children with complex communication needs?
2. What knowledge and beliefs do speech-language therapists working in early intervention have about AAC?
3. What factors do speech-language therapists working in early intervention perceive as barriers and facilitators to AAC implementation?

The key findings related to each research question are discussed in detail below.

5.3 Participants

Sixty-one speech-language therapists working with preschool children with CCN responded to the survey. This is significantly less than the 214 speech-language therapists who responded to Sutherland et. al.'s (2005) survey on AAC use and service provision in New Zealand. However, that study was open to speech-language therapists who worked across the life span. It is difficult to determine how many, if any, of the respondents in Sutherland et al. (2005) worked with preschool children.

The speech-language therapists in the current study, worked for a range of employers, but as expected most (70%) worked for the Ministry of Education; the primary service provider for preschool children. Six participants worked for TalkLink Trust; New Zealand's AAC and assistive technology assessment service.

The participants reported a range of experience. Just over half (57%) reported that they had more than six years of experience working as speech-language therapists. In terms of AAC experience, the participants reported that they had less experience overall. Just over one third (37%) reported they had 6+ years of experience providing

AAC services. Seven reported having no experience. Of these seven, five were experienced SLTs; three had 10+ years of experience. It is surprising that they would have had no experience providing AAC services particularly given they worked in settings (Ministry of Education, hospital, and early intervention) where they were likely to have served children with a broad range of needs. Perhaps they misinterpreted what was meant by “providing AAC services”. It is possible that they thought it was referring to specialist AAC services, or only included services related to high-tech AAC. Alternatively, maybe they did have caseloads that did not include any children with CCN.

5.4 Caseload Characteristics

In this study, the 61 participants reported a total of 428 children on their caseloads with CCN. It is difficult to compare this to the 1,804 students under 21 years of age that were identified in Sutherland et al. (2005) as that study did not specify the number of children who were of preschool age. In the current study, only 37% of participants stated that all the children on their caseloads with CCN were receiving AAC intervention. This aligns with previous research that has indicated that some students with CCN may not be receiving the AAC services they need (Hustad & Miles, 2010).

The reasons participants gave for not providing AAC intervention fell into five major themes: service delivery, family factors, use of other methods, child factors and education. The most commonly reported reason was challenges with buy-in from families. Some of the reasons appeared to be linked to AAC-related myths (e.g., too young, cannot associate objects to pictures, making progress with verbal intervention,

focusing on other skills first, getting needs met) and/or other barriers (e.g., waiting for TalkLink Trust involvement). These will be discussed later in the chapter.

5.4.1 Caseloads. Participants had between 1 and 22 children with CCN on their caseloads. Caseload has not been considered in existing research but could impact the quality of service provision. Three participants indicated that this was a reason why some children on their caseload with CCN were not currently using AAC. One person stated that they were “unable to supply follow-up” which might also be linked to caseload size.

Children with CCN who are learning to use AAC require more support from speech-language therapists when compared with children with other speech and language issues. This is reflected in the workload analysis forms used in the United States of America where children with multiple disabilities are given a weighting of 1.6 and children receiving AAC services an additional 5 points of weighting to accommodate for the associated workload (American Speech-Language-Hearing Association, 2017; Ohio Department of Education, 2015; Shiawassee Regional Educational Service District, 2010). This is in contrast to children with articulation issues, for example, who are given a weighting of 1. There are no workload guidance measures used in New Zealand. Using the American method, a speech-language therapist with a caseload of 22 preschool children would have significantly more than the 80-point workload recommended for a full-time speech-language therapist with these children alone. It is also possible that these speech-language therapists have other children on their caseloads as well.

5.4.2 Types of AAC Systems Used. Most children (n=101) were reported to use Makaton sign language followed by Core word boards (n=90) and Core word boards with fringe (n=73). Data regarding the types of AAC systems used by pre-schoolers has not been obtained in previous research, so it is unclear whether this is a worldwide pattern. It is possible that these systems were used more regularly because they were perceived to be more straightforward to put in place. These systems do not require significant time or resources to set up and can be implemented without a referral to TalkLink Trust or while a child is on the waitlist. It is also possible that this pattern is linked to speech-language therapist competency given these were the types of systems that the participants were more likely to report that they had competence in. The participants' competency ratings will be discussed later in the chapter.

The survey findings indicate that many speech-language therapists in New Zealand are choosing to implement Makaton sign language with preschool children with CCN. Makaton and other keyword sign approaches have been shown to decrease a communication partner's speaking rate, and increase their pause time which may increase comprehensibility. Signing is also more portable than aided techniques as it doesn't require any external aids (Mirenda, 2003). Signing may not work for all children because it requires more physical capabilities than aided language techniques (Mirenda, 2003). It may also be harder for communication partners to learn to use and can therefore result in vocabulary restrictions for children with CCN, as usually they are interacting with and acquiring their signs from others who have a limited knowledge of sign (Blockberger & Sutton, 2003). For communication to be functional, it must be understood by both familiar and unfamiliar partners. Signing is less intelligible to

unfamiliar partners (Rotholz, Berkowitz, & Burberry, 1989). People who use sign cannot easily communicate with people in the community. A multimodal approach to AAC is required for AAC competence (Zangari & Van Tatenhove, 2009) . Key word signing may be an important component of a multimodal communication system.

There were 29 children reported to be using tablet device with apps. This shows a significant shift towards using iPads for communication in New Zealand. This is part of a worldwide trend. iPads have increased the awareness and social acceptance of AAC for those that require it (McNaughton & Light, 2013). As an iPad is easily acquired and relatively low-cost, families can purchase the device. Sometimes this could be occurring without specialist knowledge or a clear plan on how to use the device to support communicative competence, possibly leading to a focus on technology rather than communication (McNaughton & Light, 2013).

The provision and implementation of iPads in New Zealand may also be easier and faster than other forms of high-tech AAC as speech-language therapists who have completed the Ministry of Health's Communication Assistive Technology (CAT) Level 1 training can assess and apply for funding for this type of device. They do not need to go via TalkLink Trust for an assessment.

5.5 Early Intervention Speech-Language Therapists' Knowledge and Beliefs about AAC

The responses to the survey provided insight into speech-language therapists' knowledge and beliefs regarding AAC in early intervention. The pattern of responses was similar to those seen in both the previous United Kingdom (Bush & Scott, 2009)

and Australian (Balandin & Iacono, 1998) studies. These are discussed in more detail in the sections below.

5.5.1 New Zealand speech-language therapists' education. In the current study, 74% of the participants reported that their qualification did not include a full paper on AAC. Sixty four percent reported that they had 1-2 lectures on AAC. This finding adds to international results (Balandin & Iacono, 1998; Bush & Scott, 2009; Costigan & Light, 2010) where there was a lack of quality preservice AAC training for speech-language therapists.

5.5.2 New Zealand speech-language therapists' competence. Overall there was a low level of competence reported by the participants. Over half (57%) rated themselves as a Novice when asked about their overall competence in providing AAC to young children. Only 7% of participants rated themselves as Highly competent; all of whom worked for TalkLink Trust. The participants reported higher levels of competence for no-tech and low-tech systems (mode=Competent) than they did for high tech systems (mode= No experience).

The United Kingdom study (Bush & Scott, 2009) found that 19% of the participants considered themselves to have specialist knowledge in AAC. In the Australian study (Balandin & Iacono, 1998), the participants had more knowledge of unaided systems, followed by low tech systems. The least amount of knowledge was for high tech systems (Balandin & Iacono, 1998).

Despite the current requirement that AAC is a core element of initial SLT training in Australia and New Zealand (Competency Based Occupational Standards, 2011),

recent graduates from New Zealand tertiary programmes did not report higher levels of competence in AAC implementation.

The lack of competence in high-tech AAC systems is concerning. This may affect the types of systems that speech-language therapists are recommending and implementing. It may also impact on the quality of follow-up that is provided when children receive high-tech systems via TalkLink Trust. The speech-language therapist supporting these children in their homes and/or preschools may not have the competence to provide appropriate follow-up. Research suggests that this may lead to abandonment of the system (Johnson et al., 2006)

5.5.3 Myths. It was encouraging to discover that most of the speech-language therapists who completed the survey did not believe in the myths related to AAC use such as the myth that ‘the introduction of AAC will hinder speech development’, or the myth ‘a child under the age of 2 are not ready for AAC’. The myth that ‘a child must recognise objects and photographs before symbols are introduced’ was the only myth that met with a range of responses. This misconception could lead to some children being required to prove that they can recognise objects and photos before being provided with access to a graphic symbol based AAC system.

As discussed in the literature review, object and photo-based AAC systems can be very limiting as it is difficult to represent anything other than concrete nouns. Most words that can be photographed or represented with an object are fringe vocabulary words that are used less frequently (Porter & Burkhart, 2010). This can result in less communication from each symbol, reducing the opportunity to learn in situations throughout the day (Porter & Burkhart, 2010). In contrast, core vocabulary words are

powerful; they are used frequently by all people across contexts. Zangari and Van Tatenhove (2009) discussed that early access to robust AAC is essential highlighting the need for core vocabulary as well as other features which support language development. As core vocabulary could not be represented in an object or photo-based AAC system, this could significantly impact language growth.

Despite the participants stating that that they did not agree with the myths highlighted in Question 15, the reasons given for why some of the children on their caseloads with CCN were not receiving AAC intervention appeared to be linked to these myths. These included participants stating that the child is “too young”, or that they “cannot associate objects to pictures”, or that they are “making progress with verbal intervention”, “focusing on other skills first” or “getting [their] needs met”. There was also a variability in response to the level of importance given to factors like age and cognition when deciding whether or not to implement AAC. This may indicate that some participants thought that these factors impacted on whether or not AAC was appropriate.

5.5.3.1 Factors affecting AAC use. Family attitudes and support were considered an Important or Very Important factor by most of the participants (87%, 92%) when deciding whether to implement AAC. As discussed in the literature review, family centred practice is an important principle to follow when working with children and their families as they help to promote positive and successful child communication interactions by supporting family involvement (American Speech-Language-Hearing Association, 2008; Boone & Crais, 1999; D. Paul & Roth, 2011; R. Paul, 2007; Polmanteer & Turbiville, 2000).

Seventeen participants stated that physical capabilities was an Important factor with a further 12 stating it was a Very Important factor when deciding whether to implement AAC with preschool children with CCN. This may link to the low competency ratings discussed above. It is possible that the participants may not have had knowledge of the alternative access options that are available to support children with physical limitations to use AAC.

5.6 Barriers and Facilitators

The most frequently identified barriers in this study were team attitudes, lack of specialist support/TalkLink Trust waiting lists, and inconsistent use of a system. The most frequently reported facilitators were a willingness to try from the team, a supportive team, and the education of those involved. Attitudes, specialist support and education are discussed in more detail below.

5.6.1 Attitudes. Team attitudes were reported as a barrier to AAC implementation by 48 participants and as a facilitator by 43 participants. Of note was that unlike the Australian (Iacono & Cameron, 2009) and United Kingdom (Bush & Scott, 2009) studies, New Zealand speech-language therapists discussed the attitudes of the whole team rather than just the child's families, including early intervention centres and teachers and other professionals within the team

The attitudes of the team may be linked to education and training. Education of the team was highlighted as a facilitator by seven of the participants in this study, as well as participants in the United Kingdom study (Bush & Scott, 2009). Respondents in Johnson et al. (2006) discussed that AAC systems were often abandoned when there was a lack of priority given to training around a system.

Families and other professionals may need education about the importance and value of the AAC system. Participants reported barriers related to attitudes and education such as team members “not understanding the point”, problems with “buy-in”, and “lack of education for parents and early childhood educators leading to lack of motivation and understanding”. In contrast, participants reported facilitators such as a “willingness to try” and “engagement” and “education of those involved around implementation and their roles in that”. Johnson et al. (2006) stated that negative attitudes towards AAC was a factor related to abandonment of AAC systems. If team members don’t value AAC, then they will not use AAC, which in turn will lead to reduced opportunities for the child with CCN to learn language and build competence with their AAC system.

Another area where team members may require additional education is the demands and requirements for building communicative competence in AAC learners. Some participants stated barriers such as team members “giving up with a lack of immediate response” or that there was “inconsistent use of the system”.

It was interesting to see in the current study that although 57% of the participants rated themselves as a Novice, only 4% identified lack of training, knowledge and experience on the part of the speech-language therapist as a barrier. Education of speech-language therapists was highlighted as a barrier in the United Kingdom study (Bush & Scott, 2009).

5.6.2 Specialist support. A lack of specialist support due to waitlist times was highlighted by 13 participants. A further three participants stated this as the reason why some children on their caseloads with CCN were not receiving AAC intervention. Those

participants that had received specialist support noted its value in facilitating access to AAC and intervention.

Binger et al. (2012); Dietz et al. (2012) discussed the roles of both general practice speech-language therapists and AAC specialist speech-language therapists within the AAC assessment process and highlighted the importance of role clarity. Within New Zealand, general practice speech-language therapists need to know when to refer to TalkLink Trust and how to contribute to the assessment process. They also need to be able to put AAC solutions in place while children on their caseload are waiting to be seen. Furthermore, they have primary responsibility for ongoing AAC implementation. It is possible that there needs to be further education for speech-language therapists around these roles.

The Ministry of Health has a credentialing process for both general and specialist speech-language therapists to conduct AAC assessments. The Communication Assistive Technology (CAT) Level One is for general speech-language therapists and the CAT Level Two is for specialist speech-language therapists who in most cases work for TalkLink Trust (Assistive Technology Alliance New Zealand, 2012). In order to be accredited, speech-language therapists must complete a series of training modules on AAC, however, the content of these modules are mainly focused around assessment. One participant stated that “Communication Assistive Technology Level 1 is not helpful for learning about AAC implementation”. As AAC implementation is a primary role for these speech-language therapists, further education is required.

5.7 Conclusion

This chapter has discussed the study's key findings with reference to the research questions and existing literature. The following chapter provides an overall conclusion of the study's findings including a discussion of clinical implications, limitations, and future directions.

Chapter Six: Conclusion

6.1 Introduction

This chapter reviews the purpose, design and findings of the study followed by an overview of the limitations. The clinical implications for speech-language therapists are discussed as well as suggestions for future research.

6.2 Purpose and Design

Children with CCN require early access to AAC services to support their development of language and communication skills. Speech-language therapists are typically the lead professional in AAC assessment, obtainment and use (National Joint Committee for the Communication Needs of Persons with Severe Disabilities, n.d.). There is limited literature on current practice in early intervention and AAC in New Zealand.

The objective of this study was to obtain information about current practice by surveying New Zealand speech-language therapists about their caseload characteristics; their knowledge and beliefs around AAC; and their perspectives on the barriers and facilitators to AAC implementation. This study provides a backdrop for further New Zealand based research focused around AAC and early intervention.

6.3 Limitations

The findings of this study must be considered against the limitations. Although steps were taken to check that all survey questions were understood as intended, one question was met with misunderstanding. Four participants' responses were removed from the data due to them misinterpreting Question nine, as it did not specify children under 5 years of age (Q9: Please indicate the number of clients on your caseload that

are using the following AAC methods/devices). Misinterpretation of the data was obvious as the number of children reported using certain devices far surpassed the number of children under the age of 5 that were reported on the participants' caseloads.

Question 9 was also not robust enough to glean information on the number of children who were using a multimodal approach. It is possible that some children were using more than one AAC system. Unfortunately, Question 9 did not allow participants to record this.

Question 7 used the descriptors "all", "some", and "none". These words were limiting as they did not ask participants to specify the exact number of children on their caseloads who were not receiving AAC intervention within New Zealand.

It is possible that some participants misinterpreted what "AAC services" or "AAC intervention" meant, for example in Question 4 and 7. It is possible that they believed this is something that only TalkLink Trust can provide. It is also possible that they thought AAC only referred to high-tech devices.

Including speech-language therapists who worked for TalkLink Trust undoubtedly influenced the results. For example, as would be expected, all 6 participants from TalkLink Trust reported that all of the clients on their caseloads were receiving AAC intervention. When rating their competence in providing AAC intervention, four of the participants who work at TalkLink Trust rated themselves as Highly competent. The other two participants from TalkLink Trust rated themselves as Competent. There were no participants in the survey who rated themselves as Highly Competent who were not employed by TalkLink Trust.

6.4 Implications for Practice

Despite the addition of multimodal communication to the Competency Based Occupational Standards (Speech Pathology Australia, 2011) in 2011, there is still a lack of education and competence in this area. Universities throughout New Zealand are urged to provide (if not already) at least one full paper on AAC to help give student speech-language therapists the knowledge they require to implement AAC after graduation. Employers within New Zealand also need to be aware of the education requirements of their staff and provide professional development opportunities in this area especially for new graduates to deliver an appropriate, timely and evidence based intervention for children with CCN on their caseloads.

Some speech-language therapists reported that they were waiting for TalkLink Trust to carry out assessments before providing AAC intervention. This may be linked to competency levels, but may also indicate some confusion around roles and responsibilities in AAC service provision. Binger et al. (2012); Dietz et al. (2012) discussed both general and specialist speech-language therapist roles in AAC assessment and identified the need for clarification to avoid gaps in service delivery. The results of the survey suggest that role clarification would be valuable in the New Zealand context. New Zealand employers therefore are urged to clarify these roles for their SLT employees.

The Ministry of Health's Communicative Assistive Technology (CAT) Level One credential is aimed at improving general speech-language therapist's competency in AAC assessment. Competency frameworks may be required that focus on AAC

implementation to help reduce the reliance on TalkLink Trust and reduce the risk of abandonment of AAC systems.

6.5 Implications for Future Research

This research has provided an important backdrop for future research in New Zealand aimed at early intervention and maximising the communication outcomes for preschool children with CCN. The results have highlighted the types of AAC systems which are most commonly being used with these children. Future research should explore the factors which influence speech-language therapists' decision-making around the AAC systems they provide to young children. As Makaton is being implemented with numerous pre-school children with CCN, it would be interesting to discover if many of these children eventually transition to graphic symbol-based AAC systems. If they do, future research should consider whether there are any ramifications for not introducing graphic symbol-based AAC in the preschool years.

In this study, information was not elicited regarding AAC intervention strategies or techniques. Further research is required to identify the intervention strategies that are being employed to support children with complex needs in New Zealand.

Several barriers to AAC implementation were also highlighted including team and family attitudes towards AAC. Further research into understanding these barriers, and methods or strategies for reducing them would be valuable. Most of the speech-language therapists who participated in this study did not believe in the myths related to AAC use. However, future research is required to explore whether these myths are still prevalent with families and other professionals.

Lastly the speech-language therapists reported low levels of competence in AAC implementation. More research is needed in this area to investigate their professional learning needs and supports for developing competency, particularly with high-tech AAC.

6.6 Final Thoughts

This study has demonstrated that despite an extensive evidence base documenting the benefits of AAC implementation for young children with CCN, a significant number of children in New Zealand are not receiving this. Numerous barriers to AAC implementation were reported highlighting the need to help speech-language therapists tackle these barriers that may arise when implementing AAC with preschool children with CCN.

The educational needs of speech-language therapists in New Zealand regarding AAC assessment and implementation has been highlighted, as many of the speech-language therapists working in this area have a self-reported lack of competence in AAC. Education in this area is not only required within university programmes but also in workplaces to assist speech-language therapists in providing AAC for children with CCN. It may be beneficial for the New Zealand Speech Therapists' Association to consider creating workload guidance measures like those used in the United States of America to help improve the time that speech-language therapists can give to children with complex needs.

References

- American Speech-Language-Hearing Association. (2004). Augmentative and alternative communication: Knowledge and skills for service delivery.
- American Speech-Language-Hearing Association. (2008). Roles and responsibilities of speech-language pathologists in early intervention: guidelines [Guidelines]. Available from www.asha.org/policy.
- American Speech-Language-Hearing Association. (2016). Augmentative and alternative communication.
- American Speech-Language-Hearing Association. (2017). Implementation guide: A workload analysis approach for establishing speech-language caseload standards in schools. <http://www.asha.org/SLP/schools/implementation-guide/>.
- Ary, D., Cheser Jacobs, L., Sorensen, C., & Walker, D. A. (2014). *Introduction to research in education* (9 ed.). Belmont, CA, USA: Wadsworth Cengage Learning.
- Assistive Technology Alliance New Zealand. (2012). Ministry of health assessor credentialing. Retrieved from <http://www.atanz.org.nz/ministry-of-health-assessor-credentialing/>
- Bailey, D. B., Hebbeler, K., Spiker, D., Scarborough, A., Mallik, S., & Nelson, L. (2005). Thirty-six-month outcomes for families of children who have disabilities participated in early intervention. *Pediatrics*, 116(6).
- Balandin, S., & Iacono, T. (1998). AAC and Australian speech pathologists: report on a national survey. *Augmentative and Alternative Communication*, 14(4), 239-249. doi:10.1080/07434619812331278416
- Bangert-Drowns, R. L., Hurley, M. M., & Wilkinson, B. (2004). The effects of school-based writing-to-learn interventions on academic achievement: A Meta Analysis. *Review of Education Research*, 74(1), 29-58.
- Barker, R. M., Akaba, S., Brady, N., & Thiemann-Bourque, K. (2013). Support for AAC use in preschool, and growth in language skills, for young children with developmental disabilities. *Augmentative and Alternative Communication*, 29(4), 334-346.
- Batorowicz, B., Mcdougall, S., & Shepherd, T. A. (2006). AAC and community partnerships: The participation path to community inclusion. *Augmentative and Alternative Communication*, 22(3), 178-195.
- Behnami, P., & Clendon, S. (2015). Early intervention and AAC research and expert recommendations. *Journal of Clinical Practice in Speech-Language Pathology*, 17(3), 134-139.
- Beukelman, D., & Mirenda, P. (2005). *Augmentative and alternative communication: Management of severe communication impairments* (3rd ed.): Baltimore: Brookes.
- Binger, C., Ball, L., Dietz, A., Kent-Walsh, J., Lasker, J., Lund, S. K., . . . Quach, W. (2012). Personnel roles in the AAC assessment process. *Augmentative and Alternative Communication*, 28(4), 278-288.
- Binger, C., & Light, J. C. (2008). The morphology and syntax of individuals who use AAC: Research review and implications for effective practice. *Augmentative and Alternative Communication*, 24, 123-138.

- Blischak, D. M., & Schlosser, R. W. (2003). Use of technology to support independent spelling by students with autism. *Topics in Language Disorders, 23*(4), 293-304.
- Blockberger, S., & Johnston, J. R. (2003). Grammatical morphology acquisition by children with complex communication needs *Augmentative and Alternative Communication, 19*(4), 207-221.
- Boone, H. A., & Crais, E. (1999). Strategies for achieving family driven assessment and intervention planning. *Young Exceptional Children, 3*(1), 2-11.
- Bornstein, M. H., Tamis-LeMonda, C. S., & Haynes, O. M. (1999). First words in the second year: Continuity, stability, and models of concurrent and predictive correspondence in vocabulary and verbal responsiveness across age and context. *Infant Behavior and Development, 22*, 65-85.
- Brady, N. (2000). Improved comprehension of object names following voice output communication aid use: Two case studies. *Augmentative and Alternative Communication, 16*, 197-204.
- Brady, N., Thiemann-Bourque, K., Fleming, K., & Matthews, K. (2013). Predicting the language outcomes for children learning augmentative and alternative communication: Child and environmental factors. *Journal of Speech, Language, and Hearing Research, 56*, 1595-1612.
- Branson, D., & Demchak, M. (2009). The use of augmentative and alternative communication methods with infants and toddlers with disabilities: a research review. *Augmentative and Alternative Communication, 25*(4), 274-286. doi:10.3109/07434610903384529
- Brown, R. (1973). *A first language*. Cambridge, MA: Harvard University Press.
- Bush, M., & Scott, R. (2009). No voice, no choice: A sustainable future for Alternative and Augmentative communication (AAC). Retrieved from <http://www.scope.org.uk/Scope/media/Documents/Publication%20Directory/No-voice-no-choice.pdf?ext=.pdf> .
- Cafiero, J. (1998). Communication power for individuals with autism. *Focus on Autism and Other Developmental Disabilities, 13*, 113-121.
- Cafiero, J. (2001). The effect of an augmentative communication intervention on the communication, behaviour and academic program of an adolescent with autism. *Focus on Autism and Other Developmental Disabilities, 16*, 179-193.
- Clendon, S., & Anderson, K. (2016). Syntax and morphology in aided language development. In M. Smith & J. Murray (Eds.), *The silent partner? Language learning and use in aided communication* (pp. 119-140). Guildford, UK: J & R Press.
- Costigan, F. A., & Light, J. C. (2010). A review of preservice training in augmentative and alternative communication for speech-language pathologists, special education teachers, and occupational therapists. *Assistive Technology, 22*, 200-212.
- Cress, C. J., & Marvin, C. A. (2003). Common questions about AAC services in early intervention. *Augmentative and Alternative Communication, 19*(4), 254-272. doi:10.1080/07434610310001598242
- Creswell, J. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*: Pearson Education.

- DaFonte, M. A., & Taber-Doughty, T. (2010). The use of graphic symbols in infancy: how early can we start? *Early Child Development and Care*, 180(4), 417-439. doi:10.1080/03004430802009141
- Dietz, A., Quach, W., Lund, S. K., & McKelvey, M. (2012). AAC assessment and clinical-decision making: The impact of experience. *Augmentative and Alternative Communication*, 28(3), 148-159.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys : the tailored design method* (4th ed.). Hoboken, New Jersey: Wiley.
- Durie, M. (2017). Te whare tapa wha. Retrieved from <http://www.health.govt.nz/our-work/populations/maori-health/maori-health-models/maori-health-models-te-whare-tapa-wha>
- Erickson, K., Hanser, G., Hatch, P., & Sanders, E. (2009). *Research--based practices for creating access to the general curriculum in reading and literacy for students with significant intellectual disabilities*. Retrieved from
- Finke, E. H., McNaughton, D., & Drager, K. D. R. (2009). "All children can and should have the opportunity to learn": General Education Teachers' Perspectives on including children with autism spectrum disorder who require AAC. *Augmentative and Alternative Communication*, 25(2), 110-122.
- Finke, E. H., & Quinn, E. (2012). Perceptions of communication style and influences on intervention practices for young children with AAC needs. *Augmentative and Alternative Communication*, 28(2), 117-126.
- Franklin, A., & Osborne, C. (2015). Independent reviewing officers' communicating with children with complex communication needs - An investigation for DCSF_0.pdf.
- Gibbs, G. (2015). *Analyzing qualitative data*. London, UK: Sage.
- Goossens, C. (1989). Aided communication intervention before assessment: A case study of a child with cerebral palsy. *Augmentative and Alternative Communication*, 5, 14-26.
- Guralnick, M. (1998). Effectiveness of early interention for vulnerable children: A developmental perspective. *American Journal of Mental Retardation*, 102(4), 319-345.
- Guralnick, M. (2000). Early childhood intervention: Evolution of the system. *Focus on Autism and Other Developmental Disabilities*, 15.
- Guralnick, M. (2001). *Early childhood inclusion: Focus on change*. Baltimore: Brookes.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children* Baltimore: Paul H. Brookes Publishing Co.
- Hetzroni, O., & Harris, O. (1996). Cultural aspects in the development of AAC users. *Augmentative and Alternative Communication*, 12(1), 52-58.
- Hustad, K. C., & Miles, L. K. (2010). Alignment between augmentative and alternative communication needs and school-based speech-language services provided to young children with cerebral palsy. *Early Childhood Services (San Diego, Calif.)*, 4(3), 129-140.
- Iacono, T., & Cameron, M. (2009). Australian speech-language pathologists' perceptions and experiences of augmentative and alternative communication in early childhood intervention. *Augmentative and Alternative Communication*, 25(4), 236-249.

- Johnson, J. M., Inglebret, E., Jones, C., & Ray, J. (2006). Perspectives of speech language pathologists regarding success versus abandonment of AAC. *Augmentative and Alternative Communication*, 22(2), 85-99.
- Kangas, K., & Lloyd, L. (1988). Early cognitive skills as prerequisites to augmentative and alternative communication use: What are we waiting for? *Augmentative and Alternative Communication*, 4(4), 211-221.
- Kent-Walsh, J., & Binger, C. (2009). Addressing the communication demands of the classroom for beginning communicators and early language users In G. Soto & C. Zangari (Eds.), *Practically speaking: language literacy, and academic development for students with AAC needs* (1st ed.). Baltimore, Maryland: Paul H. Brookes Publishing Co. .
- Kent-Walsh, J., & McNaughton, D. (2005). Communication partner instruction in AAC: present practices and future directions. . *Augmentative and Alternative Communication*, 21(3), 195-204.
- Kent-Walsh, J., Murza, K. A., Malani, M. D., & Binger, C. (2015). Effects of communication partner instruction on the communication of individuals using AAC: A meta-analysis. *Augmentative and Alternative Communication*, 31(4), 271-284.
- King, G., Lawm, M., King, S., Rosenbaum, P., Kertoy, M. K., & Young, N. L. (2003). A conceptual model of the factors affecting the recreation and leisure participation of children with disabilities. *Physical and Occupational Therapy in Pediatrics*, 23(1), 63-90.
- Kliwer, C., Biklen, D., & Kasa-Hendrickson, C. (2006). Who may be literate? Disability and resistance to the cultural denial of competence. *American Educational Research Journal*, 43(2), 163-192.
- Koppenhaver, D. A., Foley, B. E., & Williams, A. R. (2009). Diagnostic reading assessment for students with AAC needs. In G. Soto & C. Zangari (Eds.), *Practically speaking: language, literacy, and academic development for students with AAC* (1st ed.). Baltimore, Maryland: Paul H. Brookes Publishing Co. .
- Light, J. C. (1989). Toward a definition of communicative competence for individuals using augmentative and alternative communication systems. *Augmentative and Alternative Communication*, 5, 137-144.
- Light, J. C. (1997). "Let's go star fishing": Reflections on the contexts of language learning for children who use aided AAC. *Augmentative and Alternative Communication*, 13, 158-171.
- Light, J. C. (2003). Shattering the silence: Development of communicative competence by individuals who use AAC. In J. C. Light, D. Beukelman, & J. Reichle (Eds.), *Communicative Competence or Individuals who use AAC*. Baltimore, Maryland: Paul H. Brookes.
- Light, J. C., Beukelman, D., & Reichle, J. (2003). Volume Preface. In J. C. Light, D. Beukelman, & J. Reichle (Eds.), *Communicative competence for individuals who use AAC: from research to effective practice*. Baltimore, Maryland: Paul H. Brookes Publishing Co.
- Light, J. C., Binger, C., & Kelford-Smith, A. (1994). Story Reading interactions between preschoolers who use AAC and their mothers. *Augmentative and Alternative Communication*, 10(4), 255-268.

- Light, J. C., Collier, B., & Parnes, P. (1985). Communicative Interaction between Young Nonspeaking Physically Disabled Children and their Primary Caregivers: Part I- Discourse Patterns. *Augmentative and Alternative Communication*, 1(2), 74-83.
- Light, J. C., & McNaughton, D. (1993). Literacy and augmentative and alternative communication (AAC): The expectations and priorities of parents and teachers. *Topics in Language Disorders*, 13(2), 33-46.
- Light, J. C., & McNaughton, D. (2012). The changing face of augmentative and alternative communication: Past, present, and future challenges. *Augmentative and Alternative Communication*, 28(4), 197-204.
doi:10.3109/07434618.2012.737024
- Lund, S. K., & Light, J. C. (2007). Long-term outcomes for individuals who use augmentative and alternative communication: Part 2 - communicative interaction. *Augmentative and Alternative Communication*, 23(1), 1-15.
- MacFarlane, S. (2009). Te pikinga ki runga: raising possibilities. *Research Information for Teachers*, 2, 42-50.
- Maxwell, D. L., & Satake, E. (2006). *Research and statistical methods in communication sciences and disorders* (1st ed.). Boston, MA Thomson/Delmar Learning.
- McCollum, J. A., & Hemmeter, M. L. (1997). Parent-child interaction intervention when children have disabilities *The effectiveness of early intervention* (pp. 549-576).
- McDuffie, A., & Yoder, P. (2010). Types of parent verbal responsiveness that predict language in young children with Autism Spectrum Disorder. *Journal of Speech, Language, and Hearing Research*, 53, 1026-1039.
- McNaughton, D., & Light, J. C. (2013). The iPad and mobile technology revolution: Benefits and challenges for individuals who require augmentative and alternative communication. *Augmentative and Alternative Communication*, 29.
- Ministry for Culture and Heritage. (2017). Read the Treaty. Retrieved from <https://nzhistory.govt.nz/politics/treaty/read-the-treaty/english-text>
- Ministry of Education. (2015). Special education update: update action plan. In Ministry of Education (Ed.). <http://www.education.govt.nz/assets/Documents/Ministry/Initiatives/special-education-update/Special-Education-Update-action-plan-Nov2015.pdf>.
- Ministry of Education. (2016). Special education update - moderising learning support. <http://www.education.govt.nz/ministry-of-education/specific-initiatives/special-education-update/>.
- Ministry of Education. (2017a). Special education early intervention service. <https://www.education.govt.nz/early-childhood/teaching-and-learning/learning-tools-and-resources/early-intervention/>.
- Ministry of Education. (2017b). *Te Whariki*. <https://education.govt.nz/early-childhood/teaching-and-learning/ece-curriculum/te-whariki/>.
- Mirenda, P. (2003). Toward functional augmentative and alternative communication for students with autism: Manual signs, graphic symbols, and voice output communication aids. *Language, Speech and Hearing Services in Schools*, 34, 203-216.
- Muller, E., & Soto, G. (2002). Conversation patterns of three adults using aided speech: variations across partners. *Augmentative and Alternative Communication*, 18(2), 77-90.

- Nardi, P. M. (2014). *Doing survey research: A guide to quantitative methods* (3rd ed.). London: Routledge: Taylor and Francis.
- National Early Childhood Technical Assistance Centre. (2011). The importance of early intervention for infants and toddlers with disabilities and their families. http://www.inclusivechildcare.org/resourcesWeb2/uploads/eifactsheet_2pg.pdf.
- National Joint Committee for the Communication Needs of Persons with Severe Disabilities. (n.d.). Augmentative and alternative communication. Retrieved from www.asha.org/NJC/AAC.
- New South Wales Government Australia. (2015). *Complex communication needs (CCN) practice guide for speech pathologists who support people with disability*. Retrieved from http://www.adhc.nsw.gov.au/data/assets/file/0006/338829/Complex_Communication_Needs_Practice_Guide.pdf.
- Ohio Department of Education. (2015). Workload calculator calculations for full-time service providers. <http://education.ohio.gov/getattachment/Topics/Special-Education/Workload-Calculator/Workload-Calculator-Calculations.pdf.aspx>.
- Ostvik, J., Ytterhus, B., & Balandin, S. (2016). Friendship between children using augmentative and alternative communication and peers: A systematic literature review *Journal of Intellectual & Developmental Disability*.
- Paul, D., & Roth, F. P. (2011). Guiding principles and clinical applications for speech-language pathology practice in early intervention. *Language, Speech and Hearing Services in Schools*, 42, 320-330.
- Paul, R. (2007). *Language disorders from infancy through adolescence* (3rd ed.). St. Louis, MO: Mosby.
- Pennington, L., & McConachie, H. (1999). Mother-child interaction revisited: communication with non-speaking physically disabled children *International Journal of Language and Communication Disorders*, 34(4), 391-416.
- Pennington, L., & McConachie, H. (2001). Predicting patterns of interaction between children with cerebral palsy and their mothers. *Developmental Medicine & Child Neurology*, 43, 83-90.
- Polmanteer, K., & Turbiville, V. (2000). Family-responsive individualized family service plans for speech-language pathologists. *Language, Speech and Hearing Services in Schools*, 31, 4-14.
- Porter, G., & Burkhart, L. (2010). Limitations with using a representational hierarchy approach for language learning. Retrieved from http://lindaburkhart.com/wp-content/uploads/2016/07/representational_hierarchy_draft.pdf
- Porter, G., & Burkhart, L. (2015). *Which way to autonomous communication? Aided language stimulation toward autonomous communication*. Paper presented at the FAST Global Summit.
- Punch, K. F. (2009). *Introduction to research methods in education*: SAGE Publications.
- Punch, K. F. (2014). *Introduction to social research quantitative and qualitative approaches*: SAGE Publications.
- Raghavendra, P., Olsson, C., Sampson, J., Mcinerney, R., & Connell, T. (2012). School participation and social networks of children with complex communication needs, physical disabilities, and typically developing peers. *Augmentative and Alternative Communication*, 28(1), 33-43.

- Raghavendra, P., Virgo, R., Olsson, C., Connell, T., & Lane, A. E. (2011). Activity participation of children with complex communication needs, physical disabilities and typically developing peers. *Developmental Neurorehabilitation, 14*(3), 145-155.
- Roberts, M. Y., & Kaiser, A. P. (2011). The effectiveness of parent-implemented language interventions: A meta-analysis. *American Journal of Speech-Language Pathology, 20*, 180-199.
- Romski, M., & Sevcik, R. A. (1996). *Breaking the speech barrier: Language development through augmented means*. Baltimore: Brookes.
- Romski, M., & Sevcik, R. A. (2003). Augmented input: Enhancing communication development. In J. C. Light, D. Beukelman, & J. Reichle (Eds.), *Communicative competence for individuals who use AAC* (pp. 147-162). Baltimore: Brookes.
- Romski, M., & Sevcik, R. A. (2005). Augmentative communication and early interventions: myths and realities. *Infants & Young Children, 18*(3), 174-185.
- Romski, M., Sevcik, R. A., Barton-Hulsey, A., & Whitmore, A. S. (2015). Early intervention and AAC: What a difference 30 years makes. *Augmentative and Alternative Communication, 31*(3), 181-202.
doi:10.3109/07434618.2015.1064163
- Rotholz, D., Berkowitz, S., & Burberry, J. (1989). Functionality of two modes of communication in the community by students with developmental disabilities: A comparison of signing and communication books. *Journal of the Association for Persons with Severe Handicaps, 14*, 227-223.
- Roulstone, S., & Lindsay, G. (2012). *The perspectives of children and young people who have speech, language and communication needs, and their parents*. Retrieved from <https://www.gov.uk/government/publications/the-perspectives-of-children-and-young-people-who-have-speech-language-and-communication-needs-and-their-parents>:
- Sennott, S. C., Light, J. C., & McNaughton, D. (2016). AAC modelling intervention research review. *Research and Practice for Persons with Severe Disabilities*.
- Shiawassee Regional Educational Service District. (2010). Workload calculator. Retrieved from www.asha.org/events/convention/handouts/2011/scow-yauch-schafer-burtch-2/.
- Simpson, K., Beukelman, D., & Bird, A. (1998). Surevy of school speech and language service provision to students with severe commmunication impairments in Nebraska. *Augmentative and Alternative Communication, 14*(4), 212-221.
- Siu, E., Tam, E., Sin, D., Ng, C., Lam, E., Chui, M., . . . Lam, C. (2010). A survey of augmentative and alternative communication service provision in Hong Kong. *Augmentative and Alternative Communication, 26*(4), 289-298.
- Speech Pathology Australia. (2011). *Competency-based occupational standards for speech pathologists: Entry level* Retrieved from https://speechpathologyaustralia.org.au/SPAweb/Resources_For_Speech_Pathologists/CBOS/SPAweb/Resources_for_Speech_Pathologists/CBOS/CBOS.aspx?hkey=c1509605-c754-4aa8-bc10-b099c1211d4d:
- Squires, J., & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3)*. Baltimore, MD: Brookes Publishing.

- Sullivan, G. M., & Artino, A. R. (2013). Analyzing and interpreting data from likert-type scales. *Journal of Graduate Medical Education*.
- Sutherland, D. E., Gillon, G. G., & Yoder, D. E. (2005). AAC use and service provision: A survey of New Zealand speech-language therapists. *Augmentative and Alternative Communication*, 21(4), 295-307.
- Sutton, A., Soto, G., & Blockberger, S. (2002). Grammatical issues in graphic symbol communication. *Augmentative and Alternative Communication*, 18(3), 192-204.
- TalkLink Trust. (2012). About us. Retrieved from <https://www.talklink.org.nz/index.php/about/>
- Thirumanickam, A., Raghavendra, P., & Olsson, C. (2011). Participation and social networks of school-age children with complex communication needs: A descriptive study. *Augmentative and Alternative Communication*, 27(3), 195-204.
- Thomas-Stonell, N., Robertson, B., Oddson, B., & Rosenbaum, P. (2016). Communicative participation changes in pre-school children receiving augmentative and alternative communication intervention *International Journal of Speech-Language Pathology*, 18(1), 32-40.
- UN General Assembly. (1989). *Convention on the right of the child*. Retrieved from <http://www.refworld.org/docid/3ae6b38f0.html>:
- United Nations. (1948). *Universal declaration of human rights*. Retrieved from <http://www.un.org/en/universal-declaration-human-rights/>:
- United Nations. (2006). *Convention on the rights of persons with disabilities*. <http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf>.
- Van Tatenhove, G. M. (1987). Teaching power through augmentative communication: Guidelines for early intervention *Communication Disorders Quarterly*, 10(2), 185-199. doi:10.1177/152574018701000207
- Von Tetzchner, S., & Martinsen, H. (2000). *Introduction to augmentative and alternative communication : sign teaching and the use of communication aids for children, adolescents, and adults with developmental disorders* (2nd ed.). London; Philadelphia: Whurr.
- von Tetzchner, S., & Stadskleiv, K. (2016). Constructing a language in alternative forms. In M. M. Smith & J. Murray (Eds.), *The silent partner? Language, interaction and aided communication*. Guildford, Surrey, United Kingdom: J&R Publishing Services Limited.
- Warren, S. F., Brady, N., Sterling, A., K., F., & Marquis, J. (2010). Maternal responsivity predicts language development in young children with Fragile X syndrome. *American Journal of Intellectual and Developmental Disability*, 115, 54-75.
- Washington, K., Thomas-Stonell, N., Oddson, B., McLeod, S., Warr-Leeper, G., Robertson, B., & Rosenbaum, P. (2013). Construct validity of the FOCUS (focus on the outcomes of communication under six): A communicative participation outcome measure for preschool children. *Child Care Health and Development*, 39(4), 481-489.
- Wing, C., Kohnert, K., Pham, G., Cordero, K. N., Ebert, K. D., Kan, P. F., & Blasler, K. (2007). Culturally consistent treatment for late talkers. *Communication Disorders Quarterly*, 29(1), 20-27.
- World Health Organisation. (2002). *Towards a common language for functioning , disability and health*. <http://www.who.int/classifications/icf/icfbeginnersguide.pdf>.

- World Health Organisation. (2007). *International classification of functioning, disability and health: children and youth version: ICF-CY*.
http://apps.who.int/iris/bitstream/10665/43737/1/9789241547321_eng.pdf.
- Wormnaes, S., & Malek, Y. A. (2004). Egyptian speech therapists want more knowledge about augmentative and alternative communication. *Augmentative and Alternative Communication*, 20(1), 30-41.
- Yoder, P., & Warren, S. (1998). Maternal responsivity predicts the prelinguistic communication intervention that facilitates generalized intentional communication. *Journal of Speech, Language, and Hearing Research*, 41, 1207-1219.
- Yoder, P., & Warren, S. (2001). Relative treatment effects of two prelinguistic communication interventions on language development in toddlers with developmental delays vary by maternal characteristics. *Journal of Speech, Language, and Hearing Research*, 44, 224-237.
- Yoder, P., & Warren, S. (2002). Effects of prelinguistic milieu teaching and parent responsivity education on dyads involving children with intellectual disabilities. *Journal of Speech, Language, and Hearing Research*, 45, 1158-1174.
- Zangari, C., & Van Tatenhove, G. M. (2009). Supporting more advanced linguistic communicators in the classroom. In G. Soto & C. Zangari (Eds.), *Practically speaking: language, literacy, & academic development for students with AAC needs* (1st ed.). Baltimore, Maryland: Paul H. Brookes Publishing co. .

Appendices

Appendix A: Recruitment email example

Hello my name is Claire-Ellen Roberts, and I am a Masters student in the Speech-Language Therapy programme at Massey University, Auckland, under the supervision of Dr Sally Clendon and Dr Elizabeth Doell. My current employment is full-time as a Speech-Language Therapist at Kimi Ora Special School in Wellington.

The aim of my project is to explore the perceptions and experiences of New Zealand speech-language therapists who work with preschool children with complex communication needs.

The project involves completing an online survey. The survey can be completed at a time that is convenient and will take approximately 20 minutes.

Please find attached the information sheet. Please read this and if you are willing to complete the survey follow the link: <https://www.surveymonkey.com/r/3K6ZL36>

Claire-Ellen Roberts

Speech-Language Therapist
Kimi Ora Special School - Evans Bay Site
14 Kemp Street
Kilbirnie
Wellington
(04) 387 9301

Appendix B: Information sheet



MASSEY UNIVERSITY
INSTITUTE OF EDUCATION
TE KURA O TE MATĀURANGA

New Zealand Speech Language Therapists' Perceptions and Experiences of Supporting Preschool Children with Complex Communication Needs

INFORMATION SHEET – INVITATION TO PARTICIPATE IN A SURVEY

Researcher(s) Introduction

Hello my name is Claire-Ellen Roberts, and I am a Masters student in the Speech-Language Therapy programme at Massey University, Auckland, under the supervision of Dr Sally Clendon and Dr Elizabeth Doell. My current employment is full-time as a Speech-Language Therapist at Kimi Ora Special School in Wellington.

Project Description and Invitation

The aim of this project is to explore the perceptions and experiences of New Zealand speech-language therapists who work with preschool children with complex communication needs.

In this project speech-language therapists will complete a survey that will capture their clinical expertise and professional learning needs as well as their competence in introducing and supporting Augmentative and Alternative Communication (AAC). The survey will also attain the demographic characteristics of speech-language therapist's caseloads and those factors that may facilitate or hinder the use of AAC with preschool children.

I would be very grateful if you would consider participating in this project.

Participant Identification and Recruitment

I am recruiting speech-language therapists who currently work with preschool children with complex communication needs. I have sent information about the project to a number of organisations including the New Zealand Speech Language Therapists' Association, TalkLink Trust, the Ministry of Education, as well as a number of early intervention centres. I have requested their assistance in distributing the Information Sheet.

Project Procedures

The project involves completing an online survey. The survey can be completed at a time that is convenient to you and will take approximately 20 minutes.

There will be no direct benefits or identified risks to you participating. However, results of the study will help to increase the knowledge of the issues surrounding AAC implementation for preschool children with complex communication needs.

The survey is anonymous. By choosing to complete the survey, it will be assumed that you consent to your responses being used in the research project.

When the project is finished, the results of the study may be published in journals or presented at conferences; however, no publications arising from the research project will include your name or personal details, as the survey is anonymous.

The information will be stored securely in a locked office at Massey University, and/or on a password protected hard drive, and will only be accessed by the researcher and project supervisors. It will be kept for 5 years following the completion of the final publication. When disposed of, the University confidential waste service will be used for any printed materials.

Participant's Rights

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- Ask questions about the study.
- Decline to answer any question in the survey.

Project Contacts

If you think you might be interested in being part of this project, you can complete the survey online by following the link. The survey is anonymous. By choosing to complete the survey, it is assumed that you consent to your responses being used in this research project.

<https://www.surveymonkey.com/r/3K6ZL36>

If you have any questions relating to the project, please call Claire-Ellen Roberts on **027 354 4063** or Dr. Sally Clendon on **414 0800 Ext. 43537**.

Committee Approval Statement

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 16/49 . If you have any concerns about the conduct of this research, please contact Dr Lily George, Acting Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 43923, email humanethicsnorth@massey.ac.nz.

Thank you for considering this project.

This information sheet is for you to keep

Appendix C: Copy of online survey

Background Information

* 1. How many years have you practiced as a speech-language therapist?

- <1 year
- 1-2 years
- 3-5 years
- 6-10 years
- >10 years

* 2. What is your current service setting?

- Hospital
- Early Intervention (Ministry of Education)
- Early Intervention Centre
- Talklink
- ACC
- Private Practice
- Other (please specify)

* 3. How long have you been working in your current service setting?

- <1 year
- 1-2 years
- 3-5 years
- 6-10 years
- >10 years

* 4. How long have you been providing AAC services?

- <1 year
- 1-2 years
- 3-5 years
- 6-10 years
- 10 years +
- None

Caseload Information

* 5. How many children do you have on your caseload that are under 5 years of age and have no words or very limited functional speech?

* 6. What diagnoses do these children have?

- Autism Spectrum Disorder (ASD)
- Cerebral Palsy
- Dyspraxia
- Developmental delay

* 7. How many of these children are receiving AAC intervention?

- All
- Some
- None

8. If some are not, please explain why they are not receiving AAC intervention.

* 9. Please indicate the number of clients on your caseload that are using the following AAC methods/Devices.

Please Select

Makaton	<input type="text"/>
Picture Exchange Communication System (PECS)	<input type="text"/>
Core Word Boards	<input type="text"/>
Core word boards with fringe vocabulary	<input type="text"/>
Pragmatically Organised Dynamic Display (PODD)	<input type="text"/>
Low Tech devices (e.g. BIG mack, Step-by-Step, Go Talk 1, 4, 9, 20)	<input type="text"/>
High Tech Communication dedicated device (e.g. Accent, Tobii C15)	<input type="text"/>
Tablet Device with App (e.g. Proloquo2go, TouchChat)	<input type="text"/>

Professional Learning and Development

* 10. What training did you receive in AAC as part of your basic university qualification? (Please tick all that apply)

- None
- A paper on AAC
- 1-2 lectures on AAC
- Clinical Practicum experience
- Research Project experience
- Other (please specify)

* 11. What professional learning and development in AAC have you engaged in since completing your basic university qualification? (Please tick all that apply)

- None
- In-service programs
- Courses/workshops/conferences
- Post-graduate study
- Special Interest Group
- Peer learning (e.g. discussions with other professionals)
- Self-directed learning (e.g. reading books, journal articles)
- Online learning (e.g. blogs, participation in forums, websites)
- Other (please specify)

* 12. How competent do you feel in providing AAC services to young children?

- 1 - No experience
- 2 - Novice
- 3 - Competent
- 4 - Highly Competent

* 13. How competent do you feel in implementing the following AAC systems or methods?

	No experience	Novice	Competent	Highly Competent
Makaton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Picture Exchange Communication System (PECS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Core word boards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Core word boards with fringe vocabulary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pragmatically Organised Dynamic Display (PODD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low Tech devices (e.g. BIG mack, Step-by-Step, Go Talk 1, 4, 9, 20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Tech Communication dedicated device (e.g. Accent, Tobii C15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tablet Device with App (e.g. Proloquo2go, TouchChat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Beliefs around AAC implementation with young children

* 14. How much importance do you place on the following factors when deciding whether or not to implement AAC with preschool children who have no words or very limited functional speech?

	Not Important	Slightly Important	Moderately Important	Important	Very Important
Age	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cognition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Type of diagnosis/communication disorder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family attitudes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical capabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 15. Please rate each of the following statements in terms of how strongly you agree or disagree with them

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
The introduction of AAC will hinder speech development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individuals with significant cognitive delays can be very successful with AAC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A child under the age of 2 is not ready for AAC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gaining competence in AAC can take a very long time for a child	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AAC is the responsibility of every communication partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AAC is a "last resort" in speech-language intervention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AAC is only for children who have no words	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A child must recognise objects and photographs before symbols are introduced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Facilitators and Barriers to AAC Implementation with Young Children.

* 16. Please list 3 barriers to AAC implementation with preschool children.

17. Please list 3 facilitators to AAC implementation with preschool children.

Appendix D: Ethics approval letter



MASSEY

UNIVERSITY

Date: 08 February 2017

Dear Claire-Ellen Roberts

Re: Ethics Notification - NOR 16/49 - New Zealand Speech Language Therapists' Perceptions and Experiences of Supporting Preschool Children with Complex Communication Needs

Thank you for the above application that was considered by the Massey University Human Ethics Committee: Human Ethics Northern Committee at their meeting held on Wednesday, 8 February, 2017.

On behalf of the Committee I am pleased to advise you that the ethics of your application are approved.

Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

A handwritten signature in black ink, appearing to read 'B Finch'.

Dr Brian Finch

Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

Research Ethics Office, Research and Enterprise

Massey University, Private Bag 11 222t Palmerston North, 4442, New Zealand T 06 951 6841; 06 95106840

E humanethics@massey.ac.nz; animalethics@massey.ac.nz; gtc@massey.ac.nz